

## TEST REPORT

**APPLICANT** : KORG INC.

**ADDRESS** : 4015-2 Yanokuchi, Inagi-City, Tokyo 206-0812 JAPAN

**PRODUCTS** : WIRELESS TUNER

**MODEL No.** : WR-TX

**SERIAL No.** : None

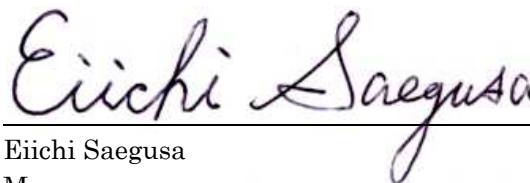
**FCC ID** : KIJ-WRTX

**TEST STANDARD** : CFR 47 FCC Rules and Regulations Part 15 Subpart A, B and C

**TESTING LOCATION** : Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department Testing Division  
1-21-25, Kinuta, Setagaya-ku, Tokyo 157-8573, Japan

**TEST RESULTS** : **Passed**

**DATE OF TEST** : November 25, 2009 - December 26, 2009



Eiichi Saegusa

Manager

Japan Quality Assurance Organization

SAFETY &amp; EMC CENTER

EMC Engineering Dept. Testing Division

1-21-25, Kinuta, Setagaya-ku, Tokyo 157-8573, Japan

- 
- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and National Institute of Information and Communications Technology (NICT) of Japan.
  - The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
  - The test results presented in this report relate only to the offered test sample.
  - The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
  - This test report shall not be reproduced except in full without the written approval of JQA.

**Table of Contents**

| <b>Documentation</b>                                  | <b>Page</b>  |
|-------------------------------------------------------|--------------|
| 1 Test Regulation                                     | 3            |
| 2 Test Location                                       | 3            |
| 3 Recognition of Test Laboratory                      | 3            |
| 4 Description of the Equipment Under Test             | 4            |
| 5 Test Condition                                      | 5-9          |
| 6 Preliminary Test and Test Setup                     | 10-14        |
| 7 Equipment Under Test Modification                   | 15           |
| 8 Responsible Party                                   | 15           |
| 9 Deviation from Standard                             | 15           |
| 10 Test Results                                       | 16-18        |
| 11 Summary                                            | 19           |
| 12 Operating Condition                                | 20           |
| 13 Test Configuration                                 | 21           |
| 14 Equipment Under Test Arrangement (Drawings)        | 21           |
| <b>Appendix A : Test Data</b>                         | <b>22-30</b> |
| A.1 Output Power (Radiation)                          |              |
| A.2 Occupied Bandwidth                                |              |
| A.3 Spurious Emissions for Transmitter (Radiation)    |              |
| A.4 AC Power Line Conducted Emissions for Transmitter |              |
| A.5 Spurious Emissions for Receiver (Radiation)       |              |
| A.6 AC Power Line Conducted Emissions for Receiver    |              |
| <b>Appendix B : Test Arrangement (Photographs)</b>    | <b>31-33</b> |
| <b>Appendix C : Test Instruments</b>                  | <b>34-36</b> |

**Definitions for Abbreviation and Symbols Used In This Test Report**

“EUT” means Equipment Under the Test.

“AE” means Associated Equipment.

“N/A” means that Not Applicable.

“N/T” means that Not Tested.

☒ indicates that the listed condition, standard or equipment is applicable for this report.

☐ indicates that the listed condition, standard or equipment is not applicable for this report.

**Documentation****1 Test Regulation**

Applied Standard : CFR 47 FCC Rules and Regulations Part 15 Subpart A, B and C

Test Procedure : The tests were performed with reference to the FCC Public Notice DA 00-705, released March 30, 2000. The test set-up was made in accordance to the general provisions of ANSI C63.4-2003.

**2 Test Location**

Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department Testing Division  
1-21-25, Kinuta, Setagaya-ku, Tokyo 157-8573, Japan

**3 Recognition of Test Laboratory**

Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department Testing Division  
is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility of Testing Division is registered by the following bodies .

VLAC Code : VLAC-001-1 (Effective through : April 3, 2010)  
NVLAP Lab Code : 200189-0 (Effective through : June 30, 2010)  
VCCI Registration Number : R-002, R-003, C-002, C-966 (Effective through : April 3, 2010)  
FCC Registration Number : 349652 (Date of Listing : April 1, 2010)  
IC Registration Number : 2079-7, 2079-8 (Effective through : August 29, 2011)  
Accredited as conformity assessment body for Japan electrical appliances and material law by METI. (Effective through : February 22, 2010)

**4 Description of the Equipment Under Test**

|    |                                                    |                                                                                                                                       |
|----|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Manufacturer                                       | : KORG DOUNG GUAN ELECTRONICS LTD.<br>Lin Dong 3 Road No.8-301 Lin Chun Tang Xia Town<br>Dong Guan City Guang Dong Province P.R.China |
| 2  | Products                                           | : WIRELESS TUNER                                                                                                                      |
| 3  | Trade Name                                         | : KORG                                                                                                                                |
| 4  | Model No.                                          | : WR-TX                                                                                                                               |
| 5  | Serial No.                                         | : None                                                                                                                                |
| 6  | FCC ID                                             | : KIJ-WRTX                                                                                                                            |
| 7  | Product Type                                       | : Pre-Production                                                                                                                      |
| 8  | Date of Manufacture                                | : None                                                                                                                                |
| 9  | Power Rating                                       | : 3.0 VDC (Lithium Battery(Type:CR2032))                                                                                              |
| 10 | EUT Grounding                                      | : None                                                                                                                                |
| 11 | Category                                           | : Transceiver                                                                                                                         |
| 12 | Received Date of EUT                               | : November 20, 2009                                                                                                                   |
| 13 | EUT Authorization                                  | : Certification                                                                                                                       |
| 14 | Fundamental Frequency<br>Generated/used in the EUT | : 16 MHz                                                                                                                              |
| 15 | Operating Frequency Range                          | : 2405 MHz - 2480 MHz                                                                                                                 |
| 16 | EUT Highest Frequency<br>Used/Generated            | : 2480 MHz (the part of Intentional Radiators)<br>16 MHz (the part of Unintentional Radiators)                                        |
| 17 | RF Output Power                                    | : 88.5 dB $\mu$ V(measured value:Average)<br>92.6 dB $\mu$ V(measured value:Peak)                                                     |
| 18 | Antenna Type                                       | : Integral Internal antenna (not accessible to the user)                                                                              |
| 19 | Antenna Gain                                       | : 2.14 dBi                                                                                                                            |
| 20 | Type of Modulation                                 | : GFSK (2Mbps)                                                                                                                        |

## 5 Test Condition

### 5.1 Output Power (Radiation)

The requirements are ☒-Applicable ☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

Test site & instruments :

| Type               | Number of test site & instruments (Refer to Appendix C) |
|--------------------|---------------------------------------------------------|
| Test Site          | 1                                                       |
| Test Receiver      | 13                                                      |
| Spectrum Analyzer  | --                                                      |
| Antenna            | 31                                                      |
| Cable              | 195                                                     |
| RF Amplifier       | --                                                      |
| Band Reject Filter | --                                                      |
| High Pass Filter   | --                                                      |
| Thermo-Hygrometer  | 204                                                     |

### 5.2 Occupied Bandwidth

The requirements are ☒-Applicable ☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

Test site & instruments :

| Type              | Number of test site & instruments (Refer to Appendix C) |
|-------------------|---------------------------------------------------------|
| Test Site         | 1                                                       |
| Test Receiver     | 13                                                      |
| Spectrum Analyzer | --                                                      |
| Antenna           | 31                                                      |
| Cable             | 195                                                     |
| RF Amplifier      | --                                                      |
| Attenuator        | --                                                      |
| Thermo-Hygrometer | --                                                      |
|                   | 204                                                     |

### 5.3 Spurious Emissions for Transmitter (Radiation)

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

Test site & instruments : (for 9 kHz – 30 MHz)

| Type              | Number of test site & instruments (Refer to Appendix C) |
|-------------------|---------------------------------------------------------|
| Test Site         | 1                                                       |
| Test Receiver     | 13                                                      |
| Spectrum Analyzer | --                                                      |
| Antenna           | 21                                                      |
| Cable             | 43                                                      |
| Thermo-Hygrometer | 204                                                     |

Test site & instruments : (for 30 MHz – 1000 MHz)

| Type              | Number of test site & instruments (Refer to Appendix C) |
|-------------------|---------------------------------------------------------|
| Test Site         | 1                                                       |
| Test Receiver     | 13                                                      |
| Spectrum Analyzer | --                                                      |
| Antenna           | 167 168                                                 |
| Cable             | 38                                                      |
| Thermo-Hygrometer | 204                                                     |

Test site & instruments : (for above 1 GHz)

| Type               | Number of test site & instruments (Refer to Appendix C) |
|--------------------|---------------------------------------------------------|
| Test Site          | 1                                                       |
| Test Receiver      | 13                                                      |
| Spectrum Analyzer  | --                                                      |
| Antenna            | 31 32                                                   |
| Cable              | 48 49 195                                               |
| RF Amplifier       | 57                                                      |
| Band Reject Filter | 78                                                      |
| High Pass Filter   | --                                                      |
| Thermo-Hygrometer  | 204                                                     |

**5.4 AC Power Line Conducted Emissions for Transmitter**

The requirements are ☐-Applicable [☐-Tested ☐-Not tested by applicant request.]  
☒-Not Applicable

