

JQA File No.: 441-70229**Issued Date:** July 10, 2007

TEST REPORT

APPLICANT : RISO KAGAKU CORPORATION

ADDRESS : 127-7 Taninosawa, Fukuda, Ami-machi, Inashiki-gun,
Ibaraki-ken 300-1156, Japan

PRODUCTS : RF-Module(RFID Tag Reader/Writer)

MODEL No. : 042-50501

SERIAL No. : 0001,0002

FCC ID : RPARFA4

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

TEST LOCATION : Japan Quality Assurance Organization
Safety & EMC Center
EMC Engineering Department, TSURU EMC Branch
2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, Japan

TEST RESULTS : **Passed**

DATE OF TEST : May 29, 2007 – June 22, 2007

This report must not be used by the client to
claim product endorsement by NVLAP or
NIST or any agency of the U.S. Government.



NVLAP LAB CODE 200192-0

A handwritten signature in black ink, reading "M. Takahashi", is written over a horizontal line.

Masanori Takahashi

Manager

Japan Quality Assurance Organization
Safety & EMC CenterEMC 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.

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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

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

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 accredited by the following bodies .

VLAC Code: VLAC-001-4 (Effective through : April 3, 2008)

NVLAP Lab Code:200192-0 (Effective through : June 30, 2008)

BSMI Recognition Number:

SL2-IN-E-6004, SL2-IS-E-6004, SL2-A1-E-6004 (Effective through : September 14, 2007)

VCCI Registration Number:

R-004, R-824, R-828, C-003, C-005, C-859, C-860, C-864 (Effective through : April 3, 2008)

FCC Registration Number : 342182 (Date of Listing : March 30, 2005)

IC Registration Number : 4126-1, 4126-2, 4126-3 (Effective through : August 29, 2008)

Accredited as conformity assessment body for Japan electrical appliances and material law
by METI. (Effective through : February 22, 2010)

4 Description of the Equipment Under Test

- | | | | |
|----|----------------------|---|--|
| 1 | Manufacturer | : | RISO KAGAKU CORPORATION
127-7 Taninosawa, Fukuda, Ami-machi, Inashiki-gun,
Ibaraki-ken 300-1156, Japan |
| 2 | Products | : | RF-Module(RFID Tag Reader/ Writer) |
| 3 | Model No. | : | 042-50501 |
| 4 | Serial No. | : | 0001,0002 |
| 5 | Product Type | : | Pre-Production |
| 6 | Date of Manufacture | : | December 2006 |
| 7 | Power Rating | : | 5.0VDC
* The EUT was operated with the printer.
(Input: 120Vac 60Hz、 Output: 5.0Vdc) |
| 8 | EUT Grounding | : | None |
| 9 | Received Date of EUT | : | May 28, 2007 |
| 10 | Operating Frequency | : | 13.56MHz(Section 15.225)
Operation within the band 13.110 – 14.010 MHz |
| 11 | Modulation | : | AM(Digital) |

5 Test Condition

5.1 Conducted Emissions at the Mains Ports (Section 15.207)

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☒ AC-1 ☐ SR-A ☐ SR-B ☐ SR-C
Test Receiver	☒ R-3 ☐ R-4 ☐ R-5
Cable	☒ CB-3 ☐ CB-4 ☐ CB-5
Network (for EUT)	☐ L-1 ☐ L-2 ☒ L-3 ☐ L-4 ☐ L-5 ☐ L-6 ☐ L-7 ☐ L-8 ☐ L-9 ☐ L-10 ☐ L-11 ☐ L-12 ☐ L-13
Network (for AE)	☐ L-1 ☐ L-2 ☐ L-3 ☐ L-4 ☐ L-5 ☐ L-6 ☐ L-7 ☐ L-8 ☐ L-9
Pulse Limiter	☒ PL-3 ☐ PL-4 ☐ PL-5
Termination	☐ TM-1 ☐ TM-2

5.2 Radiated Emissions (Section 15.225(a)(b)(C))

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☒ AC-1
Test Receiver	☐ R-1 ☐ R-2 ☒ R-3 ☐ R-4 ☐ R-5
Cable	☐ CN-1 ☐ CN-2 ☐ CN-3
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☒ AL-0

5.3.1 Radiated Emissions 0.009MHz – 30 MHz (Section 15.225(d))

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☒ AC-1
Test Receiver	☒ R-3 ☐ R-4 ☐ R-5
Cable	☐ CN-1 ☐ CN-2 ☐ CN-3
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☒ AL-0

5.3.2 Radiated Emissions 30MHz – 1000 MHz (Section 15.225(d))

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☒ AC-1
Test Receiver	☐ R-1 ☐ R-2 ☒ R-3 ☐ R-5
Cable	☐ CN-1 ☐ CN-2 ☒ CN-3
Antenna	☐ AB-1 ☐ AB-2 ☒ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☒ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☐ AL-0

5.3.3 Radiated Emissions above 1GHz(Section 15.225(d))

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☐ AC-1
Test Receiver	☐ R-3 ☐ R-5 ☐ S-1 ☐ S-3
Cable	☐ CS-1 ☐ CS-2
Antenna	☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AL-6
Pre-Amplifier	☐ PA-1 ☐ PA-2 ☐ PA-3 ☐ PA-5

5.4 Frequency Stability (Section 15.225(e))

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

Instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Receiver	☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4 ☐ R-5 ☐ S-1 ☐ S-3
Cable	☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CS-1 ☐ CS-2 ☐ CS-3 ☐ CS-4 ☐ CS-5 ☐ CN-0
Oven	☒ OV-1
Frequency Counter	☒ FC-1
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☐ AL-0

5.5 Occupied Bandwidth

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

Used test site & instruments :

Type	Number of test site & instruments (Refer to Appendix B)
Test Site	☐ OS-1 ☐ OS-2 ☒ AC-1 ☐ SR-A ☐ SR-B ☐ SR-C
Test Receiver	☐ R-1 ☐ R-2 ☒ R-3 ☐ R-4 ☐ R-5 ☐ S-1 ☐ S-3
Cable	☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CB-3 ☐ CB-4 ☐ CB-5 ☐ CS-1 ☐ CS-2 ☐ CB-3 ☐ CB-4 ☐ CB-5
Pre-Amplifier	☐ PA-1 ☐ PA-2 ☐ PA-3
Antenna	☐ AB-1 ☐ AB-2 ☐ AB-3 ☐ AD-1 ☐ AD-2 ☐ AD-3 ☐ AL-1 ☐ AL-2 ☐ AL-3 ☐ AL-4 ☐ AL-5 ☐ AD-4 ☒ AL-0

6 Preliminary Test and Test Setup

6.1 Conducted Disturbance at the Mains Ports

The test was based on ANSI C63.4-2003.

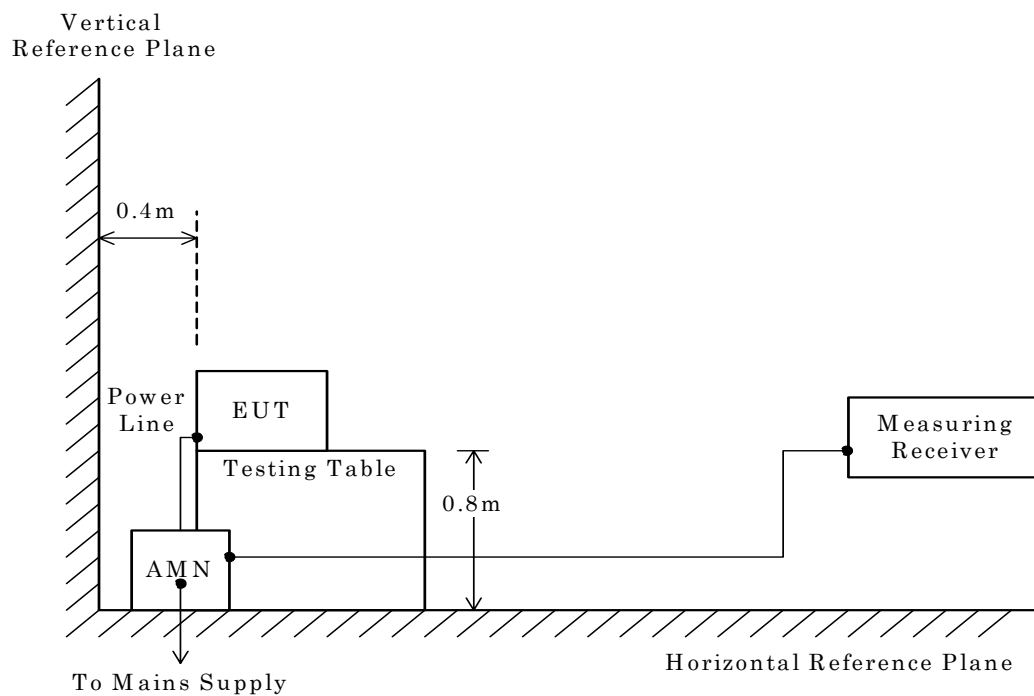
The preliminary conducted disturbance at the mains ports measurements were carried out.

