



# RADIO TEST REPORT

Test Report No. : 27IE0024-HO-I

**Applicant** : Nagano Japan Radio Co., Ltd.  
**Type of Equipment** : Wireless LAN Module  
**Model No.** : NJT-511  
**FCC ID** : D7LNJT511  
**Test standard** : FCC Part 15 Subpart C 2007  
Section 15.247  
\*Radiated Emission Test only  
**Test Result** : Complied

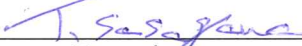
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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.

**Date of test:**


October 26 to 28, 2007

**Tested by:**

  
Takumi Shimada  
EMC Services

  
Tomotaka Sasagawa  
EMC Services

**Approved by :**

  
Tetsuo Maeno  
Site Manager of EMC Services



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.  
\*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://uljapan.co.jp/emc/nvlap.htm>

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MF060b (18.06.07)

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## **SECTION 1: Client information**

Company Name : Nagano Japan Radio Co., Ltd.  
Address : 1163 Inasato-machi, Nagano City 381-2288 Japan  
Telephone Number : +81-26-285-1093  
Facsimile Number : +81-26-285-1037  
Contact Person : Takaaki Fukaya

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : Wireless LAN Module  
Model No. : NJT-511  
Serial No. : 0013E099F133  
Country of Manufacture : JAPAN  
Rating : DC3.3V  
Receipt Date of Sample : July 2, 2007  
Condition of EUT : Production Prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No modification by this test lab

### **2.2 Product Description**

Model No: NJT-511, referred as the EUT in this report, is the Wireless LAN Module.  
It is integrated into a Handheld Terminal.  
Clock Frequency : 38.4MHz

|                             |  |           |
|-----------------------------|--|-----------|
| Equipment Type              | Transceiver  |           |
| Frequency band              | Lower limit  | 2400MHz   |
|                             | Upper limit  | 2483.5MHz |
| Frequency of Operation      | 2412-2462MHz   |           |
| Bandwidth & Channel spacing | 20MHz & 5MHz   |           |
| Type of Modulation          | DSSS (DBPSK, DQPSK, CCK)<br>OFDM (BPSK, QPSK, 16QAM,<br>64QAM) |           |
| Antenna Type                | Chip Antenna   |           |
| Antenna Connector Type      | W.FL Plug  |           |
| Antenna Gain                | 2.14dBi max  |           |
| ITU code                    | G1D / D1D  |           |
| Power Supply                | DC 3.3V  |           |

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## **UL Japan, Inc.**

### **Head Office EMC Lab.**

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart C: 2007  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

#### **FCC 15.31 (e)**

As this EUT does not have a regulator, the supplied voltage depends on the installed device. Therefore the certification is limited only for the device which can provide voltage(DC3.3V) constantly.

#### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of Handheld Terminal in which the EUT is installed. Therefore, the equipment complies with the antenna requirement of Section 15.203.

#### **3.2 Procedures and results**

| No. | Item              | Test Procedure   | Specification                               | Remarks  | Deviation | Worst margin   | Results  |
|-----|-------------------|--|---|----------|-----------|--|----------|
| 1   | Spurious Emission | FCC: ANSI C63.4:2003<br>13. Measurement of intentional radiators | FCC: Section15.247(d)                       | Radiated | N/A       | [Tx]<br>0.7dB<br>335.997MHz, QP,<br>Horizontal<br>[Rx]<br>0.8dB<br>335.997MHz, QP,<br>Horizontal | Complied |
|     |                   | IC: RSS-Gen 4.9<br>RSS-Gen 4.10                                  | IC: RSS-210 A8.5<br>RSS-Gen 7.2.1 and 7.2.3 |          |           |  |          |

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.

\*These tests were also referred to "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247".

\*These tests were performed without any deviations from test procedure except for additions or exclusions.

#### **3.3 Uncertainty**

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

#### **Spurious Emission (Radiated)**

The measurement uncertainty for this test using Biconical antenna is  $\pm 4.88\text{dB}(3\text{m})$ .

The measurement uncertainty for this test using Logperiodic antenna is  $\pm 4.86\text{dB}(3\text{m})$ .

The measurement uncertainty for this test using Horn antenna is  $\pm 5.77\text{dB}$ .

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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### 3.4 Test Location

UL Japan, Inc. Head Office EMC Lab. \*NVLAP Lab. code: 200572-0  
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Telephone: +81 596 24 8116 Facsimile: +81 596 24 8124

|                            | FCC Registration Number | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms      |
|----------------------------|-------------------------|------------------------|----------------------------|--|------------------|
| No.1 semi-anechoic chamber | 313583                  | IC4247                 | 19.2 x 11.2 x 7.7m         | 7.0 x 6.0m   | Preparation room |
| No.2 semi-anechoic chamber | 655103                  | IC4247-2               | 7.5 x 5.8 x 5.2m           | 4.0 x 4.0m   | -                |
| No.3 semi-anechoic chamber | 148738                  | IC4247-3               | 12.0 x 8.5 x 5.9m          | 6.8 x 5.75m  |                  |
| No.3 shielded room         | -                       | -                      | 4.0 x 6.0 x 2.7m           | N/A  | -                |
| No.4 semi-anechoic chamber | 134570                  | IC4247-4               | 12.0 x 8.5 x 5.9m          | 6.8 x 5.75m  | -                |
| No.4 shielded room         | -                       | -                      | 4.0 x 6.0 x 2.7m           | N/A  | -                |
| No.5 semi-anechoic chamber | -                       | -                      | 6.0 x 6.0 x 3.9m           | N/A  | -                |
| No.6 shielded room         | -                       | -                      | 4.0 x 4.5 x 2.7m           | 4.75 x 5.4 m   | -                |
| No.6 measurement room      | -                       | -                      | 4.75 x 5.4 x 3.0m          | 4.75 x 4.15 m  | -                |
| No.7 shielded room         | -                       | -                      | 4.7 x 7.5 x 2.7m           | 4.7 x 7.5m   | -                |
| No.8 measurement room      | -                       | -                      | 3.1 x 5.0 x 2.7m           | N/A  | -                |