Test site & instruments :

| Type                | Number of test site & instruments (Refer to Appendix C) |
|---------------------|---------------------------------------------------------|
| Test Site           | --                                                      |
| Test Receiver       | --                                                      |
| Spectrum Analyzer   | --                                                      |
| Cable               | --                                                      |
| AMN(for EUT)        | --                                                      |
| Pulse-Limiter       | --                                                      |
| AMN(for Peripheral) | --                                                      |
| Termination         | --                                                      |
| Thermo-Hygrometer   | --                                                      |

## 5.5 Spurious Emissions for Receiver (Radiation)

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

Test site & instruments : (for 9 kHz – 30 MHz)

| Type              | Number of test site & instruments (Refer to Appendix C) |
|-------------------|---------------------------------------------------------|
| Test Site         | 1                                                       |
| Test Receiver     | 13                                                      |
| Spectrum Analyzer | --                                                      |
| Antenna           | 21                                                      |
| Cable             | 43                                                      |
| Thermo-Hygrometer | 204                                                     |

Test site & instruments : (for 30 MHz – 1000 MHz)

| Type              | Number of test site & instruments (Refer to Appendix C) |
|-------------------|---------------------------------------------------------|
| Test Site         | 1                                                       |
| Test Receiver     | 13                                                      |
| Spectrum Analyzer | --                                                      |
| Antenna           | 167 168                                                 |
| Cable             | 38                                                      |
| Thermo-Hygrometer | 204                                                     |

Test site & instruments : (for above 1 GHz)

| Type               | Number of test site & instruments (Refer to Appendix C) |
|--------------------|---------------------------------------------------------|
| Test Site          | 1                                                       |
| Test Receiver      | 13                                                      |
| Spectrum Analyzer  | --                                                      |
| Antenna            | 31 32                                                   |
| Cable              | 48 49 195                                               |
| RF Amplifier       | 57                                                      |
| Band Reject Filter | --                                                      |
| High Pass Filter   | --                                                      |
| Thermo-Hygrometer  | 204                                                     |

**5.6 AC Power Line Conducted Emissions for Receiver**

The requirements are ☐-Applicable [☐-Tested ☐-Not tested by applicant request.]  
☒-Not Applicable

Test site & instruments :

| Type                | Number of test site & instruments (Refer to Appendix C) |
|---------------------|---------------------------------------------------------|
| Test Site           | --                                                      |
| Test Receiver       | --                                                      |
| Spectrum Analyzer   | --                                                      |
| Cable               | --                                                      |
| AMN(for EUT)        | --                                                      |
| Pulse-Limiter       | --                                                      |
| AMN(for Peripheral) | --                                                      |
| Termination         | --                                                      |
| Thermo-Hygrometer   | --                                                      |

## 6 Preliminary Test and Test Setup

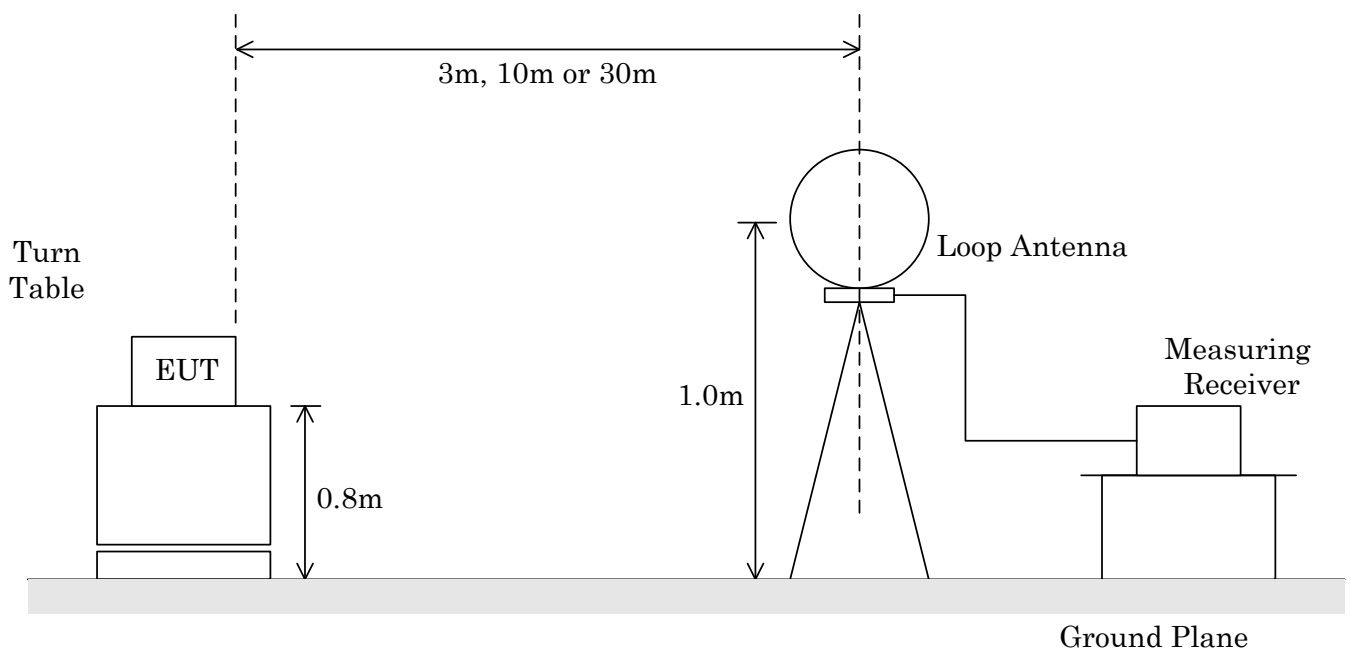
### 6.1 Output Power (Radiation) and Spurious Emissions (Radiation)

#### 6.1.1 Radiated Emission ( 9 kHz – 30 MHz)

According to description of ANSI C63.4-2003 sec.13.1.4, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

- Side View -

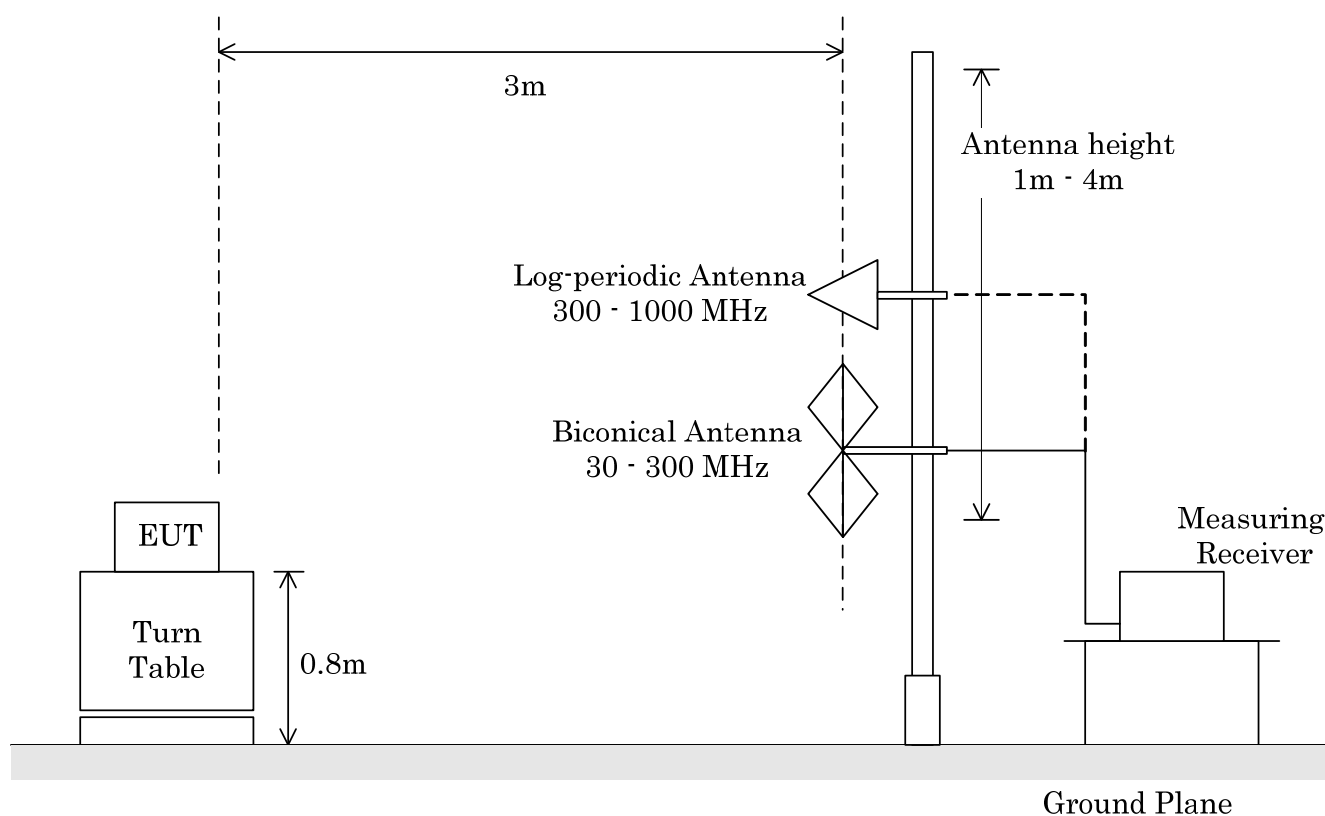


## 6.1.2 Radiated Emission (30 MHz – 1000 MHz)

According to description of ANSI C63.4-2003 sec.13.1.4, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration (in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