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.

- Side View -



* AMN : Artificial Mains Network

6.2 Radiated Emissions 0.009 MHz - 30 MHz

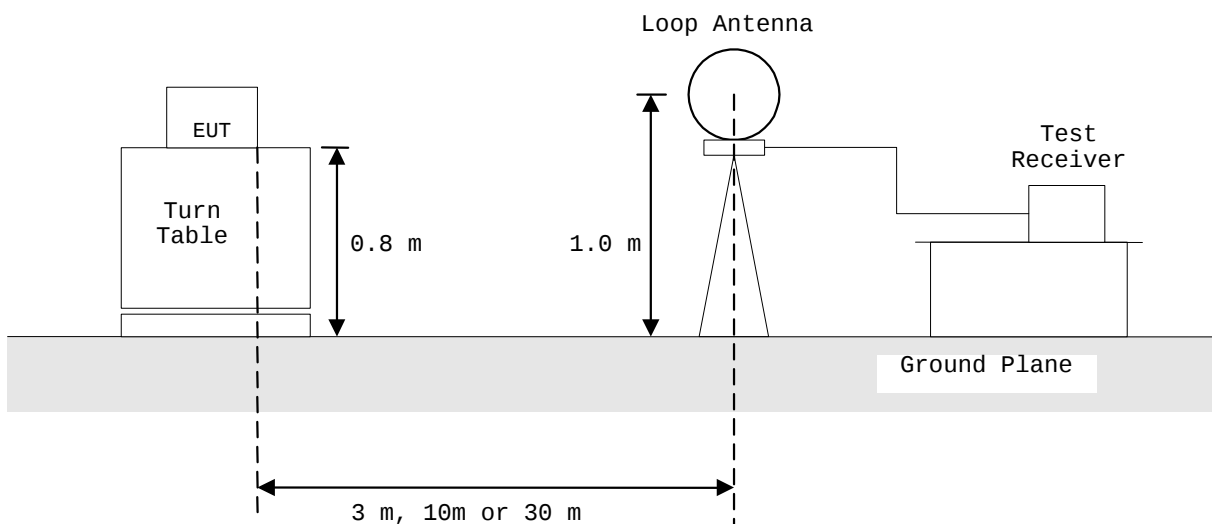
The test was based on ANSI C63.4-2003.

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.



6.3 Radiated Emissions 30MHz – 1000 MHz

The test was based on ANSI C63.4-2003.

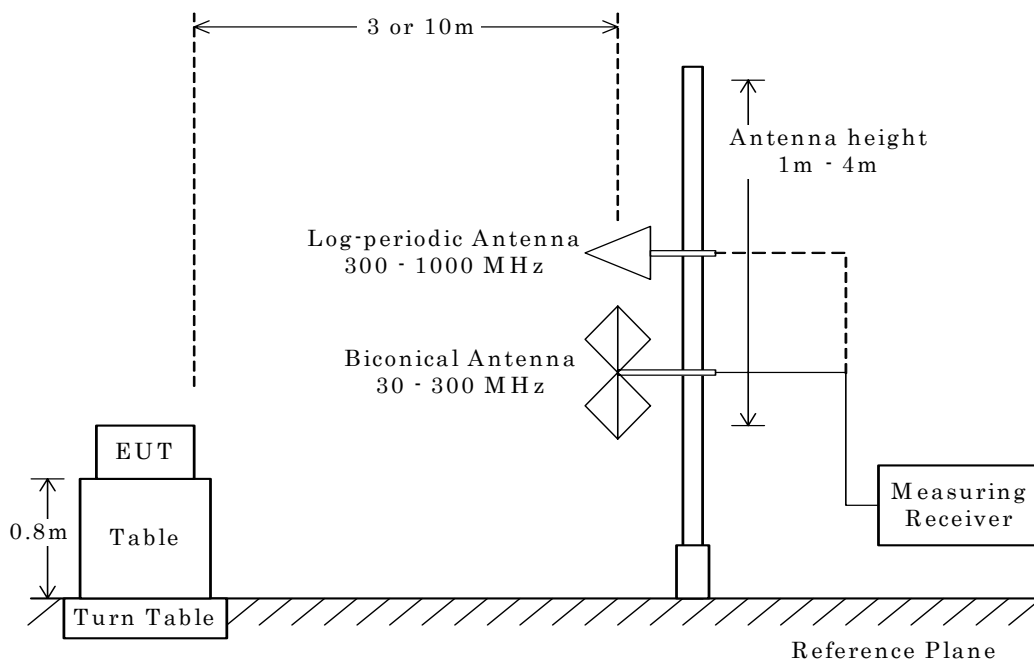
The preliminary radiated disturbance measurements were carried out.

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.

- Side View -



6.4 Radiated Emissions above 1 GHz

The test was based on ANSI C63.4-2003.

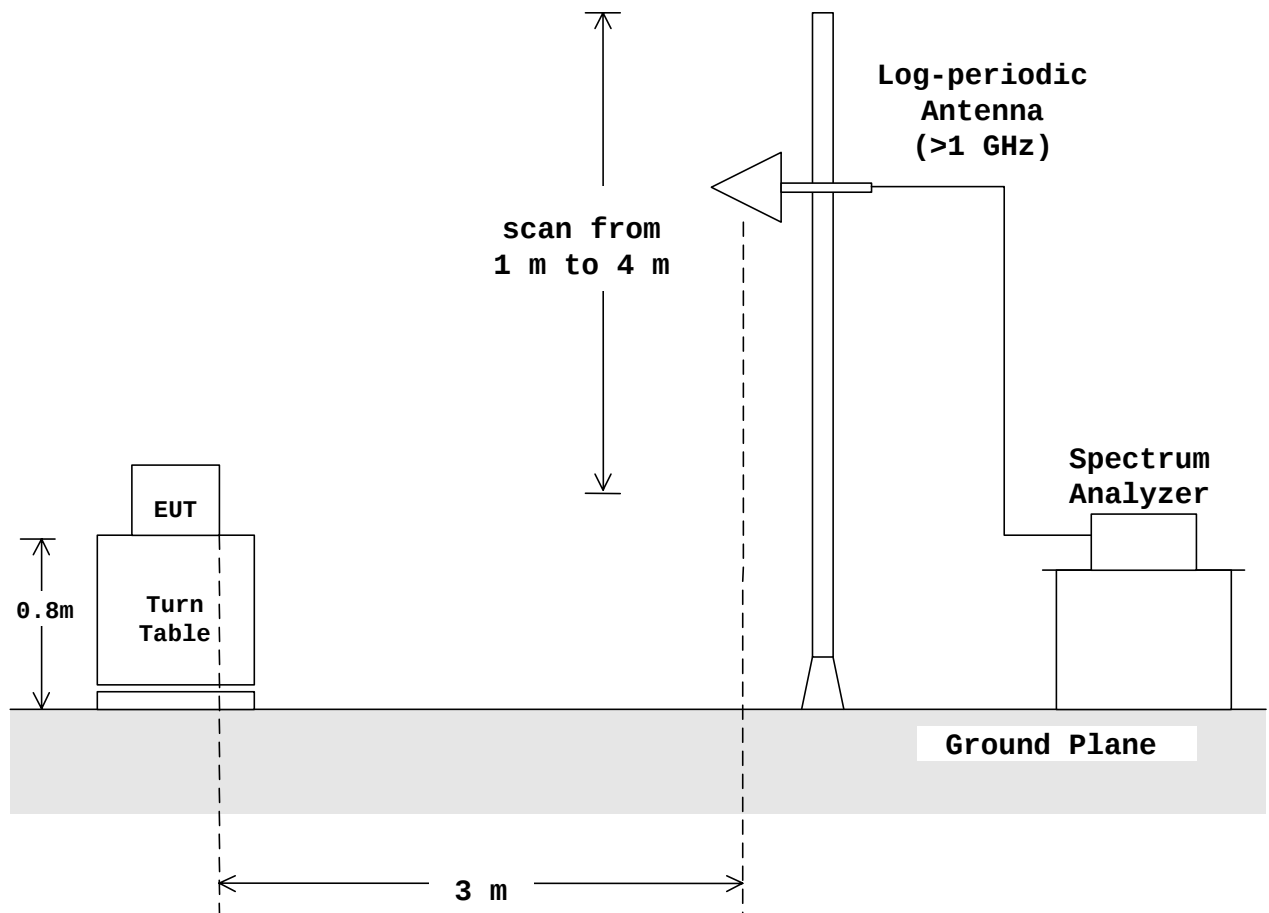
The preliminary radiated emissions measurements were carried out.