\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

### 3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Modes**

The mode used for test:

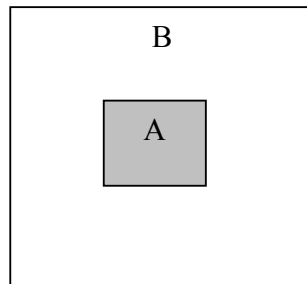
| <b>Test</b>                                | <b>Mode</b>   | <b>Tested frequency</b>       |
|--|---|-------------------------------|
| Radiated Spurious Emission<br>(below 1GHz) | IEEE802.11b Transmitting (Tx), 11Mbps<br>IEEE802.11g Transmitting (Tx), 9Mbps<br>IEEE802.11b/g Receiving (Rx) | 2437MHz                       |
| Radiated Spurious Emission<br>(above 1GHz) | IEEE802.11b Transmitting (Tx), 11Mbps<br>IEEE802.11g Transmitting (Tx), 9Mbps                                 | 2412MHz<br>2437MHz<br>2462MHz |
|  | -----<br>IEEE802.11b/g Receiving (Rx)   | 2437MHz                       |

Transmitting duty was 100% on all tests.

\*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum rated power.

\*The test was performed with the EUT integrated into the Barcode Handy Terminal.

### **4.2 Configuration and peripherals**



\* Setup were taken into consideration and test data was taken under worse case conditions.

#### **Description of EUT and Support equipment**

| <b>No.</b> | <b>Item</b>         | <b>Model number</b> | <b>Serial number</b> | <b>Manufacturer</b>          | <b>Remark</b> |
|------------|---------------------|---------------------|----------------------|------------------------------|---------------|
| A          | Wireless LAN Module | NJT-511             | 0013E099F133         | Nagano Japan Radio Co., Ltd. | EUT           |
| B          | Handheld Terminal   | BHT-300BW8MB        | 5496310377700019     | DENSO WAVE                   | -             |

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## **SECTION 5: Spurious Emission**

### **[Radiated]**

#### **Test Procedure**

EUT was placed on a urethane platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane. The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

**20dBc was applied to the frequency over the limit of FCC 15.209 / Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).**

| Frequency       | Below 1GHz                               | Above 1GHz   |
|-----------------|--|--|
| Instrument used | Test Receiver / Spectrum Analyzer        | Spectrum Analyzer                                      |
| Detector        | QP: BW 120kHz(T/R)                       | PK: RBW:1MHz/VBW: 1MHz                                 |
| IF Bandwidth    | 20dBc : RBW: 100kHz<br>VBW: 300kHz (S/A) | AV: RBW:1MHz/VBW:10Hz<br>20dBc : RBW:100kHz/VBW:300kHz |

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

**Test data : APPENDIX 2**

**Test result : Pass**

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**APPENDIX 2: Data of EMI test**

**Radiated Spurious Emission (below 1GHz)**  
**Tx 11b 11Mbps, Ch: Mid**

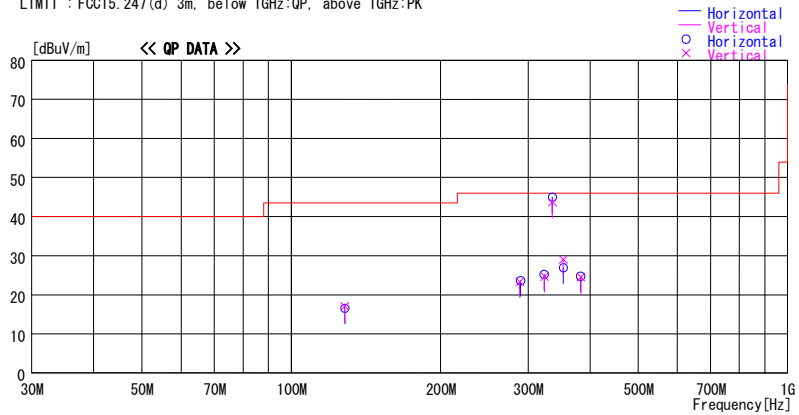
**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Date : 2007/10/28

Company : Nagano Japan Radio Co., Ltd. Report No. : 27IE0024-HO  
Kind of EUT : Wireless LAN Module Power : DC 3.3V  
Model No. : NJT-511 Temp./Humi. : 25deg. C. / 55%  
Serial No. : 0013E099F133 Operator : Tomotaka Sasagawa

Mode / Remarks : IEEE802.11b 11Mbps Tx 2437MHz, Max-Axis (Hor: Y, Ver: Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK



| Frequency<br>[MHz] | Reading<br>[dBUV] | DET | Antenna          |                     | Level<br>[dBUV/m] | Polar. | Limit<br>[dBUV/m] | Margin<br>[dB] |
|--------------------|-------------------|-----|------------------|---------------------|-------------------|--------|-------------------|----------------|
|                    |                   |     | Factor<br>[dB/m] | Loss & Gain<br>[dB] |                   |        |                   |                |
| 128.279            | 26.4              | QP  | 13.8             | -23.6               | 16.6              | Hori.  | 43.5              | 26.9           |
| 128.112            | 26.8              | QP  | 13.8             | -23.6               | 17.0              | Vert.  | 43.5              | 26.5           |
| 288.660            | 26.1              | QP  | 19.3             | -22.1               | 23.3              | Vert.  | 46.0              | 22.7           |
| 289.740            | 26.3              | QP  | 19.4             | -22.1               | 23.6              | Hori.  | 46.0              | 22.4           |
| 323.100            | 30.7              | QP  | 16.4             | -21.9               | 25.2              | Hori.  | 46.0              | 20.8           |
| 323.800            | 30.2              | QP  | 16.4             | -21.9               | 24.7              | Vert.  | 46.0              | 21.3           |
| 335.977            | 50.1              | QP  | 16.6             | -21.8               | 44.9              | Hori.  | 46.0              | 1.1            |
| 335.998            | 48.9              | QP  | 16.6             | -21.8               | 43.7              | Vert.  | 46.0              | 2.3            |
| 353.201            | 31.7              | QP  | 16.9             | -21.7               | 26.9              | Hori.  | 46.0              | 19.1           |
| 353.112            | 33.9              | QP  | 16.9             | -21.7               | 29.1              | Vert.  | 46.0              | 16.9           |
| 383.212            | 28.9              | QP  | 17.3             | -21.5               | 24.7              | Hori.  | 46.0              | 21.3           |
| 383.302            | 28.7              | QP  | 17.3             | -21.5               | 24.5              | Vert.  | 46.0              | 21.5           |

