

## TEST REPORT

**APPLICANT** : CITIZEN SYSTEMS JAPAN CO., LTD.

**ADDRESS** : 6-12 Tanashi-cho, Nishi-Tokyo-shi, Tokyo 188-8511, Japan

**PRODUCTS** : Digital Photo Printer

**MODEL No.** : JR10-M01

**SERIAL No.** : CY01-ES04

**FCC ID** : TLGJR10M01

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

**TESTING LOCATION** : Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department Testing Division  
and EMC Engineering Department TSURU EMC Branch

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

**DATE OF TEST** : February 15, 2011 - March 3, 2011



A handwritten signature in black ink that reads "Shinichi Yokoi".

Shinichi Yokoi

Manager

Japan Quality Assurance Organization

Safety &amp; EMC Center

EMC Engineering Department, TSURU EMC Branch  
2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, 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.
  - VLAC does not approve, certify or warrant the product by this test report.

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**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 and C

Test procedure : ANSI C63.4-2003

### 2 Test Location

#### 2.1 Test Location 1

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

#### 2.2 Test Location 2

Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department TSURU EMC Branch  
2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, JAPAN

### 3 Recognition of Test Laboratory

#### 3.1 Test Laboratory 1

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 : March 30, 2012)  
NVLAP Lab Code : 200189-0 (Effective through : June 30, 2011)  
VCCI Registration Number : R-002, R-003, C-002, C-966, C-3679, T-1814, T-1815, T-1816,  
G-170, G-171 (Effective through : March 30, 2012)  
FCC Registration Number : 349652 (Date of Listing : March 30, 2012)  
IC Registration Number : 2079A-1, 2079A-2 (Effective through : October 20, 2012)  
Accredited as conformity assessment body for Japan electrical appliances and material law  
by METI. (Effective through : February 22, 2013)

#### 3.2 Test Laboratory 2

Japan Quality Assurance Organization  
SAFETY & EMC CENTER  
EMC Engineering Department TSURU EMC Branch  
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-001-4 (Effective through : March 30, 2012)  
NVLAP Lab Code : 200192-0 (Effective through : June 30, 2011)  
BSMI Recognition Number : SL2-IN-E-6004, SL2-IS-E-6004, SL2-A1-E-6004  
(Effective through : September 14, 2013)  
VCCI Registration Number : R-004, R-824, R-828, C-003, C-005, C-859, C-860, C-864, C-3085,  
T-1420, T-1421, T-1422, T-1423, T-1424, T-1425, G-175, G-176, G-177  
(Effective through : March 30, 2012)  
FCC Registration Number : 444763 (Effective through : March 30, 2012)  
IC Registration Number : 2079D-1, 2079D-2, 2079D-3 (Effective through : December 16, 2012)  
Accredited as conformity assessment body for Japan electrical appliances and material law  
by METI. (Effective through : February 22, 2013)

#### 4 Description of the Equipment Under Test

- |    |                                         |   |                                                                                               |
|----|-----------------------------------------|---|-----------------------------------------------------------------------------------------------|
| 1  | Manufacturer                            | : | CITIZEN SYSTEMS JAPAN CO., LTD.<br>6-1-12 TANASHI-CHO NISHI-TOKYO-SHI TOKYO<br>188-8511 JAPAN |
| 2  | Products                                | : | Digital Photo Printer                                                                         |
| 3  | Model No.                               | : | JR10-M01(*)                                                                                   |
| 4  | Serial No.                              | : | CY01-ES04                                                                                     |
| 5  | Product Type                            | : | Production                                                                                    |
| 6  | Date of Manufacture                     | : | February 7, 2011                                                                              |
| 7  | Power Rating                            | : | 100VAC-240VAC 50/60Hz                                                                         |
| 8  | EUT Grounding                           | : | Grounded at the plug end of the power Line cord.                                              |
| 9  | Received Date of EUT                    | : | February 10, 2011                                                                             |
| 10 | EUT Authorization                       | : | Certification                                                                                 |
| 11 | EUT Highest Frequency<br>Used/Generated | : | 13.56MHz(Section 15.225)<br>Operation within the band 13.110 - 14.010 MHz                     |
| 12 | Modulation                              | : | ASK                                                                                           |
| 13 | Antenna type                            | : | Fixed using                                                                                   |
| 14 | Temperature Range                       | : | 5 ~ 40 degree                                                                                 |

Note 1 : \* The following models exist by customer's difference. No structural changes.  
JR10-M01, CY-01, DS-RX1

## 5 Test Condition

### 5.1 AC Powerline Conducted Emission

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         | <input type="checkbox"/> OS-1                           | <input type="checkbox"/> OS-2          | <input type="checkbox"/> AC-1 | <input checked="" type="checkbox"/> SR-A | <input type="checkbox"/> SR-B | <input checked="" type="checkbox"/> 5   |
| Test Receiver     | <input type="checkbox"/> R-3                            | <input type="checkbox"/> R-4           | <input type="checkbox"/> R-5  | <input type="checkbox"/> R-5             | <input type="checkbox"/> R-5  | <input checked="" type="checkbox"/> 172 |
| Cable             | <input type="checkbox"/> CB-3                           | <input type="checkbox"/> CB-4          | <input type="checkbox"/> CB-5 | <input checked="" type="checkbox"/> 42   |                               |                                         |
| Network (for EUT) | <input type="checkbox"/> L-1                            | <input type="checkbox"/> L-2           | <input type="checkbox"/> L-3  | <input type="checkbox"/> L-4             | <input type="checkbox"/> L-5  | <input type="checkbox"/> L-6            |
|                   | <input type="checkbox"/> L-7                            | <input type="checkbox"/> L-8           | <input type="checkbox"/> L-9  | <input type="checkbox"/> L-10            | <input type="checkbox"/> L-11 | <input type="checkbox"/> L-12           |
|                   | <input type="checkbox"/> L-13                           | <input checked="" type="checkbox"/> 34 |                               |                                          |                               |                                         |
| Network (for AE)  | <input type="checkbox"/> L-1                            | <input type="checkbox"/> L-2           | <input type="checkbox"/> L-3  | <input type="checkbox"/> L-4             | <input type="checkbox"/> L-5  | <input type="checkbox"/> L-6            |
|                   | <input type="checkbox"/> L-7                            | <input type="checkbox"/> L-8           | <input type="checkbox"/> L-9  |                                          |                               |                                         |
| Pulse Limiter     | <input type="checkbox"/> PL-3                           | <input type="checkbox"/> PL-4          | <input type="checkbox"/> PL-5 | <input checked="" type="checkbox"/> 175  |                               |                                         |
| Termination       | <input type="checkbox"/> TM-1                           | <input type="checkbox"/> TM-2          |                               |                                          |                               |                                         |
| High Pass Filter  | <input type="checkbox"/> 246                            |                                        |                               |                                          |                               |                                         |
| Thermo-Hygrometer | <input checked="" type="checkbox"/> 202                 |                                        |                               |                                          |                               |                                         |

## 5.2 Radiated Emission

### 5.2.1 Radiated Emission 0.009 MHz - 30 MHz

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     | <input type="checkbox"/> OS-1                           | <input type="checkbox"/> OS-2 | <input checked="" type="checkbox"/> AC-1 |                               |                               |                               |
| Test Receiver | <input checked="" type="checkbox"/> R-4                 | <input type="checkbox"/> R-5  | <input type="checkbox"/> S-1             |                               |                               |                               |
| Cable         | <input type="checkbox"/> CN-1                           | <input type="checkbox"/> CN-2 | <input type="checkbox"/> CN-3            |                               |                               |                               |
| Antenna       | <input type="checkbox"/> AB-1                           | <input type="checkbox"/> AB-2 | <input type="checkbox"/> AB-3            | <input type="checkbox"/> AD-1 | <input type="checkbox"/> AD-2 | <input type="checkbox"/> AD-3 |
|               | <input type="checkbox"/> AL-1                           | <input type="checkbox"/> AL-2 | <input type="checkbox"/> AL-3            | <input type="checkbox"/> AL-4 | <input type="checkbox"/> AL-5 | <input type="checkbox"/> AD-4 |
|               | <input checked="" type="checkbox"/> AL-0                |                               |                                          |                               |                               |                               |

### 5.2.2 Radiated Emission 30 MHz - 1000 MHz

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     | <input type="checkbox"/> OS-1                           | <input type="checkbox"/> OS-2 | <input type="checkbox"/> AC-1            | <input checked="" type="checkbox"/> 1  |                               |                                         |
| Test Receiver | <input type="checkbox"/> R-1                            | <input type="checkbox"/> R-2  | <input type="checkbox"/> R-6             | <input type="checkbox"/> R-5           | <input type="checkbox"/> S-1  | <input checked="" type="checkbox"/> 13  |
| Cable         | <input type="checkbox"/> CN-1                           | <input type="checkbox"/> CN-2 | <input type="checkbox"/> CN-3            | <input checked="" type="checkbox"/> 38 |                               |                                         |
| Antenna       | <input type="checkbox"/> AB-1                           | <input type="checkbox"/> AB-2 | <input checked="" type="checkbox"/> AB-3 | <input type="checkbox"/> AD-1          | <input type="checkbox"/> AD-2 | <input checked="" type="checkbox"/> 167 |
|               | <input type="checkbox"/> AL-1                           | <input type="checkbox"/> AL-2 | <input checked="" type="checkbox"/> AL-3 | <input type="checkbox"/> AL-4          | <input type="checkbox"/> AL-5 | <input checked="" type="checkbox"/> 168 |

### 5.2.3 Radiated Emission above 1 GHz

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     | <input type="checkbox"/> OS-1 <input type="checkbox"/> OS-2 <input type="checkbox"/> AC-1                                                                                           |
| Test Receiver | <input type="checkbox"/> R-3 <input type="checkbox"/> R-5 <input type="checkbox"/> S-1 <input type="checkbox"/> S-3 <input type="checkbox"/> S-4 <input type="checkbox"/> S-5       |
| Cable         | <input type="checkbox"/> CS-1 <input type="checkbox"/> CS-2                                                                                                                         |
| Antenna       | <input type="checkbox"/> AL-1 <input type="checkbox"/> AL-2 <input type="checkbox"/> AL-3 <input type="checkbox"/> AL-4 <input type="checkbox"/> AL-5 <input type="checkbox"/> AL-6 |
| Pre-Amplifier | <input type="checkbox"/> PA-1 <input type="checkbox"/> PA-2 <input type="checkbox"/> PA-3 <input type="checkbox"/> PA-5                                                             |

### 5.3 Frequency Stability

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 Receiver     | <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3 <input type="checkbox"/> R-4 <input type="checkbox"/> R-5 <input type="checkbox"/> S-1<br><input type="checkbox"/> S-3 <input checked="" type="checkbox"/> 13                                                                                                                                                        |
| Cable             | <input type="checkbox"/> CB-3 <input type="checkbox"/> CB-4 <input type="checkbox"/> CB-5 <input type="checkbox"/> CB-3 <input type="checkbox"/> CB-4 <input type="checkbox"/> CB-5<br><input type="checkbox"/> CS-1 <input type="checkbox"/> CS-2 <input type="checkbox"/> CS-3 <input type="checkbox"/> CS-4 <input type="checkbox"/> CS-5 <input checked="" type="checkbox"/> 45                         |
| Oven              | <input checked="" type="checkbox"/> 76                                                                                                                                                                                                                                                                                                                                                                      |
| Frequency Counter | <input checked="" type="checkbox"/> 75                                                                                                                                                                                                                                                                                                                                                                      |
| Antenna           | <input type="checkbox"/> AB-1 <input type="checkbox"/> AB-2 <input type="checkbox"/> AB-3 <input type="checkbox"/> AD-1 <input type="checkbox"/> AD-2 <input type="checkbox"/> AD-3<br><input type="checkbox"/> AL-1 <input type="checkbox"/> AL-2 <input type="checkbox"/> AL-3 <input type="checkbox"/> AL-4 <input type="checkbox"/> AL-5 <input type="checkbox"/> AD-4<br><input type="checkbox"/> AL-0 |

### 5.4 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)                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oven          | <input type="checkbox"/> 76                                                                                                                                                                                                                                                                                                                                                                                 |
| Test Receiver | <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3 <input type="checkbox"/> R-4 <input type="checkbox"/> R-5 <input type="checkbox"/> S-1<br><input type="checkbox"/> S-3 <input checked="" type="checkbox"/> 13                                                                                                                                                        |
| Cable         | <input type="checkbox"/> CB-3 <input type="checkbox"/> CB-4 <input type="checkbox"/> CB-5 <input type="checkbox"/> CB-3 <input type="checkbox"/> CB-4 <input type="checkbox"/> CB-5<br><input type="checkbox"/> CS-1 <input type="checkbox"/> CS-2 <input type="checkbox"/> CB-3 <input type="checkbox"/> CB-4 <input type="checkbox"/> CB-5 <input checked="" type="checkbox"/> 45                         |
| Pre-Amplifier | <input type="checkbox"/> PA-1 <input type="checkbox"/> PA-2 <input type="checkbox"/> PA-3                                                                                                                                                                                                                                                                                                                   |
| Antenna       | <input type="checkbox"/> AB-1 <input type="checkbox"/> AB-2 <input type="checkbox"/> AB-3 <input type="checkbox"/> AD-1 <input type="checkbox"/> AD-2 <input type="checkbox"/> AD-3<br><input type="checkbox"/> AL-1 <input type="checkbox"/> AL-2 <input type="checkbox"/> AL-3 <input type="checkbox"/> AL-4 <input type="checkbox"/> AL-5 <input type="checkbox"/> AD-4<br><input type="checkbox"/> AL-0 |

## 6 Preliminary Test and Test Setup

### 6.1 AC Powerline Conducted Emission

The preliminary conducted disturbance at the mains ports measurements were carried out.

