JQA File No.: 441-80971
Issued Date: March 13, 2009

TEST REPORT

APPLICANT	:	RISO KAGAKU CORPORATION
ADDRESS	:	127-7 Taninosawa, Fukuda, Ami-machi, Inashiki-gun, Ibaraki-ken 300-1156, Japan
PRODUCTS	:	IC card reader / writer
MODEL No.	:	HR33IC-RS
SERIAL No.	:	-
FCC ID	:	RPAICSX1
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, TSURU EMC Branch 2096, Ohata, Tsuru-shi, Yamanashi-ken 402-0045, Japan
TEST RESULTS	:	**Passed**
DATE OF TEST	:	February 4, 2009 – March 5, 2009

This report must not 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

M. Takahashi

Masanori Takahashi
Manager
Japan Quality Assurance Organization
Safety & 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.

Table of Contents

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 recognized 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, 2010)
NVLAP Lab Code:200192-0 (Effective through : June 30, 2009)
BSMI Recognition Number:
SL2-IN-E-6004, SL2-IS-E-6004, SL2-A1-E-6004 (Effective through : September 14, 2010)

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 (Effective through : April 3, 2010)
FCC Registration Number : 444763 (Effective through : April 1, 2010)
IC Registration Number : 2079D-1, 2079D-2, 2079D-3 (Effective through : December 11, 2010)

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	:	IC card reader / writer
3	Model No.	:	HR33IC-RS
4	Serial No.	:	-
5	Product Type	:	Prototype
6	Date of Manufacture	:	-
7	Power Rating	:	4.75 - 5.25VDC * The EUT was operated with the Personal Computer via USB cable.
8	EUT Grounding	:	None
9	Received Date of EUT	:	February 4, 2009
10	EUT Authorization	:	Certification
11	EUT Generated Frequency	:	13.56MHz
12	Modulation	:	ASK
13	Antenna type	:	Loop Antenna(Fixed Use)
14	Temperature Range	:	0 ~ 40 degree

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	☐ 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 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	☐ OS-1 ☐ OS-2 ☒ AC-1
Test Receiver	☐ R-4 ☐ R-5 ☒ R-3
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

5.2.2 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	☐ OS-1 ☐ OS-2 ☒ AC-1
Test Receiver	☐ R-1 ☐ R-2 ☒ R-3 ☐ R-5 ☐ S-1 ☐ S-4
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

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	☐ OS-1 ☐ OS-2 ☐ AC-1
Test Receiver	☐ R-3 ☐ R-5 ☐ S-1 ☐ S-3 ☐ S-4 ☐ S-5
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

5.3 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)
Oven	☒ OV-1
Frequency Counter	☒ FC-1

5.4 Occupied Bandwidth

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

Test site & instruments :

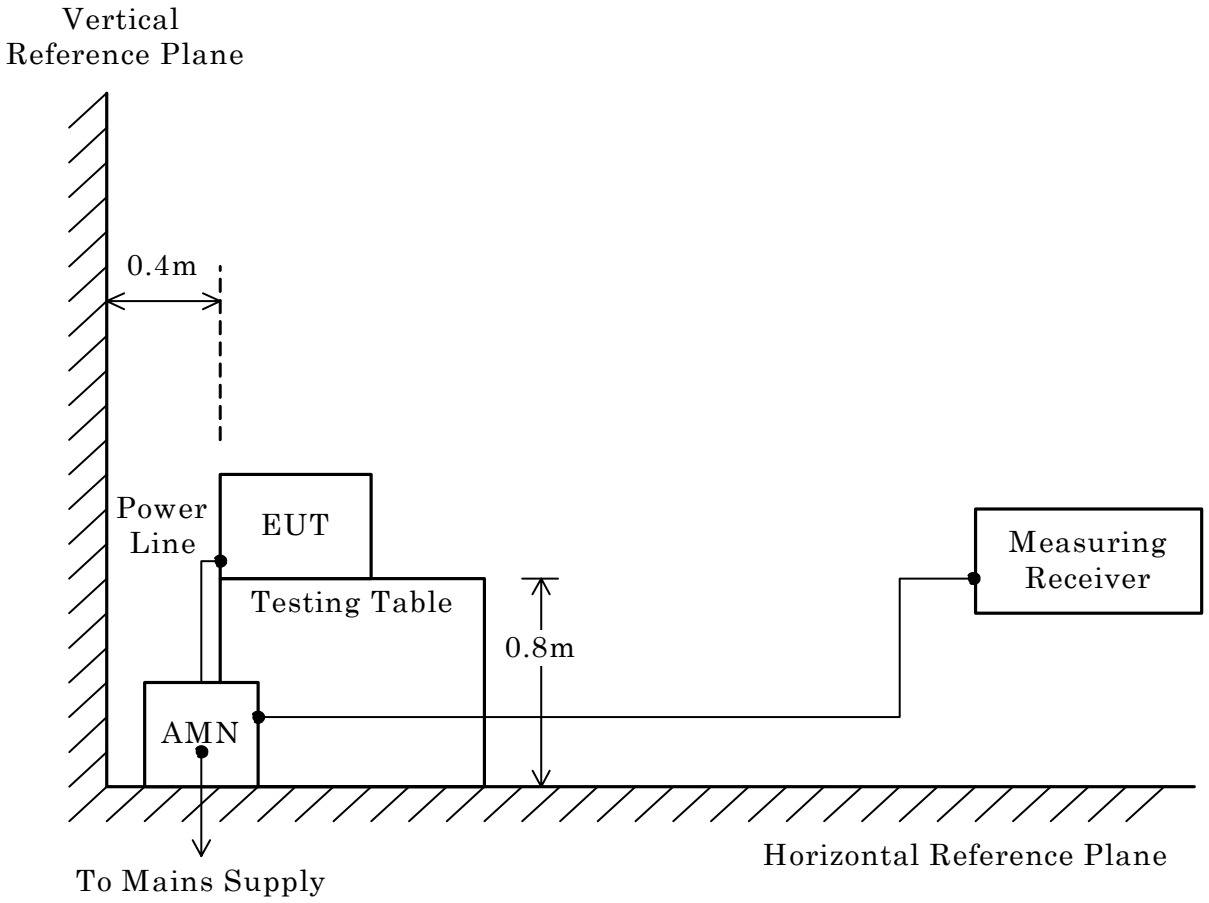
Type	Number of test site & instruments (Refer to Appendix C)
Oven	☒ OV-1
Test Receiver	☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4 ☐ R-5 ☐ S-1 ☐ S-3 ☒ 13

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.