The preliminary radiated emissions 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 emissions measurements.

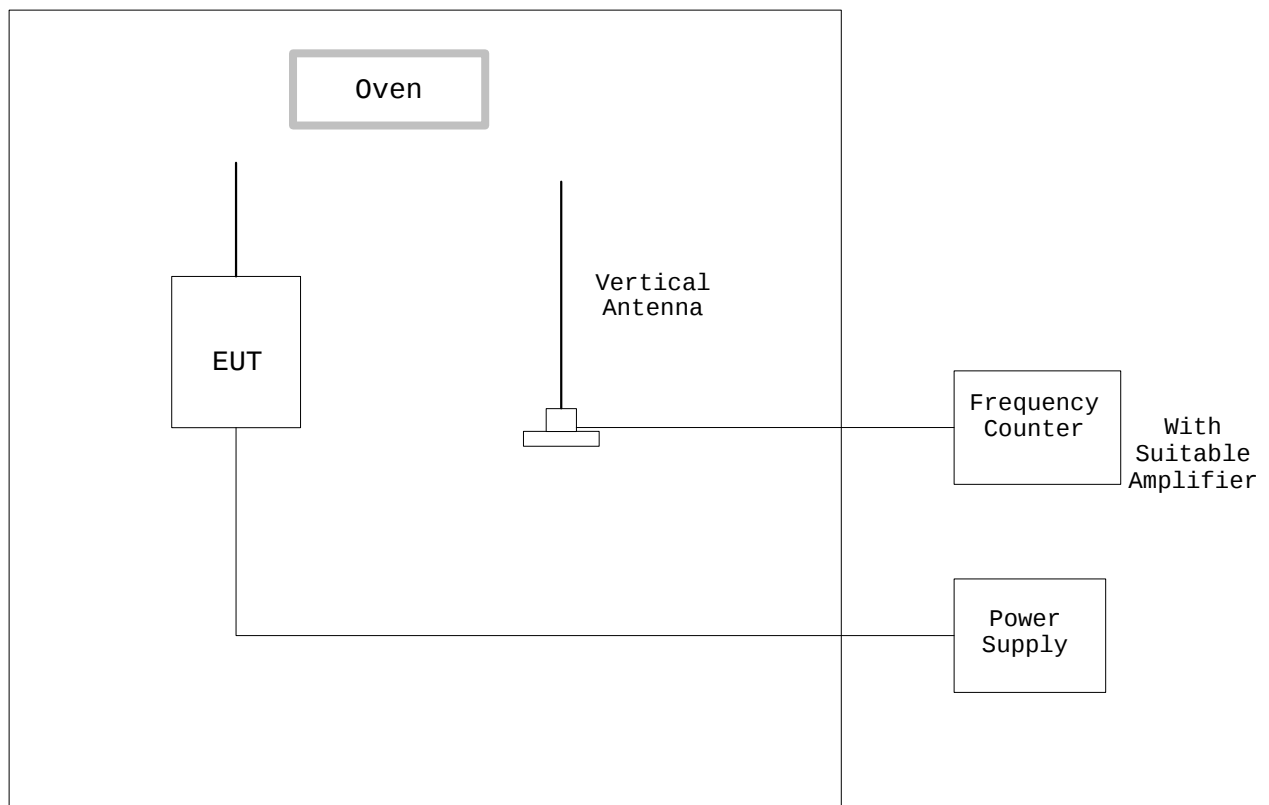
- Side View -



6.5 Frequency Stability

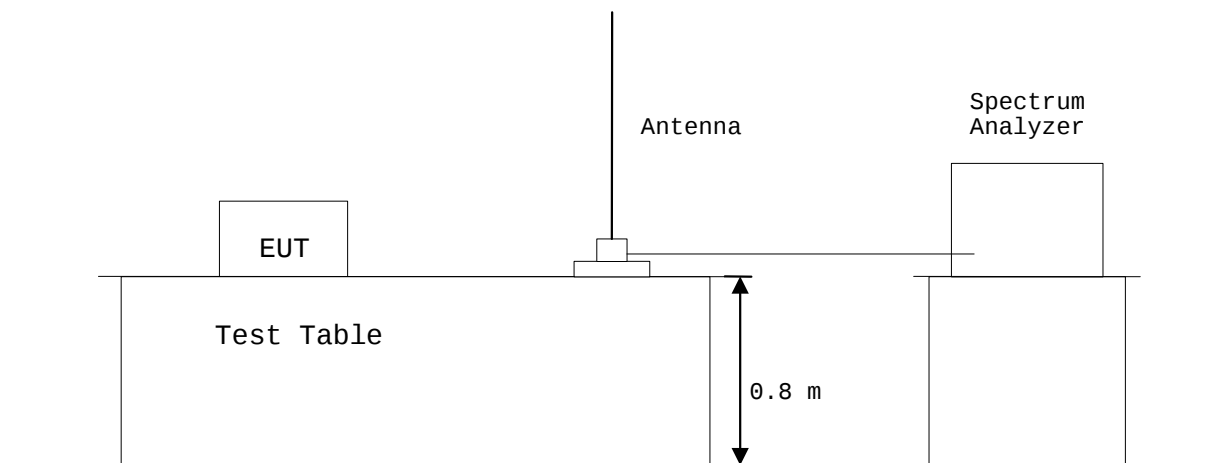
The test was based on ANSI C63.4-2003.

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°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.



6.6 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.