### - Side View -

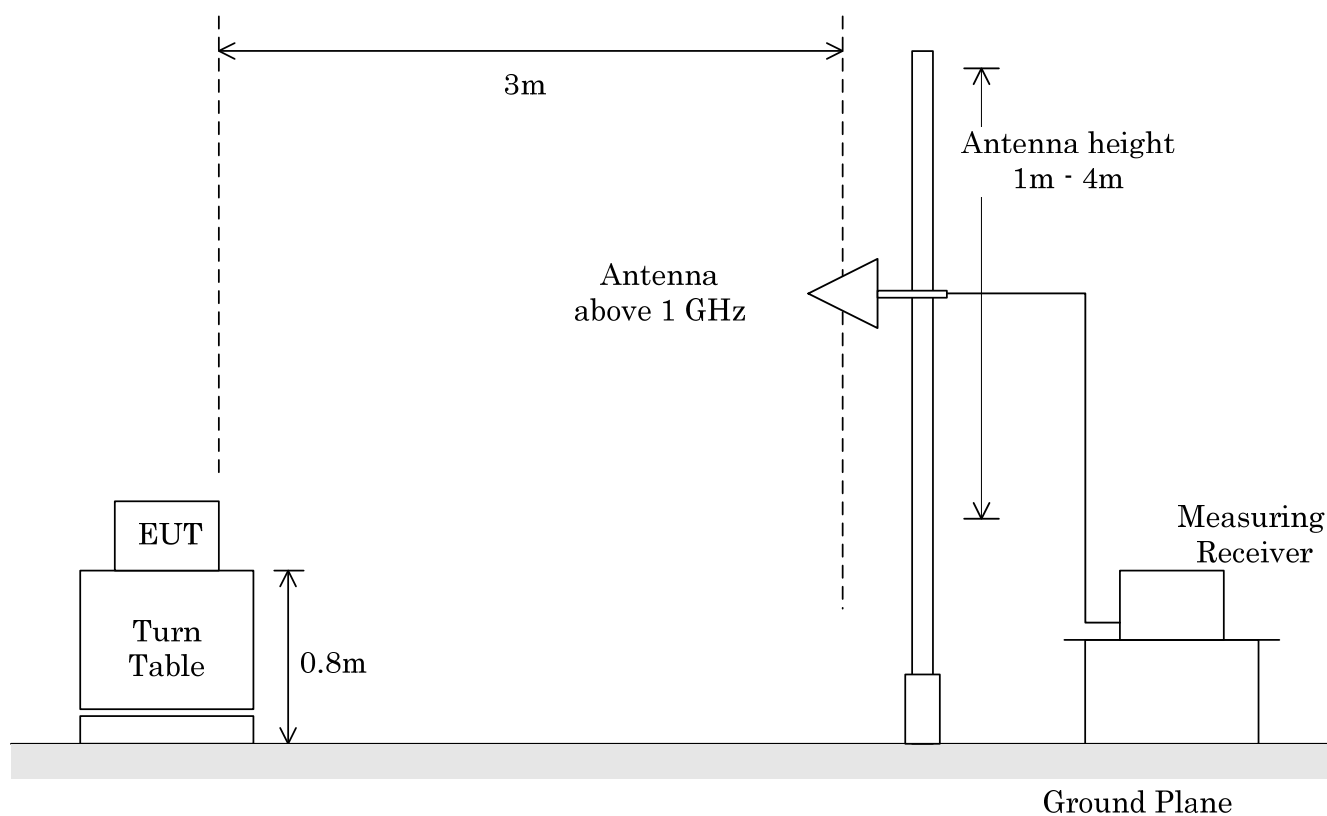


### 6.1.3 Radiated Emission (above 1 GHz)

According to description of ANSI C63.4-2003 sec.13.1.4, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration (in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions measurements.

#### - Side View -



## 6.2 Occupied Bandwidth

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 6 dB or 20 dB bandwidth, centered on a channel

RBW  $\geq$  1% of the 6 dB or 20 dB bandwidth

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB or 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB or 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

Measurement setup is same as sub-clause 6.1.

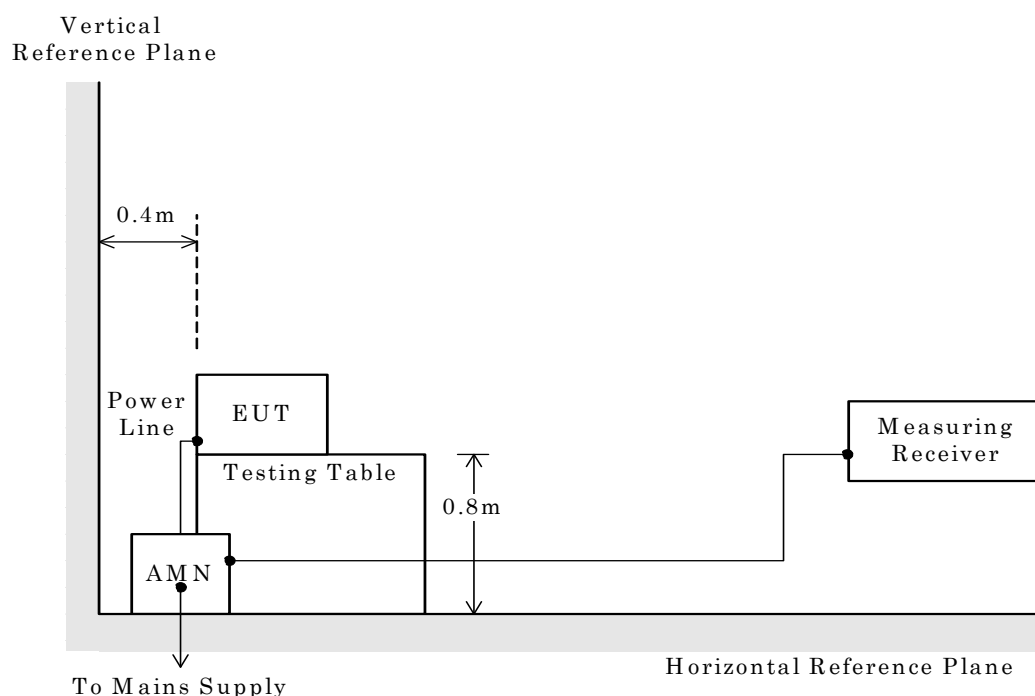
### 6.3 AC Power Line Conducted Emissions (150 kHz – 30 MHz)

According to description of ANSI C63.4-2003 sec.13.1.3, the AC power line preliminary conducted emissions measurements were carried out.

The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for final AC power line conducted emissions measurements.

#### - Side View -



\* AMN : Artificial Mains Network

**7 Equipment Under Test Modification**

- ☒ No modifications were conducted by JQA to achieve compliance to the limitations.  
☐ To achieve compliance to the limitations, the following changes were made by JQA during the compliance test.

The modifications will be implemented in all production models of this equipment.

Applicant : Not Applicable

Date : Not Applicable

Typed Name : Not Applicable

Position : Not Applicable

Signatory : Not Applicable

**8 Responsible Party**Responsible Party of Test Item (Product)

Responsible Party :

Contact Person :

\_\_\_\_\_  
Signatory

**9 Deviation from Standard**

- ☒ No deviations from the standard described in clause 1.  
☐ The following deviations were employed from the standard described in clause 1.

---

---

---

**10 Test Results****10.1 Output Power (Radiation) [§15.249(a)]**

The requirements are ☒-Applicable ☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

For the Frequency Range below 1000 MHz

Min. Limit Margin           --           dB at           --           MHz

Max. Limit Excess           --           dB at           --           MHz

For the Frequency Range above 1000 MHz

Min. Limit Margin(Average)           5.5           dB at       2480.00       MHz

Min. Limit Margin(Peak)          21.4           dB at       2480.00       MHz

Max. Limit Excess           --           dB at           --           MHz

Uncertainty of measurement results

|          |     |                          |        |
|----------|-----|--------------------------|--------|
| 30-300   | MHz | <u>      ± 4.6      </u> | dB(2σ) |
| 300-1000 | MHz | <u>      ± 4.5      </u> | dB(2σ) |
| 1-18     | GHz | <u>      ± 5.0      </u> | dB(2σ) |
| 18-40    | GHz | <u>      ± 5.3      </u> | dB(2σ) |

Remarks : \_\_\_\_\_  
\_\_\_\_\_

**10.2 Occupied Bandwidth [§15.215(c)]**

The requirements are ☒-Applicable ☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Uncertainty of measurement results

      ± 0.6       %(2σ)

Remarks :   Within in the specified frequency band.    
\_\_\_\_\_

**10.3 Spurious Emissions for Transmitter (Radiation) [§15.249(a) / §15.249(d) / §15.35(b) / §15.209(a)]**

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

☒-Passed ☐-Failed ☐- Not judged

For the Frequency Range below 1000 MHz

Min. Limit Margin > 20.0 dB at 30 - 1000 MHz

Max. Limit Excess -- dB at -- MHz

For the Frequency Range above 1000 MHz

Min. Limit Margin(Average) 10.8 dB at 9920.80 MHz

Min. Limit Margin(Peak) 17.8 dB at 9920.80 MHz

Max. Limit Excess -- dB at -- MHz

Uncertainty of measurement results

|          |     |              |        |
|----------|-----|--------------|--------|
| 30-300   | MHz | <u>± 4.6</u> | dB(2σ) |
| 300-1000 | MHz | <u>± 4.5</u> | dB(2σ) |
| 1-18     | GHz | <u>± 5.0</u> | dB(2σ) |
| 18-40    | GHz | <u>± 5.3</u> | dB(2σ) |

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

**10.4 AC Power Line Conducted Emissions for Transmitter [§15.207(a)]**

The requirements are ☐-Applicable [☐-Tested ☐-Not tested by applicant request.]  
☒-Not Applicable

