



JAPAN QUALITY ASSURANCE ORGANIZATION
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JQA APPLICATION NO. : 441-20631
Issue Date : December 12, 2002
Page 1 of 25

EMI TEST REPORT

JQA APPLICATION NO. : **441-20631**

Model No. : SU-1000

Type of Equipment : Ultrasonic Toothbrush

Regulations Applied : CFR 47 FCC Rules and Regulations Part 18

FCC ID : QRWUT-250

Applicant : Asahi Irika Co.,Ltd.

Address : 2-29-8, Yoshino-cho, Saitama-shi,
Saitama-ken 331-0031, Japan

Manufacturer : Asahi Irika Co.,Ltd.

Address : 2-29-8, Yoshino-cho, Saitama-shi,
Saitama-ken 331-0031, Japan

Received date of EUT : November 12, 2002

Final Judgment : Passed

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and Communication Research Laboratory (CRL) of Japan.

The test results only responds to the tested sample.

THIS REPORT should not be reproduced, except in full, without the approval of the JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH.

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



NVLAP LAB CODE: 200192-0

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1. DOCUMENTATION**1.1 TEST REGULATION**

FCC Rules and Regulations Part 18 Subpart A and C (September 27, 1985).

Test procedure :

AC Powerline Conducted Emission and Radiated Emission were performed according to the procedures in FCC/OST MP-5(1985).

1.2 GENERAL INFORMATION**1.2.1 Test facility :**

1) Test Facility located at JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT.

TSURU EMC BRANCH:

Open Site No.1, No.2, An Anechoic Chamber (3 m and 10 m, on common plane) and a Shielded Room

FCC Registration Number: 90728 (Date of Listing : April 2, 2002)

2) JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance established in title 15, Part 285 Code of Federal Regulations.

NVLAP Lab Code : 200192-0 (Effective through : June 30, 2003)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|-------------------------------|
| 1) Type of Equipment | : Ultrasonic Toothbrush |
| 2) Product Type | : Pre-production |
| 3) Category | : Ultrasonic |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : QRWUT-250 |
| 6) Trade Name | : ULTRASONEX |
| 7) Model No. | : SU-1000 |
| 8) Fundamental Frequency Generated | |
| | /Operated In the EUT : 1.6MHz |
| 9) Highest Frequency Used in the EUT | : 1.6MHz |
| 10) Serial No. | : - |
| 11) Date of Manufacture | : - |
| 12) Power Rating | : 5.0Vdc(Ni-MH Battery) |
| 13) EUT Grounding | : None |

1.2.3 Definitions for symbols used in this test report :

 X - 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.

1.3 TEST CONDITION

1.3.1 The measurement of the AC Powerline Conducted Emissions

X - was performed in the following test site.

___ - was not applicable.

Test location :

JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH

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X - Shielded Room A

___ - Shielded Room B

___ - Anechoic Chamber

___ - Open Site No.1

___ - Open Site No.2

Used test instruments :

	<u>Type</u>	<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Last Cal.</u>	<u>Interval</u>
___ -	Test Receiver	ESI7	Rohde & Schwarz	100059	2002/10	1 Year
<u>X</u> -	Test Receiver	ESHS30	Rohde & Schwarz	842053/001	2002/10	1 Year
___ -	Test Receiver	ESH3	Rohde & Schwarz	881460/016	2002/5	1 Year
___ -	LISN(for peripheral)	KNW-407	Kyoritsu Electrical	8-833-5	2002/8	1 Year
___ -	LISN(for EUT)	KNW-407	Kyoritsu Electrical	8-680-14	2002/8	1 Year
___ -	LISN	KNW-407	Kyoritsu Electrical	8-757-1	2002/6	1 Year
___ -	LISN	KNW-242	Kyoritsu Electrical	8-755-1	2002/6	1 Year
___ -	LISN	KNW-242C	Kyoritsu Electrical	8-837-14	2002/6	1 Year
<u>X</u> -	LISN	KNW-243C	Kyoritsu Electrical	8-831-2	2002/6	1 Year
___ -	LISN	KNW-243C	Kyoritsu Electrical	8-831-3	2002/6	1 Year
___ -	LISN	KNW-243C	Kyoritsu Electrical	8-831-4	2002/6	1 Year
___ -	LISN	KNW-243C	Kyoritsu Electrical	8-692-5	2002/8	1 Year
<u>X</u> -	RF Cable	3D-2W	Fujikura	No.1	2002/5	1 Year
___ -	RF Cable	3D-2W	Fujikura	No.2	2002/5	1 Year
___ -	RF Cable	3D-2W	Fujikura	No.3	2002/5	1 Year
___ -	50ohm Termination	-	TDC	15406501E1	2002/2	1 Year
___ -	50ohm Termination	-	-	15406502E1	2002/2	1 Year

1.3.2 The measurement of the Radiated Emissions (Magnetic field:0.01 MHz - 30 MHz)

X - was performed in the following test site.