7 Equipment Under Test Modification

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

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

Applicant : Not Applicable

Date : Not Applicable

Typed Name : Not Applicable

Position : Not Applicable

Signatory: Not Applicable

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

Responsible Party :

Contact Person :

Signatory

9 Deviation from Standard

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

10 Test Results

10.1 Conducted Emissions at the Mains Ports (Section 15.207)

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

☐-Not Applicable

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin (QP) 11.5 dB at 13.56 MHz

Min. Limit Margin (AVE) 5.0 dB at 13.56 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 37.1 dB at 27.12 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 8.0 dB at 71.8 MHz

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

Uncertainty of measurement results

3 meters	0.009-30	MHz	<u>± 1.9</u>	<u>dB(2σ)</u>
	30- 300	MHz	<u>± 4.5</u>	<u>dB(2σ)</u>
	300-1000	MHz	<u>± 4.6</u>	<u>dB(2σ)</u>
	1 - 18	GHz	<u>± 3.7</u>	<u>dB(2σ)</u>
10 meters	0.009-30	MHz	<u>± 1.9</u>	<u>dB(2σ)</u>
	30- 300	MHz	<u>± 4.5</u>	<u>dB(2σ)</u>
	300-1000	MHz	<u>± 4.5</u>	<u>dB(2σ)</u>
	1 - 18	GHz	<u>± 3.7</u>	<u>dB(2σ)</u>

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 : _____

10.6 Conducted Emissions at the Mains Ports for Receiver (Section 15.107(a))

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

☐-Passed ☐-Failed ☐-Not judged

Min. Limit Margin N/A dB at N/A MHz

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

Remarks : The transceiver is used in combination with permanently co-located
transmitter continuously transmitting, and it start to TX/RX at the
time of the power is on simultaneously. Therefore this requirement could
not be measured under RX or Standby mode.

10.7 Radiated Emissions (Section 15.109(a))

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

☐-Passed ☐-Failed ☐-Not judged

Min. Limit Margin N/A dB at N/A MHz

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

Remarks : The transceiver is used in combination with permanently co-located
transmitter continuously transmitting, and it start to TX/RX at the
time of the power is on simultaneously. Therefore this requirement could
not be measured under RX or Standby mode.

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 11 to 13.

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

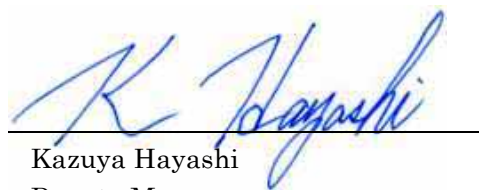
Test Results :

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:



Kazuya Hayashi

Deputy Manager

TSURU EMC Branch

EMC Engineering Department

Tested by:



Kazuyuki Makimoto

Assistant Manager

TSURU EMC Branch

EMC Engineering Department

12 Operating Condition

Power Supply Voltage : 5.0VDC

* The EUT was operated with the printer.

(Input: 120Vac 60Hz、 Output: 5.0Vdc)

Operation Mode

Transmitting

The Test have been carried out under continuous transmission/Reception Mode.

13 Test Configuration

The equipment under test consists of :

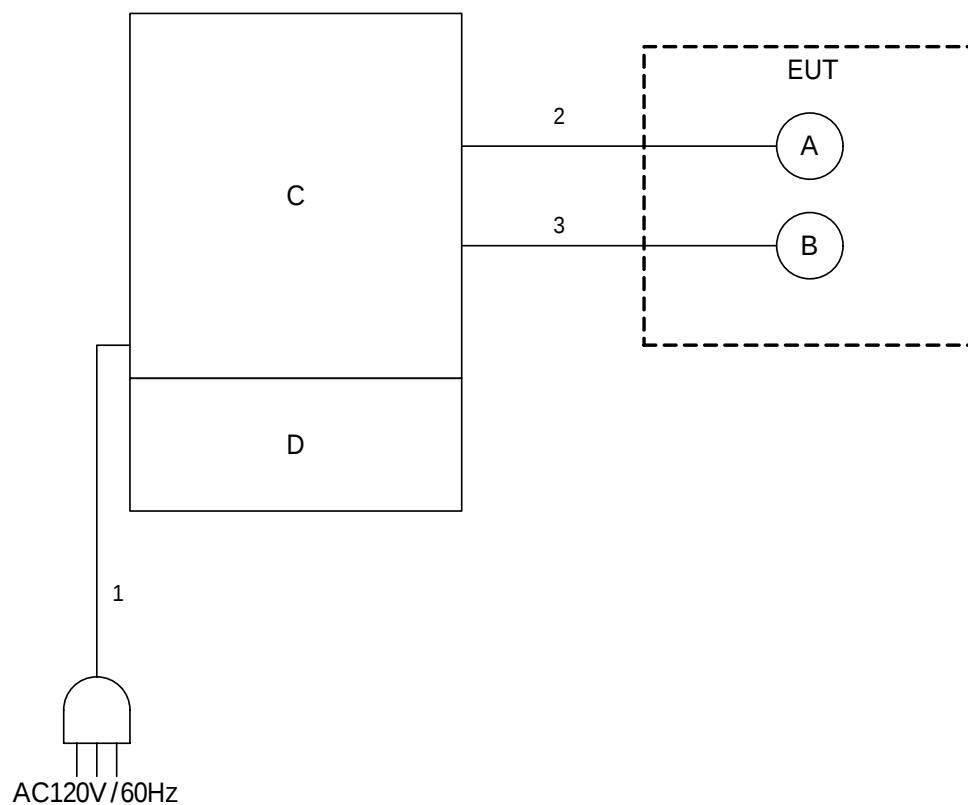
Sign	Item	Manufacturer	Model No.	FCC ID	Serial No.
A	RF-Module(RFID Tag Reader/Writer)	RISO	042-50501	RPARFA4	0001
B	RF-Module(RFID Tag Reader/Writer)	RISO	042-50501	RPARFA4	0002

The auxiliary equipment used for testing :

Sign	Item	Manufacturer	Model No.	FCC ID	Serial No.
C	Duplicator	RISO	CZ180(120)	N/A	86090006
D	Exclusive Table	RISO	RISO STAND N TYPE	N/A	None

Type of Cable:

No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	AC Power Cable(for C)	None	None	None	None	3.0
2	Signal Cable	None	None	None	None	0.55
3	Signal Cable	None	None	None	None	0.55

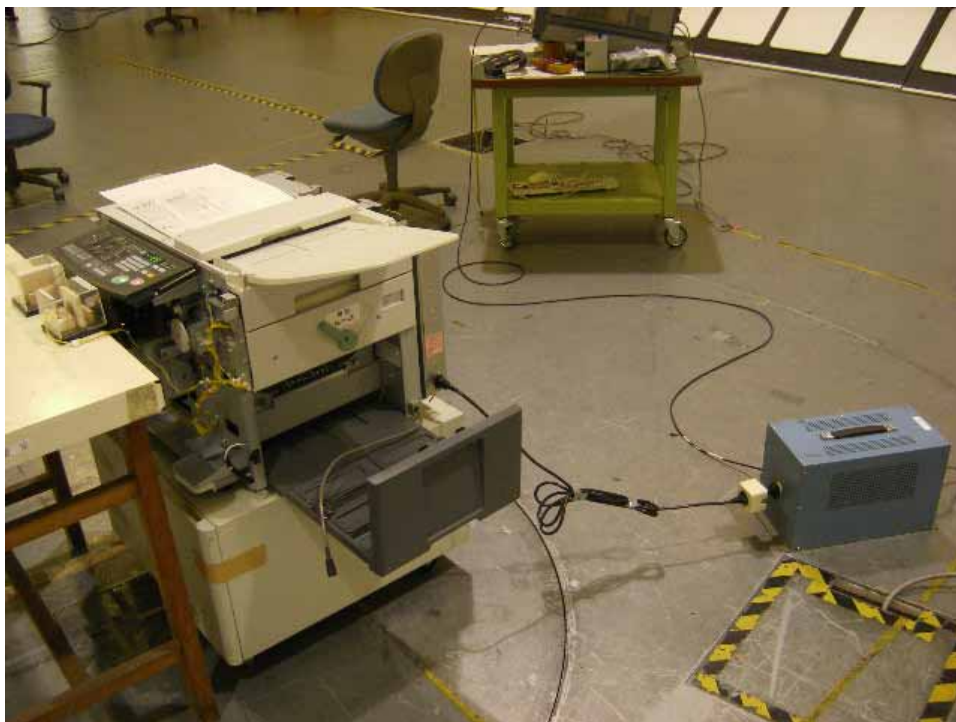
14 Equipment Under Test Arrangement (Drawings)