- Side View -

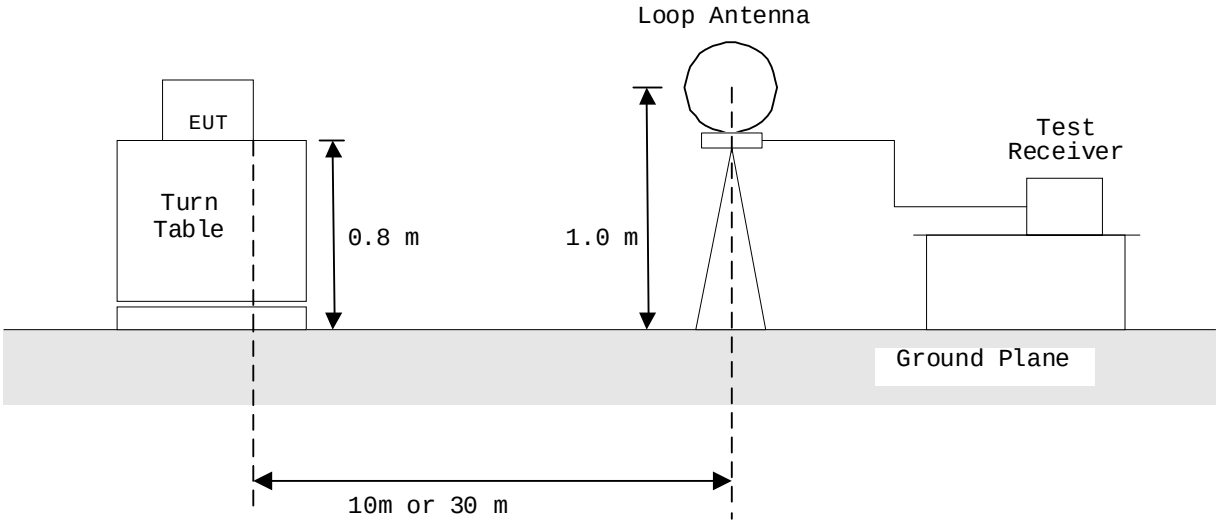


* AMN : Artificial Mains Network

6.2 Radiated Emission

6.2.1 Radiated Emission 0.009 MHz - 30 MHz

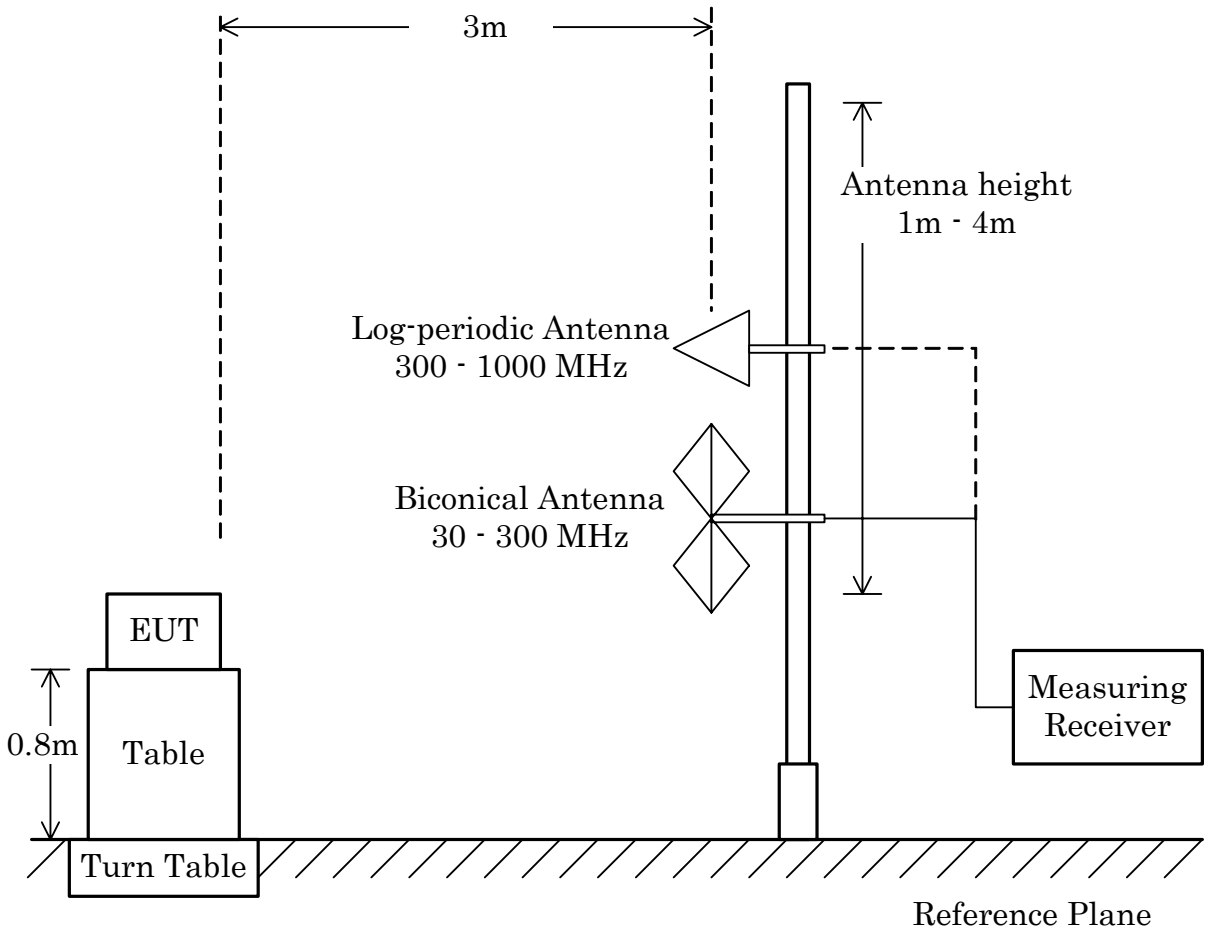
The preliminary radiated disturbance measurements were carried out.
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final radiated disturbance measurements.



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.