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz--HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

\*The test result is rounded off to one or two decimal places, so some differences might be observed.



**Radiated Spurious Emission (below 1GHz)**  
**Tx 11g 9Mbps, Ch: Mid**

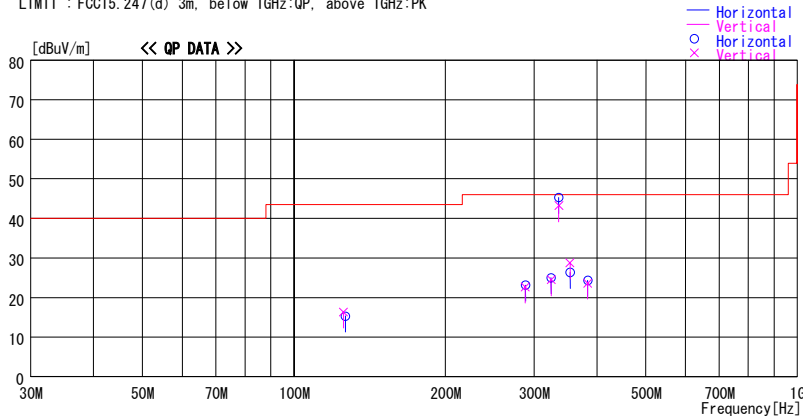
**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber  
Date : 2007/10/28

Company : Nagano Japan Radio Co., Ltd. Report No. : 271E0024-HO  
Kind of EUT : Wireless LAN Module Power : DC 3.3V  
Model No. : NJT-511 Temp./Humi. : 25deg.C. / 55%  
Serial No. : 0013E099F133 Operator : Tomotaka Sasagawa

Mode / Remarks : IEEE802.11g 9Mbps Tx 2437MHz, Max-Axis (Hor: Y, Ver: Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK



| Frequency<br>[MHz] | Reading<br>[dBuV] | DET | Antenna          | Loss &       | Level<br>[dBuV/m] | Polar. | Limit<br>[dBuV/m] | Margin<br>[dB] |
|--------------------|-------------------|-----|------------------|--------------|-------------------|--------|-------------------|----------------|
|                    |                   |     | Factor<br>[dB/m] | Gain<br>[dB] |                   |        |                   |                |
| 125.455            | 26.5              | QP  | 13.5             | -23.7        | 16.3              | Vert.  | 43.5              | 27.2           |
| 126.659            | 25.3              | QP  | 13.6             | -23.6        | 15.3              | Hori.  | 43.5              | 28.2           |
| 288.390            | 25.9              | QP  | 19.3             | -22.1        | 23.1              | Hori.  | 46.0              | 22.9           |
| 287.973            | 25.5              | QP  | 19.3             | -22.1        | 22.7              | Vert.  | 46.0              | 23.3           |
| 324.411            | 30.5              | QP  | 16.4             | -21.9        | 25.0              | Hori.  | 46.0              | 21.0           |
| 324.416            | 30.0              | QP  | 16.4             | -21.9        | 24.5              | Vert.  | 46.0              | 21.5           |
| 335.986            | 48.4              | QP  | 16.6             | -21.8        | 43.2              | Vert.  | 46.0              | 2.8            |
| 335.997            | 50.5              | QP  | 16.6             | -21.8        | 45.3              | Hori.  | 46.0              | 0.7            |
| 353.903            | 31.1              | QP  | 16.9             | -21.7        | 26.3              | Hori.  | 46.0              | 19.7           |
| 353.892            | 33.5              | QP  | 16.9             | -21.7        | 28.7              | Vert.  | 46.0              | 17.3           |
| 383.381            | 28.6              | QP  | 17.3             | -21.5        | 24.4              | Hori.  | 46.0              | 21.6           |
| 383.394            | 27.8              | QP  | 17.3             | -21.5        | 23.6              | Vert.  | 46.0              | 22.4           |

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

**Radiated Spurious Emission (below 1GHz)**  
**Rx 11b/g, Ch:Mid**

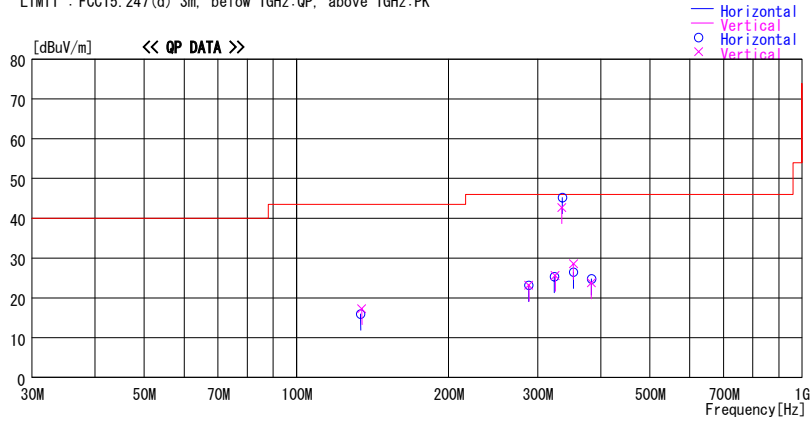
**DATA OF RADIATED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber  
Date : 2007/10/28