15 Equipment Under Test Arrangement (Photographs)

15.1 Conducted Emissions at the Mains Ports



- Front View -



- Side View -

Photograph present configuration with maximum emission

15.2 Radiated Emissions



- Front View -



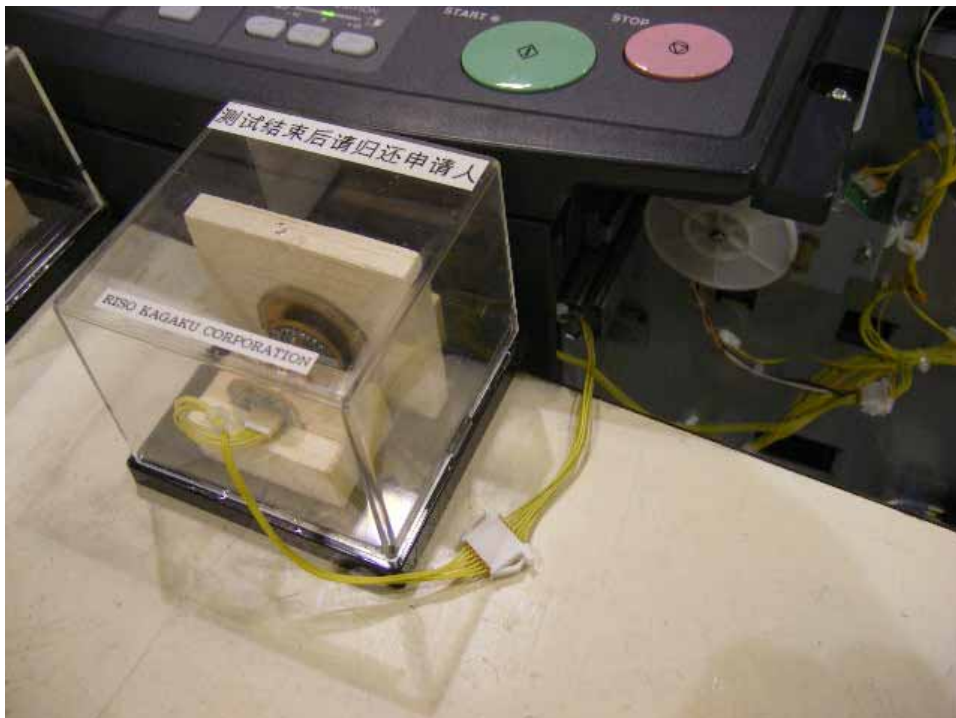
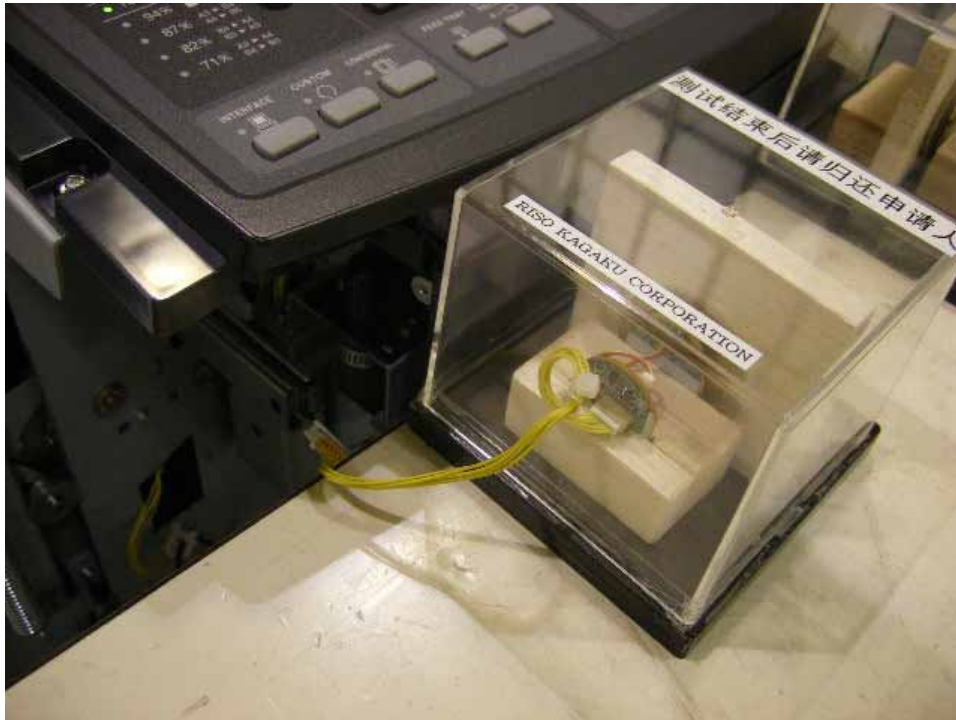
- Rear View -

Photograph present configuration with maximum emission

(Antenna Photographs)



(Antenna Photographs)



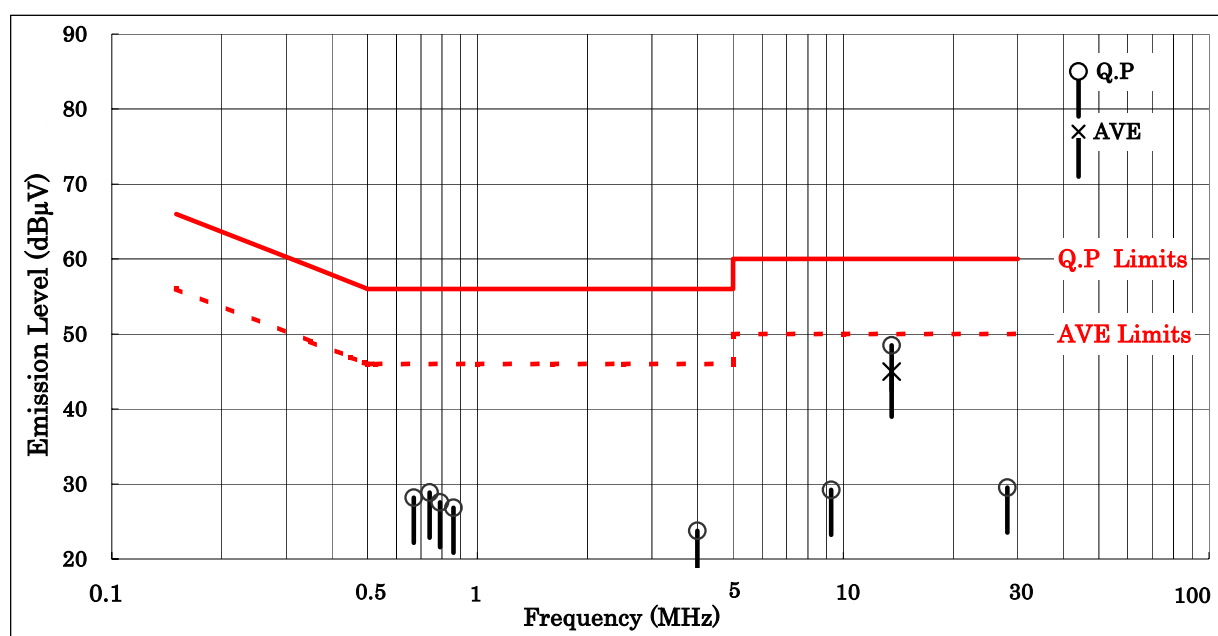
Appendix A: Test Data

A.1 Conducted Emissions at the Mains Ports

Date: May 29, 2007

Temp : 20 Humi : 45% Atom : 960hPa

Frequency (MHz)	AMN Factor (dB)	Meter Reading (dBμV)				Limits (dBμV)		Max. Emission Level (dBμV)		Margin (dB)	
		V-A		V-B		Q.P	AVE	Q.P	AVE	Q.P	AVE
0.67	0.2	28.0	-	20.5	-	56.0	46.0	28.2	-	27.8	-
0.74	0.2	28.7	-	20.7	-	56.0	46.0	28.9	-	27.1	-
0.79	0.2	27.4	-	< 20.0	-	56.0	46.0	27.6	-	28.4	-
0.86	0.2	26.7	-	< 20.0	-	56.0	46.0	26.9	-	29.1	-
3.99	0.1	23.7	-	< 20.0	-	56.0	46.0	23.8	-	32.2	-
9.27	0.1	29.1	-	27.2	-	60.0	50.0	29.2	-	30.8	-
13.56	0.2	48.3	44.8	47.9	44.4	60.0	50.0	48.5	45.0	11.5	5.0
28.10	0.3	28.2	-	29.2	-	60.0	50.0	29.5	-	30.5	-