☐-Passed ☐-Failed ☐- Not judged

Min. Limit Margin (QP) -- dB at -- MHz

Min. Limit Margin (AVE) -- dB at -- MHz

Max. Limit Exceeding (QP) -- dB at -- MHz

Max. Limit Exceeding (AVE) -- dB at -- MHz

Uncertainty of measurement results

± 2.9 dB(2σ)

Remarks : The EUT does not have AC power port.  
 \_\_\_\_\_

### 10.5 Spurious Emissions for Receiver (Radiation) [§15.109(a)]

The requirements are ☒-Applicable [☒-Tested ☐-Not tested by applicant request.]  
☐-Not Applicable

☒-Passed ☐-Failed ☐- Not judged

For the Frequency Range below 1000 MHz

Min. Limit Margin > 20.0 dB at 30 - 1000 MHz

Max. Limit Excess -- dB at -- MHz

For the Frequency Range above 1000 MHz

Min. Limit Margin(Average) 11.8 dB at 2750.90 MHz

Min. Limit Margin(Peak) 26.6 dB at 2750.90 MHz

Max. Limit Excess -- dB at -- MHz

Uncertainty of measurement results

|          |     |              |        |
|----------|-----|--------------|--------|
| 30-300   | MHz | <u>± 4.6</u> | dB(2σ) |
| 300-1000 | MHz | <u>± 4.5</u> | dB(2σ) |
| 1-18     | GHz | <u>± 5.0</u> | dB(2σ) |
| 18-40    | GHz | <u>± 5.3</u> | dB(2σ) |

Remarks : \_\_\_\_\_  
 \_\_\_\_\_

### 10.6 AC Power Line Conducted Emissions for Receiver [§15.107(a)]

The requirements are ☐-Applicable [☐-Tested ☐-Not tested by applicant request.]  
☒-Not Applicable

☐-Passed ☐-Failed ☐- Not judged

Min. Limit Margin (QP) -- dB at -- MHz

Min. Limit Margin (AVE) -- dB at -- MHz

Max. Limit Exceeding (QP) -- dB at -- MHz

Max. Limit Exceeding (AVE) -- dB at -- MHz

Uncertainty of measurement results

± 2.9 dB(2σ)

Remarks : The EUT does not have AC power port.  
 \_\_\_\_\_

**11 Summary****General Remarks**

The EUT was tested according to the requirements of CFR 47 FCC Rules and Regulations Part 15 under the test configuration, as shown in clause 12 to 14.

The conclusion for the test items of which are required by the applied regulation is indicated under the test result.

**Test Result :**

The "as received" sample;

☒-fulfill the test requirements of the regulation mentioned on clause 1.

☐-doesn't fulfill the test requirements of the regulation mentioned on clause 1.

Reviewed by:



Shigeru Osawa  
Deputy Manager  
SAFETY & EMC CENTER  
EMC Engineering Dept. Testing Division

Tested by:



Katsunori Miura  
Assistant Manager  
SAFETY & EMC CENTER  
EMC Engineering Dept. Testing Division

## 12 Operating Condition

Power Supply Voltage : 3.0 VDC operate with Lithium Battery(Type:CR2032)

### Operation Mode

The EUT is set with the test mode, the specification of the test mode is as following.

- (1) TX Mode (2405MHz)
- (2) TX Mode (2440MHz)
- (3) TX Mode (2480MHz)
- (4) RX Mode

Used application to controlled : The operation of the EUT is carried out using the especially control.  
The especially control is exclusive control for the test mode.

## 13 Test Configuration

The equipment under test consists of :

| Sign | Item           | Manufacturer                     | Model No. | Serial No. | FCC ID   |
|------|----------------|----------------------------------|-----------|------------|----------|
| A    | WIRELESS TUNER | KORG DOUNG GUAN ELECTRONICS LTD. | WR-TX     | None       | KIJ-WRTX |

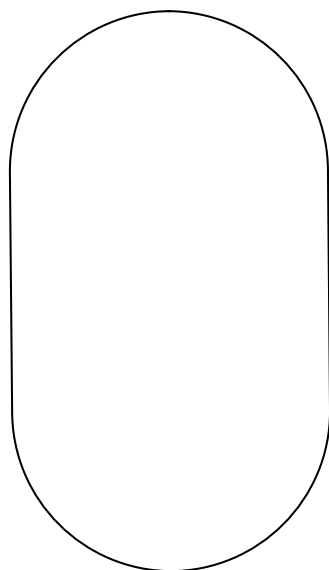
The auxiliary equipment used for testing :

| Sign | Item | Manufacturer | Model No. | Serial No. | FCC ID |
|------|------|--------------|-----------|------------|--------|
| --   | --   | --           | --        | --         | --     |

Type of Cable:

| No. | Description | Identification (Manu. Etc.) | Connector Shielded | Cable Shielded | Ferrite Core | Length (m) |
|-----|-------------|-----------------------------|--------------------|----------------|--------------|------------|
| --  | --          | --                          | --                 | --             | --           | --         |

## 14 Equipment Under Test Arrangement (Drawings)



A :  
WIRELESS TUNER  
(EUT)

## Appendix A : Test Data

### A.1 Output Power (Radiation)

Date : December 26, 2009

Temp. : 22 °C Humi. : 30 %

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |      | Limits<br>(dBuV/m) |       | Emission Levels<br>(dBuV/m) |      | Margins<br>(dB) |      |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|------|--------------------|-------|-----------------------------|------|-----------------|------|
|                    |                       |                              |              | AV                      | Peak | AV                 | Peak  | AV                          | Peak | AV              | Peak |
| 2.4050             | 0.0                   | 31.6                         | V            | 54.0                    | 58.1 | 94.0               | 114.0 | 85.6                        | 89.7 | 8.4             | 24.3 |
| 2.4400             | 0.0                   | 31.7                         | H            | 55.6                    | 59.8 | 94.0               | 114.0 | 87.3                        | 91.5 | 6.7             | 22.5 |
| 2.4800             | 0.0                   | 31.9                         | H            | 56.6                    | 60.7 | 94.0               | 114.0 | 88.5                        | 92.6 | 5.5             | 21.4 |

Note : 1) The cable loss, amp. gain and antenna factor are included in the correction factor.

2) A sample calculation(Average) was made at 2405 GHz.

$$PA + CF + MR = 0 + (31.6) + 54.0 = 85.6 \text{ (dBuV/m)}$$

PA : Peak to Average Factor (P-A Factor)

CF : Correction Factor

MR : Meter Reading

3) Measuring Instruments Setting :

| Detector Function | Resolution Bandwidth | Video Bandwidth |
|-------------------|----------------------|-----------------|
| Average (AV)      | 1 MHz                | 10 Hz           |
| Peak              | 1 MHz                | 1 MHz           |

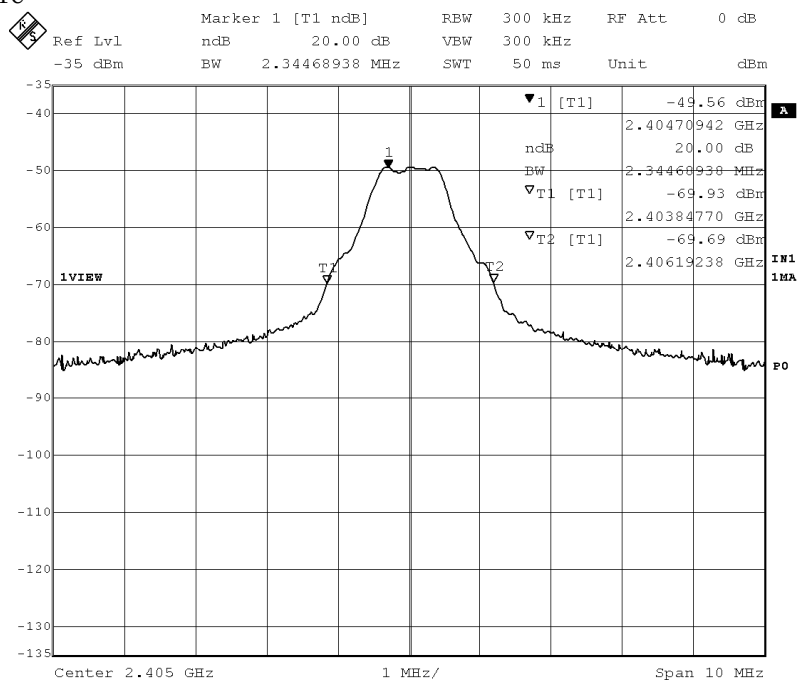
### A.2 Occupied Bandwidth

Date : December 26, 2009

Temp. : 22 °C Humi. : 30 %

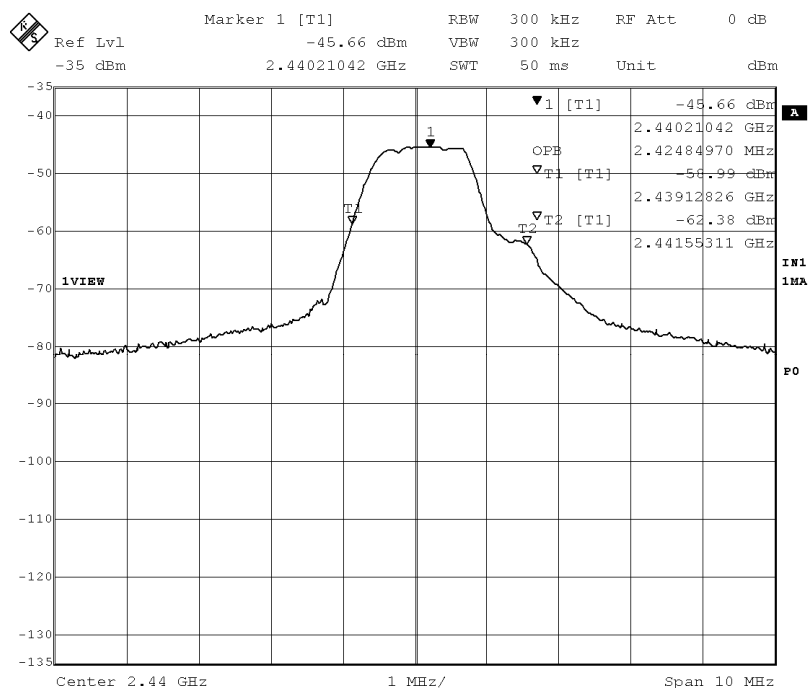
Mode of EUT : TX Mode (2405MHz)