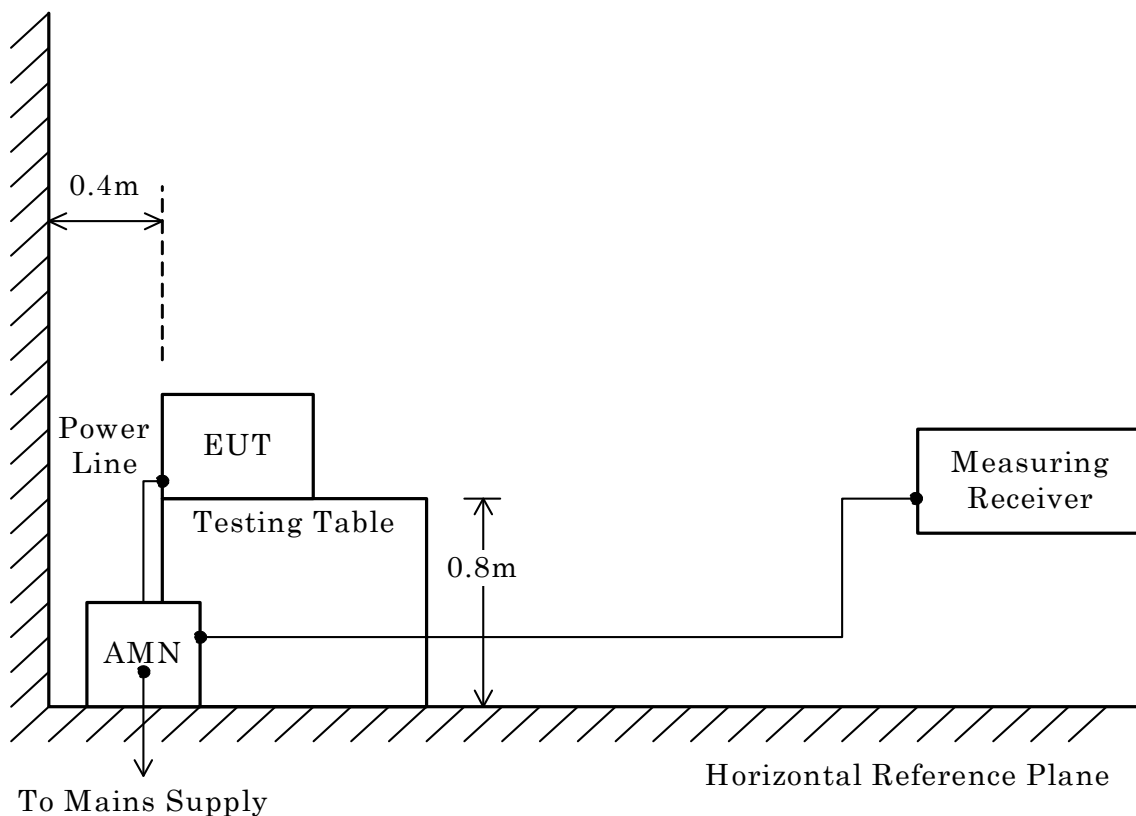
The preliminary conducted disturbance at the mains ports were performed using the spectrum analyzer to observe the emissions characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions. This configurations was used for final conducted disturbance at the mains ports measurements.

(Referred documentation is No.G34364I in JQA Tsuru)

- Side View -

Vertical  
Reference Plane



\* AMN : Artificial Mains Network

## 6.2 Radiated Emission

### 6.2.1 Radiated Emission 0.009 MHz - 30 MHz

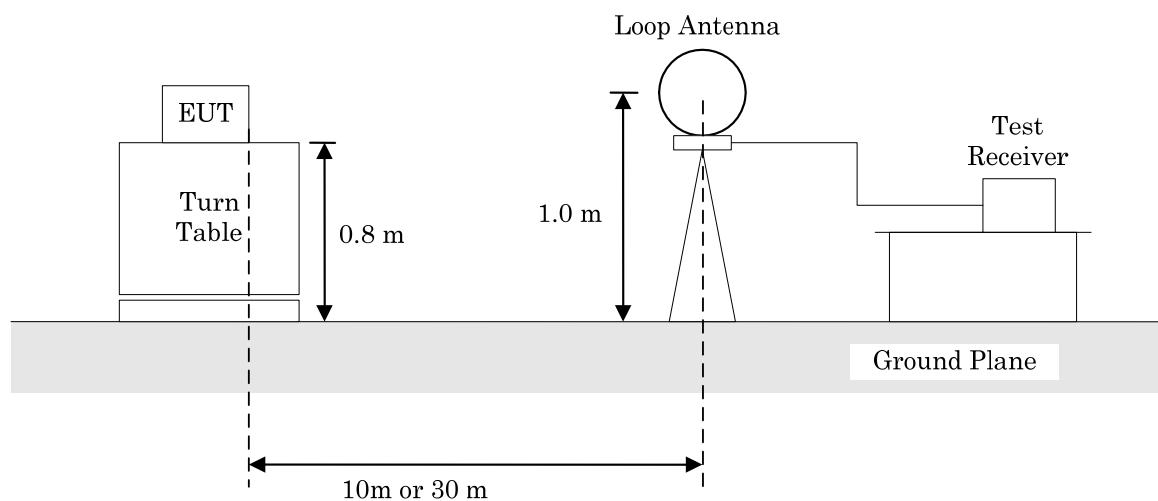
The preliminary radiated disturbance measurements were carried out.

The preliminary radiated disturbance 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.

This configurations was used for the final radiated disturbance measurements.

(Referred documentation is No.G34364I in JQA Tsuru)





## 6.2.2 Radiated Emission 30 MHz - 1000 MHz

The preliminary radiated disturbance measurements were carried out.

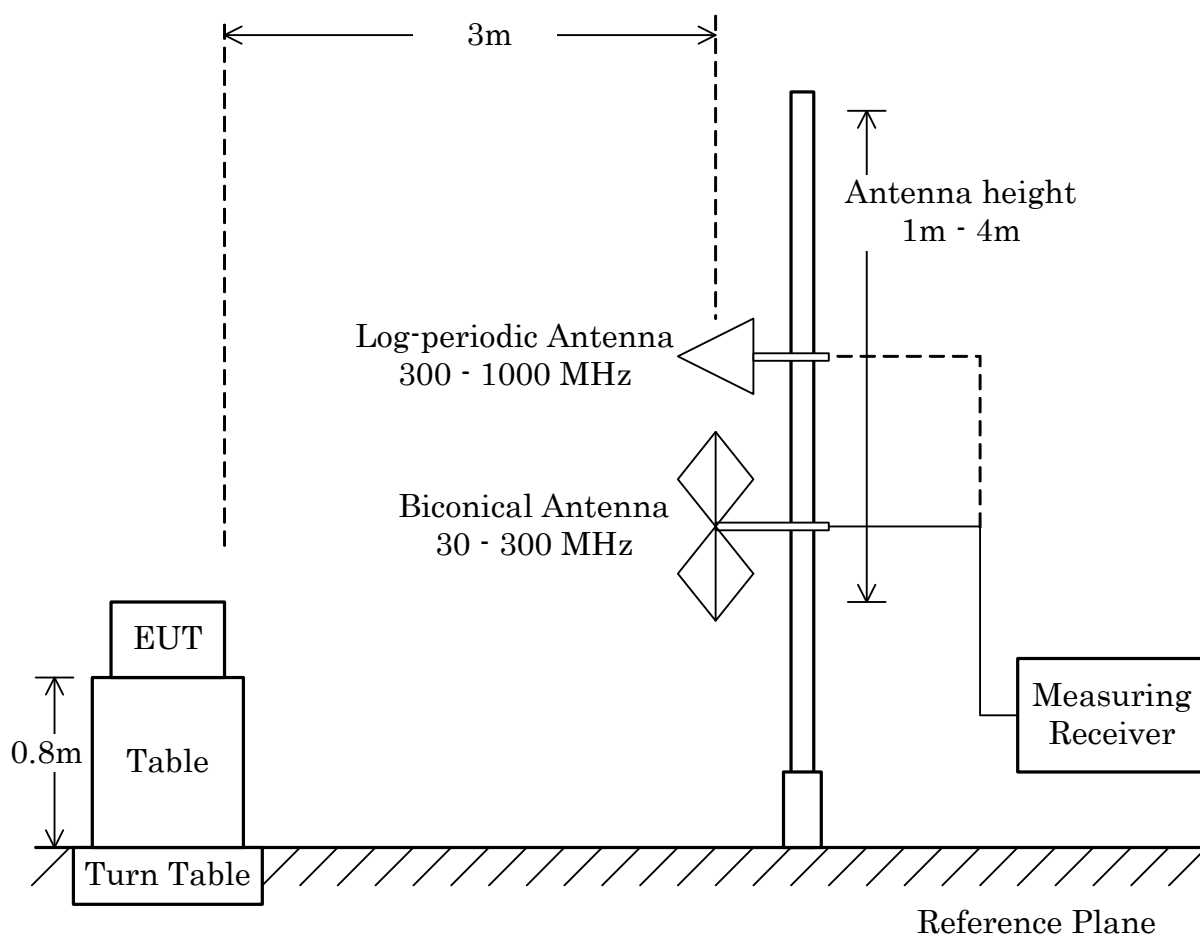
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final radiated disturbance measurements.

(Referred documentation is No.G34364I in JQA Tsuru)

- Side View -



### 6.2.3 Radiated Emission above 1 GHz

The preliminary radiated disturbance measurements were carried out.

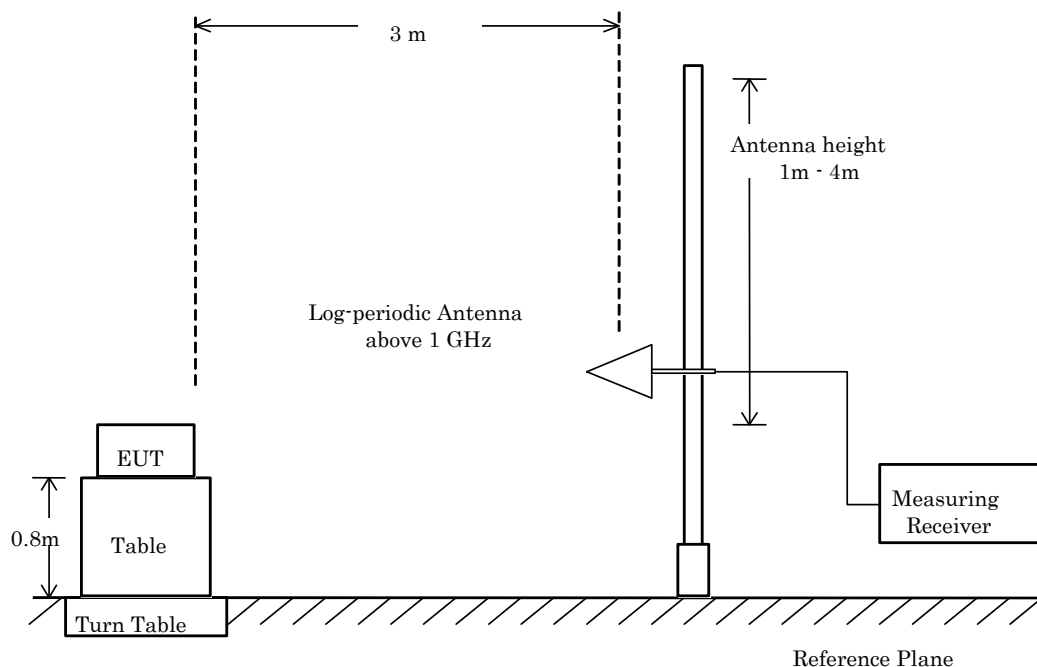
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final radiated disturbance measurements.