- Notes:
- 1) The testing location : Anechoic Chamber No.1
 - 2) The spectrum was checked from 0.15 MHz to 30 MHz
 - 3) AMN(Artificial Mains Network) factor includes the cable loss.
 - 4) V-A : One end & Ground V-B : The other end & Ground
 - 5) Q.P : Quasi-Peak Detector AVE : Average Detector
 - 6) The symbol of "<" means "or less".
 - 7) The symbol of ">" means "more than".
 - 8) The symbol of "-" means "Not applicable".
 - 9) A sample calculation was made at 0.67 MHz
 $(\text{AMN Factor}) + (\text{Meter Reading}) = 0.2 + 28.0 = 28.2 \text{ dB}\mu\text{V}$

A.2 Radiated Emissions (Section 15.225(a)(b)(C))

Date: May 29, 2007

Temp : 20 Humi : 45% Atom : 960hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading/ 10m (dBμV) Q.P	Limits/ 30 m (dBμV) Q.P	Field Strength/ 30m (dBμV) Q.P	Margin (dB) Q.P
13.56	-	32.0	84.0	12.9	71.1
27.12	-	11.5	29.5	-7.6	37.1

Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 10 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 "Not applicable", because the 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: $32.0 \text{ dBmV/m} - 20\log_{10}((30/10)^2) = 32.0 - 19.1 = 12.9 \text{ dBmV/m}$ at 30 meters

Limits for fundamental(§15.225(a)) = $20\log_{10}(15848) = 84.0 \text{ dBmV/m}$

Harmonic : $11.5 \text{ dBmV/m} - 20\log_{10}((30/10)^2) = 11.5 - 19.1 = -7.6 \text{ dBmV/m}$ at 30 meters

Limits for (§15.225(d)) = $20\log_{10}(30) = 29.5 \text{ dBmV/m}$

8) The spectrum was checked from 0.009 MHz to 30 MHz.

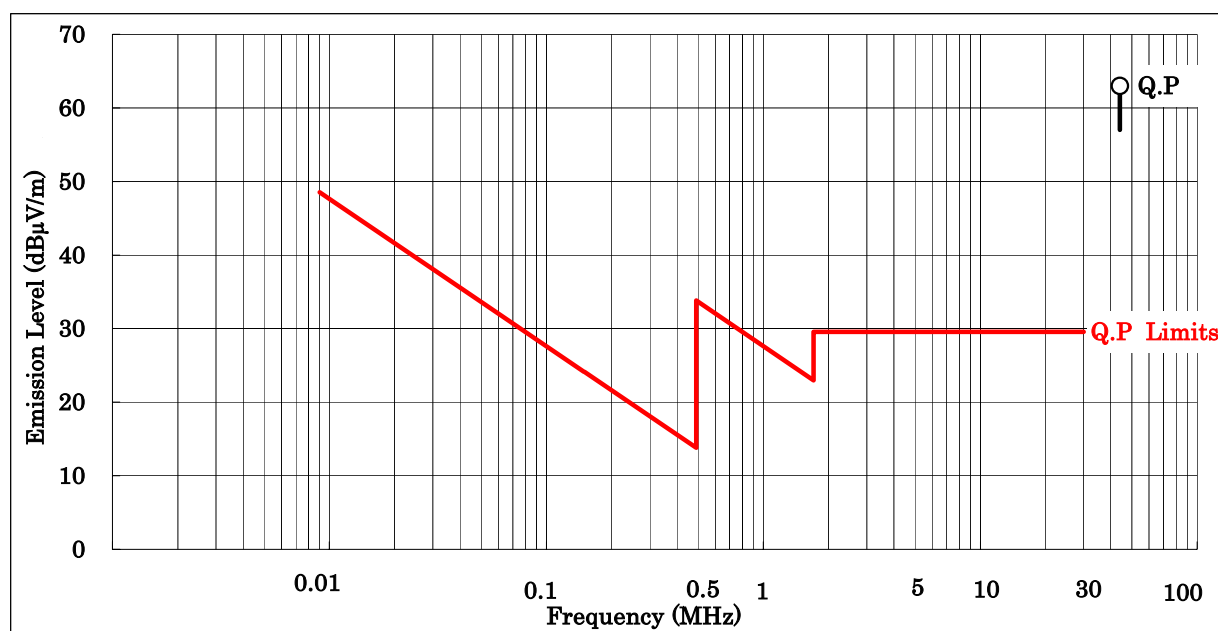
A.3 Radiated Emissions

A.3.1 Radiated Emissions 0.009MHz – 30 MHz (Section 15.225(d))

Date: May 29, 2007

Temp : 22 Humi : 41% Atom : 960hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading at 10m (dBμV) Q.P	Limits (dBμV) Q.P	Specified Distance (m)	Extrapolated Emission Level (dBμV) Q.P	Margin (dB) Q.P
0.009	-	< 22.5	48.5	300.0	< -36.6	> 85.1
0.01	-	< 22.1	47.6	300.0	< -37.0	> 84.6
0.02	-	< 20.5	41.6	300.0	< -38.6	> 80.2
0.03	-	< 19.9	38.1	300.0	< -39.2	> 77.2
0.05	-	< 19.5	33.6	300.0	< -39.6	> 73.2
0.07	-	< 19.4	30.7	300.0	< -39.7	> 70.4
0.10	-	< 19.3	27.6	300.0	< -39.8	> 67.4
0.20	-	< 19.4	21.6	300.0	< -39.7	> 61.3
0.30	-	< 19.4	18.1	300.0	< -39.7	> 57.8
0.50	-	< 19.3	33.6	30.0	< 0.2	> 33.5
1.00	-	< 19.3	27.6	30.0	< 0.2	> 27.4
2.00	-	< 19.5	29.5	30.0	< 0.5	> 29.1
3.00	-	< 19.8	29.5	30.0	< 0.7	> 28.8
5.00	-	< 19.8	29.5	30.0	< 0.7	> 28.9
10.00	-	< 19.8	29.5	30.0	< 0.8	> 28.8
20.00	-	< 21.9	29.5	30.0	< 2.8	> 26.7
30.00	-	< 23.0	29.5	30.0	< 3.9	> 25.6