Test Port : Enclosure



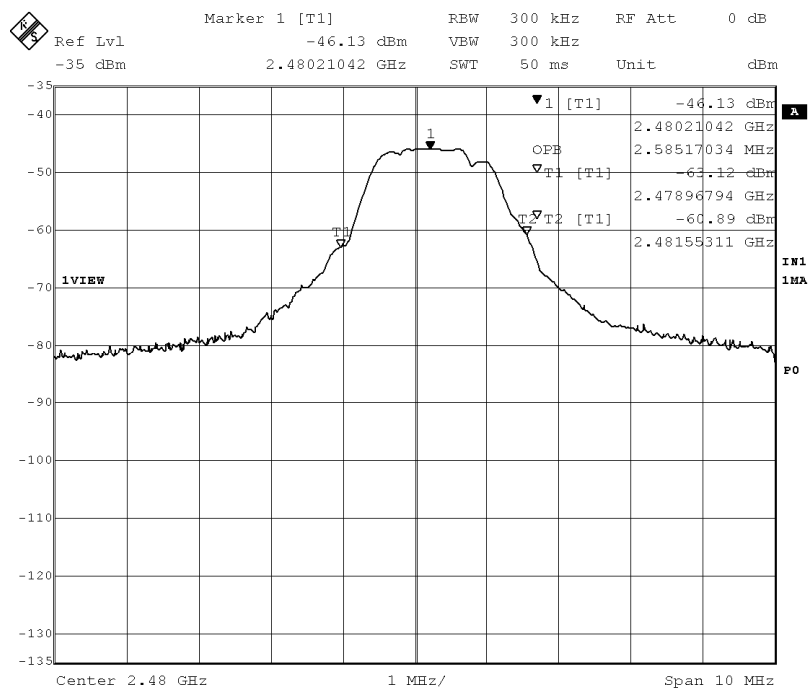
Mode of EUT : TX Mode (2440MHz)

Test Port : Enclosure



Mode of EUT : TX Mode (2480MHz)

Test Port : Enclosure



## A.3 Spurious Emissions for Transmitter (Radiation)

### A.3.1 Band Edge Compliance

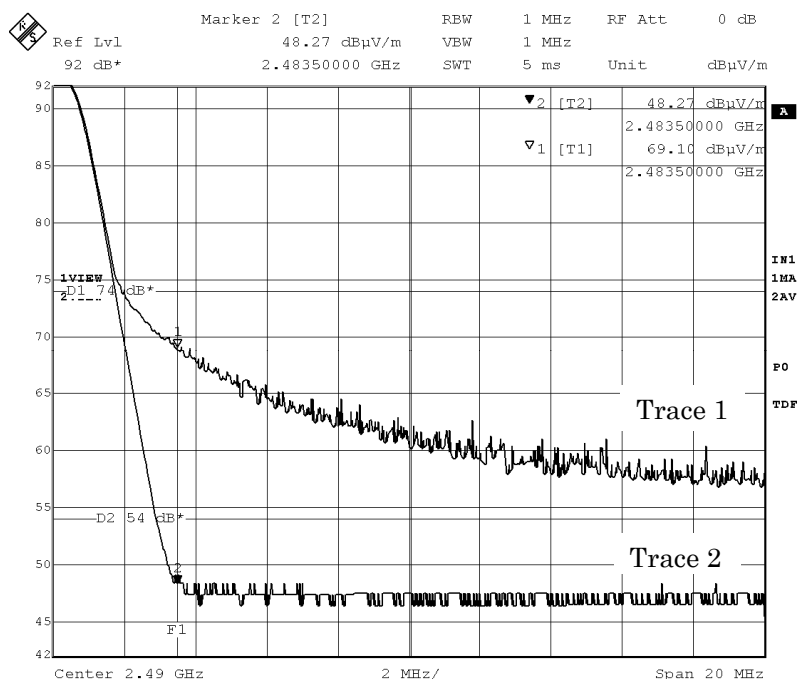
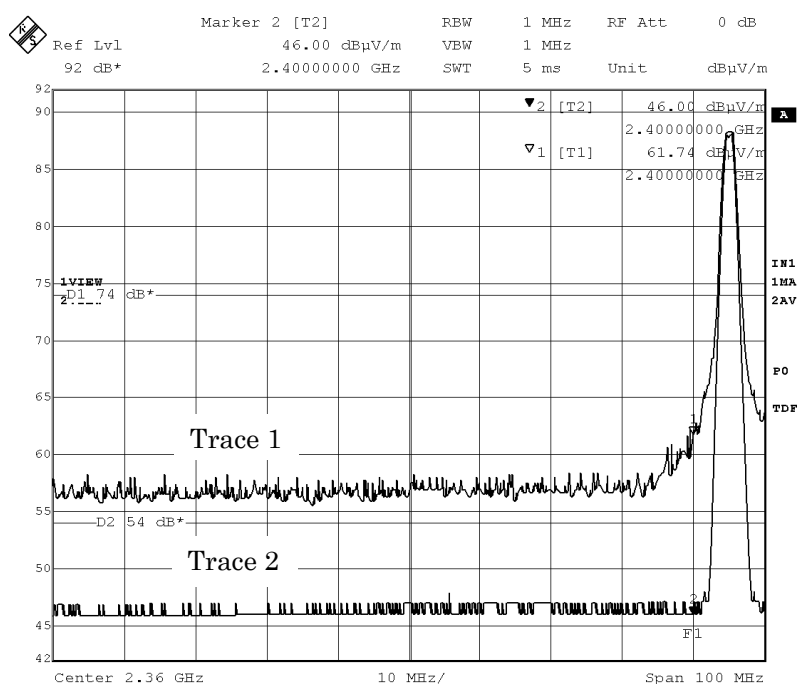
Date : December 26, 2009

Temp. : 22 °C Humi. : 30 %

Mode of EUT : TX Mode

Test Port : Enclosure

Antenna Polarization : Horizontal

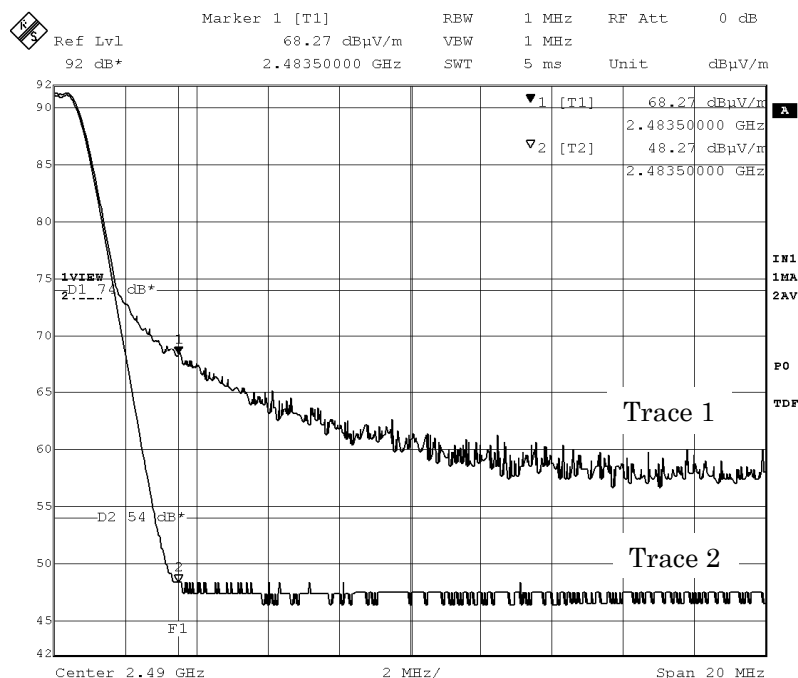
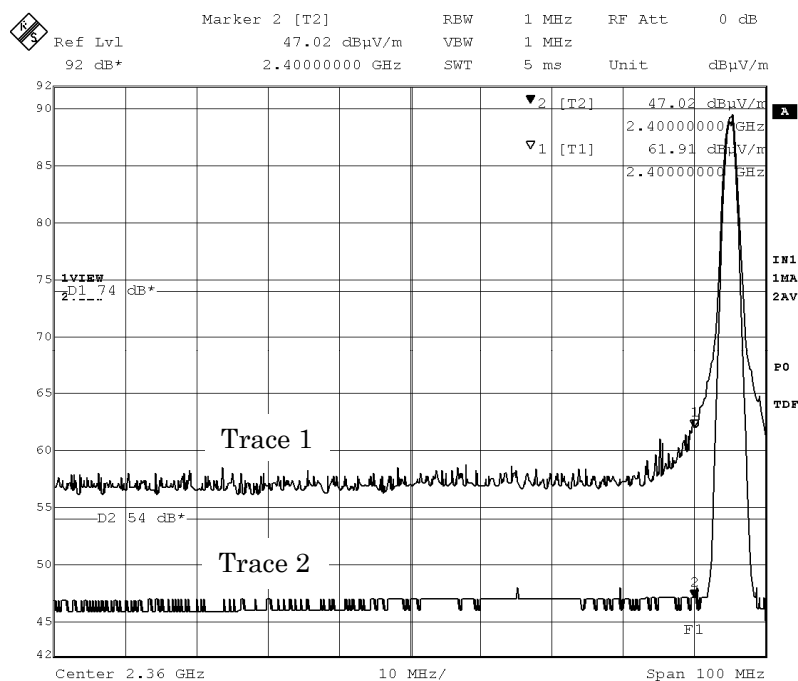


Note : The trace 1 is Peak detection. The Trace 2 is Average detection.