Company : Nagano Japan Radio Co., Ltd. Report No. : 271E0024-HO  
Kind of EUT : Wireless LAN Module Power : DC 3.3V  
Model No. : NJT-511 Temp./Humi. : 25deg. C. / 55%  
Serial No. : 0013E099F133 Operator : Tomotaka Sasagawa

Mode / Remarks : IEEE802.11b 11Mbps Rx 2437MHz, Max-Axis (Hor: Y, Ver: Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK



| Frequency<br>[MHz] | Reading<br>[dBuV] | DET | Antenna          | Loss &       | Level<br>[dBuV/m] | Polar. | Limit<br>[dBuV/m] | Margin<br>[dB] |
|--------------------|-------------------|-----|------------------|--------------|-------------------|--------|-------------------|----------------|
|                    |                   |     | Factor<br>[dB/m] | Gain<br>[dB] |                   |        |                   |                |
| 133.949            | 25.2              | QP  | 14.2             | -23.5        | 15.9              | Hori.  | 43.5              | 27.6           |
| 134.759            | 26.5              | QP  | 14.3             | -23.5        | 17.3              | Vert.  | 43.5              | 26.2           |
| 288.120            | 25.9              | QP  | 19.3             | -22.1        | 23.1              | Hori.  | 46.0              | 22.9           |
| 288.390            | 26.0              | QP  | 19.3             | -22.1        | 23.2              | Vert.  | 46.0              | 22.8           |
| 323.800            | 30.8              | QP  | 16.4             | -21.9        | 25.3              | Hori.  | 46.0              | 20.7           |
| 325.200            | 31.0              | QP  | 16.5             | -21.9        | 25.6              | Vert.  | 46.0              | 20.4           |
| 335.001            | 47.9              | QP  | 16.6             | -21.8        | 42.7              | Vert.  | 46.0              | 3.3            |
| 335.997            | 50.4              | QP  | 16.6             | -21.8        | 45.2              | Hori.  | 46.0              | 0.8            |
| 353.201            | 31.2              | QP  | 16.9             | -21.7        | 26.4              | Hori.  | 46.0              | 19.6           |
| 353.112            | 33.4              | QP  | 16.9             | -21.7        | 28.6              | Vert.  | 46.0              | 17.4           |
| 383.302            | 28.9              | QP  | 17.3             | -21.5        | 24.7              | Hori.  | 46.0              | 21.3           |
| 383.221            | 28.0              | QP  | 17.3             | -21.5        | 23.8              | Vert.  | 46.0              | 22.2           |

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11b 11Mbps, Ch:Low**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

Company : Nagano Japan Radio Co., Ltd.  
Equipment : Wireless LAN Module  
Model : NJT-511  
Sample No. : 0013E099F133  
Power : DC 3.3V  
Mode : Transmitting mode 11b (11M bps)  
Remarks : Hor Y, Ver Z-axis

REPORT NO : 27IE0024-HO  
REGULATION : FCC15.247(d)/RSS-210A8.5  
TEST DISTANCE : 3/m  
DATE : 10/28/2007  
TEMPERATURE : 25deg.C  
HUMIDITY : 55%  
ENGINEER : Tomotaka Sasagawa

**PK DETECT (RBW: 1MHz, VBW: 1MHz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2390.0        | 53.8        | 54.0 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 51.2   | 51.4 | 73.9                    | 22.7   | 22.5 |
| 2*  | 2400.0        | 64.5        | 61.6 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 61.9   | 59.0 | -                       | -      | -    |
| 3   | 4824.0        | 42.2        | 41.7 | 30.8                    | 31.2                | 3.4                   | 1.0                       | 46.2   | 45.7 | 73.9                    | 27.7   | 28.2 |
| 4   | 7236.0        | 42.1        | 42.1 | 35.7                    | 32.5                | 4.2                   | 0.7                       | 50.2   | 50.2 | 73.9                    | 23.7   | 23.7 |
| 5   | 9648.0        | 42.9        | 42.5 | 38.2                    | 32.9                | 5.3                   | 0.5                       | 54.0   | 53.6 | 73.9                    | 19.9   | 20.3 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12060.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 14472.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 16884.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 19296.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 10  | 21708.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 11  | 24120.0       | 45.6        | 44.9 | 38.7                    | 32.2                | 8.1                   | 0.0                       | 50.7   | 50.0 | 73.9                    | 23.2   | 23.9 |

**AV DETECT (RBW: 1MHz, VBW: 10Hz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2390.0        | 41.4        | 39.3 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 38.8   | 36.7 | 53.9                    | 15.1   | 17.2 |
| 2*  | 2400.0        | 50.7        | 48.6 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 48.1   | 46.0 | -                       | -      | -    |
| 3   | 4824.0        | 29.5        | 29.1 | 30.8                    | 31.2                | 3.4                   | 1.0                       | 33.5   | 33.1 | 53.9                    | 20.4   | 20.8 |
| 4   | 7236.0        | 29.5        | 29.6 | 35.7                    | 32.5                | 4.2                   | 0.7                       | 37.6   | 37.7 | 53.9                    | 16.3   | 16.2 |
| 5   | 9648.0        | 29.6        | 29.7 | 38.2                    | 32.9                | 5.3                   | 0.5                       | 40.7   | 40.8 | 53.9                    | 13.2   | 13.1 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12060.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 7   | 14472.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 8   | 16884.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 9   | 19296.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 10  | 21708.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 11  | 24120.0       | 33.4        | 33.1 | 38.7                    | 32.2                | 8.1                   | 0.0                       | 38.5   | 38.2 | 53.9                    | 15.4   | 15.7 |

\* Reference data

**20dBc(Fundamental 2412MHz) (RBW: 100kHz, VBW: 300kHz)**

| No.  | FREQ<br>[MHz] | S/A READING |       | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>20dBc<br>[dBuV/m] | MARGIN |      |
|--|---------------|-------------|-------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|----------------------------|--------|------|
|  |               | HOR         | VER   |                         |                     |                       |                           | HOR    | VER  |                            | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b> |               |             |       |                         |                     |                       |                           |        |      |                            |        |      |
| 0  | 2412.0        | 103.1       | 101.0 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 100.5  | 98.4 | -                          | -      | -    |
| 2  | 2400.0        | 52.3        | 49.7  | 27.0                    | 32.1                | 2.5                   | 0.0                       | 49.7   | 47.1 | Funda-20dB                 | 30.8   | 31.3 |

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Filter was not used for factor 0.0dB of the above table.