(Referred documentation is No.G34364I in JQA Tsuru)

- Side View -

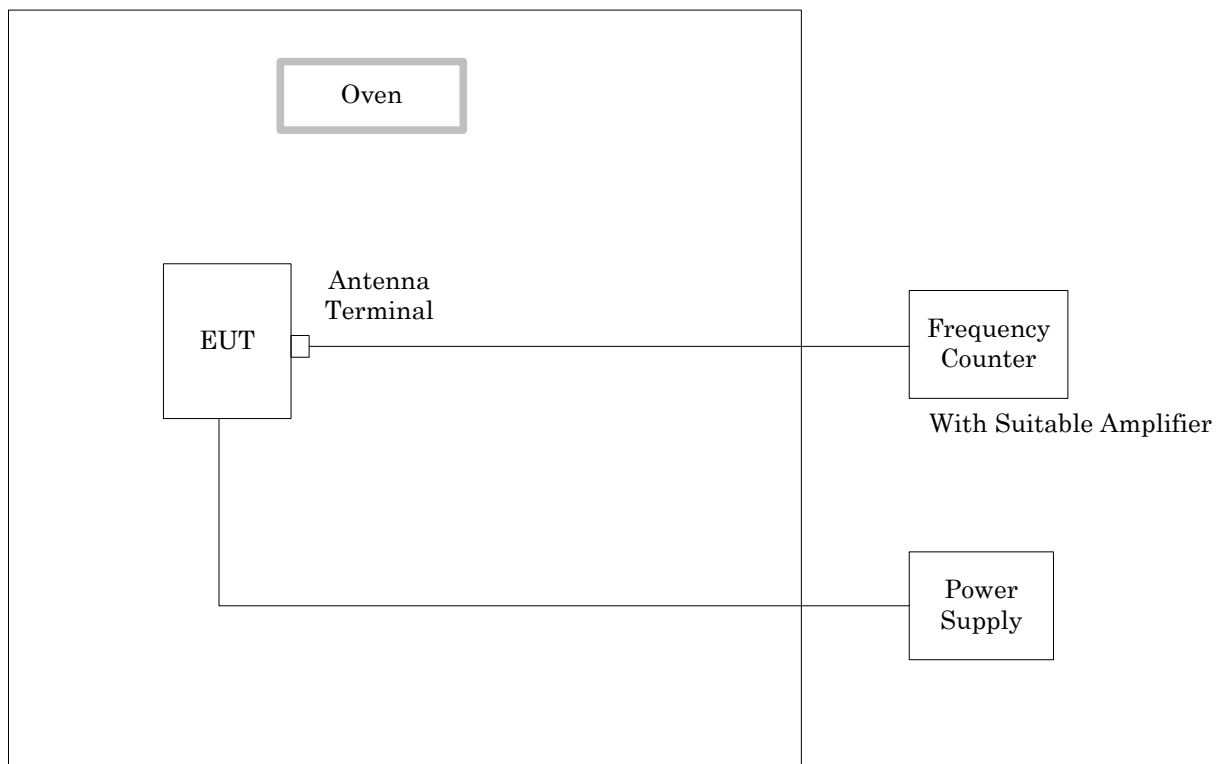


### 6.3 Frequency Stability

The frequency stability measurements were carried out. By using frequency counter with suitable RF amplifier, the carrier frequency of the transmitter under test was measured with a temperature variation of  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at the normal supply voltage, and if required, with a variation in the primary voltage from 85% to 115% the rated supply voltage at the temperature of  $+20^{\circ}\text{C}$ .

These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.

(Referred documentation is No.G34366L in JQA Testing section)

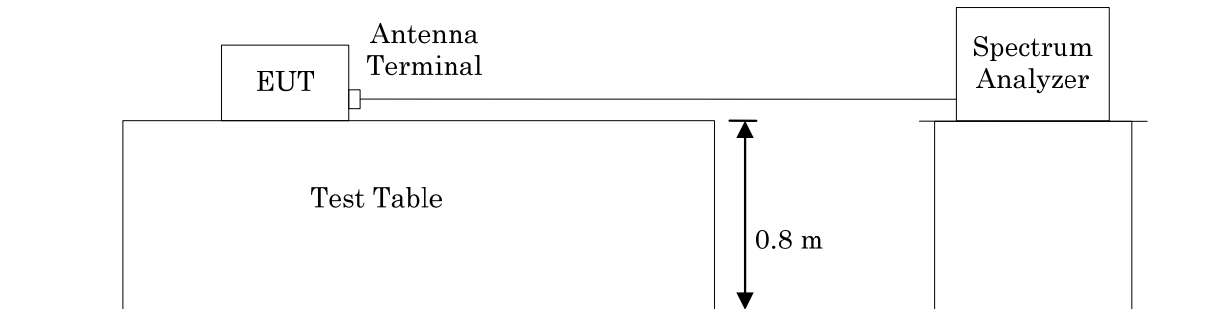


## 6.4 Occupied Bandwidth

According to description of ANSI C63.4-2003 sec.13.1.7, the occupied bandwidth measurements were carried out. By using a spectrum analyzer with a vertical antenna for picking up the signal, the measurements of the emission were made under the transmitting modes of the EUT.

The resolution bandwidth of spectrum analyzer was set to the value specified in sec.13.1.7.

(Referred documentation is No.G34366K in JQA Testing section)



**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.

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## 10 Test Results

### 10.1 AC Powerline Conducted Emission

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

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin (QP) 0.16 dB at 24.2 MHz

Min. Limit Margin (AVE) N/A dB at N/A MHz

Max. Limit Exceeding N/A dB at N/A MHz

Uncertainty of measurement results ± 2.6 dB(2σ)

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

### 10.2 Radiated Emissions (Section 15.225(a)(b)(c))

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

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin 100.3 dB at 13.560 MHz

Max. Limit Exceeding N/A dB at N/A MHz

Uncertainty of measurement results ± 1.9 dB(2σ)

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

### 10.3 Radiated Emissions (Section 15.225(d))

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

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin 4.6 dB at 447.5 MHz

Max. Limit Exceeding N/A dB at N/A MHz

Uncertainty of measurement results

|                                                |              |                     |
|------------------------------------------------|--------------|---------------------|
| <input checked="" type="checkbox"/> - 3 meters | 0.009-30 MHz | <u>± 1.9</u> dB(2σ) |
|                                                | 30- 300 MHz  | <u>± 4.5</u> dB(2σ) |
|                                                | 300-1000 MHz | <u>± 4.6</u> dB(2σ) |
|                                                | 1 - 18 GHz   | <u>± 3.7</u> dB(2σ) |

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

### 10.4 Frequency Stability (Section 15.225(e))

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

☒-Passed ☐-Failed ☐-Not judged

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

### 10.5 Occupied Bandwidth

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

☒-Passed ☐-Failed ☐-Not judged

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

## 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 results.

Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### Test Results :

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:



Shinichi Yokoi  
Manager  
TSURU EMC Branch  
EMC Engineering Department

Tested by:



Takashi Koyama  
Assistant Manager  
TSURU EMC Branch  
EMC Engineering Department



## 12 Operating Condition

Power Supply Voltage : 120VAC 60Hz

Operation Mode : The RFID module continuously repeats communication.

## 13 Test Configuration

The equipment under test consists of :

| Sign | Item                  | Manufacturer                       | Model No. | Serial No. | FCC ID     |
|------|-----------------------|------------------------------------|-----------|------------|------------|
| A    | Digital Photo Printer | CITIZEN SYSTEMS<br>JAPAN CO., LTD. | JR10-M01  | CY01-ES04  | TLGJR10M01 |

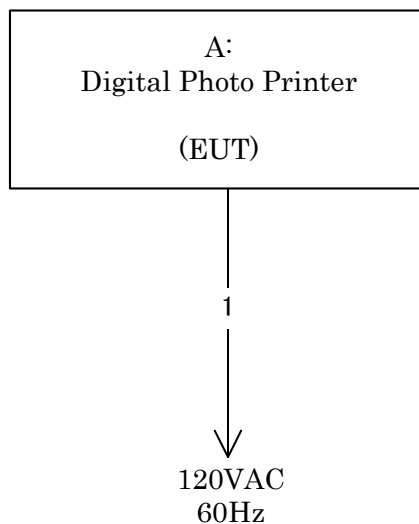
The auxiliary equipment used for testing :

None

Type of Cable:

| No. | Description    | Identification<br>(Manu. etc.) | Connector<br>Shielded | Cable<br>Shielded | Ferrite<br>Core | Length<br>(m) |
|-----|----------------|--------------------------------|-----------------------|-------------------|-----------------|---------------|
| 1   | AC Power Cable | None                           | No                    | No                | No              | 1.95          |

## 14 Equipment Under Test Arrangement (Drawings)



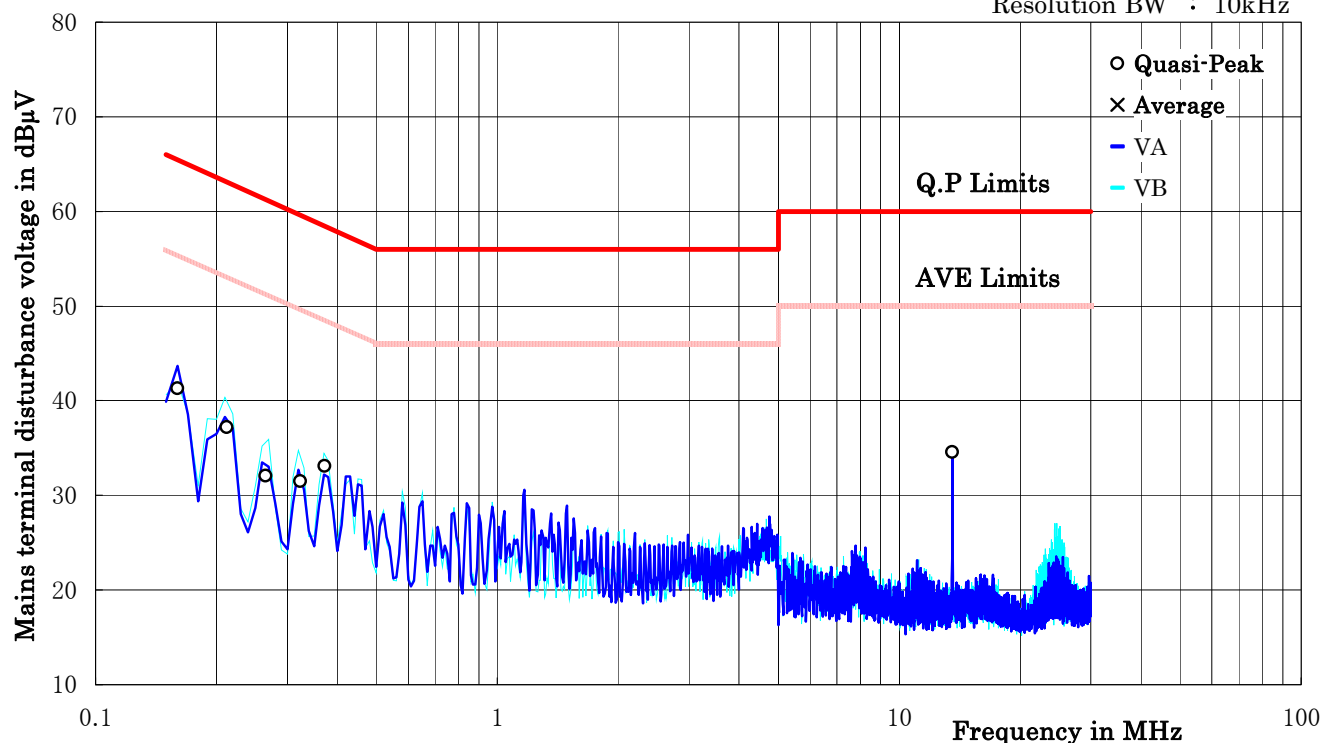
# Appendix A: Test Data

## A.1 AC Powerline Conducted Emission

Date : February 20, 2011

Temp. : 18°C Humi. : 51%

Resolution BW : 10kHz



| Freq.<br>[ MHz ] | Factor.<br>[ dB ] | Meter Reading[dBμV] |        |    |    | Limit<br>[dBμV] |      | Result.<br>[dBμV] |    | Margin<br>[dB] |    |
|------------------|-------------------|---------------------|--------|----|----|-----------------|------|-------------------|----|----------------|----|
|                  |                   | QP                  |        | AV |    | QP              | AV   | QP                | AV | QP             | AV |
|                  |                   | VA                  | VB     | VA | VB |                 |      |                   |    |                |    |
| 0.16             | 22.0              | 18.6                | 19.3   | -  | -  | 65.5            | 55.5 | 41.3              | -  | 24.2           | -  |
| 0.212            | 21.2              | 14.9                | 16.0   | -  | -  | 63.1            | 53.1 | 37.2              | -  | 25.9           | -  |
| 0.265            | 20.8              | < 10.0              | 11.3   | -  | -  | 61.3            | 51.3 | 32.1              | -  | 29.2           | -  |
| 0.323            | 20.6              | < 10.0              | 10.9   | -  | -  | 59.6            | 49.6 | 31.5              | -  | 28.1           | -  |
| 0.371            | 20.4              | < 10.0              | 12.7   | -  | -  | 58.5            | 48.5 | 33.1              | -  | 25.4           | -  |
| 13.56            | 20.4              | 14.2                | 13.5   | -  | -  | 60.0            | 50.0 | 34.6              | -  | 25.4           | -  |
| 27.12            | 20.7              | < 10.0              | < 10.0 | -  | -  | 60.0            | 50.0 | < 30.7            | -  | > 29.3         | -  |

Note : 1) QP : CISPR Quasi-Peak. ; AV : Average.

2) VA : One end & grounded ; VB : The other end & grounded

3) The symbol of '<' means 'or less' .

4) The symbol of '>' means 'or greater' .

5) The symbol of '-' means 'Not applicable' .

6) Factor includes an A. M. N. factor, Hi-Pass Filter loss, Pulse Limiter loss and a cable loss.

7) A sample calculation was made at 0.16MHz

Factor + Meter Reading = 22.0 + 19.3 = 41.3

## A.2 Radiated Emissions

### A.2.1 Radiated Emission (Section 15.225(a)(b)(c))

Date : February 15, 2011

Temp : 15.7°C Humi : 35.7% Atom : 954hPa

| Frequency<br>(MHz) | Antenna<br>Factor<br>(dB) | Meter Reading/<br>3m<br>(dBμV)<br>Q.P | Limits/<br>30m<br>(dBμV)<br>Q.P | Field Strength/<br>30m<br>(dBμV)<br>Q.P | Margin<br>(dB)<br>Q.P |
|--------------------|---------------------------|---------------------------------------|---------------------------------|-----------------------------------------|-----------------------|
| 13.110             | -                         | < 30.0                                | 29.5                            | < 10.9                                  | > 18.6                |
| 13.410             | -                         | < 30.0                                | 40.5                            | < 10.9                                  | > 29.6                |
| 13.553             | -                         | < 30.0                                | 50.5                            | < 10.9                                  | > 39.6                |
| 13.560             | -                         | 42.8                                  | 84.0                            | 2.8                                     | 81.2                  |
| 13.567             | -                         | < 30.0                                | 50.5                            | < 10.9                                  | > 39.6                |
| 13.710             | -                         | < 30.0                                | 40.5                            | < 10.9                                  | > 29.6                |
| 14.010             | -                         | < 30.0                                | 29.5                            | < 10.9                                  | > 18.6                |

Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 3 m

2) Q.P : Quasi-Peak Detector (IF Band width : 9 kHz)

3) The symbol of "<" means "or less".