Mode of EUT : TX Mode

Test Port : Enclosure

Antenna Polarization : Vertical



Note : The trace 1 is Peak detection. The Trace 2 is Average detection.

**A.3.2 Other Spurious Emissions****A.3.2.1 Spurious Emissions in the frequency range from 9 kHz to 30 MHz**Date : December 26, 2009Temp. : 22 °C Humi. : 30 %

Mode of EUT : All modes have been investigated and worst case mode for Channel (0ch : 2405 MHz)  
has been listed.

Test Port : Enclosure

No spurious emissions of the EUT in the range 20 dB below the limit.

**A.3.2.2 Spurious Emissions in the frequency range from 30 MHz to 1000 MHz**Date : December 26, 2009Temp. : 22 °C Humi. : 30 %

Mode of EUT : All modes have been investigated and worst case mode for Channel (0ch : 2405 MHz)  
has been listed.

Test Port : Enclosure

No spurious emissions of the EUT in the range 20 dB below the limit.

### A.3.2.3 Spurious Emissions in the frequency range above 1 GHz

Date : December 26, 2009

Temp. : 22 °C Humi. : 30 %

Mode of EUT : TX Mode (2405MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |      | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |      | Margins<br>(dB) |      |   |      |   |      |   |      |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|------|--------------------|------|-----------------------------|------|-----------------|------|---|------|---|------|---|------|
|                    |                       |                              |              | AV                      | Peak | AV                 | Peak | AV                          | Peak | AV              | Peak |   |      |   |      |   |      |
| 1.2025             | 0.0                   | -2.0                         | V            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 26.0 | < | 39.0 | > | 28.0 | > | 35.0 |
| 4.8101             | 0.0                   | 8.4                          | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 36.4 | < | 49.4 | > | 17.6 | > | 24.6 |
| 7.2151             | 0.0                   | 12.0                         | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 40.0 | < | 53.0 | > | 14.0 | > | 21.0 |
| 9.6201             | 0.0                   | 14.8                         | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 42.8 | < | 55.8 | > | 11.2 | > | 18.2 |

Mode of EUT : TX Mode (2440MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |      | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |      | Margins<br>(dB) |      |   |      |   |      |   |      |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|------|--------------------|------|-----------------------------|------|-----------------|------|---|------|---|------|---|------|
|                    |                       |                              |              | AV                      | Peak | AV                 | Peak | AV                          | Peak | AV              | Peak |   |      |   |      |   |      |
| 1.2200             | 0.0                   | -2.0                         | V            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 26.0 | < | 39.0 | > | 28.0 | > | 35.0 |
| 4.8801             | 0.0                   | 8.5                          | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 36.5 | < | 49.5 | > | 17.5 | > | 24.5 |
| 7.3201             | 0.0                   | 12.1                         | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 40.1 | < | 53.1 | > | 13.9 | > | 20.9 |
| 9.7601             | 0.0                   | 15.0                         | H            | <                       | 28.0 | <                  | 41.0 | 54.0                        | 74.0 | <               | 43.0 | < | 56.0 | > | 11.0 | > | 18.0 |

Mode of EUT : TX Mode (2480MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |      |    |      | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |      | Margins<br>(dB) |      |   |      |   |      |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|------|----|------|--------------------|------|-----------------------------|------|-----------------|------|---|------|---|------|
|                    |                       |                              |              | AV                      | Peak | AV | Peak | AV                 | Peak | AV                          | Peak |                 |      |   |      |   |      |
| 1.2400             | 0.0                   | -1.9                         | H            | <                       | 28.0 | <  | 41.0 | 54.0               | 74.0 | <                           | 26.1 | <               | 39.1 | > | 27.9 | > | 34.9 |
| 4.9601             | 0.0                   | 8.6                          | V            | <                       | 28.0 | <  | 41.0 | 54.0               | 74.0 | <                           | 36.6 | <               | 49.6 | > | 17.4 | > | 24.4 |
| 7.4401             | 0.0                   | 12.3                         | H            | <                       | 28.0 | <  | 41.0 | 54.0               | 74.0 | <                           | 40.3 | <               | 53.3 | > | 13.7 | > | 20.7 |
| 9.9201             | 0.0                   | 15.2                         | H            | <                       | 28.0 | <  | 41.0 | 54.0               | 74.0 | <                           | 43.2 | <               | 56.2 | > | 10.8 | > | 17.8 |

Note : 1) The spectrum was checked from 1.0 GHz to 26.5 GHz.

2) The cable loss, amp. gain and antenna factor are included in the correction factor.

3) The symbol of "&lt;" means "or less".

4) The symbol of "&gt;" means "or greater".

5) A sample calculation(Peak) was made at 1.2025 GHz.

$$PA + CF + MR = 0 + (-2.0) + 41.0 = 39.0 \text{ (dBuV/m)}$$

PA : Peak to Average Factor (P-A Factor)

CF : Correction Factor

MR : Meter Reading

6) Measuring Instruments Setting :

| Detector Function | Resolution Bandwidth | Video Bandwidth |
|-------------------|----------------------|-----------------|
| Average (AV)      | 1 MHz                | 10 Hz           |
| Peak              | 1 MHz                | 1 MHz           |

**A.4 AC Power Line Conducted Emissions for Transmitter**

Not Applicable

**A.5 Spurious Emissions for Receiver (Radiation)****A.5.1 Spurious Emissions in the frequency range from 30 MHz to 1000 MHz**Date : December 26, 2009Temp. : 22 °C Humi. : 30 %

Mode of EUT : All modes have been investigated and worst case mode for Channel (0ch : 2405 MHz)  
has been listed.

Test Port : Enclosure

No spurious emissions of the EUT in the range 20 dB below the limit.

**A.5.2 Spurious Emissions in the frequency range above 1 GHz**

Date : December 26, 2009

Temp. : 22 °C Humi. : 30 %

Mode of EUT : RX Mode (2405MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |        | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |        | Margins<br>(dB) |        |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|--------|--------------------|------|-----------------------------|--------|-----------------|--------|
|                    |                       |                              |              | AV                      | Peak   | AV                 | Peak | AV                          | Peak   | AV              | Peak   |
| 1.3755             | 0.0                   | -1.8                         | H            | 32.2                    | < 41.0 | 54.0               | 74.0 | 30.4                        | < 39.2 | 23.6            | > 34.8 |
| 2.7509             | 0.0                   | 3.1                          | H            | 39.1                    | 44.3   | 54.0               | 74.0 | 42.2                        | 47.4   | 11.8            | 26.6   |

Mode of EUT : RX Mode (2440MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |        | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |        | Margins<br>(dB) |        |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|--------|--------------------|------|-----------------------------|--------|-----------------|--------|
|                    |                       |                              |              | AV                      | Peak   | AV                 | Peak | AV                          | Peak   | AV              | Peak   |
| 1.3955             | 0.0                   | -1.8                         | H            | 31.5                    | < 41.0 | 54.0               | 74.0 | 29.7                        | < 39.2 | 24.3            | > 34.8 |
| 2.7909             | 0.0                   | 3.2                          | V            | 36.7                    | 42.9   | 54.0               | 74.0 | 39.9                        | 46.1   | 14.1            | 27.9   |

Mode of EUT : RX Mode (2480MHz)

Test Port : Enclosure

| Frequency<br>(GHz) | P-A<br>Factor<br>(dB) | Correction<br>Factor<br>(dB) | Polarization | Meter Reading<br>(dBuV) |        | Limits<br>(dBuV/m) |      | Emission Levels<br>(dBuV/m) |        | Margins<br>(dB) |        |
|--------------------|-----------------------|------------------------------|--------------|-------------------------|--------|--------------------|------|-----------------------------|--------|-----------------|--------|
|                    |                       |                              |              | AV                      | Peak   | AV                 | Peak | AV                          | Peak   | AV              | Peak   |
| 1.4184             | 0.0                   | -1.7                         | H            | 29.8                    | < 41.0 | 54.0               | 74.0 | 28.1                        | < 39.3 | 25.9            | > 34.7 |
| 2.8366             | 0.0                   | 3.4                          | H            | 35.9                    | 42.6   | 54.0               | 74.0 | 39.3                        | 46.0   | 14.7            | 28.0   |

Note : 1) The spectrum was checked from 1.0 GHz to 26.5 GHz.

2) The cable loss, amp. gain and antenna factor are included in the correction factor.

3) The symbol of "&lt;" means "or less".

4) The symbol of "&gt;" means "or greater".