\*NS:Non Signal

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11b 11Mbps, Ch:Mid**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                   |               |                                    |
|------------|-----------------------------------|---------------|------------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd.    | REPORT NO     | : 27IE0024-HO                      |
| Equipment  | : Wireless LAN Module             | REGULATION    | : FCC 15.247(d)/RSS-210A8.5        |
| Model      | : NJT-511                         | TEST DISTANCE | : 3/1m                             |
| Sample No. | : 0013E099F133                    | DATE          | : 10/26/2007 10/28/2007            |
| Power      | : DC 3.3V                         | TEMPERATURE   | : 24deg.C 25deg.C                  |
| Mode       | : Transmitting mode 11b (11M bps) | HUMIDITY      | : 60% 55%                          |
| Remarks    | : Hor Y , Ver Z-axis              | ENGINEER      | : Takumi Shimada Tomotaka Sasagawa |

**PK DETECT (RBW : 1MHz, VBW : 1MHz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 4874.0        | 41.2        | 40.9 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 45.4   | 45.1 | 73.9                    | 28.5   | 28.8 |
| 2   | 7311.0        | 41.2        | 42.1 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 49.6   | 50.5 | 73.9                    | 24.3   | 23.4 |
| 3   | 9748.0        | 42.7        | 41.2 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 53.9   | 52.4 | 73.9                    | 20.0   | 21.5 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 4   | 12185.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 5   | 14622.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 6   | 17059.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 19496.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 21933.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 24370.0       | 45.9        | 45.6 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 51.2   | 50.9 | 73.9                    | 22.7   | 23.0 |

**AV DETECT (RBW : 1MHz, VBW : 10Hz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 4874.0        | 28.6        | 28.7 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 32.8   | 32.9 | 53.9                    | 21.1   | 21.0 |
| 2   | 7311.0        | 29.6        | 29.5 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 38.0   | 37.9 | 53.9                    | 15.9   | 16.0 |
| 3   | 9748.0        | 29.9        | 29.3 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 41.1   | 40.5 | 53.9                    | 12.8   | 13.4 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 4   | 12185.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 5   | 14622.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 6   | 17059.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 7   | 19496.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 8   | 21933.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 9   | 24370.0       | 33.7        | 32.8 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 39.0   | 38.1 | 53.9                    | 14.9   | 15.8 |

\* Reference data

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*NS:Non Signal

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11b 11Mbps, Ch:High**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                  |               |                              |
|------------|----------------------------------|---------------|------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd.   | REPORT NO     | : 27IE0024-HO                |
| Equipment  | : Wireless LAN Module            | REGULATION    | : FCC 15.247(d)/RSS-210A 8.5 |
| Model      | : NJT-511                        | TEST DISTANCE | : 3/1m                       |
| Sample No. | : 0013E099F133                   | DATE          | : 10/28/2007                 |
| Power      | : DC 3.3V                        | TEMPERATURE   | : 25deg.C                    |
| Mode       | : Transmitting mode 11b (11Mbps) | HUMIDITY      | : 55%                        |
| Remarks    | : Hor Y , Ver Z-axis             | ENGINEER      | : Tomotaka Sasagawa          |

**PK DETECT (RBW : 1MHz, VBW : 1MHz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 1579.5        | 51.2        | 44.8 | 25.6                    | 33.1                | 2.0                   | 0.0                       | 45.7   | 39.3 | 73.9                    | 28.2   | 34.6 |
| 2   | 2483.5        | 54.7        | 53.0 | 27.2                    | 32.1                | 2.6                   | 0.0                       | 52.4   | 50.7 | 73.9                    | 21.5   | 23.2 |
| 3   | 4924.0        | 41.2        | 41.2 | 31.1                    | 31.2                | 3.4                   | 1.0                       | 45.5   | 45.5 | 73.9                    | 28.4   | 28.4 |
| 4   | 7386.0        | 42.7        | 42.3 | 36.0                    | 32.6                | 4.3                   | 0.7                       | 51.1   | 50.7 | 73.9                    | 22.8   | 23.2 |
| 5   | 9848.0        | 41.6        | 42.5 | 38.3                    | 32.9                | 5.4                   | 0.5                       | 52.9   | 53.8 | 73.9                    | 21.0   | 20.1 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12310.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 14772.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 17234.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 19696.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 10  | 22158.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 11  | 24620.0       | 45.2        | 44.8 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 50.5   | 50.1 | 73.9                    | 23.4   | 23.8 |