4) The symbol of ">" means "more than".

5) The symbol of "-" means "Zero", because the used test receiver calculated and displayed in the Meter Reading including the Correction Factor(Antenna and cable loss) directly .

6) The testing loop antenna was rotated at the vertical and horizontal axis to maximize received emissions. The above Meter Reading was maximum emissions level.

7) Calculation :

For fundamental, the measured field strength was extrapolated to distance 30 meters, using the formula that field strength varies as the inverse distance square (40 dB per decade of distance).

Fundamental(13.560MHz):  $42.8 \text{ dB}\mu\text{V/m} - 20\log_{10}((30/3)^2) = 42.8 - 40.0 = 2.8 \text{ dB}\mu\text{V/m}$  at 30 meters

Limits for 13.553-13.567MHz (§15.225(a)) =  $20\log_{10}(15848) = 84.0 \text{ dB}\mu\text{V/m}$

Limits for 13.410-13.553, 13.567-13.710 MHz (§15.225(b)) =  $20\log_{10}(334) = 50.5 \text{ dB}\mu\text{V/m}$

Limits for 13.110-13.410, 13.710-14.010MHz (§15.225(c)) =  $20\log_{10}(106) = 40.5 \text{ dB}\mu\text{V/m}$

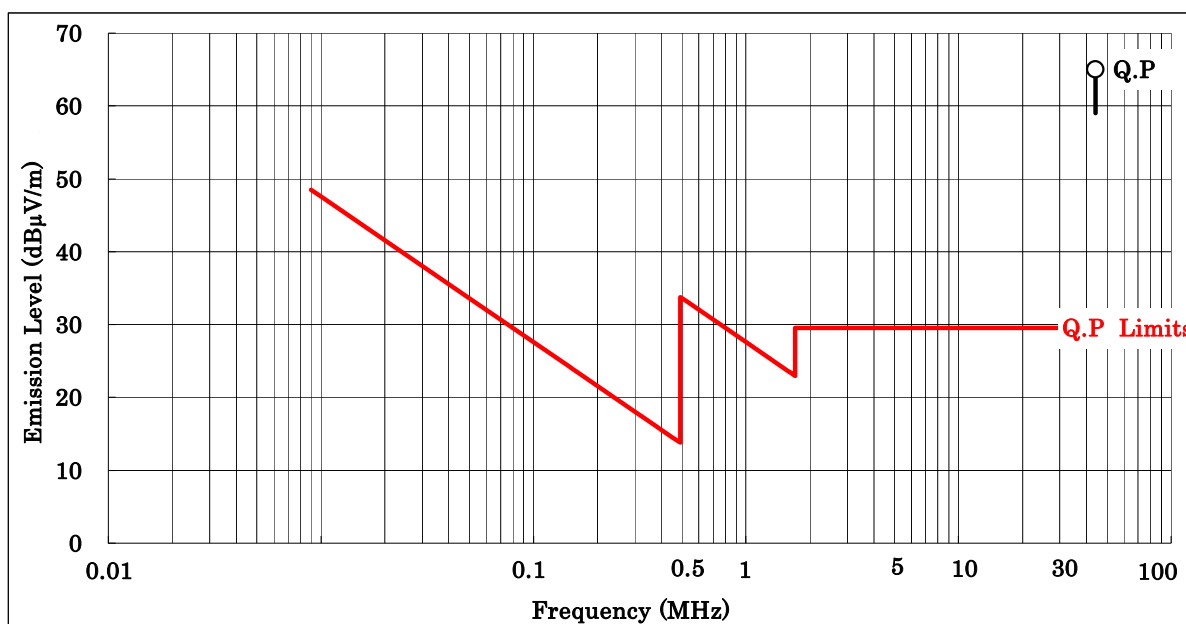
Limits for except for 13.110-14.010MHz (§15.225(d)) =  $20\log_{10}(30) = 29.5 \text{ dB}\mu\text{V/m}$

## A.2.2 Radiated Emission 0.009 MHz - 30 MHz

Date : February 15, 2011

Temp : 15.7°C Humi : 35.7% Atom : 954hPa

| Frequency<br>(MHz) | Antenna<br>Factor<br>(dB) | Meter Reading<br>(dBμV)<br>Q.P | Limits<br>(dBμV)<br>Q.P | Specified<br>Distance<br>(m) | Extrapolated<br>Emission Level<br>(dBμV)<br>Q.P | Margin<br>(dB)<br>Q.P |
|--------------------|---------------------------|--------------------------------|-------------------------|------------------------------|-------------------------------------------------|-----------------------|
| 0.009              | -                         | < 60.0                         | 48.5                    | 300.0                        | < 0.9                                           | > 47.6                |
| 0.01               | -                         | < 60.0                         | 47.6                    | 300.0                        | < 0.9                                           | > 46.7                |
| 0.02               | -                         | < 60.0                         | 41.6                    | 300.0                        | < 0.9                                           | > 40.7                |
| 0.03               | -                         | < 60.0                         | 38.1                    | 300.0                        | < 0.9                                           | > 37.1                |
| 0.05               | -                         | < 60.0                         | 33.6                    | 300.0                        | < 0.9                                           | > 32.7                |
| 0.07               | -                         | < 60.0                         | 30.7                    | 300.0                        | < 0.9                                           | > 29.8                |
| 0.10               | -                         | < 60.0                         | 27.6                    | 300.0                        | < 0.9                                           | > 26.7                |
| 0.20               | -                         | < 60.0                         | 21.6                    | 300.0                        | < 0.9                                           | > 20.7                |
| 0.30               | -                         | < 60.0                         | 18.1                    | 300.0                        | < 0.9                                           | > 17.1                |
| 0.50               | -                         | < 30.0                         | 33.6                    | 30.0                         | < 10.9                                          | > 22.7                |
| 1.00               | -                         | < 30.0                         | 27.6                    | 30.0                         | < 10.9                                          | > 16.7                |
| 2.00               | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |
| 3.00               | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |
| 5.00               | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |
| 10.00              | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |
| 27.12              | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |
| 30.00              | -                         | < 30.0                         | 29.5                    | 30.0                         | < 10.9                                          | > 18.6                |



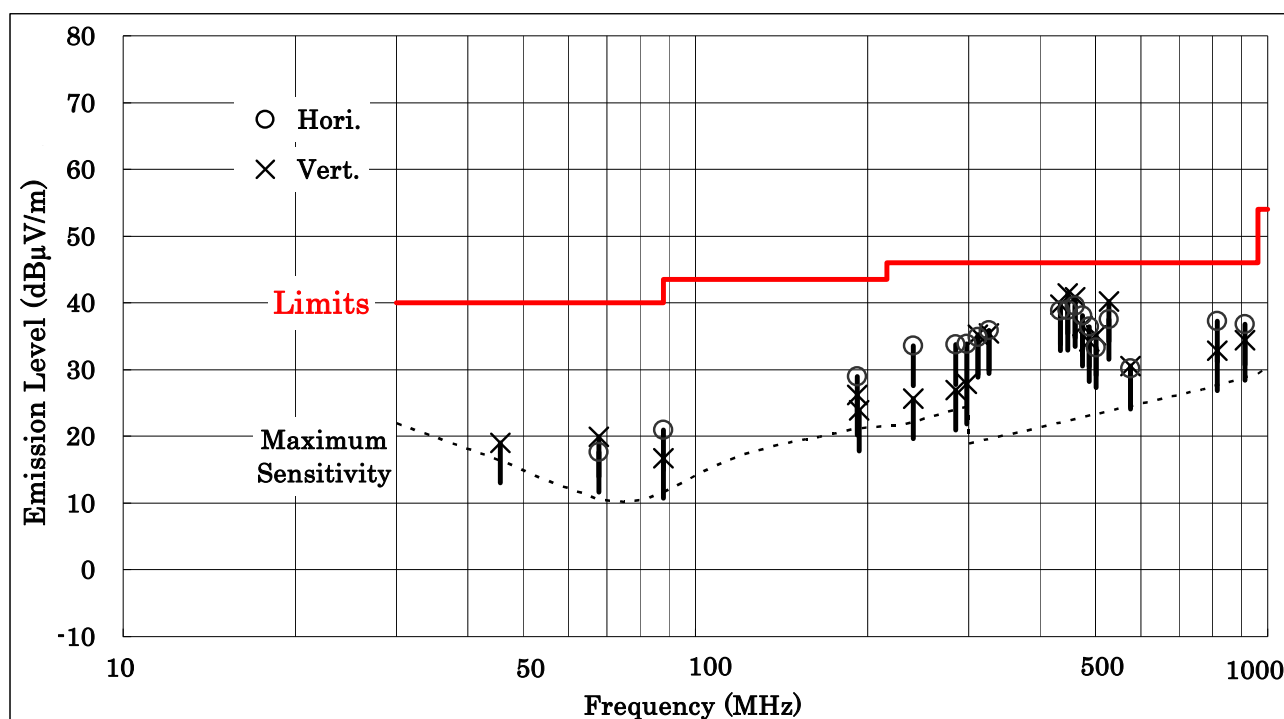
- Notes:
- 1) The testing location : Anechoic Chamber No.1 Distance : 10 m
  - 2) The symbol of "<" means "or less".
  - 3) The symbol of ">" means "more than".
  - 4) The symbol of "-" means "Zero", because the used test receiver calculated and displayed in the Meter Reading including the Correction Factor(Antenna and cable loss) directly
  - 5) A sample calculation was made at 0.009 MHz  
 $60 \text{ dB}\mu\text{V/m (at 10m distance)} \Rightarrow 60 - 20\log_{10}((300/10)^2) = 0.9 \text{ dB}\mu\text{V/m (at 300m distance)}$
  - 6) Setting of measuring instrument :  
 Quasi-Peak Detector, IF Bandwidth: 9 kHz or 200Hz (9 kHz - 90 kHz, 110-490kHz)  
 Average Detector, IF Bandwidth: 9 kHz or 200Hz (except for 9 kHz - 90 kHz, 110-490kHz)
  - 7) The spectrum was checked from 0.009 MHz to 30 MHz.

## A.2.2 Radiated Emission 30 MHz - 1000 MHz

Date : February 15, 2011

Temp : 15 °C Humi : 35 %

| Frequency<br>(MHz) | Antenna<br>Factor<br>(dB/m) | Meter Reading<br>(dBμV) |       | Limits<br>(dBμV)<br>Q.P | Emission Level<br>(dBμV/m) |       | Margin<br>(dB) |       |
|--------------------|-----------------------------|-------------------------|-------|-------------------------|----------------------------|-------|----------------|-------|
|                    |                             | Hori.                   | Vert. |                         | Hori.                      | Vert. | Hori.          | Vert. |
| 45.6               | 16.4                        | < 0.0                   | 2.6   | 40.0                    | < 16.4                     | 19.0  | > 23.6         | 21.0  |
| 67.8               | 10.6                        | 7.1                     | 9.3   | 40.0                    | 17.7                       | 19.9  | 22.3           | 20.1  |
| 88.0               | 11.6                        | 9.4                     | 5.1   | 40.0                    | 21.0                       | 16.7  | 19.0           | 23.3  |
| 192.0              | 21.1                        | 7.8                     | 5.1   | 43.5                    | 28.9                       | 26.2  | 14.6           | 17.3  |
| 193.2              | 21.2                        | < 0.0                   | 2.7   | 43.5                    | < 21.2                     | 23.9  | > 22.3         | 19.6  |
| 240.0              | 21.8                        | 11.7                    | 3.8   | 46.0                    | 33.5                       | 25.6  | 12.5           | 20.4  |
| 284.8              | 23.7                        | 10.0                    | 3.2   | 46.0                    | 33.7                       | 26.9  | 12.3           | 19.1  |
| 298.3              | 24.5                        | 9.3                     | 3.4   | 46.0                    | 33.8                       | 27.9  | 12.2           | 18.1  |
| 311.9              | 18.9                        | 15.9                    | 16.4  | 46.0                    | 34.8                       | 35.3  | 11.2           | 10.7  |
| 325.4              | 19.0                        | 16.8                    | 16.4  | 46.0                    | 35.9                       | 35.4  | 10.1           | 10.6  |
| 433.9              | 22.2                        | 16.7                    | 17.6  | 46.0                    | 38.9                       | 39.8  | 7.1            | 6.2   |
| 447.5              | 22.4                        | 16.5                    | 19.0  | 46.0                    | 38.9                       | 41.4  | 7.1            | 4.6   |
| 461.0              | 22.6                        | 16.9                    | 18.2  | 46.0                    | 39.5                       | 40.8  | 6.5            | 5.2   |
| 474.6              | 22.8                        | 15.3                    | 13.7  | 46.0                    | 38.1                       | 36.5  | 7.9            | 9.5   |
| 488.2              | 23.1                        | 13.3                    | 11.1  | 46.0                    | 36.4                       | 34.2  | 9.6            | 11.8  |
| 501.7              | 23.3                        | 10.0                    | 11.9  | 46.0                    | 33.3                       | 35.2  | 12.7           | 10.8  |
| 528.0              | 23.8                        | 13.8                    | 16.4  | 46.0                    | 37.5                       | 40.2  | 8.5            | 5.8   |
| 576.0              | 24.7                        | 5.4                     | 5.8   | 46.0                    | 30.1                       | 30.5  | 15.9           | 15.5  |
| 816.0              | 27.8                        | 9.4                     | 5.0   | 46.0                    | 37.2                       | 32.9  | 8.8            | 13.1  |
| 912.0              | 29.2                        | 7.5                     | 5.2   | 46.0                    | 36.8                       | 34.4  | 9.2            | 11.6  |



Notes: 1) The testing location : Anechoic Chamber A Distance : 3 m

2) The spectrum was checked from 30 MHz to 1000 MHz.