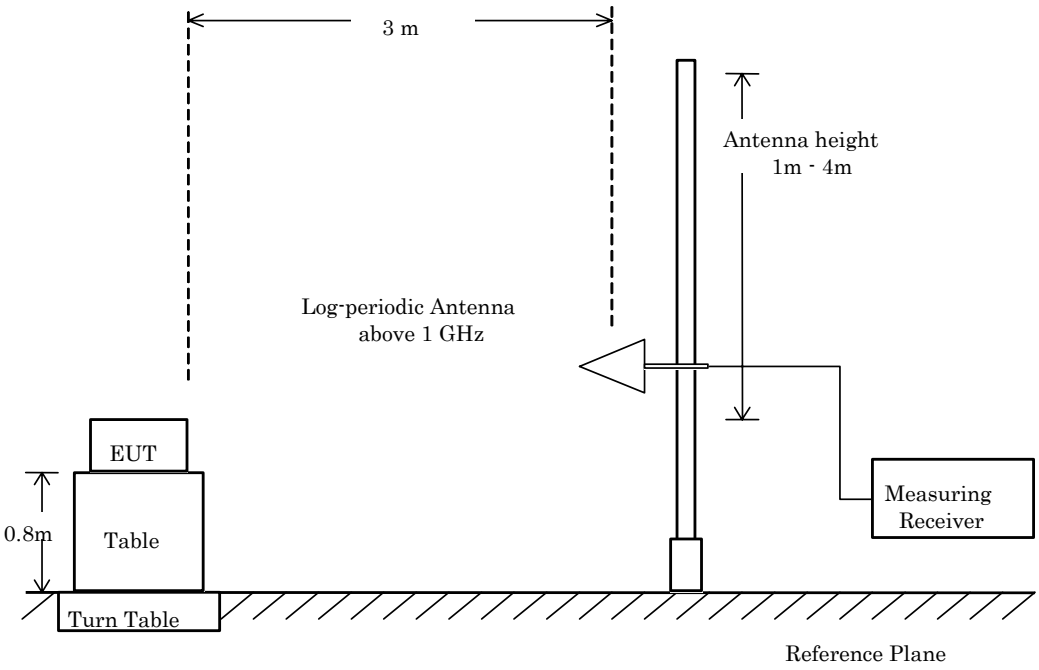
- Side View -



6.2.3 Radiated Emission above 1 GHz

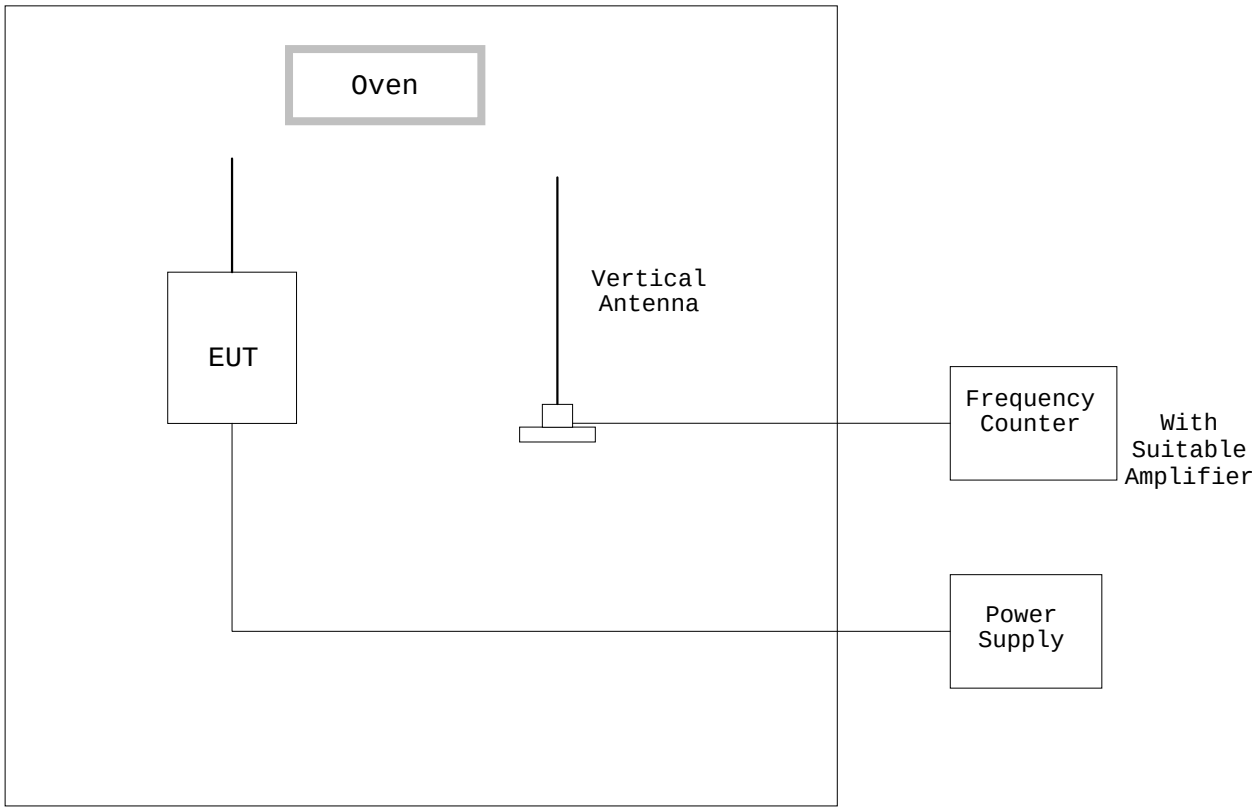
The preliminary radiated disturbance measurements were carried out.
The preliminary radiated disturbance measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final radiated disturbance measurements.

- Side View -



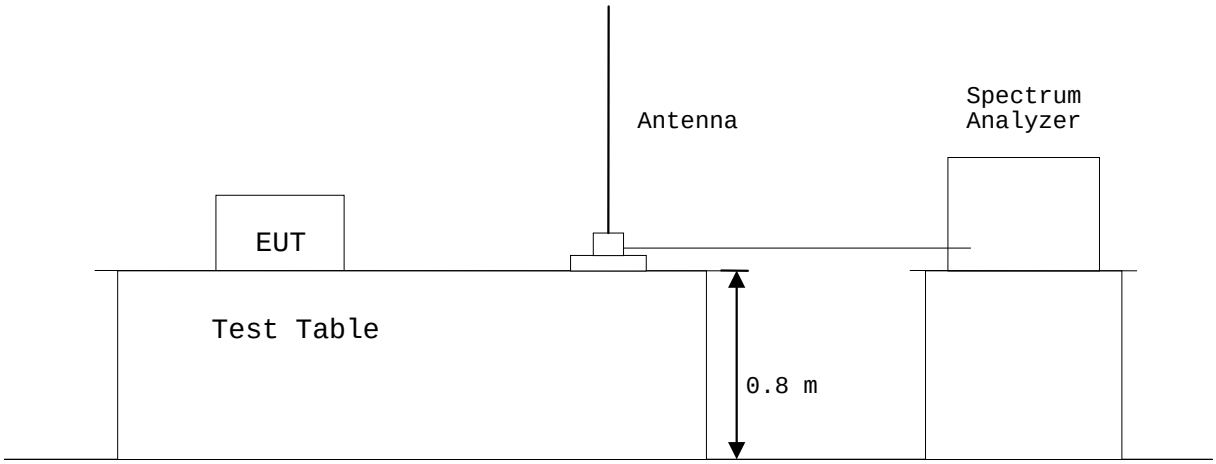
6.3 Frequency Stability

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°C to +50°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°C.
These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.



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.



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 Signatory: Not Applicable
Position : 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 AC Powerline Conducted Emission(Section 15.207)

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

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin (QP)	9.4	dB	at	0.19	MHz
Min. Limit Margin (AVE)	10.7	dB	at	0.19	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)(d))

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

☒-Passed ☐-Failed ☐-Not judged

Min. Limit Margin	6.4	dB	at	40.7	MHz
Max. Limit Exceeding	N/A	dB	at	N/A	MHz

Uncertainty of measurement results

☒- 3 meters	0.009-30	MHz	± 1.9	dB(2σ)
	30- 300	MHz	± 4.5	dB(2σ)
	300-1000	MHz	± 4.6	dB(2σ)
	1 - 18	GHz	± 3.7	dB(2σ)
☐-10 meters	0.009-30	MHz	± 1.9	dB(2σ)
	30- 300	MHz	± 4.5	dB(2σ)
	300-1000	MHz	± 4.5	dB(2σ)
	1 - 18	GHz	± 3.7	dB(2σ)

Remarks :

10.3 Frequency Stability (Section 15.225(e))

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

☒-Passed ☐-Failed ☐-Not judged

Remarks : _____

10.4 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 11 to 13.
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:

Masanori Takahashi
Manager
TSURU EMC Branch
EMC Engineering Department

Tested by:

Yuzo Tanaka
Engineer
TSURU EMC Branch
EMC Engineering Department

12 Operating Condition

Power Supply Voltage : 5.0VDC
* The EUT was operated with the Personal Computer via USB cable.

Operation Mode :
The test have been carried out under continuous transmitting/receiving simultaneously.