**AV DETECT (RBW : 1MHz, VBW : 10Hz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>A V<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|--------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                          | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                          |        |      |
| 1   | 1579.5        | 38.5        | 33.0 | 25.6                    | 33.1                | 2.0                   | 0.0                       | 33.0   | 27.5 | 53.9                     | 20.9   | 26.4 |
| 2   | 2483.5        | 41.7        | 39.3 | 27.2                    | 32.1                | 2.6                   | 0.0                       | 39.4   | 37.0 | 53.9                     | 14.5   | 16.9 |
| 3   | 4924.0        | 29.4        | 29.8 | 31.1                    | 31.2                | 3.4                   | 1.0                       | 33.7   | 34.1 | 53.9                     | 20.2   | 19.8 |
| 4   | 7386.0        | 29.9        | 29.8 | 36.0                    | 32.6                | 4.3                   | 0.7                       | 38.3   | 38.2 | 53.9                     | 15.6   | 15.7 |
| 5   | 9848.0        | 29.7        | 29.5 | 38.3                    | 32.9                | 5.4                   | 0.5                       | 41.0   | 40.8 | 53.9                     | 12.9   | 13.1 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                          |        |      |
| 7   | 14772.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                     | -      | -    |
| 8   | 17234.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                     | -      | -    |
| 9   | 19696.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                     | -      | -    |
| 10  | 22158.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                     | -      | -    |
| 11  | 24620.0       | 33.4        | 33.6 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 38.7   | 38.9 | 53.9                     | 15.2   | 15.0 |

\* Reference data

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*NS:Non Signal

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11g 9Mbps, Ch:Low**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                 |               |                                    |
|------------|---------------------------------|---------------|------------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd.  | REPORT NO     | : 27IE0024-HO                      |
| Equipment  | : Wireless LAN Module           | REGULATION    | : FCC15.247(d)/RSS-210A8.5         |
| Model      | : NJT-511                       | TEST DISTANCE | : 3/1m                             |
| Sample No. | : 0013E099F133                  | DATE          | : 10/26/2007 10/28/2007            |
| Power      | : DC 3.3V                       | TEMPERATURE   | : 24deg.C 25deg.C                  |
| Mode       | : Transmitting mode 11g (9Mbps) | HUMIDITY      | : 60% 55%                          |
| Remarks    | : Hor Y, Ver Z-axis             | ENGINEER      | : Takumi Shimada Tomotaka Sasagawa |

**PK DETECT (RBW: 1MHz, VBW: 1MHz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2390.0        | 70.5        | 65.9 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 67.9   | 63.3 | 73.9                    | 6.0    | 10.6 |
| 2*  | 2400.0        | 83.7        | 78.6 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 81.1   | 76.0 | -                       | -      | -    |
| 3   | 4824.0        | 41.0        | 40.6 | 30.8                    | 31.2                | 3.4                   | 1.0                       | 45.0   | 44.6 | 73.9                    | 28.9   | 29.3 |
| 4   | 7236.0        | 41.9        | 42.2 | 35.7                    | 32.5                | 4.2                   | 0.7                       | 50.0   | 50.3 | 73.9                    | 23.9   | 23.6 |
| 5   | 9648.0        | 42.2        | 41.9 | 38.2                    | 32.9                | 5.3                   | 0.5                       | 53.3   | 53.0 | 73.9                    | 20.6   | 20.9 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12060.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 14472.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 16884.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 19296.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 10  | 21708.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 11  | 24120.0       | 45.4        | 45.1 | 38.7                    | 32.2                | 8.1                   | 0.0                       | 50.5   | 50.2 | 73.9                    | 23.4   | 23.7 |

**AV DETECT (RBW: 1MHz, VBW: 10Hz)**

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2390.0        | 52.8        | 49.3 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 50.2   | 46.7 | 53.9                    | 3.7    | 7.2  |
| 2*  | 2400.0        | 64.5        | 59.5 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 61.9   | 56.9 | -                       | -      | -    |
| 3   | 4824.0        | 28.8        | 28.9 | 30.8                    | 31.2                | 3.4                   | 1.0                       | 32.8   | 32.9 | 53.9                    | 21.1   | 21.0 |
| 4   | 7236.0        | 29.7        | 29.5 | 35.7                    | 32.5                | 4.2                   | 0.7                       | 37.8   | 37.6 | 53.9                    | 16.1   | 16.3 |
| 5   | 9648.0        | 30.3        | 29.4 | 38.2                    | 32.9                | 5.3                   | 0.5                       | 41.4   | 40.5 | 53.9                    | 12.5   | 13.4 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12060.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 7   | 14472.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 8   | 16884.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 9   | 19296.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 10  | 21708.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 11  | 24120.0       | 32.9        | 33.3 | 38.7                    | 32.2                | 8.1                   | 0.0                       | 38.0   | 38.4 | 53.9                    | 15.9   | 15.5 |

\* Reference data

**20dBc(Fundamental 2412MHz) (RBW: 100kHz, VBW: 300kHz)**

| No.  | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>20dBc<br>[dBuV/m] | MARGIN |      |
|--|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|----------------------------|--------|------|
|  |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                            | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b> |               |             |      |                         |                     |                       |                           |        |      |                            |        |      |
| 0  | 2412.0        | 99.9        | 96.1 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 97.3   | 93.5 | -                          | -      | -    |
| 2  | 2400.0        | 64.5        | 59.5 | 27.0                    | 32.1                | 2.5                   | 0.0                       | 61.9   | 56.9 | Funda-20dB                 | 15.4   | 16.6 |

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Filter was not used for factor 0.0dB of the above table.

\*NS:Non Signal

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11g 9Mbps, Ch:Mid**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                  |               |                                    |
|------------|----------------------------------|---------------|------------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd.   | REPORT NO     | : 27IE0024-HO                      |
| Equipment  | : Wireless LAN Module            | REGULATION    | : FCC 15.247(d)/RSS-210A8.5        |
| Model      | : NJT-511                        | TEST DISTANCE | : 3/1m                             |
| Sample No. | : 0013E099F133                   | DATE          | : 10/26/2007 10/28/2007            |
| Power      | : DC 3.3V                        | TEMPERATURE   | : 24deg.C 25deg.C                  |
| Mode       | : Transmitting mode 11g (9M bps) | HUMIDITY      | : 60% 55%                          |
| Remarks    | : Hor Y , Ver Z-axis             | ENGINEER      | : Takumi Shimada Tomotaka Sasagawa |