3) Antenna factor includes the cable loss.

4) Hori. : Horizontal polarization Vert. : Vertical polarization

5) Q.P: Quasi-Peak Detector

6) The symbol of "<" means "or less", ">" means "more than".

7) A sample calculation was made at 45.6 MHz

(Antenna Factor) + (Meter Reading) = 16.4 + 2.6 = 19.0 dBμV

**A.2.3 Radiated Emission above 1 GHz**

-Not applicable-

### A.3 Frequency Stability

Testing Date : March 4, 2011

Ambient Temperature : 16 (°C), Humidity : 30(%)

Operating Frequency:13.56MHz

| Temperature (°C) | Primary Supply Voltage (V) | Frequency (MHz) |                 |                 |                  |
|------------------|----------------------------|-----------------|-----------------|-----------------|------------------|
|                  |                            | 0 minute later  | 2 minutes later | 5 minutes later | 10 minutes later |
| -20              | 102                        | 13.5600765      | 13.5600945      | 13.5600815      | 13.5600910       |
|                  | 120                        | 13.5600780      | 13.5600880      | 13.5600935      | 13.5600945       |
|                  | 138                        | 13.5600720      | 13.5600880      | 13.5600850      | 13.5600780       |
| 20               | 102                        | 13.5601600      | 13.5601585      | 13.5601585      | 13.5601585       |
|                  | 120                        | 13.5601385      | 13.5601555      | 13.5601555      | 13.5601555       |
|                  | 138                        | 13.5601615      | 13.5601590      | 13.5601595      | 13.5601595       |
| 50               | 102                        | 13.5600865      | 13.5600870      | 13.5600860      | 13.5600865       |
|                  | 120                        | 13.5600860      | 13.5600865      | 13.5600870      | 13.5600865       |
|                  | 138                        | 13.5600865      | 13.5600875      | 13.5600850      | 13.5600875       |

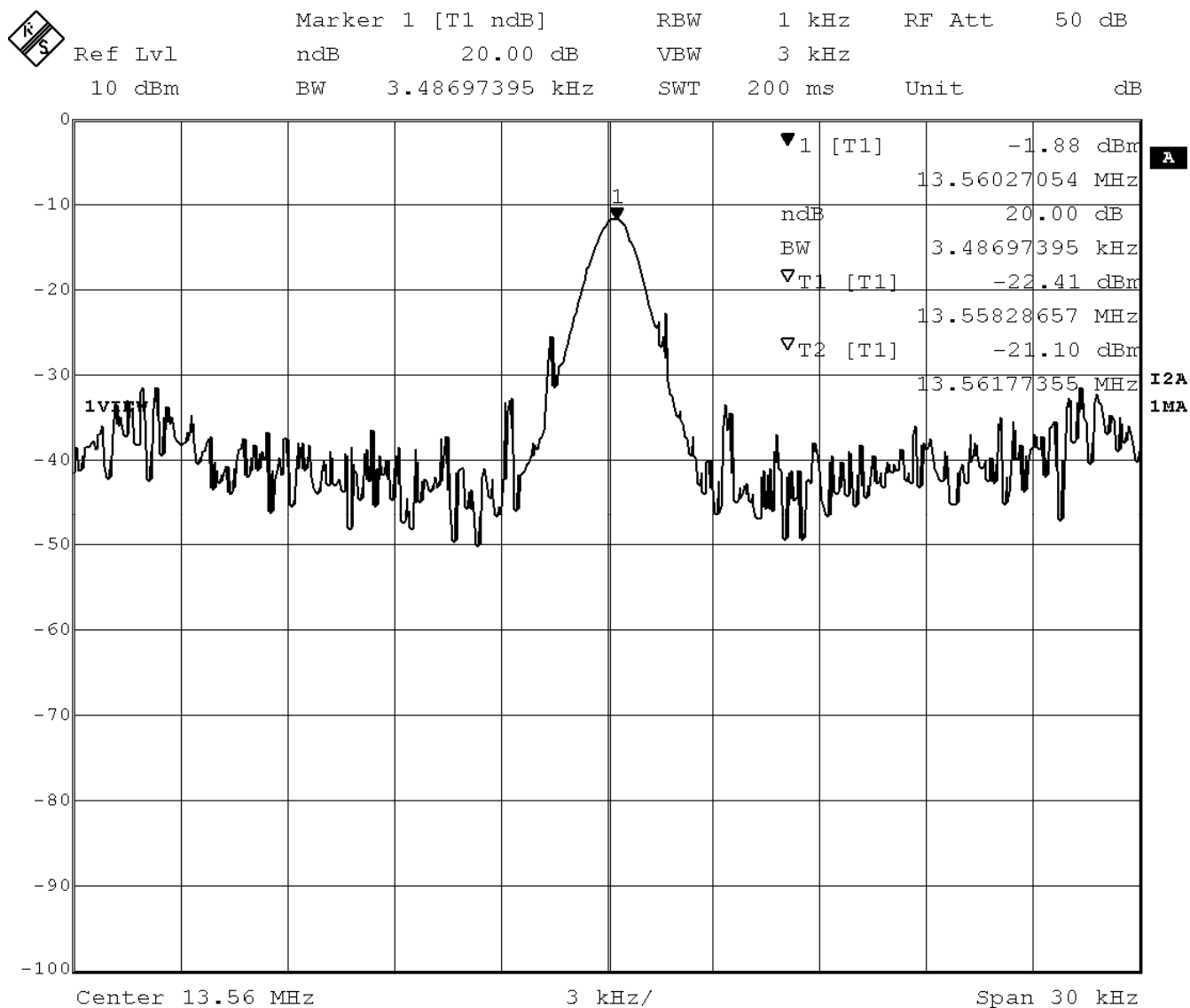
Specified Limit +/-0.01%

| Temperature (°C) | Primary Supply Voltage (V) | Frequency with time elapse (%) |                 |                 |                  |
|------------------|----------------------------|--------------------------------|-----------------|-----------------|------------------|
|                  |                            | 0 minute later                 | 2 minutes later | 5 minutes later | 10 minutes later |
| -20              | 102                        | 0.0005642                      | 0.0006969       | 0.0006010       | 0.0006711        |
|                  | 120                        | 0.0005752                      | 0.0006490       | 0.0006895       | 0.0006969        |
|                  | 138                        | 0.0005310                      | 0.0006490       | 0.0006268       | 0.0005752        |
| 20               | 102                        | 0.0011799                      | 0.0011689       | 0.0011689       | 0.0011689        |
|                  | 120                        | 0.0010214                      | 0.0011468       | 0.0011468       | 0.0011468        |
|                  | 138                        | 0.0011910                      | 0.0011726       | 0.0011763       | 0.0011763        |
| 50               | 102                        | 0.0006379                      | 0.0006416       | 0.0006342       | 0.0006379        |
|                  | 120                        | 0.0006342                      | 0.0006379       | 0.0006416       | 0.0006379        |
|                  | 138                        | 0.0006379                      | 0.0006453       | 0.0006268       | 0.0006453        |

## A.4 Occupied Bandwidth

Testing Date : March 4, 2011

Ambient Temperature : 16 (°C), Humidity : 30(%)





**Appendix B : Test Arrangement (Photographs)****B.1 AC Powerline Conducted Emission**

- Front View -



- Side View -

\* The EUT was rotated all axis(X-axis, Y- axis, Z-axis), this photograph present configuration with maximum emission.

**B.2 Radiated Emissions**

- Front View -



- Rear View -

\* The EUT was rotated all axis(X-axis, Y- axis, Z-axis), this photograph present configuration with maximum emission.

## Appendix C: Test Instruments For Test Laboratory 1

07-Mar-2011

| No                      | Type               | Model   | Manufacturer        | Serial  | ID           | Last Cal. | Interval |
|-------------------------|--------------------|---------|---------------------|---------|--------------|-----------|----------|
| <b>Test Facilities:</b> |                    |         |                     |         |              |           |          |
| 1                       | Anechoic Chamber A | -       | TDK                 | -       | 800-01-502E0 | Apr 2010  | 1 Year   |
| 2                       | Anechoic Chamber B | -       | TDK                 | -       | 800-01-503E0 | Apr 2010  | 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 | -         | -        |
| 8                       | H/F Test Room      | -       | Shimizu Corporation | -       | -            | -         | -        |
| 259                     | GTEM Cell          | EGT-250 | ELENA Electronics   | G280080 | 800-03-506E0 | Oct 2010  | 1 Year   |

### Measuring Instruments:

|     |                           |          |                 |            |              |          |        |
|-----|---------------------------|----------|-----------------|------------|--------------|----------|--------|
| 10  | Test Receiver             | ESHS10   | Rohde & Schwarz | 835871/004 | 119-01-505E0 | Jun 2010 | 1 Year |
| 11  | Test Receiver             | ESVS10   | Rohde & Schwarz | 826148/002 | 119-03-504E0 | Jul 2010 | 1 Year |
| 12  | Test Receiver             | ESVS10   | Rohde & Schwarz | 832699/001 | 119-03-506E0 | Oct 2010 | 1 Year |
| 13  | Test Receiver             | ESI26    | Rohde & Schwarz | 100043     | 119-04-511E0 | Oct 2010 | 1 Year |
| 14  | Spectrum Analyzer         | R3182    | Advantest       | 120600581  | 122-02-521E0 | Apr 2010 | 1 Year |
| 19  | Spectrum Analyzer         | R3132    | Advantest       | 120500072  | 122-02-520E0 | May 2010 | 1 Year |
| 20  | Spectrum Analyzer         | R3132    | Advantest       | 150400998  | 122-02-523E0 | Jul 2010 | 1 Year |
| 65  | Power Meter               | 436A     | Hewlett Packard | 1725A01930 | 100-02-501E0 | May 2010 | 1 Year |
| 66  | Power Sensor              | 8482A    | Hewlett Packard | 1551A01013 | 100-02-501E0 | May 2010 | 1 Year |
| 68  | FM Linear Detector        | MS61A    | Anritsu         | M77486     | 123-02-008E0 | Oct 2010 | 1 Year |
| 69  | Level Meter               | ML422C   | Anritsu         | M87571     | 114-02-501E0 | Jul 2010 | 1 Year |
| 70  | Measuring Amplifier       | 2636     | B & K           | 1614851    | 082-01-502E0 | May 2010 | 1 Year |
| 75  | Frequency Counter         | 53131A   | Hewlett Packard | 3546A11807 | 102-02-075E0 | May 2010 | 1 Year |
| 83  | FFT Analyzer              | R9211C   | Advantest       | 02020253   | 122-02-506E0 | Jul 2010 | 1 Year |
| 84  | Noise Meter               | MN-446   | Meguro          | 53030478   | 082-01-144E0 | Apr 2010 | 1 Year |
| 129 | Audio Analyzer            | A2       | Neutrik         | 2482       | 082-04-503E0 | Sep 2010 | 1 Year |
| 165 | Multimeter                | VOAC7413 | Iwatsu Electric | 0267973    | 114-02-502E0 | Apr 2010 | 1 Year |
| 172 | Test Receiver             | ESCI     | Rohde & Schwarz | 100408     | 119-04-512E0 | Oct 2010 | 1 Year |
| 210 | Peak Power Meter          | ML2495A  | Anritsu         | 0836023    | 100-02-507E0 | Dec 2010 | 1 Year |
| 211 | Power Sensor              | MA2491A  | Anritsu         | 0811206    | 100-02-507E0 | Dec 2010 | 1 Year |
| 212 | Power Sensor              | MA2411B  | Anritsu         | 0738312    | 100-02-507E0 | Dec 2010 | 1 Year |
| 230 | Spectrum Analyzer         | U3751    | Advantest       | 150800116  | 122-02-003T  | Mar 2010 | 1 Year |
| 232 | Digital Oscilloscope      | TDS3052C | Tektronix, Inc. | C010708    | 121-02-504E0 | Jun 2010 | 1 Year |
| 227 | Harmonic/Flicker Analyzer | KHA1000  | Kikusui         | MH002292   | 122-02-525E0 | Nov 2010 | 1 Year |
| 251 | Signal Analyzer           | N9010A   | Agilent         | MY50210236 | 122-02-526E0 | Aug 2010 | 1 Year |

### Antennas:

|     |                            |                |                  |             |              |          |        |
|-----|----------------------------|----------------|------------------|-------------|--------------|----------|--------|
| 21  | Loop Antenna               | HFH2-Z2        | Rohde & Schwarz  | 881058/62   | 119-05-033E0 | Aug 2010 | 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 |
| 31  | Horn Antenna               | 3115           | EMC Test Systems | 6442        | 119-05-514E0 | Jan 2010 | 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 2010 | 1 Year |
| 168 | Log-periodic Antenna       | UHALP9108A     | Schwarzbeck      | 0666        | 119-05-521E0 | Jun 2010 | 1 Year |
| 169 | Biconical Antenna          | BBA9106        | Schwarzbeck      | VHA91032399 | 119-05-522E0 | Jul 2010 | 1 Year |
| 170 | Log-periodic Antenna       | UHALP9108A     | Schwarzbeck      | 0724        | 119-05-523E0 | Jul 2010 | 1 Year |
| 198 | Log-periodic Antenna       | HL050          | Rohde & Schwarz  | 100251      | 119-05-524E0 | Oct 2010 | 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 | Nov 2010 | 2 Year |
| 237 | Horn Antenna               | 3160-08        | EMC Test Systems | 00026081    | 119-05-517E0 | Feb 2010 | 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 |