13 Test Configuration

The equipment under test consists of :

Sign	Item	Manufacturer	Model No.	Serial No.	FCC ID
A	IC card reader / writer	RISO KAGAKU CORPORATION	HR33IC-RS	-	RPAICSX1

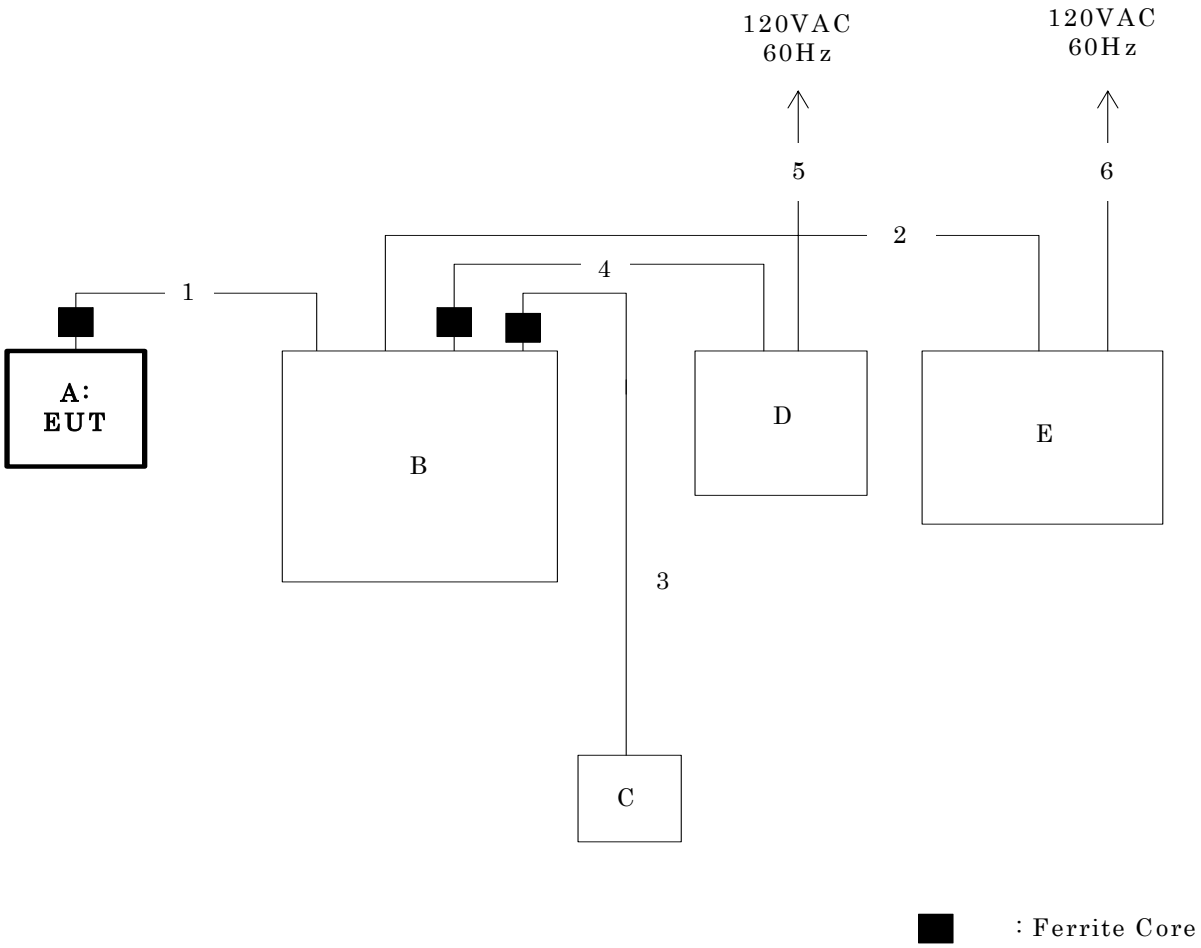
The auxiliary equipment used for testing :

Sign	Item	Manufacturer	Model No.	Serial No.	FCC ID
B	Personal Computer	Lenovo	0658-DJJ	L3-ET035 07/04	N/A (DoC)
C	Printer	HP	C6429A	MY04Q1F0RB	N/A (DoC)
D	IntelliMouse Optical 1.0A	Microsoft	-	-	N/A (DoC)
E	AC Adapter	Lenovo	DCWP MMC	11S92P1156Z1 ZBGF6AG4F1	N/A

Type of Cable:

No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	USB Cable (for EUT)	None	Yes	Yes	Yes	1.4
2	USB Cable (for Printer)	None	Yes	Yes	No	3.0
3	Mouse Cable	None	Yes	Yes	Yes	1.8
4	DC Cable	None	No	No	Yes	1.7
5	AC Cable (for AC Adapter)	None	No	No	No	0.9
6	AC Cable (for Printer)	None	No	No	No	1.7

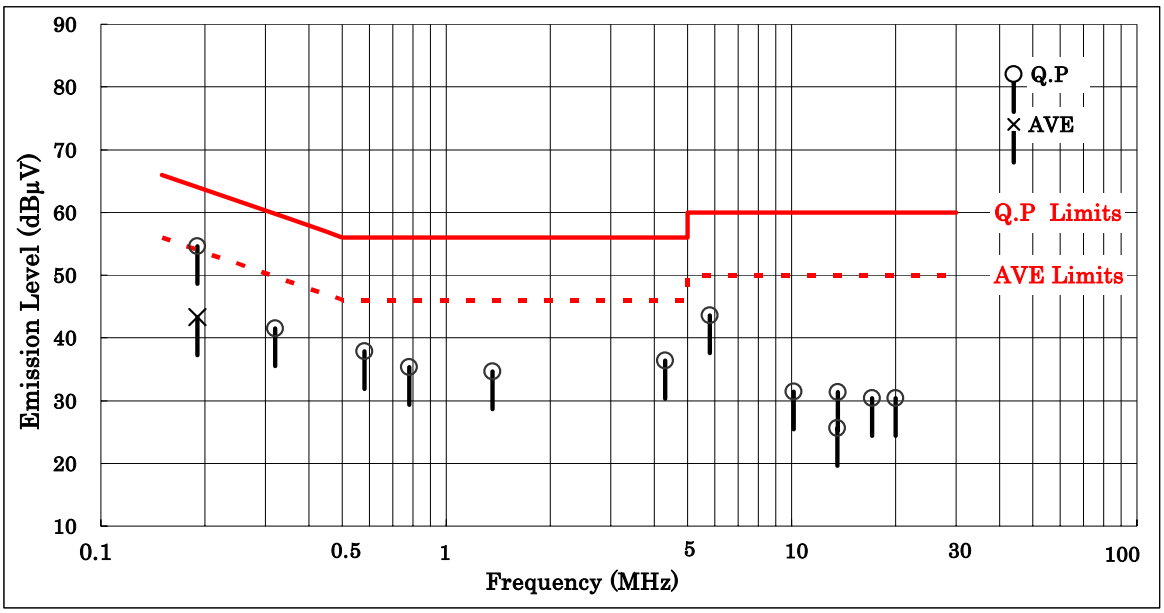
14 Equipment Under Test Arrangement (Drawings)



Appendix A: Test Data
A.1 AC Powerline Conducted Emission(Section 15.207)

Date : February 13, 2009
Temp : 16℃ Humi : 44% Atom : 956hPa

Frequency	AMN Factor	Meter Reading (dBμV) V-A		V-B		Limits (dBμV)		Max. Emission Level (dBμV)		Margin (dB)	
(MHz)	(dB)	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE
0.19	10.2	44.4	33.1	44.2	33.0	64.0	54.0	54.6	43.3	9.4	10.7
0.32	10.1	31.1	-	31.4	-	59.7	49.7	41.5	-	18.2	-
0.58	10.1	26.2	-	27.8	-	56.0	46.0	37.9	-	18.1	-
0.78	10.1	22.8	-	25.3	-	56.0	46.0	35.4	-	20.6	-
1.36	10.1	18.8	-	24.6	-	56.0	46.0	34.7	-	21.3	-
4.30	10.1	26.2	-	25.1	-	56.0	46.0	36.3	-	19.7	-
5.79	10.2	33.4	-	29.6	-	60.0	50.0	43.6	-	16.4	-
10.15	10.2	21.2	-	17.2	-	60.0	50.0	31.4	-	28.6	-
13.56	10.3	15.3	-	14.0	-	60.0	50.0	25.6	-	34.4	-
17.12	10.4	20.0	-	18.6	-	60.0	50.0	30.4	-	29.6	-
20.00	10.4	20.0	-	18.3	-	60.0	50.0	30.4	-	29.6	-
27.12	10.5	< 10.0	-	< 10.0	-	60.0	50.0	< 20.5	-	> 39.5	-
29.91	10.5	< 10.0	-	< 10.0	-	60.0	50.0	< 20.5	-	> 39.5	-
13.61	10.3	21.0	-	16.1	-	60.0	50.0	31.3	-	28.7	-
27.17	10.5	< 10.0	-	< 10.0	-	60.0	50.0	< 20.5	-	> 39.5	-