**PK DETECT** (RBW : 1MHz, VBW : 1MHz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 4874.0        | 40.6        | 40.4 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 44.8   | 44.6 | 73.9                    | 29.1   | 29.3 |
| 2   | 7311.0        | 42.3        | 42.7 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 50.7   | 51.1 | 73.9                    | 23.2   | 22.8 |
| 3   | 9748.0        | 41.9        | 41.2 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 53.1   | 52.4 | 73.9                    | 20.8   | 21.5 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 4   | 12185.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 5   | 14622.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 6   | 17059.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 19496.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 21933.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 24370.0       | 45.1        | 45.3 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 50.4   | 50.6 | 73.9                    | 23.5   | 23.3 |

**AV DETECT** (RBW : 1MHz, VBW : 10Hz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 4874.0        | 28.6        | 28.4 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 32.8   | 32.6 | 53.9                    | 21.1   | 21.3 |
| 2   | 7311.0        | 29.5        | 29.5 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 37.9   | 37.9 | 53.9                    | 16.0   | 16.0 |
| 3   | 9748.0        | 29.3        | 29.0 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 40.5   | 40.2 | 53.9                    | 13.4   | 13.7 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 4   | 12185.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 5   | 14622.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 6   | 17059.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 7   | 19496.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 8   | 21933.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 9   | 24370.0       | 32.8        | 33.4 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 38.1   | 38.7 | 53.9                    | 15.8   | 15.2 |

\* Reference data

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*NS:Non Signal

**Radiated Spurious Emission (above 1GHz)**  
**Tx 11g 9Mbps, Ch:High**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                 |               |                                    |
|------------|---------------------------------|---------------|------------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd.  | REPORT NO     | : 27IE0024-HO                      |
| Equipment  | : Wireless LAN Module           | REGULATION    | : FCC15.247(d)/RSS-210A8.5         |
| Model      | : NJT-511                       | TEST DISTANCE | : 3/1m                             |
| Sample No. | : 0013E099F133                  | DATE          | : 10/26/2007 10/28/2007            |
| Power      | : DC 3.3V                       | TEMPERATURE   | : 24deg.C 25deg.C                  |
| Mode       | : Transmitting mode 11g (9Mbps) | HUMIDITY      | : 60% 55%                          |
| Remarks    | : Hor Y , Ver Z-axis            | ENGINEER      | : Takumi Shimada Tomotaka Sasagawa |

**PK DETECT** (RBW: 1MHz, VBW: 1MHz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 1579.5        | 55.9        | 47.7 | 25.6                    | 33.1                | 2.0                   | 0.0                       | 50.4   | 42.2 | 73.9                    | 23.5   | 31.7 |
| 2   | 2483.5        | 66.1        | 60.7 | 27.2                    | 32.1                | 2.6                   | 0.0                       | 63.8   | 58.4 | 73.9                    | 10.1   | 15.5 |
| 3   | 4924.0        | 41.6        | 40.8 | 31.1                    | 31.2                | 3.4                   | 1.0                       | 45.9   | 45.1 | 73.9                    | 28.0   | 28.8 |
| 4   | 7386.0        | 41.4        | 41.1 | 36.0                    | 32.6                | 4.3                   | 0.7                       | 49.8   | 49.5 | 73.9                    | 24.1   | 24.4 |
| 5   | 9848.0        | 42.2        | 42.7 | 38.3                    | 32.9                | 5.4                   | 0.5                       | 53.5   | 54.0 | 73.9                    | 20.4   | 19.9 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12310.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 7   | 14772.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 8   | 17234.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 9   | 19696.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 10  | 22158.0       | NS          | NS   | -                       | -                   | -                     | -                         | -      | -    | 73.9                    | -      | -    |
| 11  | 24620.0       | 44.8        | 45.2 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 50.1   | 50.5 | 73.9                    | 23.8   | 23.4 |

**AV DETECT** (RBW: 1MHz, VBW: 10Hz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| <b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>        |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 1579.5        | 40.1        | 33.7 | 25.6                    | 33.1                | 2.0                   | 0.0                       | 34.6   | 28.2 | 53.9                    | 19.3   | 25.7 |
| 2   | 2483.5        | 46.6        | 42.7 | 27.2                    | 32.1                | 2.6                   | 0.0                       | 44.3   | 40.4 | 53.9                    | 9.6    | 13.5 |
| 3   | 4924.0        | 28.6        | 28.5 | 31.1                    | 31.2                | 3.4                   | 1.0                       | 32.9   | 32.8 | 53.9                    | 21.0   | 21.1 |
| 4   | 7386.0        | 29.8        | 29.8 | 36.0                    | 32.6                | 4.3                   | 0.7                       | 38.2   | 38.2 | 53.9                    | 15.7   | 15.7 |
| 5   | 9848.0        | 29.5        | 29.3 | 38.3                    | 32.9                | 5.4                   | 0.5                       | 40.8   | 40.6 | 53.9                    | 13.1   | 13.3 |
| <b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b> |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 6   | 12310.0       | -           | -    | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 7   | 14772.0       | -           | -    | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 8   | 17234.0       | -           | -    | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 9   | 19696.0       | -           | -    | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 10  | 22158.0       | -           | -    | -                       | -                   | -                     | -                         | -      | -    | 53.9                    | -      | -    |
| 11  | 24620.0       | 33.4        | 33.1 | 38.8                    | 32.2                | 8.2                   | 0.0                       | 38.7   | 38.4 | 53.9                    | 15.2   | 15.5 |

\* Reference data

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.