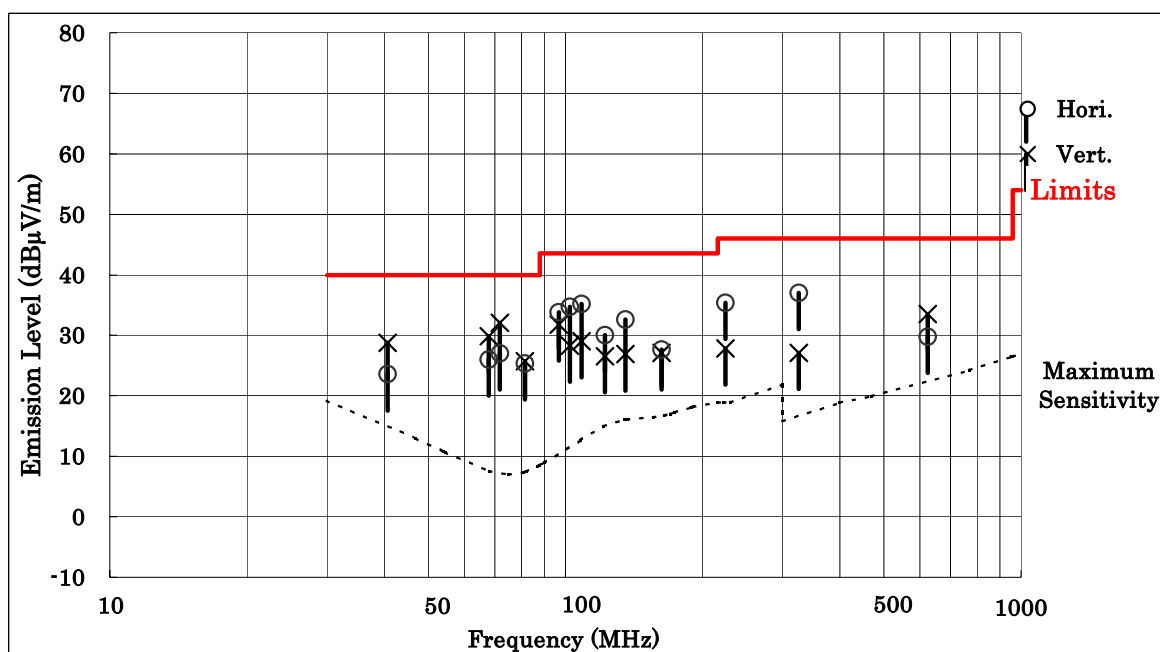
- Notes:
- 1) The testing location : Anechoic Chamber No.1 Distance : 10 m
 - 2) The symbol of "<" means "or less".
 - 3) The symbol of ">" means "more than".
 - 4) The symbol of "-" means "zero".
 - 5) A sample calculation was made at 0.009 MHz
 $22.5 \text{ dB}\mu\text{V/m (at 10m distance)} \Rightarrow 22.5 - 20\log_{10}((300/10)^2) = -36.6\text{dB}\mu\text{V/m (at 300m distance)}$
 - 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)

A.3.2 Radiated Emissions 30MHz – 1000 MHz (Section 15.225(d))

Date: May 29, 2007

Temp : 20 Humi : 45% Atom : 960hPa

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading (dBμV)		Limits (dBμV) Q.P	Emission Level (dBμV/m)		Margin (dB)	
		Hori.	Vert.		Hori.	Vert.	Hori.	Vert.
40.7	15.1	8.5	13.7	40.0	23.6	28.8	16.4	11.2
67.8	7.5	18.5	22.4	40.0	26.0	29.9	14.0	10.1
71.8	7.0	20.0	25.0	40.0	27.0	32.0	13.0	8.0
81.4	7.3	18.1	18.4	40.0	25.4	25.7	14.6	14.3
96.8	10.4	23.4	21.4	43.5	33.8	31.8	9.7	11.7
102.4	11.6	23.1	16.7	43.5	34.7	28.3	8.8	15.2
108.5	12.6	22.6	16.5	43.5	35.2	29.1	8.3	14.4
122.0	14.8	15.2	11.7	43.5	30.0	26.5	13.5	17.0
135.6	15.9	16.7	11.0	43.5	32.6	26.9	10.9	16.6
162.7	16.4	11.3	10.7	43.5	27.7	27.1	15.8	16.4
224.8	18.7	16.7	9.2	46.0	35.4	27.9	10.6	18.1
325.4	16.3	20.7	10.8	46.0	37.0	27.1	9.0	18.9
624.5	21.8	8.0	11.8	46.0	29.8	33.6	16.2	12.4
1000.0	26.2	< -2.0	< -2.0	54.0	< 24.2	< 24.2	> 29.8	> 29.8



Notes: 1) The testing location : Anechoic Chamber No.1 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) The symbol of "<" means "or less".

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

7) A sample calculation was made at 40.7 MHz

(Antenna Factor) + (Meter Reading) = 15.1 + 13.7 = 28.8 dBμV

A.3.3 Radiated Emissions above 1GHz(Section 15.225(d))

Not applicable.

A.4 Frequency Stability (Section 15.225(e))

Testing Date : June 22, 2007

Ambient Temperature : 25 (°C) Humidity : 55(%)

Temperature (°C)	Primary Supply Voltage (V)	Frequency (MHz)			
		0 minute later	2 minutes later	5 minutes	10 minutes
-20	102	13.56099308	13.5609922	13.56022236	13.56099253
	120	13.56099297	13.5609925	13.56099268	13.56099278
	138	13.56099142	13.56099213	13.56099267	13.56099274
20	102	13.56089741	13.56089361	13.56089334	13.56089277
	120	13.56089794	13.56089299	13.56089292	13.56089269
	138	13.56089299	13.56089264	13.56089252	13.5608925
50	102	13.56081733	13.56081654	13.56081629	13.56081606
	120	13.56081581	13.56081603	13.56081591	13.5608159
	138	13.56081568	13.56081608	13.56081596	13.56081587

Operating Frequency:13.56MHz

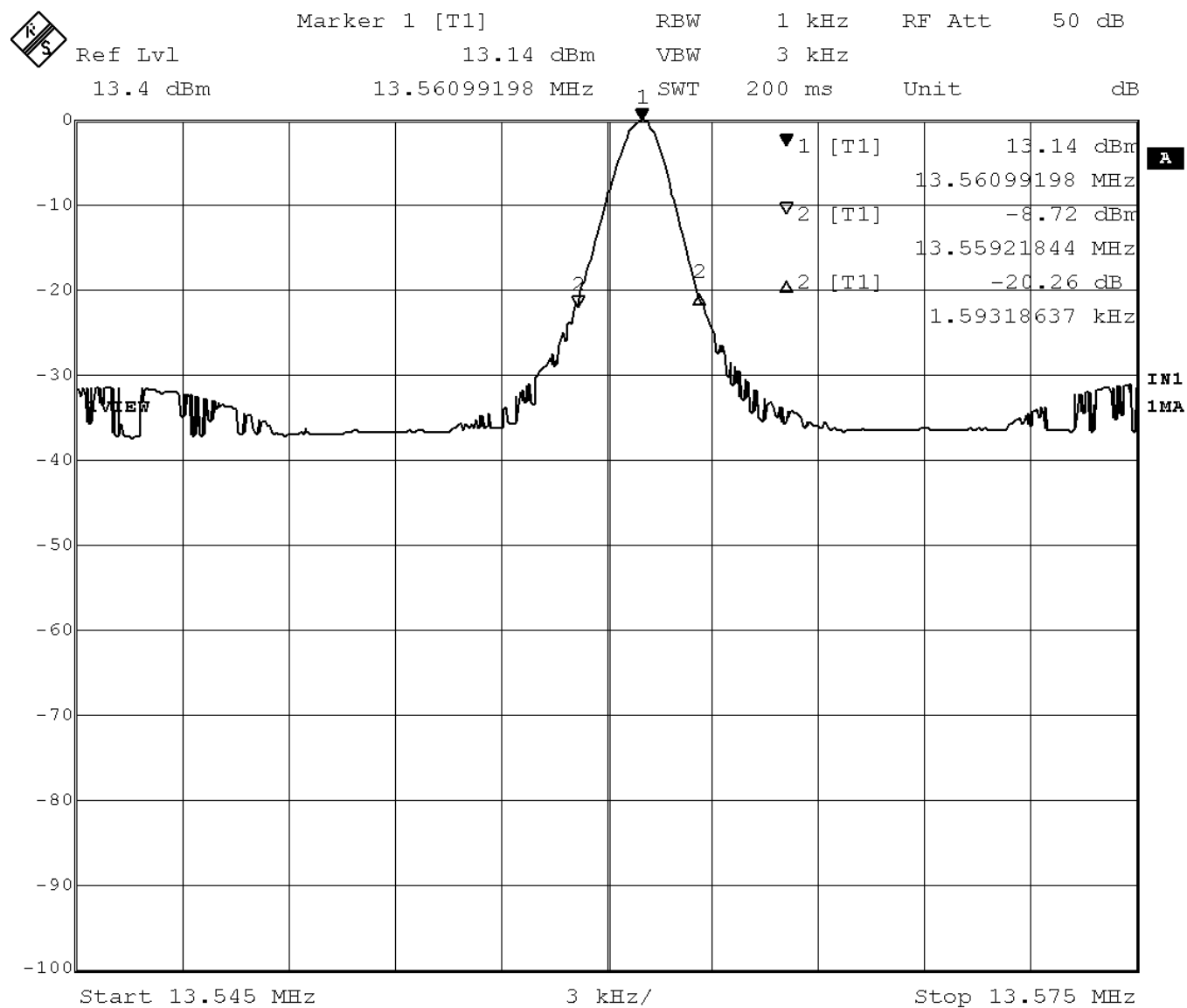
Temperature (°C)	Primary Supply Voltage (V)	Frequency with time elapse (%)			
		0 minute later	2 minutes later	5 minutes	10 minutes
-20	102	0.000073	0.000073	0.000016	0.000073
	120	0.000073	0.000073	0.000073	0.000073
	138	0.000073	0.000073	0.000073	0.000073
20	102	0.000066	0.000066	0.000066	0.000066
	120	0.000066	0.000066	0.000066	0.000066
	138	0.000066	0.000066	0.000066	0.000066
50	102	0.000060	0.000060	0.000060	0.000060
	120	0.000060	0.000060	0.000060	0.000060
	138	0.000060	0.000060	0.000060	0.000060