07-Mar-2011

| No                        | Type                        | Model              | Manufacturer    | Serial                 | ID                        | Last Cal. | Interval |
|---------------------------|-----------------------------|--------------------|-----------------|------------------------|---------------------------|-----------|----------|
| <b><u>Cables:</u></b>     |                             |                    |                 |                        |                           |           |          |
| 38                        | RF Cable                    | 5D-2W              | Fujikura        | -                      | 155-21-001E0              | Feb 2011  | 1 Year   |
| 39                        | RF Cable                    | 5D-2W              | Fujikura        | -                      | 155-21-002E0              | Feb 2011  | 1 Year   |
| 41                        | RF Cable                    | RG223/U            | HUBER+SUHNER    | -                      | 155-21-006E0              | Apr 2010  | 1 Year   |
| 42                        | RF Cable                    | RG223/U            | HUBER+SUHNER    | -                      | 155-21-007E0              | Apr 2010  | 1 Year   |
| 43                        | RF Cable                    | RG213/U            | Rohde & Schwarz | -                      | 155-21-010E0              | Apr 2010  | 1 Year   |
| 44                        | RF Cable(10m)               | S 04272B           | Suhner          | -                      | 155-21-011E0              | May 2010  | 1 Year   |
| 45                        | RF Cable(1.5m 18GHz)        | S 04272B           | Suhner          | -                      | 155-21-012E0              | May 2010  | 1 Year   |
| 46                        | RF Cable(1m 18GHz)          | SUCOFLEX104        | Suhner          | -                      | 155-21-013E0              | Aug 2010  | 1 Year   |
| 48                        | RF Cable(1m 26GHz)          | SUCOFLEX           | Suhner          | 14543/4E               | 155-21-016E0              | Dec 2010  | 1 Year   |
| 49                        | RF Cable(4m 26GHz)          | SUCOFLEX104        | Suhner          | 190630                 | 155-21-017E0              | Dec 2010  | 1 Year   |
| 50                        | RF Cable(10m)               | F130-S1S1-394      | MEGA PHASE      | 10510                  | 155-21-018E0              | Dec 2010  | 1 Year   |
| 52                        | RF Cable(7m)                | RG223/U            | Suhner          | -                      | 155-21-021E0              | May 2010  | 1 Year   |
| 195                       | RF Cable(10m)               | F130-S1S1-394      | MEGA PHASE      | 20051                  | 155-21-020E0              | Apr 2010  | 1 Year   |
| 241                       | RF Cable(6m 40GHz)          | SUCOFLEX           | Suhner          | 6257/2E                | 155-21-024E0              | Oct 2010  | 1 Year   |
| 252                       | RF Cable(10m)               | MWX315             | Junkosha Inc.   | J12J101305-            | 155-21-025E0              | Aug 2010  | 1 Year   |
| 253                       | RF Cable(1m 26GHz)          | MWX221             | Junkosha Inc.   | 1004S138               | 155-21-026E0              | Aug 2010  | 1 Year   |
| <b><u>Networks:</u></b>   |                             |                    |                 |                        |                           |           |          |
| 33                        | LISN                        | KNW-407            | Kyoritsu        | 8-833-6                | 149-04-052E0              | Nov 2010  | 1 Year   |
| 34                        | LISN                        | KNW-407            | Kyoritsu        | 8-855-2                | 149-04-055E0              | May 2010  | 1 Year   |
| 35                        | LISN                        | KNW-407            | Kyoritsu        | 8-1130-6               | 149-04-062E0              | May 2010  | 1 Year   |
| 36                        | LISN                        | KNW-242C           | Kyoritsu        | 8-837-13               | 149-04-054E0              | Apr 2010  | 1 Year   |
| 164                       | LISN                        | KNW-403D           | Kyoritsu        | 8-1474-3               | 149-04-059E0              | Apr 2010  | 1 Year   |
| 255                       | LISN for DC                 | NNBM8125           | Schwarzbeck     | 81251823 /<br>81251824 | 149-04-505E0<br>/ 149-04- | Sep 2010  | 2 Year   |
| 174                       | Pulse Limiter               | ESH3-Z2            | Rohde & Schwarz | -                      | 156-01-502E0              | Apr 2010  | 1 Year   |
| 175                       | Pulse Limiter               | ESH3-Z2            | Rohde & Schwarz | -                      | 156-01-503E0              | Apr 2010  | 1 Year   |
| 224                       | RF Current Probe            | KTC-2504           | Kyoritsu        | 8S-2916-1              | 083-01-502E0              | May 2010  | 2 Year   |
| 194                       | High Impedance Probe        | HP-2               | JQA             | 001                    | 149-06-503E0              | Oct 2010  | 1 Year   |
| 248                       | High Impedance Probe        | KNW-411            | Kyoritsu        | 8-2071-2               | 149-06-504E0              | Feb 2011  | 1 Year   |
| 228                       | Reference Impedance Network | LIN40MA-PCR-L      | Kikusui         | NC003432               | 800-03-507E0              | Aug 2010  | 1 Year   |
| 247                       | LISN                        | KNW-243C           | Kyoritsu        | 8-831-4                | 149-04-047E0              | Jun 2010  | 1 Year   |
| 250                       | Absorbing Clamp             | MDS21              | Luthi           | 3974                   | 119-06-508E0              | Aug 2010  | 1 Year   |
| <b><u>Amplifiers:</u></b> |                             |                    |                 |                        |                           |           |          |
| 53                        | AF Amplifier                | P-500L             | Accuphase       | BOY806                 | 127-01-501E0              | Feb 2011  | 1 Year   |
| 54                        | RF Amplifier                | WJ-6882-814        | Watkins-Johnson | 0414                   | 127-04-017E0              | Aug 2010  | 1 Year   |
| 55                        | RF Amplifier                | WJ-5315-556        | Watkins-Johnson | 106                    | 127-04-006E0              | Aug 2010  | 1 Year   |
| 56                        | RF Amplifier                | WJ-5320-307        | Watkins-Johnson | 645                    | 127-04-005E0              | Aug 2010  | 1 Year   |
| 57                        | RF Amplifier                | JS4-00102600-28-5A | MITEQ           | 669167                 | 127-04-502E0              | Aug 2010  | 1 Year   |
| 226                       | Differential Amplifier      | 5303               | NF              | 155726-<br>5305046     | 127-01-502E0              | Apr 2010  | 1 Year   |



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|--------------------|--------------------|----------------|--------------------------|------------|--------------|-----------|----------|
| <b>Generators:</b> |                    |                |                          |            |              |           |          |
| 58                 | Function Generator | 3325B          | Hewlett Packard          | 2847A03284 | 118-08-124E0 | Jul 2010  | 1 Year   |
| 59                 | Function Generator | VP-7422A       | Matsushita Communication | 050351E122 | 118-08-503E0 | Jul 2010  | 1 Year   |
| 60                 | Signal Generator   | 8664A          | Hewlett Packard          | 3035A00140 | 118-03-014E0 | May 2010  | 1 Year   |
| 61                 | Signal Generator   | 8664A          | Hewlett Packard          | 3438A00756 | 118-04-502E0 | May 2010  | 1 Year   |
| 62                 | Signal Generator   | 6061A          | Gigatronics              | 5130593    | 118-04-024E0 | Apr 2010  | 1 Year   |
| 171                | Signal Generator   | SML03          | Rohde & Schwarz          | 102651     | 118-04-509E0 | Mar 2011  | 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 2011  | 1 Year   |
| 64                 | Termination(50)    | -              | Suhner                   | -          | 154-06-502E0 | Jan 2011  | 1 Year   |
| 76                 | Oven               | -              | Ohnishi                  | -          | 023-02-018E0 | -         | -        |
| 77                 | DC Power Supply    | 6628A          | Hewlett Packard          | 3224A00284 | 072-05-503E0 | Jul 2010  | 1 Year   |
| 78                 | Band Reject Filter | BRM12294       | Micro-tronics            | 003        | 149-01-501E0 | Jan 2011  | 1 Year   |
| 79                 | High Pass Filter   | F-100-4000-5-R | RLC Electronics          | 0149       | 149-01-502E0 | Feb 2011  | 1 Year   |
| 80                 | Attenuator         | 43KC-10        | Anritsu                  | -          | 148-03-506E0 | Feb 2011  | 1 Year   |
| 81                 | Attenuator         | 43KC-20        | Anritsu                  | -          | 148-03-507E0 | Feb 2011  | 1 Year   |
| 82                 | Attenuator         | 355D           | Hewlett Packard          | 219-10782  | 148-03-065E0 | Apr 2010  | 1 Year   |
| 85                 | RF Detector        | 75KC-50        | Anritsu                  | 305002     | 100-02-506E0 | Aug 2010  | 1 Year   |
| 200                | Artificial Hand    | AH-1           | ES Factory               | 001        | 155-07-561E0 | Jul 2010  | 1 Year   |
| 201                | Barometer          | TYPE6          | Yanagi                   | 16076      | 209-02-014E0 | Mar 2010  | 2 Year   |
| 202                | Thermo-Hygrometer  | -              | Empex                    | -          | 141-01-504E0 | Mar 2010  | 2 Year   |
| 203                | Thermo-Hygrometer  | EX-2727        | Empex                    | -          | 141-01-505E0 | Mar 2010  | 2 Year   |
| 204                | Thermo-Hygrometer  | EX-2727        | Empex                    | -          | 141-01-506E0 | Mar 2010  | 2 Year   |
| 205                | Thermo-Hygrometer  | EX-2727        | Empex                    | -          | 141-01-507E0 | Mar 2010  | 2 Year   |
| 206                | Low Pass Filter    | LPM13323       | Micro-tronics            | 001        | 149-01-505E0 | Aug 2010  | 1 Year   |
| 207                | High Pass Filter   | HPM13321       | Micro-tronics            | 001        | 149-01-506E0 | Aug 2010  | 1 Year   |
| 208                | High Pass Filter   | HPM13322       | Micro-tronics            | 001        | 149-01-507E0 | Aug 2010  | 1 Year   |
| 242                | Power Divider      | 1575           | Aeroflex Weischel        | 1153       | 086-02-501E0 | Oct 2010  | 1 Year   |
| 243                | Power Divider      | 1575           | Aeroflex Weischel        | 1157       | 086-02-502E0 | Oct 2010  | 1 Year   |
| 244                | Power Divider      | 1575           | Aeroflex Weischel        | 1161       | 086-02-503E0 | Oct 2010  | 1 Year   |
| 229                | Multi Outlet Unit  | OT01-KHA       | Kikusui                  | MG002628   | 155-07-562E0 | -         | -        |
| 249                | AC Power Supply    | PCR4000LA      | Kikusui                  | MH001847   | 072-10-510E0 | -         | -        |
| 245                | High Pass Filter   | KFL-009        | Kyoritsu                 | 8-1996-1   | 149-01-512E0 | Apr 2010  | 1 Year   |
| 246                | High Pass Filter   | KFL-009        | Kyoritsu                 | 8-2072-5   | 149-01-513E0 | Apr 2010  | 1 Year   |