\*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

\*NS:Non Signal



**Radiated Spurious Emission (above 1GHz)**  
**Rx 11b/g, Ch:Mid**

UL Japan, Inc.  
Head Office EMC Lab. No.4 Semi Anechoic Chamber

|            |                                |               |                              |
|------------|--------------------------------|---------------|------------------------------|
| Company    | : Nagano Japan Radio Co., Ltd. | REPORT NO     | : 27IE0024-HO                |
| Equipment  | : Wireless LAN Module          | REGULATION    | : FCC 15.247(d)/RSS-210A 8.5 |
| Model      | : NJT-511                      | TEST DISTANCE | : 3m                         |
| Sample No. | : 0013E099F133                 | DATE          | : 10/28/2007                 |
| Power      | : DC 3.3V                      | TEMPERATURE   | : 25deg.C                    |
| Mode       | : Receiving mode 11b/g         | HUMIDITY      | : 55%                        |
| Remarks    | : Hor Y , Ver Z-axis           | ENGINEER      | : Tomotaka Sasagawa          |

**PK DETECT** (RBW : 1MHz, VBW : 1MHz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>PK<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2437.0        | 42.1        | 41.9 | 27.1                    | 32.1                | 2.5                   | 0.0                       | 39.6   | 39.4 | 73.9                    | 34.3   | 34.5 |
| 2   | 4874.0        | 42.5        | 41.9 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 46.7   | 46.1 | 73.9                    | 27.2   | 27.8 |
| 3   | 7311.0        | 41.9        | 42.1 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 50.3   | 50.5 | 73.9                    | 23.6   | 23.4 |
| 4   | 9748.0        | 41.9        | 42.4 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 53.1   | 53.6 | 73.9                    | 20.8   | 20.3 |

**AV DETECT** (RBW : 1MHz, VBW : 10Hz)

| No.   | FREQ<br>[MHz] | S/A READING |      | ANT<br>Factor<br>[dB/m] | AMP<br>GAIN<br>[dB] | CABLE<br>LOSS<br>[dB] | Hi-Pass<br>Filter<br>[dB] | RESULT |      | Limit<br>AV<br>[dBuV/m] | MARGIN |      |
|---|---------------|-------------|------|-------------------------|---------------------|-----------------------|---------------------------|--------|------|-------------------------|--------|------|
|   |               | HOR         | VER  |                         |                     |                       |                           | HOR    | VER  |                         | HOR    | VER  |
| Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss |               |             |      |                         |                     |                       |                           |        |      |                         |        |      |
| 1   | 2437.0        | 30.2        | 29.8 | 27.1                    | 32.1                | 2.5                   | 0.0                       | 27.7   | 27.3 | 53.9                    | 26.2   | 26.6 |
| 2   | 4874.0        | 30.4        | 30.2 | 31.0                    | 31.2                | 3.4                   | 1.0                       | 34.6   | 34.4 | 53.9                    | 19.3   | 19.5 |
| 3   | 7311.0        | 30.1        | 29.7 | 35.9                    | 32.5                | 4.3                   | 0.7                       | 38.5   | 38.1 | 53.9                    | 15.4   | 15.8 |
| 4   | 9748.0        | 30.5        | 29.6 | 38.3                    | 32.9                | 5.3                   | 0.5                       | 41.7   | 40.8 | 53.9                    | 12.2   | 13.1 |

\*Except for the above table : All other spurious emissions were less than 20dB for the limit.  
\*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.  
\*The test result is rounded off to one or two decimal places, so some differences might be observed.  
\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

### **APPENDIX 3:Test instruments**

#### **EMI test equipment**

| Control No. | Instrument                 | Manufacturer      | Model No                 | Test Item | Calibration Date *<br>Interval(month) |
|-------------|----------------------------|-------------------|--------------------------|-----------|---------------------------------------|
| MAEC-04     | Anechoic Chamber           | TDK               | Semi Anechoic Chamber 3m | RE        | 2007/03/03 * 12                       |
| MSA-05      | Spectrum Analyzer          | Advantest         | R3273                    | RE        | 2007/06/01 * 12                       |
| MHA-21      | Horn Antenna 1-18GHz       | Schwarzbeck       | BBHA9120D                | RE        | 2007/08/16 * 12                       |
| MCC-57      | Microwave Cable 1G-26.5GHz | Suhner            | SUCOFLEX104              | RE        | 2007/03/30 * 12                       |
| MHF-05      | High Pass Filter 3.5-18GHz | Tokimec           | TF323DCA                 | RE        | 2007/01/16 * 12                       |
| MPA-12      | MicroWave System Amplifier | Agilent           | 83017A                   | RE        | 2007/03/12 * 12                       |
| MOS-15      | Thermo-Hygrometer          | Custom            | CTH-180                  | RE        | 2006/01/19 * 24                       |
| MJM-07      | Measure                    | PROMART           | SEN1955                  | RE        | -                                     |
| MCC-50      | Coaxial cable              | UL Japan          | -                        | RE        | 2007/03/06 * 12                       |
| MAT-31      | Attenuator(6dB)            | TME               | UFA-01                   | RE        | 2007/03/05 * 12                       |
| MBA-05      | Biconical Antenna          | Schwarzbeck       | BBA9106                  | RE        | 2007/01/19 * 12                       |
| MLA-08      | Logperiodic Antenna        | Schwarzbeck       | UKLP9140-A               | RE        | 2007/01/19 * 12                       |
| MHA-17      | Horn Antenna 15-40GHz      | Schwarzbeck       | BBHA9170                 | RE        | 2007/04/06 * 12                       |
| MPA-14      | Pre Amplifier              | SONOMA INSTRUMENT | 310                      | RE        | 2007/03/12 * 12                       |
| MTR-07      | Test Receiver              | Rohde & Schwarz   | ESCI                     | RE        | 2007/09/14 * 12                       |
| MSTW-14     | EMI measurement program    | TSJ               | TEPTO-DV                 | RE        | -                                     |

**The expiration date of the calibration is the end of the expired month.**

**All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.**

**\*Some calibrations were performed after the tested dates, however those EMI test equipment have been controlled by means of an unbroken chains of calibrations.**

**Test Item: RE: Radiated Emission**

**UL Japan, Inc.**

**Head Office EMC Lab.**

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