5) A sample calculation(Peak) was made at 1.3755 GHz.

$$PA + CF + MR = 0 + (-1.8) + 41.0 = 39.2 \text{ (dBuV/m)}$$

PA : Peak to Average Factor (P-A Factor)

CF : Correction Factor

MR : Meter Reading

6) Measuring Instruments Setting :

| Detector Function | Resolution Bandwidth | Video Bandwidth |
|-------------------|----------------------|-----------------|
| Average (AV)      | 1 MHz                | 10 Hz           |
| Peak              | 1 MHz                | 1 MHz           |

**A.6 AC Power Line Conducted Emissions for Receiver**

Not Applicable

**Appendix B : Test Arrangement (Photographs)****B.1 External**

**B.2 Radiated Emissions**

- X axis -



- Y axis -

Photograph present configuration with maximum emission



- Z axis -

Photograph present configuration with maximum emission

### **B.3 AC Power Line Conducted Emissions**

Not Applicable

## Appendix C : Test Instruments

|                         |                    |       |              |        |              | 30-Nov-2009 |          |
|-------------------------|--------------------|-------|--------------|--------|--------------|-------------|----------|
| No                      | Type               | Model | Manufacturer | Serial | ID           | Last Cal.   | Interval |
| <u>Test Facilities:</u> |                    |       |              |        |              |             |          |
| 1                       | Anechoic Chamber A | -     | TDK          | -      | 800-01-502E0 | Apr 2009    | 1 Year   |
| 2                       | Anechoic Chamber B | -     | TDK          | -      | 800-01-503E0 | Apr 2009    | 1 Year   |
| 3                       | Shield Room A      | -     | TDK          | -      | 800-01-501E0 | -           | -        |
| 4                       | Shield Room B      | -     | Ray Proof    | -      | 800-01-010E0 | -           | -        |
| 5                       | Shield Room C      | -     | TDK          | -      | 800-01-504E0 | -           | -        |
| 6                       | Shield Room D      | -     | Emerson      | -      | 800-01-022E0 | -           | -        |
| 7                       | Shield Room E      | -     | TDK          | -      | 800-01-505E0 | -           | -        |

### Measuring Instruments:

|     |                      |          |                 |            |              |          |        |
|-----|----------------------|----------|-----------------|------------|--------------|----------|--------|
| 10  | Test Receiver        | ESHS10   | Rohde & Schwarz | 835871/004 | 119-01-505E0 | May 2009 | 1 Year |
| 11  | Test Receiver        | ESVS10   | Rohde & Schwarz | 826148/002 | 119-03-504E0 | Jun 2009 | 1 Year |
| 12  | Test Receiver        | ESVS10   | Rohde & Schwarz | 832699/001 | 119-03-506E0 | Sep 2009 | 1 Year |
| 13  | Test Receiver        | ESI26    | Rohde & Schwarz | 100043     | 119-04-511E0 | Oct 2009 | 1 Year |
| 14  | Spectrum Analyzer    | R3182    | Advantest       | 120600581  | 122-02-521E0 | Mar 2009 | 1 Year |
| 19  | Spectrum Analyzer    | R3132    | Advantest       | 120500072  | 122-02-520E0 | May 2009 | 1 Year |
| 20  | Spectrum Analyzer    | R3132    | Advantest       | 150400998  | 122-02-523E0 | Jul 2009 | 1 Year |
| 65  | Power Meter          | 436A     | Hewlett Packard | 1725A01930 | 100-02-501E0 | Apr 2009 | 1 Year |
| 66  | Power Sensor         | 8482A    | Hewlett Packard | 1551A01013 | 100-02-501E0 | Apr 2009 | 1 Year |
| 68  | FM Linear Detector   | MS61A    | Anritsu         | M77486     | 123-02-008E0 | Oct 2009 | 1 Year |
| 69  | Level Meter          | ML422C   | Anritsu         | M87571     | 114-02-501E0 | Jun 2009 | 1 Year |
| 70  | Measuring Amplifier  | 2636     | B & K           | 1614851    | 082-01-502E0 | May 2009 | 1 Year |
| 75  | Frequency Counter    | 53131A   | Hewlett Packard | 3546A11807 | 102-02-075E0 | May 2009 | 1 Year |
| 83  | FFT Analyzer         | R9211C   | Advantest       | 02020253   | 122-02-506E0 | Jun 2009 | 1 Year |
| 84  | Noise Meter          | MN-446   | Meguro          | 53030478   | 082-01-144E0 | Apr 2009 | 1 Year |
| 163 | Digital Oscilloscope | 54502A   | Hewlett Packard | 2934A05573 | 121-02-502E0 | May 2009 | 1 Year |
| 165 | Multimeter           | VOAC7413 | Iwatsu Electric | 0267973    | 114-02-502E0 | Apr 2009 | 1 Year |
| 172 | Test Receiver        | ESCI     | Rohde & Schwarz | 100408     | 119-04-512E0 | Oct 2009 | 1 Year |
| 210 | Peak Power Meter     | ML2495A  | Anritsu         | 0836023    | 100-02-507E0 | Nov 2009 | 1 Year |
| 211 | Power Sensor         | MA2491A  | Anritsu         | 0811206    | 100-02-507E0 | Nov 2009 | 1 Year |
| 212 | Power Sensor         | MA2411B  | Anritsu         | 0738312    | 100-02-507E0 | Nov 2009 | 1 Year |
| 230 | Spectrum Analyzer    | U3751    | Advantest       | 150800116  | 122-02-003T  | Feb 2009 | 1 Year |
| 232 | Digital Oscilloscope | TDS3052C | Tektronix, Inc. | C010708    | 121-02-504E0 | Jun 2009 | 1 Year |

### Antennas:

|     |                            |                |                  |             |              |          |        |
|-----|----------------------------|----------------|------------------|-------------|--------------|----------|--------|
| 21  | Loop Antenna               | HFH2-Z2        | Rohde & Schwarz  | 881058/62   | 119-05-033E0 | Jul 2009 | 1 Year |
| 234 | Dipole Antenna             | KBA-511A       | Kyoritsu         | 0-316-5     | 119-05-123E0 | Nov 2009 | 2 Year |
| 235 | Dipole Antenna             | KBA-611        | Kyoritsu         | 0-317-3     | 119-05-124E0 | Nov 2009 | 2 Year |
| 27  | Biconical Antenna          | BBA9106        | Schwarzbeck      | -           | 119-05-078E0 | Nov 2008 | 1 Year |
| 28  | Log-periodic Antenna       | UHALP9107      | Schwarzbeck      | -           | 119-05-079E0 | Nov 2008 | 1 Year |
| 31  | Horn Antenna               | 3115           | EMC Test Systems | 6442        | 119-05-514E0 | Jan 2008 | 2 Year |
| 32  | Horn Antenna               | 3116           | EMC Test Systems | 2547        | 119-05-515E0 | Jun 2009 | 2 Year |
| 167 | Biconical Antenna          | BBA9106        | Schwarzbeck      | VHA91032325 | 119-05-520E0 | Jun 2009 | 1 Year |
| 168 | Log-periodic Antenna       | UHALP9108A     | Schwarzbeck      | 0666        | 119-05-521E0 | Jun 2009 | 1 Year |
| 169 | Biconical Antenna          | BBA9106        | Schwarzbeck      | VHA91032399 | 119-05-522E0 | Jun 2009 | 1 Year |
| 170 | Log-periodic Antenna       | UHALP9108A     | Schwarzbeck      | 0724        | 119-05-523E0 | Jun 2009 | 1 Year |
| 198 | Log-periodic Antenna       | HL050          | Rohde & Schwarz  | 100251      | 119-05-524E0 | Sep 2009 | 1 Year |
| 225 | Loop Sensor/Radiating Loop | F55103-2-0.13M | FCC              | 03018       | 119-05-516E0 | -        | -      |
| 236 | Horn Antenna               | 3160-03        | EMC Test Systems | 00078687    | 119-05-525E0 | Oct 2008 | 2 Year |
| 237 | Horn Antenna               | 3160-08        | EMC Test Systems | 00026081    | 119-05-517E0 | Jan 2008 | 2 Year |
| 238 | Horn Antenna               | 3160-09        | EMC Test Systems | 00023883    | 119-05-518E0 | May 2009 | 2 Year |
| 239 | Horn Antenna               | 3160-10        | EMC Test Systems | 00026026    | 119-05-519E0 | Jul 2009 | 2 Year |