Specified Limit +/-0.01%

A.5 Occupied Bandwidth

Testing Date : June 22, 2007

Ambient Temperature : 20(°C) Humidity : 55(%)



Appendix B: Test Instruments

Sign	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
OP-1	Open Site	-	Toshiba	-	2007/5	1 Year
OP-2	Open Site	-	Toshiba	-	2007/5	1 Year
AC-1	Anechoic Chamber (L)	-	TDK	-	2007/5	1 Year
AC-2	Anechoic Chamber (S)	-	TDK	-	2007/5	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	2007/3	1 Year
R-2	Test Receiver	ESVS10	Rohde & Schwarz	843744/018	2007/6	1 Year
R-3	Test Receiver	ESIB7	Rohde & Schwarz	100059/007	2006/11	1 Year
R-4	Test Receiver	ESHS30	Rohde & Schwarz	842053/001	2007/2	1 Year
R-5	Test Receiver	ESCS30	Rohde & Schwarz	100203	2007/2	1 Year
S-1	Spectrum Analyzer	R3361C	Advantest	71720774	2007/4	1 Year
S-3	Spectrum Analyzer	U3751	Advantest	160100139	2007/3	1 Year
S-4	Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	2007/4	1 Year
S-5	Spectrum Analyzer	U3751	Advantest	170500170	2007/6	1 Year
CB-3	RF Cable	3D-2W	Fujikura	-	2007/5	1 Year
CB-4	RF Cable	3D-2W	Fujikura	-	2007/5	1 Year
CB-5	RF Cable	3D-2W	Fujikura	-	2007/5	1 Year
CN-1	RF Cable	20D/5D-2W	Fujikura	-	2007/5	1 Year
CN-2	RF Cable	20D/5D-2W	Fujikura	-	2007/5	1 Year
CN-3	RF Cable	20D/5D-2W	Fujikura	-	2007/5	1 Year
CS-1	RF Cable	SUCOFLEX 104P	Huber+Suhner	27290/4P	2006/11	1 Year
CS-2	RF Cable	SUCOFLEX 104P	Huber+Suhner	27289/4P	2006/11	1 Year
L-1	AMN	KNW-407	Kyoritsu Corp.	8-833-5	2006/9	1 Year
L-2	AMN	KNW-407	Kyoritsu Corp.	8-680-14	2006/9	1 Year
L-3	AMN	KNW-407	Kyoritsu Corp.	8-757-1	2007/6	1 Year
L-4	AMN	KNW-242	Kyoritsu Corp.	8-755-1	2007/6	1 Year
L-5	AMN	KNW-242C	Kyoritsu Corp.	8-837-14	2007/6	1 Year
L-6	AMN	KNW-243C	Kyoritsu Corp.	8-692-5	2006/9	1 Year
L-7	AMN	KNW-243C	Kyoritsu Corp.	8-831-3	2007/6	1 Year
L-8	AMN	KNW-243C	Kyoritsu Corp.	8-831-4	2007/6	1 Year
L-9	AMN	KNW-244C	Kyoritsu Corp.	8-1373-3	2006/8	1 Year
L-10	ISN	FCC-TLISN-T2-02	FCC	20234	2006/11	1 Year
L-11	ISN	FCC-TLISN-T4-02	FCC	20235	2006/11	1 Year
L-12	High Impedance Probe	KNW-410	Kyoritsu Corp.	8-876-3	2006/8	1 Year
L-13	Artificial Hand	K-9003	Kyoritsu Corp.	7-1639-4	2006/10	1 Year
PL-3	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2006/11	1 Year
PL-4	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2007/2	1 Year
PL-5	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2007/2	1 Year
TM-1	50ohm Termination	BNC-P-1.5	TDC	-	2007/3	1 Year
TM-2	50ohm Termination	-	Y&R	-	2007/3	1 Year
AL-0	Loop Antenna	HFH2-Z2	Rohde & Schwarz	879284/14	2006/8	1 Year
AT-1	Triple Loop Antenna	HXYZ9170	Schwarzbeck	9170-138	2006/7	1 Year

AB-1	Biconical Antenna	BBA9106	Schwarzbeck	VHA91031741	2006/9	1 Year
AB-2	Biconical Antenna	BBA9106	Schwarzbeck	VHA91031516	2006/9	1 Year
AB-3	Biconical Antenna	BBA9106	Schwarzbeck	VHA11905516	2006/9	1 Year
AL-1	Log-Periodic Antenna	UHALP9108A	Schwarzbeck	0678	2006/9	1 Year
AL-2	Log-Periodic Antenna	UHALP9108A	Schwarzbeck	0679	2006/9	1 Year
AL-3	Log-Periodic Antenna	UHALP9108A1	Schwarzbeck	0278	2006/9	1 Year
AL-4	Log-Periodic Antenna	USLP9143	Schwarzbeck	140	2007/6	1 Year
AL-5	Log-Periodic Antenna	94612-1	Eaton	97062301	2007/4	1 Year
AL-6	Log-Periodic Antenna	ESLP9145	Schwarzbeck	9145-216	2007/3	1 Year
AH-5	Horn Antenna	12-12	Scientific Atlanta	741	2007/5	1 Year
AD-1	Dipole Antenna	KBA-511A	Kyoritsu Corp.	0-195-5	2006/8	1 Year
AD-2	Dipole Antenna	KBA-511A	Kyoritsu Corp.	0-228-13	2006/8	1 Year
AD-3	Dipole Antenna	KBA-611	Kyoritsu Corp.	0-196-8	2006/8	1 Year
AD-4	Dipole Antenna	KBA-611	Kyoritsu Corp.	0-230-6	2006/8	1 Year
CL-1	Absorbing Clamp	MDS21	Rohde & Schwarz	894245/002	2007/6	1 Year
PA-1	Pre-Amplifier	WJ-6811-513	Watkins Johnson	0288	2007/2	1 Year
PA-2	Pre-Amplifier	WJ-6682-824	Watkins Johnson	0052	2007/2	1 Year
PA-3	Pre-Amplifier	WJ-6870-506	Watkins Johnson	0018	2007/2	1 Year
3-1	Signal Generator	SMT 02	Rohde & Schwarz	838616/021	2006/7	1 Year
3-2	Signal Generator	83732B	Hewlett Packard	US37101411	2006/10	1 Year
3-3	Function Generator	1941	NF	328730	2006/10	1 Year
6-1	Signal Generator	PSG1000B	W.K. Electronics	000234	2006/7	1 Year
OV-1	Oven	-	Ohnishi	-	-	-
FC-1	Frequency Counter	53131A	Hewlett Packard	3546A11807	2007/5	1 Year