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| <b>ESD Immunity:</b>                               |                                   |                 |                   |                |              |           |          |
| 100                                                | ESD Tester                        | ESD-3000        | EMC-PARTNER       | 069            | 118-18-515E0 | Mar 2011  | 1 Year   |
| <b>Radiated Immunity:</b>                          |                                   |                 |                   |                |              |           |          |
| 60                                                 | Signal Generator                  | 8664A           | Hewlett Packard   | 3035A00140     | 118-03-014E0 | May 2010  | 1 Year   |
| 62                                                 | Signal Generator                  | 6061A           | Gigatronics       | 5130593        | 118-04-024E0 | Apr 2010  | 1 Year   |
| 171                                                | Signal Generator                  | SML03           | Rohde & Schwarz   | 102651         | 118-04-509E0 | Mar 2011  | 1 Year   |
| 176                                                | FAN Antenna                       | FAN-1           | JQA               | 1              | 119-05-047E0 | Jun 2010  | 1 Year   |
| 121                                                | Log-periodic Antenna              | VULP9118-E      | Schwarzbeck       | VULP9118-E-704 | 119-05-016E0 | Jun 2010  | 1 Year   |
| 218                                                | Horn Antenna                      | AT4002A         | Amplfier Research | 26532          | 119-05-508E1 | Jun 2010  | 1 Year   |
| 233                                                | RF Power Amplifier                | R122C           | RF POWER LABS     | 092695-2       | 127-07-014E0 | Jun 2010  | 1 Year   |
| 216                                                | RF Power Amplifier                | 2068-BBS2Q4AMP  | RF Systems        | 1007 D/C 0633  | 127-07-501E0 | Jun 2010  | 1 Year   |
| 217                                                | RF Power Amplifier                | 50S1G4          | Amplfier Research | 24616          | 127-07-501E1 | Jun 2010  | 1 Year   |
| 213                                                | Field Probe/Meter                 | FP1000 / FM1000 | Amplfier Research | 12025/12175    | 119-04-005E0 | Dec 2010  | 1 Year   |
| 214                                                | Power Meter                       | NRVD            | Rohde & Schwarz   | 101020         | 100-03-507E0 | Jun 2010  | 1 Year   |
| 215                                                | Insertion Unit                    | URV5-Z4         | Rohde & Schwarz   | 100193         | 100-03-507E0 | Jun 2010  | 1 Year   |
| 219                                                | Dual Directional Coupler          | C5086-10        | Werlatone Inc.    | 67819          | 155-02-504E0 | Jun 2010  | 1 Year   |
| 220                                                | Dual Directional Coupler          | DC6180A         | AR                | 0328620        | 155-02-503E0 | Jun 2010  | 1 Year   |
| 221                                                | Dual Directional Coupler          | CCS30-B26       | Pulsar Microwave  | 0740           | 155-02-502E0 | Jun 2010  | 1 Year   |
| <b>EFT/B Immunity:</b>                             |                                   |                 |                   |                |              |           |          |
| 101                                                | EFT/B Generator                   | PEFT-JUNIOR     | Haefely           | 083818-14      | 118-18-037E0 | Nov 2010  | 1 Year   |
| 166                                                | EFT/Burst & Surge Generator       | TRA2000         | EMC-PARTNER       | 582            | 118-18-514E0 | Jul 2010  | 1 Year   |
| 177                                                | Capacitive Clamp                  | IP4             | Haefely           | 083926-07      | 118-18-508E0 | -         | -        |
| <b>Surge Immunity:</b>                             |                                   |                 |                   |                |              |           |          |
| 166                                                | EFT/Burst & Surge Generator       | TRA2000         | EMC-PARTNER       | 582            | 118-18-514E0 | Jul 2010  | 1 Year   |
| <b>Transient and Surge Immunity for Vehicular:</b> |                                   |                 |                   |                |              |           |          |
| 256                                                | Transient Immunity Tester         | KES7702         | Kikusui           | QF001066       | 118-18-516E0 | Aug 2010  | 1 Year   |
| 257                                                | Transient Immunity Tester         | KES7713B        | Kikusui           | QF001068       | 118-18-517E0 | Aug 2010  | 1 Year   |
| 258                                                | Intelligent Bi-Polar Power Supply | PBZ40-10        | Kikusui           | QB001180       | 072-04-501E0 | Aug 2010  | 1 Year   |

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| <b>RF Conductive Immunity:</b>            |                             |               |                           |            |              |           |          |
| 61                                        | Signal Generator            | 8664A         | Hewlett Packard           | 3438A00756 | 118-04-502E0 | May 2010  | 1 Year   |
| 62                                        | Signal Generator            | 6061A         | Gigatronics               | 5130593    | 118-04-024E0 | Apr 2010  | 1 Year   |
| 171                                       | Signal Generator            | SML03         | Rohde & Schwarz           | 102651     | 118-04-509E0 | Mar 2011  | 1 Year   |
| 178                                       | RF Amplifier                | FLL-75        | Frankonia                 | 0040       | 127-03-501E0 | Jul 2010  | 1 Year   |
| 179                                       | Attenuator                  | 8341-060      | Bird Electronic           | 766        | 148-06-001E0 | Jul 2010  | 1 Year   |
| 180                                       | Coupling/Decoupling Network | FCC-801-M1-16 | FCC                       | 97-07      | 155-07-554E0 | Jul 2010  | 1 Year   |
| 182                                       | Coupling/Decoupling Network | FCC-801-M2-16 | FCC                       | 97-12      | 155-07-555E0 | Jul 2010  | 1 Year   |
| 183                                       | Coupling/Decoupling Network | TSCDN-M2-25A  | TSJ(FCC)                  | 06006      | 155-07-558E0 | Jul 2010  | 1 Year   |
| 184                                       | Coupling/Decoupling Network | FCC-801-M3-16 | FCC                       | 158        | 155-07-556E0 | Jul 2010  | 1 Year   |
| 185                                       | Coupling/Decoupling Network | TSCDN-M3-25A  | TSJ(FCC)                  | 06011      | 155-07-559E0 | Jul 2010  | 1 Year   |
| 186                                       | 150-50 ohms Adaptor         | FCC-150-50    | FCC                       | 380        | 155-07-557E0 | Jul 2010  | 1 Year   |
| 187                                       | 150-50 ohms Adaptor         | FCC-150-50    | FCC                       | 381        | 155-07-557E0 | Jul 2010  | 1 Year   |
| 188                                       | EM Clamp                    | EM101         | Luthi                     | 35196      | 119-06-008E0 | Jul 2010  | 1 Year   |
| 196                                       | BCI Probe                   | F-120-9A      | FCC                       | 509        | 083-01-503E0 | Jul 2010  | 1 Year   |
| 260                                       | Termination(50)             | BNC-P-1.5 TDC | TDC                       | -          | 154-06-503E0 | Jan 2011  | 1 Year   |
| <b>Magnetic Field Immunity:</b>           |                             |               |                           |            |              |           |          |
| 189                                       | Magnetic Field Tester       | TRA2000       | EMC-PARTNER               | 582        | 118-18-514E0 | -         | -        |
| 190                                       | Loop Coil                   | MF1000-1      | EMC-PARTNER               | 087        | 118-18-514E0 | -         | -        |
| 223                                       | Helmholtz Coil              | 6400-X-H-6404 | Electro-Mechanics Company | -          | 800-03-028E0 | -         | -        |
| 192                                       | Magnetic Field Sensor       | EFA-200       | Wandel & Goltermann       | H-0027     | 115-01-508E0 | Dec 2009  | 2 Year   |
| <b>Voltage Dip Immunity:</b>              |                             |               |                           |            |              |           |          |
| 193                                       | Dip/Interruption Tester     | PLINE1610     | Haefely                   | 083732-14  | 800-15-001E0 | Feb 2011  | 1 Year   |
| <b>Low Frequency Conductive Immunity:</b> |                             |               |                           |            |              |           |          |
| 53                                        | AF Amplifier                | P-500L        | Accuphase                 | BOY806     | 127-01-501E0 | Feb 2011  | 1 Year   |
| 58                                        | Function Generator          | 3325B         | Hewlett Packard           | 2847A03284 | 118-08-124E0 | Jul 2010  | 1 Year   |
| 84                                        | Noise Meter                 | MN-446        | Meguro                    | 53030478   | 082-01-144E0 | Apr 2010  | 1 Year   |
| <b>Others:</b>                            |                             |               |                           |            |              |           |          |
| 201                                       | Barometer                   | TYPE6         | Yanagi                    | 16076      | 209-02-014E0 | Mar 2010  | 2 Year   |
| 202                                       | Thermo-Hygrometer           | -             | Empex                     | -          | 141-01-504E0 | Mar 2010  | 2 Year   |
| 203                                       | Thermo-Hygrometer           | EX-2727       | Empex                     | -          | 141-01-505E0 | Mar 2010  | 2 Year   |
| 204                                       | Thermo-Hygrometer           | EX-2727       | Empex                     | -          | 141-01-506E0 | Mar 2010  | 2 Year   |
| 205                                       | Thermo-Hygrometer           | EX-2727       | Empex                     | -          | 141-01-507E0 | Mar 2010  | 2 Year   |
| 224                                       | RF Current Probe            | KTC-2504      | Kyoritsu                  | 8S-2916-1  | 083-01-502E0 | May 2010  | 2 Year   |
| 129                                       | Audio Analyzer              | A2            | Neutrik                   | 2482       | 082-04-503E0 | Sep 2010  | 1 Year   |

**For Test Laboratory 2**

| Sign | Type                 | Model No.       | Manufacturer    | Serial No.  | Last Cal. | Interval |
|------|----------------------|-----------------|-----------------|-------------|-----------|----------|
| OS-1 | Open Site            | -               | Toshiba         | -           | 2010/5    | 1 Year   |
| OS-2 | Open Site            | -               | Toshiba         | -           | 2010/5    | 1 Year   |
| AC-1 | Anechoic Chamber (L) | -               | TDK             | -           | 2010/5    | 1 Year   |
| AC-2 | Anechoic Chamber (S) | -               | TDK             | -           | 2010/11   | 1 Year   |
| SR-A | Shielded Room        | -               | TDK             | -           | -         | -        |
| SR-B | Shielded Room        | -               | TDK             | -           | -         | -        |
| SR-C | Shielded Room        | -               | TDK             | -           | -         | -        |
| TR-1 | Tested Room          | -               | -               | -           | -         | -        |
| R-1  | Test Receiver        | ESVS10          | Rohde & Schwarz | 849231/004  | 2010/3    | 1 Year   |
| R-2  | Test Receiver        | ESVS10          | Rohde & Schwarz | 843744/018  | 2010/6    | 1 Year   |
| R-3  | Test Receiver        | ESI7            | Rohde & Schwarz | 100059/007  | 2010/10   | 1 Year   |
| R-4  | Test Receiver        | ESHS30          | Rohde & Schwarz | 842053/001  | 2010/2    | 1 Year   |
| R-5  | Test Receiver        | ESCS30          | Rohde & Schwarz | 100203      | 2010/5    | 1 Year   |
| R-6  | Test Receiver        | ESU40           | Rohde & Schwarz | 100214      | 2010/11   | 1 Year   |
| S-3  | Spectrum Analyzer    | U3751           | Advantest       | 160100139   | 2010/3    | 1 Year   |
| S-4  | Spectrum Analyzer    | 8563E           | Hewlett Packard | 3221A00201  | 2010/4    | 1 Year   |
| S-5  | Spectrum Analyzer    | U3751           | Advantest       | 170500170   | 2010/6    | 1 Year   |
| CB-3 | RF Cable             | 3D-2W           | Fujikura        | -           | 2010/5    | 1 Year   |
| CB-4 | RF Cable             | 3D-2W           | Fujikura        | -           | 2010/5    | 1 Year   |
| CB-5 | RF Cable             | 3D-2W           | Fujikura        | -           | 2010/5    | 1 Year   |
| CN-1 | RF Cable             | 20D/5D-2W       | Fujikura        | -           | 2010/8    | 1 Year   |
| CN-2 | RF Cable             | 20D/5D-2W       | Fujikura        | -           | 2010/10   | 1 Year   |
| CN-3 | RF Cable             | 20D/5D-2W       | Fujikura        | -           | 2010/9    | 1 Year   |
| CS-1 | RF Cable             | SUCOFLEX 104P   | Huber+Suhner    | 27290/4P    | 2010/11   | 1 Year   |
| CS-2 | RF Cable             | SUCOFLEX 104P   | Huber+Suhner    | 27289/4P    | 2010/11   | 1 Year   |
| CS-3 | RF Cable             | SUCOFLEX 104P   | Huber+Suhner    | 37027/4P    | 2010/3    | 1 Year   |
| CS-4 | RF Cable             | SUCOFLEX 104P   | Huber+Suhner    | 37028/4P    | 2010/3    | 1 Year   |
| L-1  | AMN                  | KNW-407         | Kyoritsu Corp.  | 8-833-5     | 2010/9    | 1 Year   |
| L-2  | AMN                  | KNW-407         | Kyoritsu Corp.  | 8-680-14    | 2010/9    | 1 Year   |
| L-3  | AMN                  | KNW-407         | Kyoritsu Corp.  | 8-757-1     | 2010/6    | 1 Year   |
| L-4  | AMN                  | KNW-242         | Kyoritsu Corp.  | 8-755-1     | 2010/6    | 1 Year   |
| L-5  | AMN                  | KNW-242C        | Kyoritsu Corp.  | 8-837-14    | 2010/6    | 1 Year   |
| L-6  | AMN                  | KNW-243C        | Kyoritsu Corp.  | 8-692-5     | 2010/9    | 1 Year   |
| L-7  | AMN                  | KNW-243C        | Kyoritsu Corp.  | 8-831-3     | 2010/6    | 1 Year   |
| L-9  | AMN                  | KNW-244C        | Kyoritsu Corp.  | 8-1373-3    | 2010/8    | 1 Year   |
| L-10 | ISN                  | FCC-TLISN-T2-02 | FCC             | 20234       | 2010/11   | 1 Year   |
| L-11 | ISN                  | FCC-TLISN-T4-02 | FCC             | 20235       | 2010/11   | 1 Year   |
| L-12 | High Impedance Probe | KNW-410         | Kyoritsu Corp.  | 8-876-3     | 2010/8    | 1 Year   |
| L-13 | Artificial Hand      | K-9003          | Kyoritsu Corp.  | 7-1639-4    | 2010/10   | 1 Year   |
| L-14 | Hi-pass Filter       | KFL-009D        | Kyoritsu Corp.  | 8-1996-8    | 2010/7    | 1 Year   |
| L-15 | ISN                  | F-070306-1057-1 | FCC             | 20591       | 2010/7    | 1 Year   |
| L-16 | RF Current Probe     | KCT-2504        | Kyoritsu Corp   | 8S-3061-5   | 2010/5    | 1 Year   |
| PL-3 | Pulse Limiter        | ESH3-Z2         | Rohde & Schwarz | -           | 2010/10   | 1 Year   |
| PL-4 | Pulse Limiter        | ESH3-Z2         | Rohde & Schwarz | -           | 2010/2    | 1 Year   |
| PL-5 | Pulse Limiter        | ESH3-Z2         | Rohde & Schwarz | -           | 2010/5    | 1 Year   |
| TM-1 | 50ohm Termination    | BNC-P-1.5       | TDC             | -           | 2010/3    | 1 Year   |
| TM-2 | 50ohm Termination    | -               | Y&R             | -           | 2010/3    | 1 Year   |
| AL-0 | Loop Antenna         | HFH2-Z2         | Rohde & Schwarz | 879284/14   | 2010/4    | 1 Year   |
| AT-1 | Triple Loop Antenna  | HXYZ9170        | Schwarzbeck     | 9170-138    | 2010/7    | 1 Year   |
| AT-3 | Bilog Antenna        | CBL6111D        | Teseq GmbH      | 27075       | 2010/8    | 1 Year   |
| AB-1 | Biconical Antenna    | BBA9106         | Schwarzbeck     | 91031741    | 2010/8    | 1 Year   |
| AB-2 | Biconical Antenna    | BBA9106         | Schwarzbeck     | 91032349    | 2010/10   | 1 Year   |
| AB-3 | Biconical Antenna    | BBA9106         | Schwarzbeck     | VHA11905516 | 2010/9    | 1 Year   |
| AL-1 | Log-Periodic Antenna | UHALP9108-A     | Schwarzbeck     | 0678        | 2010/8    | 1 Year   |
| AL-2 | Log-Periodic Antenna | UHALP9108-A     | Schwarzbeck     | 0679        | 2010/10   | 1 Year   |
| AL-3 | Log-Periodic Antenna | UHALP9108-A     | Schwarzbeck     | 0278        | 2010/9    | 1 Year   |
| AL-4 | Log-Periodic Antenna | USLP9143        | Schwarzbeck     | 140         | 2010/6    | 1 Year   |