30-Nov-2009

| No                    | Type                 | Model                 | Manufacturer        | Serial   | ID           | Last Cal. | Interval |
|-----------------------|----------------------|-----------------------|---------------------|----------|--------------|-----------|----------|
| <b><u>Cables:</u></b> |                      |                       |                     |          |              |           |          |
| 38                    | RF Cable             | 5D-2W                 | Fujikura            | -        | 155-21-001E0 | Feb 2009  | 1 Year   |
| 39                    | RF Cable             | 5D-2W                 | Fujikura            | -        | 155-21-002E0 | Feb 2009  | 1 Year   |
| 40                    | RF Cable             | 3D-2W                 | Fujikura            | -        | 155-21-005E0 | Apr 2009  | 1 Year   |
| 41                    | RF Cable             | 3D-2W                 | Fujikura            | -        | 155-21-006E0 | Apr 2009  | 1 Year   |
| 42                    | RF Cable             | 3D-2W                 | Fujikura            | -        | 155-21-007E0 | Apr 2009  | 1 Year   |
| 43                    | RF Cable             | RG213/U               | Rohde & Schwarz     | -        | 155-21-010E0 | Apr 2009  | 1 Year   |
| 44                    | RF Cable(10m)        | S 04272B              | Suhner              | -        | 155-21-011E0 | May 2009  | 1 Year   |
| 45                    | RF Cable(1.5m 18GHz) | S 04272B              | Suhner              | -        | 155-21-012E0 | May 2009  | 1 Year   |
| 46                    | RF Cable(1m 18GHz)   | SUCOFLEX10            | Suhner              | -        | 155-21-013E0 | May 2009  | 1 Year   |
| 47                    | RF Cable(1m N)       | S 04272B              | Suhner              | -        | 155-21-015E0 | Jun 2009  | 1 Year   |
| 48                    | RF Cable(1m 26GHz)   | SUCOFLEX<br>104E      | Suhner              | 14543/4E | 155-21-016E0 | Dec 2008  | 1 Year   |
| 49                    | RF Cable(4m 26GHz)   | SUCOFLEX10            | Suhner              | 190630   | 155-21-017E0 | Dec 2008  | 1 Year   |
| 50                    | RF Cable(10m)        | F130-S1S1-394         | MEGA PHASE          | 10510    | 155-21-018E0 | Dec 2008  | 1 Year   |
| 51                    | RF Cable(5m)         | 3D-2W                 | Fujikura            | -        | 155-21-009E0 | Apr 2009  | 1 Year   |
| 52                    | RF Cable(7m)         | RG223/U               | Suhner              | -        | 155-21-021E0 | May 2009  | 1 Year   |
| 195                   | RF Cable(10m)        | F130-S1S1-394         | MEGA PHASE          | 20051    | 155-21-020E0 | Apr 2009  | 1 Year   |
| 240                   | RF Cable(3m 40GHz)   | KPS-1501-<br>1181-KPS | Insulated Wire Inc. | 11292001 | 155-21-019E0 | Jan 2009  | 1 Year   |
| 241                   | RF Cable(6m 40GHz)   | SUCOFLEX<br>102E      | Suhner              | 6257/2E  | 155-21-024E0 | Oct 2009  | 1 Year   |

**Networks:**

|     |                      |          |                 |          |              |          |        |
|-----|----------------------|----------|-----------------|----------|--------------|----------|--------|
| 33  | LISN                 | KNW-407  | Kyoritsu        | 8-833-6  | 149-04-052E0 | Nov 2009 | 1 Year |
| 34  | LISN                 | KNW-407  | Kyoritsu        | 8-855-2  | 149-04-055E0 | May 2009 | 1 Year |
| 35  | LISN                 | KNW-407  | Kyoritsu        | 8-1130-6 | 149-04-062E0 | May 2009 | 1 Year |
| 36  | LISN                 | KNW-242C | Kyoritsu        | 8-837-13 | 149-04-054E0 | Apr 2009 | 1 Year |
| 37  | Absorbing Clamp      | MDS21    | Luthi           | 03293    | 119-06-506E0 | Aug 2009 | 1 Year |
| 164 | LISN                 | KNW-403D | Kyoritsu        | 8-1474-3 | 149-04-059E0 | Apr 2009 | 1 Year |
| 173 | Pulse Limiter        | ESH3-Z2  | Rohde & Schwarz | -        | 156-01-501E0 | Apr 2009 | 1 Year |
| 174 | Pulse Limiter        | ESH3-Z2  | Rohde & Schwarz | -        | 156-01-502E0 | Apr 2009 | 1 Year |
| 175 | Pulse Limiter        | ESH3-Z2  | Rohde & Schwarz | -        | 156-01-503E0 | Apr 2009 | 1 Year |
| 194 | High Impedance Probe | HP-2     | JQA             | 001      | 149-06-503E0 | Oct 2009 | 1 Year |

**Amplifiers:**

|     |                        |                        |                 |                    |              |          |        |
|-----|------------------------|------------------------|-----------------|--------------------|--------------|----------|--------|
| 53  | AF Amplifier           | P-500L                 | Accuphase       | BOY806             | 127-01-501E0 | Feb 2009 | 1 Year |
| 54  | RF Amplifier           | WJ-6882-814            | Watkins-Johnson | 0414               | 127-04-017E0 | Jun 2009 | 1 Year |
| 55  | RF Amplifier           | WJ-5315-556            | Watkins-Johnson | 106                | 127-04-006E0 | Jun 2009 | 1 Year |
| 56  | RF Amplifier           | WJ-5320-307            | Watkins-Johnson | 645                | 127-04-005E0 | Jun 2009 | 1 Year |
| 57  | RF Amplifier           | JS4-00102600-<br>28-5A | MITEQ           | 669167             | 127-04-502E0 | Apr 2009 | 1 Year |
| 226 | Differential Amplifier | 5303                   | NF              | 155726-<br>5305046 | 127-01-502E0 | Apr 2009 | 1 Year |

30-Nov-2009

| No                 | Type               | Model          | Manufacturer                | Serial     | ID           | Last Cal. | Interval |
|--------------------|--------------------|----------------|-----------------------------|------------|--------------|-----------|----------|
| <b>Generators:</b> |                    |                |                             |            |              |           |          |
| 58                 | Function Generator | 3325B          | Hewlett Packard             | 2847A03284 | 118-08-124E0 | Jul 2009  | 1 Year   |
| 59                 | Function Generator | VP-7422A       | Matsushita<br>Communication | 050351E122 | 118-08-503E0 | Jul 2009  | 1 Year   |
| 60                 | Signal Generator   | 8664A          | Hewlett Packard             | 3035A00140 | 118-03-014E0 | May 2009  | 1 Year   |
| 61                 | Signal Generator   | 8664A          | Hewlett Packard             | 3438A00756 | 118-04-502E0 | May 2009  | 1 Year   |
| 62                 | Signal Generator   | 6061A          | Gigatronics                 | 5130593    | 118-04-024E0 | Mar 2009  | 1 Year   |
| 171                | Signal Generator   | SML03          | Rohde & Schwarz             | 102651     | 118-04-509E0 | Feb 2009  | 1 Year   |
| 222                | Signal Generator   | 8673D          | Hewlett Packard             | 2938A00988 | 118-04-015E0 | Jul 2009  | 2 Year   |
| <b>Others:</b>     |                    |                |                             |            |              |           |          |
| 63                 | Termination(50)    | -              | Suhner                      | -          | 154-06-501E0 | Jan 2009  | 1 Year   |
| 64                 | Termination(50)    | -              | Suhner                      | -          | 154-06-502E0 | Jan 2009  | 1 Year   |
| 71                 | Microphone         | 4134           | B & K                       | 1253497    | 147-01-502E0 | May 2009  | 1 Year   |
| 72                 | Preamplifier       | 2639           | B & K                       | 1268763    | 127-01-504E0 | -         | -        |
| 73                 | Pistonphone        | 4220           | B & K                       | 1165008    | 147-02-501E0 | Mar 2009  | 1 Year   |
| 74                 | Artificial Mouth   | 4227           | B & K                       | 1274869    | -            | -         | -        |
| 76                 | Oven               | -              | Ohnishi                     | -          | 023-02-018E0 | -         | -        |
| 77                 | DC Power Supply    | 6628A          | Hewlett Packard             | 3224A00284 | 072-05-503E0 | Jun 2009  | 1 Year   |
| 78                 | Band RejectFilter  | BRM12294       | Micro-tronics               | 003        | 149-01-501E0 | Jan 2009  | 1 Year   |
| 79                 | High Pass Filter   | F-100-4000-5-R | RLC Electronics             | 0149       | 149-01-502E0 | Feb 2009  | 1 Year   |
| 80                 | Attenuator         | 43KC-10        | Anritsu                     | -          | 148-03-506E0 | Feb 2009  | 1 Year   |
| 81                 | Attenuator         | 43KC-20        | Anritsu                     | -          | 148-03-507E0 | Feb 2009  | 1 Year   |
| 82                 | Attenuator         | 355D           | Hewlett Packard             | 219-10782  | 148-03-065E0 | Apr 2009  | 1 Year   |
| 85                 | RF Detector        | 75KC-50        | Anritsu                     | 305002     | 100-02-506E0 | Jul 2009  | 1 Year   |
| 200                | Artificial Hand    | AH-1           | ES Factory                  | 001        | 155-07-561E0 | Jul 2009  | 1 Year   |
| 201                | Barometer          | TYPE6          | Yanagi                      | 16076      | 209-02-014E0 | Feb 2008  | 2 Year   |
| 202                | Thermo-Hygrometer  | -              | Empex                       | -          | 141-01-504E0 | Mar 2008  | 2 Year   |
| 203                | Thermo-Hygrometer  | EX-2727        | Empex                       | -          | 141-01-505E0 | Mar 2008  | 2 Year   |
| 204                | Thermo-Hygrometer  | EX-2727        | Empex                       | -          | 141-01-506E0 | Mar 2008  | 2 Year   |
| 205                | Thermo-Hygrometer  | EX-2727        | Empex                       | -          | 141-01-507E0 | Mar 2008  | 2 Year   |
| 206                | Low Pass Filter    | LPM13323       | Micro-tronics               | 001        | 149-01-505E0 | Jul 2009  | 1 Year   |
| 207                | High Pass Filter   | HPM13321       | Micro-tronics               | 001        | 149-01-506E0 | Jul 2009  | 1 Year   |
| 208                | High Pass Filter   | HPM13322       | Micro-tronics               | 001        | 149-01-507E0 | Jul 2009  | 1 Year   |
| 242                | Power Divider      | 1575           | Aeroflex Weischel           | 1153       | 086-02-501E0 | Oct 2009  | 1 Year   |
| 243                | Power Divider      | 1575           | Aeroflex Weischel           | 1157       | 086-02-502E0 | Oct 2009  | 1 Year   |
| 244                | Power Divider      | 1575           | Aeroflex Weischel           | 1161       | 086-02-503E0 | Oct 2009  | 1 Year   |