Notes: 1) The testing location : Shielded Room A
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 0.19 MHz
(AMN Factor) + (Meter Reading) = 10.2 + 44.4 = 54.6 dBμV

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

Date : February 10, 2009
Temp : 21℃ Humi : 22% Atom : 946hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading/ 10m (dBμV) Q.P	Limits/ 30m (dBμV) Q.P	Field Strength/ 30m (dBμV) Q.P	Margin (dB) Q.P
13.110	-	< 32.0	29.5	< 12.9	> 16.6
13.410	-	< 32.0	40.5	< 12.9	> 27.6
13.553	-	< 32.0	50.5	< 12.9	> 37.6
13.560	-	43.7	84.0	24.6	59.4
13.567	-	33.8	50.5	14.7	35.8
13.710	-	< 32.0	40.5	< 12.9	> 27.6
14.010	-	< 32.0	29.5	< 12.9	> 16.6

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 "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): 43.7 dBμV/m – $20\log_{10}((30/10)^2)$= 43.7 – 19.1 = 24.6 dBμV/m at 30 meters

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

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

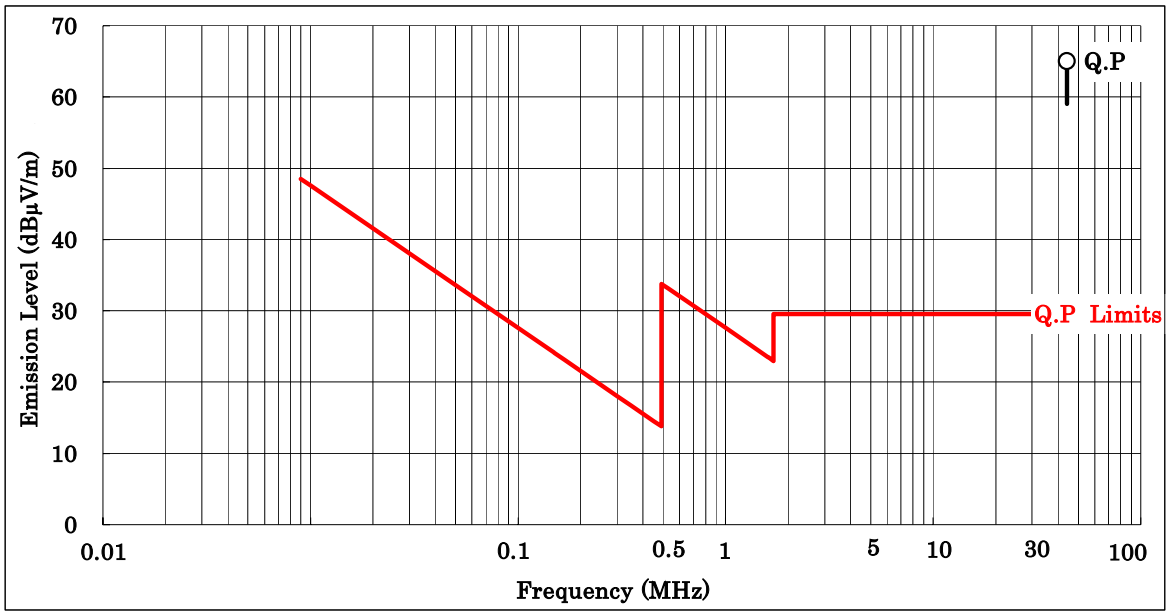
Limits for 13.110-13.410, 13.710-14.010MHz (§15.225(c)) = $20\log_{10}(106)$ = 40.5 dBμV/m

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

A.3 Radiated Emissions (Section 15.225(d))
A.3.1 Radiated Emission 0.009 MHz - 30 MHz

Date : February 10, 2009
Temp : 21℃ Humi : 22% Atom : 946hPa

Frequency (MHz)	Antenna Factor (dB)	Meter Reading (dBμV) Q.P	Limits (dBμV) Q.P	Specified Distance (m)	Extrapolated Emission Level (dBμV) Q.P	Margin (dB) Q.P
0.009	-	< 60.0	48.5	300.0	< 0.9	> 47.6
0.02	-	< 60.0	43.7	300.0	< 0.9	> 42.8
0.03	-	< 60.0	37.6	300.0	< 0.9	> 36.7
0.07	-	< 60.0	31.3	300.0	< 0.9	> 30.4
0.15	-	< 60.0	24.1	300.0	< 0.9	> 23.2
2.04	-	< 60.0	29.5	30.0	< 0.9	> 28.6
7.27	-	< 60.0	29.5	30.0	< 0.9	> 28.6
15.69	-	< 60.0	29.5	30.0	< 0.9	> 28.6
23.09	-	< 60.0	29.5	30.0	< 0.9	> 28.6
25.06	-	< 35.0	29.5	30.0	< 15.9	> 13.6
27.12	-	< 35.0	29.5	30.0	< 15.9	> 13.6

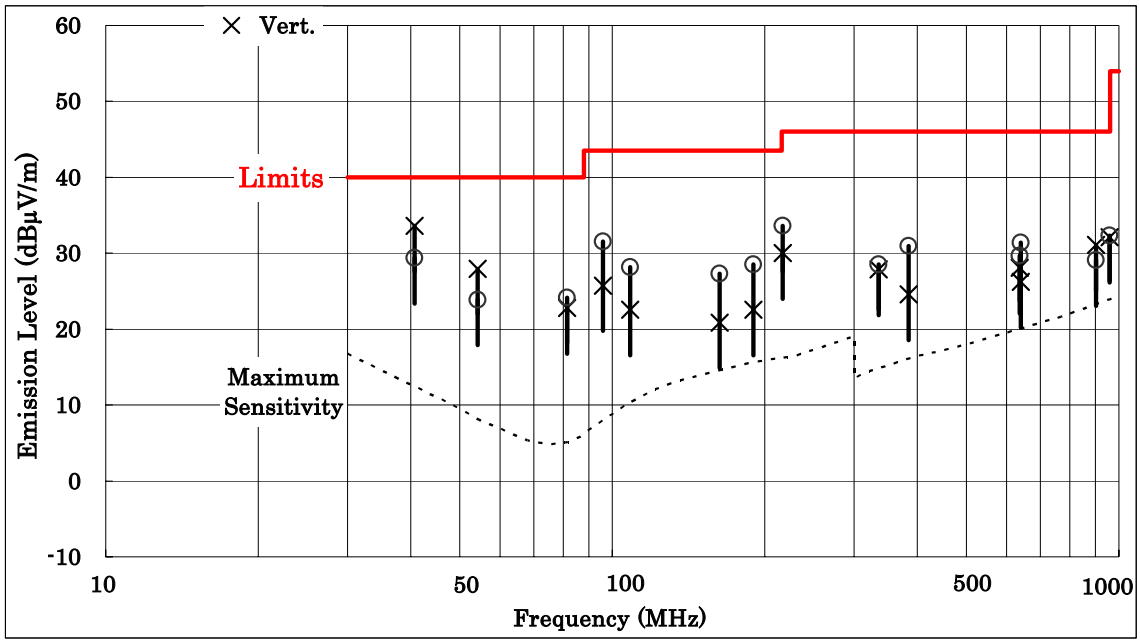


Notes: 1) The testing location : Anechoic Chamber No.1 Distance : 10 m
2) The symbol of "<" means "or less".
3) The symbol of ">" means "more than".
4) The symbol of "-" means "Zero", because the used test receiver calculated and displayed in the Meter Reading including the Correction Factor(Antenna and cable loss) directly
5) A sample calculation was made at 0.009 MHz
60 dBμV/m (at 10m distance) =>60 - $20\log_{10}((300/10)^2)$ = 0.9 dBμV/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.3.2 Radiated Emission 30 MHz - 1000 MHz