| Sign  | Type                        | Model No.            | Manufacturer                    | Serial No.    | Last Cal. | Interval |
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| AL-5  | Log-Periodic Antenna        | 94612-1              | Eaton                           | 97062301      | 2010/4    | 1 Year   |
| AL-6  | Log-Periodic Antenna        | ESLP9145             | Schwarzbeck                     | 9145-216      | 2010/3    | 1 Year   |
| AH-1  | Horn Antenna                | 91888-2              | EATON                           | 563           | 2010/5    | 1 Year   |
| AH-2  | Horn Antenna                | 91889-2              | EATON                           | 569           | 2010/5    | 1 Year   |
| AH-3  | Horn Antenna                | 94613-1              | EATON                           | 575           | 2010/5    | 1 Year   |
| AH-4  | Horn Antenna                | 91891-2              | EATON                           | 583           | 2010/5    | 1 Year   |
| AH-5  | Horn Antenna                | 12-12                | Scientific Atlanta              | 741           | 2010/5    | 1 Year   |
| AH-12 | Horn Antenna                | 3177                 | ETS LINDGREN                    | 00051800      | 2010/7    | 1 Year   |
| AD-1  | Dipole Antenna              | KBA-511A             | Kyoritsu Corp.                  | 0-195-5       | 2010/8    | 1 Year   |
| AD-2  | Dipole Antenna              | KBA-511A             | Kyoritsu Corp.                  | 0-228-13      | 2010/8    | 1 Year   |
| AD-3  | Dipole Antenna              | KBA-611              | Kyoritsu Corp.                  | 0-196-8       | 2010/8    | 1 Year   |
| AD-4  | Dipole Antenna              | KBA-611              | Kyoritsu Corp.                  | 0-230-6       | 2010/8    | 1 Year   |
| CL-1  | Absorbing Clamp             | MDS21                | Rohde & Schwarz                 | 894245/002    | 2010/5    | 1 Year   |
| PA-1  | Pre-Amplifier               | WJ-6811-513          | Watkins Johnson                 | 0288          | 2010/3    | 1 Year   |
| PA-2  | Pre-Amplifier               | WJ-6682-824          | Watkins Johnson                 | 0052          | 2010/3    | 1 Year   |
| PA-3  | Pre-Amplifier               | WJ-6870-506          | Watkins Johnson                 | 0018          | 2010/3    | 1 Year   |
| PA-5  | Pre-Amplifier               | AMF-4D-005080-18-13P | MITEQ, INC.                     | 1218917       | 2010/11   | 1 Year   |
| RN-1  | Reference Impedance Network | 4151                 | NF ELECTRONIC INSTRUMENTS       | 3168114151011 | 2010/5    | 1 Year   |
| RN-2  | Reference Impedance Network | ES4153               | NF ELECTRONIC INSTRUMENTS       | 9099436       | 2010/10   | 1 Year   |
| HF-1  | Harmonic/Flicker Analyzer   | KHA3000              | KIKUSUI ELECTRONICS CORPORATION | NB001642      | 2010/4    | 1 Year   |
| 2-1   | ESD Tester                  | ESD3000              | EMC PARTNER                     | 092           | 2010/5    | 1 Year   |
| 2-2   | ESD Tester                  | ESD3000              | EMC PARTNER                     | 428           | 2010/6    | 1 Year   |
| 3-1   | Signal Generator            | SMT 02               | Rohde & Schwarz                 | 838616/021    | 2010/3    | 1 Year   |
| 3-2   | Signal Generator            | 83732B               | Hewlett Packard                 | US37101411    | 2010/10   | 1 Year   |
| 3-3   | Function Generator          | 1941                 | NF                              | 328730        | 2010/10   | 1 Year   |
| 3-4   | RF Power Amplifier          | 150W1000M1           | Amplifier Research              | 0328963       | 2010/11   | 1 Year   |
| 3-5   | RF Power Amplifier          | 500A100M1            | Amplifier Research              | 19671         | 2010/11   | 1 Year   |
| 3-6   | RF Power Amplifier          | 200W1000M2A          | Amplifier Research              | 19572         | 2010/5    | 1 Year   |
| 3-7   | RF Power Amplifier          | 60S1G3M1             | Amplifier Research              | 0325545       | 2010/11   | 1 Year   |
| 3-8   | Biconical Antenna           | 3109                 | EMCO                            | 9607-3014     | 2010/11   | 1 Year   |
| 3-10  | Log-Periodic Antenna        | 3144                 | EMCO                            | 9701-1032     | 2010/5    | 1 Year   |
| 3-11  | Log-Periodic Antenna        | AT5080               | Amplifier Research              | 322092        | 2010/11   | 1 Year   |
| 3-12  | Horn Antenna                | AT4002A              | Amplifier Research              | 0325039       | 2010/5    | 1 Year   |
| 3-13  | Field Monitor               | FM2000               | Amplifier Research              | 19166         | -         | 1 Year   |
| 3-14  | Field Monitor               | FM5004               | Amplifier Research              | 25843         | -         | 1 Year   |
| 3-15  | Field Probe                 | FP2000               | Amplifier Research              | 18767         | 2010/5    | 1 Year   |
| 3-16  | Field Probe                 | FP2000               | Amplifier Research              | 22646         | 2010/8    | 1 Year   |
| 3-18  | Field Probe                 | FP6001               | Amplifier Research              | 303557        | 2010/10   | 1 Year   |
| 3-19  | Power Meter                 | 4421                 | Bird                            | 2919          | 2010/7    | 1 Year   |
| 3-20  | Power Head                  | 4022                 | Bird                            | 6147          | 2010/7    | 1 Year   |
| 3-21  | Power Meter                 | PM2002               | Amplifier Research              | 25774         | 2010/7    | 1 Year   |
| 3-22  | Power Head                  | PH2000               | Amplifier Research              | 26413         | 2010/7    | 1 Year   |
| 3-23  | Power Head                  | PH2000               | Amplifier Research              | 26414         | 2010/7    | 1 Year   |
| 3-24  | Dual Coupler                | DC2600               | Amplifier Research              | 19734         | 2010/7    | 1 Year   |
| 3-25  | Dual Coupler                | DC6080               | Amplifier Research              | 302555        | 2010/7    | 1 Year   |
| 3-26  | Dual Coupler                | DC7144               | Amplifier Research              | 26463         | 2010/7    | 1 Year   |
| 3-27  | Signal Generator            | SML 03               | Rohde & Schwarz                 | 103413        | 2010/9    | 1 Year   |
| 3-29  | Power Meter                 | NRT                  | Rohde & Schwarz                 | 103116        | 2010/10   | 1 Year   |
| 3-30  | Power Head                  | NRT-Z44              | Rohde & Schwarz                 | 102682        | 2010/10   | 1 Year   |
| 3-31  | Field Probe                 | EP 600               | Narda S.T.S.                    | 301WX90609    | 2010/1    | 1 Year   |
| 3-32  | Field Probe                 | EP 601               | Narda S.T.S.                    | 301WX00125    | 2010/7    | 1 Year   |
| 3-33  | Signal Generator            | SMB100A              | Rohde & Schwarz                 | 103740        | 2010/6    | 1 Year   |
| 4-1   | Immunity Tester             | TRA2000              | EMC PARTNER                     | 659           | 2010/7    | 1 Year   |
| 4-2   | EFT/B Generator             | PEFT-Junior          | HAEFELY                         | 083818-13     | 2010/5    | 1 Year   |

| Sign | Type                         | Model No.      | Manufacturer       | Serial No. | Last Cal. | Interval |
|------|------------------------------|----------------|--------------------|------------|-----------|----------|
| 4-3  | EFT/B Generator              | FNS-AXII B50   | Noise Laboratory   | FNS0620431 | 2010/5    | 1 Year   |
| 4-4  | Coupling Clamp               | IP4            | HAEFELY            | -          | 2010/5    | 1 Year   |
| 4-5  | Coupling Clamp               | 15-00001A      | Noise Laboratory   | -          | 2010/5    | 1 Year   |
| 5-1  | Surge Tester                 | PSURGE4.1      | HAEFELY            | 083665-08  | 2010/11   | 1 Year   |
| 5-2  | Coupling Filter              | FP-SURGE 100M  | HAEFELY            | 149163     | 2010/11   | 1 Year   |
| 5-3  | Coupling Network             | IP6.2          | HAEFELY            | 083811-10  | 2010/11   | 1 Year   |
| 5-4  | Decoupling Network           | DEC1A          | HAEFELY            | 083793-08  | 2010/11   | 1 Year   |
| 5-5  | Pruefpistole                 | AP 300         | HAEFELY            | 081 438    | 2010/11   | 1 Year   |
| 6-1  | Signal Generator             | PSG1000B       | W.K. Electronics   | 000234     | 2010/6    | 1 Year   |
| 6-2  | RF Power Amplifier           | 75A250         | Amplifier Research | 19502      | 2010/8    | 1 Year   |
| 6-3  | RF Power Amplifier           | 75A250         | Amplifier Research | 26255      | 2010/8    | 1 Year   |
| 6-4  | 6dB Attenuator               | 8343-060       | Bird               | 2054       | 2010/8    | 1 Year   |
| 6-5  | 6dB Attenuator               | 65-6-33        | Weinschel          | LW166      | 2010/8    | 1 Year   |
| 6-6  | CDN                          | FCC-801-M1-16  | FCC                | 50         | 2010/5    | 1 Year   |
| 6-7  | CDN                          | FCC-801-M1-25A | FCC                | 04001      | 2010/6    | 1 Year   |
| 6-8  | CDN                          | FCC-801-M2-25  | FCC                | 59         | 2010/5    | 1 Year   |
| 6-9  | CDN                          | FCC-801-M2-25A | FCC                | 03023      | 2010/6    | 1 Year   |
| 6-10 | CDN                          | FCC-801-M2-25A | FCC                | 03024      | 2010/6    | 1 Year   |
| 6-11 | CDN                          | FCC-801-M3-25  | FCC                | 137        | 2010/5    | 1 Year   |
| 6-12 | CDN                          | FCC-801-M3-25A | FCC                | 05021      | 2010/6    | 1 Year   |
| 6-13 | CDN                          | FCC-801-M3-25A | FCC                | 99133      | 2010/6    | 1 Year   |
| 6-14 | CDN                          | FCC-801-M4-25  | FCC                | 21         | 2010/5    | 1 Year   |
| 6-15 | CDN                          | FCC-801-M4-50  | FCC                | 9806       | 2010/4    | 1 Year   |
| 6-16 | CDN                          | FCC-801-C1     | FCC                | 79         | 2010/6    | 1 Year   |
| 6-19 | CDN                          | FCC-801-T8     | FCC                | 9956       | 2010/6    | 1 Year   |
| 6-20 | 150-50 Ohms Adaptor          | FCC-801-150-50 | FCC                | 638        | 2010/6    | 1 Year   |
| 6-21 | 150-50 Ohms Adaptor          | FCC-801-150-50 | FCC                | 639        | 2010/6    | 1 Year   |
| 6-22 | EM Clamp                     | F-203I         | FCC                | 220        | 2010/8    | 1 Year   |
| 6-23 | Decoupling Clamp             | F-203I-DCN     | FCC                | 105        | -         | -        |
| 6-24 | Bulk Current Injection Clamp | F-120-2        | FCC                | 53         | 2010/8    | 1 Year   |
| 6-25 | CDN                          | FCC-801-M3-25A | FCC                | 08008      | 2010/6    | 1 Year   |
| 8-1  | Interference Tester          | LFP6.1         | HAEFELY            | 083374-03  | 2010/3    | 1 Year   |
| 8-2  | Magnetic Field Tester        | MFG100.1       | HAEFELY            | 080136-06  | 2010/3    | 1 Year   |
| 8-3  | Field Coil                   | FC-1           | ES Factory         | 001        | 2010/3    | 1 Year   |
| 8-4  | Large Coil                   | L2X1.6         | ES Factory         | 001        | 2010/3    | 1 Year   |
| 11-1 | Voltage Dip Tester           | PLINE1610      | HAEFELY            | 148709     | 2010/10   | 1 Year   |
| 11-2 | 3 Phase Extension            | PLS1630        | HAEFELY            | 149685     | 2010/4    | 1 Year   |
| 11-3 | External Variac Network      | VAR-EXT1000    | EMC PARTNER        | 046        | 2010/12   | 1 Year   |