Date : February 4, 2009
Temp : 20℃ Humi : 21% Atom : 959hPa

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading (dBμV) Hori.	Meter Reading (dBμV) Vert.	Limits (dBμV) Q.P	Emission Level (dBμV/m) Hori.	Emission Level (dBμV/m) Vert.	Margin (dB) Hori.	Margin (dB) Vert.
40.7	14.7	14.7	18.9	40.0	29.4	33.6	10.6	6.4
54.2	10.2	13.7	17.8	40.0	23.9	28.0	16.1	12.0
81.4	7.1	17.1	15.7	40.0	24.2	22.8	15.8	17.2
95.9	9.9	21.6	15.8	43.5	31.5	25.7	12.0	17.8
108.5	12.4	15.8	10.2	43.5	28.2	22.6	15.3	20.9
162.7	16.6	10.7	4.3	43.5	27.3	20.9	16.2	22.6
189.8	17.6	10.9	4.9	43.5	28.5	22.5	15.0	21.0
217.0	18.3	15.3	11.7	46.0	33.6	30.0	12.4	16.0
336.0	16.9	11.6	10.9	46.0	28.5	27.8	17.5	18.2
384.7	18.2	12.8	6.4	46.0	31.0	24.6	15.0	21.4
637.3	22.5	7.2	5.6	46.0	29.7	28.1	16.3	17.9
640.0	22.5	8.9	3.7	46.0	31.4	26.2	14.6	19.8
902.0	25.3	3.8	5.8	46.0	29.1	31.1	16.9	14.9
959.3	25.9	6.4	6.2	46.0	32.3	32.1	13.7	13.9



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) Q.P: Quasi-Peak Detector
6) The symbol of "<" means "or less", ">" means "more than".
7) A sample calculation was made at 40.7 MHz
(Antenna Factor) + (Meter Reading) = 14.7 + 18.9 = 33.6 dBμV

A.2.3 Radiated Emission above 1 GHz

Not Applicable

A.3 Frequency Stability(Section 15.225(e))

Testing Date : March 5, 2009
Ambient Temperature / Humidity : 22° / 40%

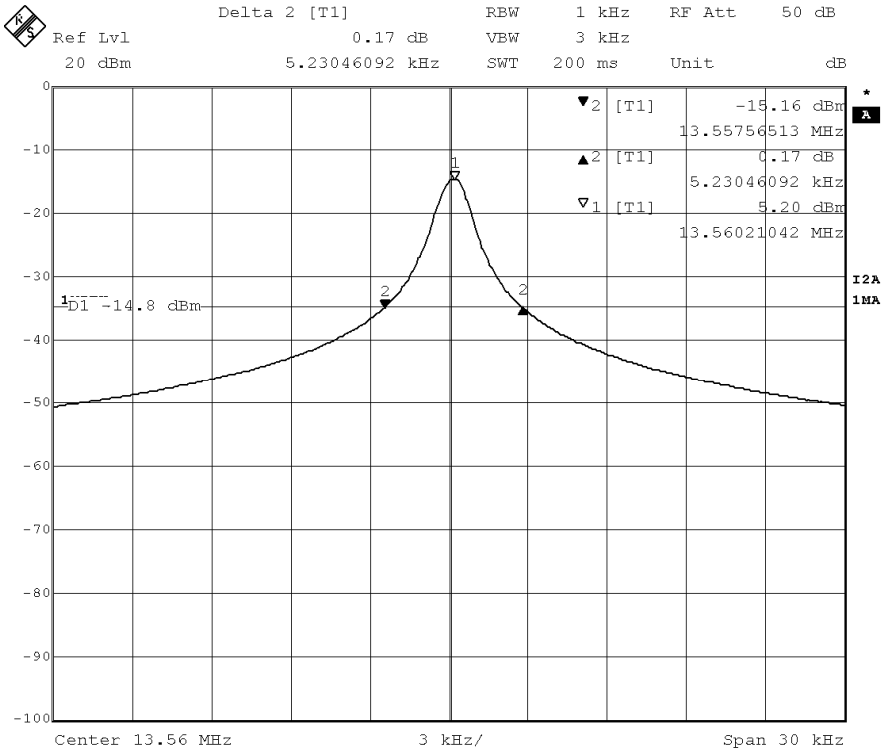
Temperature (°C)	Primary Supply Voltage (V)	Frequency (MHz)			
		0 minute later	2 minutes later	5 minutes later	10 minutes later
-20	4.25	13.5600584	13.56005832	13.56005781	13.56005854
	5	13.55996797	13.55999366	13.56003378	13.560049
	5.75	13.56005959	13.5600596	13.56005912	13.56005972
20	4.25	13.56010354	13.5601036	13.5601035	13.5601034
	5	13.56010464	13.56010431	13.56010423	13.560104
	5.75	13.56010274	13.56010325	13.5601029	13.56010281
50	4.25	13.5600915	13.56009111	13.5600914	13.56009143
	5	13.5600909	13.56009108	13.5600915	13.56009162
	5.75	13.5600913	13.56009126	13.5600911	13.56009108

Basic Frequency: Corrected value by using 13.56 MHz as nominal frequency.

Temperature (°C)	Primary Supply Voltage (V)	Frequency with time elapse (%)			
		0 minute later	2 minutes later	5 minutes later	10 minutes later
-20	4.25	0.0004307	0.0004301	0.0004263	0.0004317
	5	0.0002362	0.0000468	0.0002491	0.0003614
	5.75	0.0004395	0.0004395	0.0004360	0.0004404
20	4.25	0.0007636	0.0007640	0.0007633	0.0007625
	5	0.0007717	0.0007692	0.0007687	0.0007670
	5.75	0.0007577	0.0007614	0.0007588	0.0007582
50	4.25	0.0006748	0.0006719	0.0006740	0.0006743
	5	0.0006704	0.0006717	0.0006748	0.0006757
	5.75	0.0006733	0.0006730	0.0006718	0.0006717

Specified Limit : The frequency tolerance of the carrier signal shall be maintained within ±0.01%.

A.4 Occupied Bandwidth



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

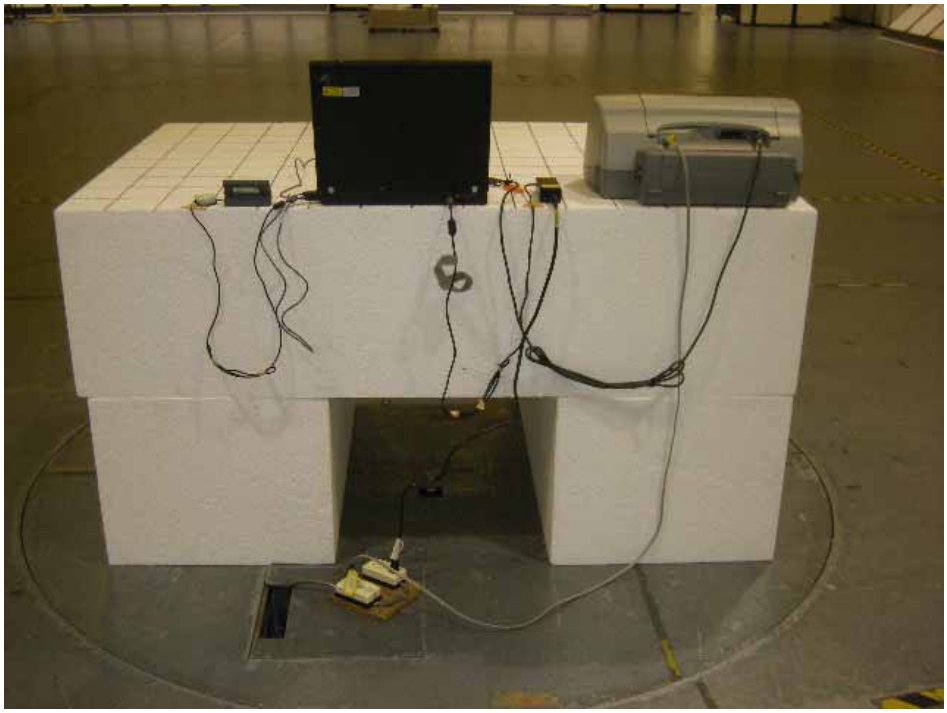
- Front View -

- Side View -

Photograph present configuration with maximum emission

B.2 Radiated Emissions

- Front View -



- Rear View -

Photograph present configuration with maximum emission

Appendix C: Test Instruments

Sign	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
OS-1	Open Site	-	Toshiba	-	2008/5	1 Year
OS-2	Open Site	-	Toshiba	-	2008/5	1 Year
AC-1	Anechoic Chamber (L)	-	TDK	-	2008/5	1 Year
AC-2	Anechoic Chamber (S)	-	TDK	-	2008/11	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	2008/3	1 Year
R-2	Test Receiver	ESVS10	Rohde & Schwarz	843744/018	2008/6	1 Year
R-3	Test Receiver	ESI7	Rohde & Schwarz	100059/007	2008/10	1 Year
R-4	Test Receiver	ESHS30	Rohde & Schwarz	842053/001	2009/2	1 Year
R-5	Test Receiver	ESCS30	Rohde & Schwarz	100203	2008/5	1 Year
S-3	Spectrum Analyzer	U3751	Advantest	160100139	2008/3	1 Year
S-4	Spectrum Analyzer	8563E	Hewllet Packard	3221A00201	2008/4	1 Year
S-5	Spectrum Analyzer	U3751	Advantest	170500170	2008/5	1 Year
CB-3	RF Cable	3D-2W	Fujikura	-	2008/5	1 Year
CB-4	RF Cable	3D-2W	Fujikura	-	2008/5	1 Year
CB-5	RF Cable	3D-2W	Fujikura	-	2008/5	1 Year
CN-1	RF Cable	20D/5D-2W	Fujikura	-	2008/5	1 Year
CN-2	RF Cable	20D/5D-2W	Fujikura	-	2008/5	1 Year
CN-3	RF Cable	20D/5D-2W	Fujikura	-	2008/5	1 Year
CS-1	RF Cable	SUCOFLEX 104P	Huber+Suhner	27290/4P	2008/11	1 Year
CS-2	RF Cable	SUCOFLEX 104P	Huber+Suhner	27289/4P	2008/11	1 Year
CS-3	RF Cable	SUCOFLEX 104P	Huber+Suhner	37027/4P	2009/2	1 Year
CS-4	RF Cable	SUCOFLEX 104P	Huber+Suhner	37028/4P	2009/2	1 Year
L-1	AMN	KNW-407	Kyoritsu Corp.	8-833-5	2008/10	1 Year
L-2	AMN	KNW-407	Kyoritsu Corp.	8-680-14	2008/10	1 Year
L-3	AMN	KNW-407	Kyoritsu Corp.	8-757-1	2008/6	1 Year
L-4	AMN	KNW-242	Kyoritsu Corp.	8-755-1	2008/7	1 Year
L-5	AMN	KNW-242C	Kyoritsu Corp.	8-837-14	2008/7	1 Year
L-6	AMN	KNW-243C	Kyoritsu Corp.	8-692-5	2008/10	1 Year
L-7	AMN	KNW-243C	Kyoritsu Corp.	8-831-3	2008/6	1 Year
L-9	AMN	KNW-244C	Kyoritsu Corp.	8-1373-3	2008/8	1 Year
L-10	ISN	FCC-TLISN-T2-02	FCC	20234	2008/11	1 Year
L-11	ISN	FCC-TLISN-T4-02	FCC	20235	2008/11	1 Year
L-12	High Impedance Probe	KNW-410	Kyoritsu Corp.	8-876-3	2008/8	1 Year
L-13	Artificial Hand	K-9003	Kyoritsu Corp.	7-1639-4	2008/10	1 Year
L-14	Hi-pass Filter	KFL-009D	Kyoritsu Corp.	8-1996-8	2008/7	1 Year
L-15	ISN	F-070306-1057-1	FCC	20591	2008/7	1 Year
PL-3	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2008/10	1 Year
PL-4	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2009/2	1 Year
PL-5	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	-	2008/5	1 Year
TM-1	50ohm Termination	BNC-P-1.5	TDC	-	2008/3	1 Year
TM-2	50ohm Termination	-	Y&R	-	2008/3	1 Year
AL-0	Loop Antenna	HFH2-Z2	Rohde & Schwarz	879284/14	2008/5	1 Year
AT-1	Triple Loop Antenna	HXYZ9170	Schwarzbeck	9170-138	2008/7	1 Year
AT-2	Trilog Broardband Antenna	VULB9160	Schwarzbeck	9160-3251	2008/9	1 Year
AB-1	Biconical Antenna	BBA9106	Schwarzbeck	91031741	2008/8	1 Year
AB-2	Biconical Antenna	BBA9106	Schwarzbeck	91032349	2008/9	1 Year
AB-3	Biconical Antenna	BBA9106	Schwarzbeck	VHA11905516	2008/9	1 Year
AL-1	Log-Periodic Antenna	UHALP9108-A	Schwarzbeck	0678	2008/8	1 Year
AL-2	Log-Periodic Antenna	UHALP9108-A	Schwarzbeck	0679	2008/9	1 Year
AL-3	Log-Periodic Antenna	UHALP9108-A	Schwarzbeck	0278	2008/9	1 Year
AL-4	Log-Periodic Antenna	USLP9143	Schwarzbeck	140	2008/6	1 Year
AL-5	Log-Periodic Antenna	94612-1	Eaton	97062301	2008/4	1 Year

AL-6	Log-Periodic Antenna	ESLP9145	Schwarzbeck	9145-216	2008/3	1 Year
AH-5	Horn Antenna	12-12	Scientific Atlanta	741	2008/5	1 Year
AD-1	Dipole Antenna	KBA-511A	Kyoritsu Corp.	0-195-5	2008/8	1 Year
AD-2	Dipole Antenna	KBA-511A	Kyoritsu Corp.	0-228-13	2008/9	1 Year
AD-3	Dipole Antenna	KBA-611	Kyoritsu Corp.	0-196-8	2008/8	1 Year
AD-4	Dipole Antenna	KBA-611	Kyoritsu Corp.	0-230-6	2008/9	1 Year
CL-1	Absorbing Clamp	MDS21	Rohde & Schwarz	894245/002	2008/5	1 Year
PA-1	Pre-Amplifier	WJ-6811-513	Watkins Johnson	0288	2009/2	1 Year
PA-2	Pre-Amplifier	WJ-6682-824	Watkins Johnson	0052	2009/2	1 Year
PA-3	Pre-Amplifier	WJ-6870-506	Watkins Johnson	0018	2009/2	1 Year
PA-5	Pre-Amplifier	AMF-4D-005080-18-13P	MITEQ, INC.	1218917	2008/11	1 Year
RN-1	Reference Impedance Network	4151	NF ELECTRONIC INSTRUMENTS	3168114151011	2008/5	1 Year
RN-2	Reference Impedance Network	ES4153	NF ELECTRONIC INSTRUMENTS	9099436	2008/10	1 Year
HF-1	Harmonic/Flicker Analyzer	KHA3000	KIKUSUI ELECTRONICS CORPORATION	NB001642	2008/5	1 Year
2-1	ESD Tester	ESD3000	EMC PARTNER	092	2008/5	1 Year
2-2	ESD Tester	ESD3000	EMC PARTNER	164	2008/3	1 Year
3-1	Signal Generator	SMT 02	Rohde & Schwarz	838616/021	2008/5	1 Year
3-2	Signal Generator	83732B	Hewlett Packard	US37101411	2008/10	1 Year
3-3	Function Generator	1941	NF	328730	2008/10	1 Year
3-4	RF Power Amplifier	150W1000M1	Amplifier Research	0328963	2009/1	1 Year
3-5	RF Power Amplifier	500A100M1	Amplifier Research	19671	2008/5	1 Year
3-6	RF Power Amplifier	200W1000M2A	Amplifier Research	19572	2008/5	1 Year
3-7	RF Power Amplifier	60S1G3M1	Amplifier Research	0325545	2008/5	1 Year
3-8	Biconical Antenna	3109	EMCO	9607-3014	2008/5	1 Year
3-10	Log-Periodic Antenna	3144	EMCO	9701-1032	2008/5	1 Year
3-11	Log-Periodic Antenna	AT5080	Amplifier Research	322092	2008/11	1 Year
3-12	Horn Antenna	AT4002A	Amplifier Research	0325039	2008/5	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	2008/5	1 Year
3-16	Field Probe	FP2000	Amplifier Research	22646	2008/8	1 Year
3-17	Field Probe	FP5080	Amplifier Research	25212	2008/8	1 Year
3-18	Field Probe	FP6001	Amplifier Research	303557	2008/10	1 Year
3-19	Power Meter	4421	Bird	2919	2008/7	1 Year
3-20	Power Head	4022	Bird	6147	2008/7	1 Year
3-21	Power Meter	PM2002	Amplifier Research	25774	2008/7	1 Year
3-22	Power Head	PH2000	Amplifier Research	26413	2008/7	1 Year
3-23	Power Head	PH2000	Amplifier Research	26414	2008/7	1 Year
3-24	Dual Coupler	DC2600	Amplifier Research	19734	2008/7	1 Year
3-25	Dual Coupler	DC6080	Amplifier Research	302555	2008/7	1 Year
3-26	Dual Coupler	DC7144	Amplifier Research	26463	2008/7	1 Year
3-27	Signal Generator	SML 03	Rohde & Schwarz	103413	2008/9	1 Year
3-28	Field Probe	FP6001	ETS LINDGREN	00064158	2008/9	1 Year
3-29	Power Meter	NRT	Rohde & Schwarz	103116	2008/9	1 Year
3-30	Power Head	NRT-Z44	Rohde & Schwarz	102682	2008/9	1 Year
4-1	Immunity Tester	TRA2000	EMC PARTNER	659	2008/7	1 Year
4-2	EFT/B Generator	PEFT-Junior	HAEFELY	083818-13	2008/5	1 Year
4-3	EFT/B Generator	FNS-AXII B50	Noise Laboratory	FNS0620431	2008/5	1 Year
4-4	Coupling Clamp	IP4	HAEFELY	-	-	-
4-5	Coupling Clamp	15-00001A	Noise Laboratory	-	-	-
5-1	Surge Tester	PSURGE4.1	HAEFELY	083665-08	2008/11	1 Year
5-2	Coupling Filter	FP-SURGE 100M	HAEFELY	149163	2008/11	1 Year
5-3	Coupling Network	IP6.2	HAEFELY	083811-10	2008/11	1 Year
5-4	Decoupling Network	DEC1A	HAEFELY	083793-08	2008/11	1 Year
5-5	Pruefpistole	AP 300	HAEFELY	081 438	2008/11	1 Year

6-1	Signal Generator	PSG1000B	W.K. Electronics	000234	2008/6	1 Year
6-2	RF Power Amplifier	75A250	Amplifier Research	19502	2008/8	1 Year
6-3	RF Power Amplifier	75A250	Amplifier Research	26255	2008/8	1 Year
6-4	6dB Attenuator	8343-060	Bird	2054	2008/8	1 Year
6-5	6dB Attenuator	65-6-33	Weinschel	LW166	2008/8	1 Year
6-6	CDN	FCC-801-M1-16	FCC	50	2008/5	1 Year
6-7	CDN	FCC-801-M1-25A	FCC	04001	2008/5	1 Year
6-8	CDN	FCC-801-M2-25	FCC	59	2008/5	1 Year
6-9	CDN	FCC-801-M2-25A	FCC	03023	2008/5	1 Year
6-10	CDN	FCC-801-M2-25A	FCC	03024	2008/6	1 Year
6-11	CDN	FCC-801-M3-25	FCC	137	2008/5	1 Year
6-12	CDN	FCC-801-M3-25A	FCC	05021	2008/5	1 Year
6-13	CDN	FCC-801-M3-25A	FCC	99133	2008/6	1 Year
6-14	CDN	FCC-801-M4-25	FCC	21	2008/5	1 Year
6-15	CDN	FCC-801-M4-50	FCC	9806	2008/4	1 Year
6-16	CDN	FCC-801-C1	FCC	79	2008/5	1 Year
6-17	CDN	FCC-801-T2	FCC	77	2008/5	1 Year
6-18	CDN	FCC-801-T4	FCC	81	2008/6	1 Year
6-19	CDN	FCC-801-T8	FCC	9956	2008/6	1 Year
6-20	150-50 Ohms Adaptor	FCC-801-150-50	FCC	638	2008/6	1 Year
6-21	150-50 Ohms Adaptor	FCC-801-150-50	FCC	639	2008/6	1 Year
6-22	EM Clamp	F-203I	FCC	220	2008/8	1 Year
6-23	Decoupling Clamp	F-203I-DCN	FCC	105	-	-
6-24	Bulk Current Injection Clamp	F-120-2	FCC	53	2008/8	1 Year
6-25	CDN	FCC-801-M3-25A	FCC	08008	2008/6	1 Year
8-1	Interference Tester	LFP6.1	HAEFELY	083374-03	2008/3	1 Year
8-2	Magnetic Field Tester	MFG100.1	HAEFELY	080136-06	2008/3	1 Year
8-3	Field Coil	FC-1	ES Factory	001	2008/6	1 Year
8-4	Large Coil	L2X1.6	ES Factory	001	2008/3	1 Year
11-1	Voltage Dip Tester	PLINE1610	HAEFELY	148709	2008/4	1 Year
11-2	3 Phase Extension	PLS1630	HAEFELY	149685	2008/4	1 Year
11-3	External Variac Network	VAR-EXT1000	EMC PARTNER	046	2008/12	1 Year
13	Test Receiver	ESI26	Rohde & Schwarz	100043	2008/9	1 Year
OV-1	Oven	-	Ohnishi	-	-	-
FC-1	Frequency Counter	53131A	Hewlett Packard	3546A11807	2008/5	1 Year
PM-1	Power Meter	436A	Hewlett Packard	1725A01930	2008/4	1 Year
PS-1	Power Sensor	8482A	Hewlett Packard	1551A01013	2008/4	1 Year
PS-2	Power Sensor	8485A	Hewlett Packard	2942A08969	2008/4	1 Year