___ - was not applicable.

Test location :

JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH
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X - Anechoic Chamber

___ - 3 meters

___ - Open Site No.1

X - 10 meters

___ - Open Site No.2

___ - 30 meters

Used test instruments :

	<u>Type</u>	<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Last Cal.</u>	<u>Interval</u>
<u>X</u> -	Test Receiver	ESI7	Rohde & Schwarz	100059	2002/10	1 Year
___ -	Test Receiver	ESHS30	Rohde & Schwarz	842053/001	2002/10	1 Year
___ -	Test Receiver	ESH3	Rohde & Schwarz	872994/047	2002/5	1 Year
___ -	Test Receiver	ESH3	Rohde & Schwarz	881460/016	2002/5	1 Year
<u>X</u> -	Loop Antenna	HFH2-Z2	Rohde & Schwarz	879284/14	2002/5	1 Year
___ -	Loop Antenna	6502	EMCO	8905-2347	2002/5	1 Year

1.3.3 The measurement of the Radiated Emissions(30 MHz - 1000 MHz) - was performed in the following test site. X - was not applicable.**Test location :**

JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH
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 - Anechoic Chamber - 3 meters - Open Site No.1 - 10 meters - Open Site No.2 - 30 meters**Validation of Site Attenuation :**

1) Last Confirmed Date : 2002/5

2) Interval : 1 year

Used test instruments :

	<u>Type</u>	<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Last Cal.</u>	<u>Interval</u>
<u> </u> -	Test Receiver	ESI7	Rohde & Schwarz	100059	2002/10	1 Year
<u> </u> -	Test Receiver	ESV	Rohde & Schwarz	863796/015	2002/5	1 Year
<u> </u> -	Test Receiver	ESVS10	Rohde & Schwarz	84231/004	2002/5	1 Year
<u> </u> -	Test Receiver	ESVS10	Rohde & Schwarz	843744/018	2002/5	1 Year
<u> </u> -	Biconical Antenna	BBA9106	Schwarzbeck	11905065-2	2002/5	1 Year
<u> </u> -	Biconical Antenna	BBA9106	Schwarzbeck	91031516	2002/5	1 Year
<u> </u> -	Biconical Antenna	BBA9106	Schwarzbeck	G4397001	2002/5	1 Year
<u> </u> -	Log-Periodic Antenna	UHALP9107	Schwarzbeck	91031436	2002/5	1 Year
<u> </u> -	Log-Periodic Antenna	UHALP9107	Schwarzbeck	9107915	2002/5	1 Year
<u> </u> -	Log-Periodic Antenna	UHALP9107	Schwarzbeck	G43597003	2002/5	1 Year
<u> </u> -	Dipole Antenna	KBA-511A	Kyoritsu Electrical	0-195-5	2002/5	1 Year
<u> </u> -	Dipole Antenna	KBA-611	Kyoritsu Electrical	0-228-13	2002/5	1 Year
<u> </u> -	Dipole Antenna	KBA-511A	Kyoritsu Electrical	0-196-8	2002/5	1 Year
<u> </u> -	Dipole Antenna	KBA-611	Kyoritsu Electrical	0-230-6	2002/5	1 Year
<u> </u> -	RF Cable	20D/5D-2W	Fujikura	No.1	2002/5	1 Year
<u> </u> -	RF Cable	20D/5D-2W	Fujikura	No.2	2002/5	1 Year
<u> </u> -	RF Cable	20D/5D-2W	Fujikura	No.3	2002/5	1 Year

1.3.4 The measurement of the Radiated Emissions(Above 1000 MHz)

☐ - was performed in the following test site.

☒ - was not applicable.

Test location :

JQA SAFETY & EMC CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH
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☐ - Anechoic Chamber

☐ - 3 meters

☐ - Open Site No.1

☐ - 10 meters

☐ - Open Site No.2

☐ - 30 meters

Validation of Site Attenuation :

1) Last Confirmed Date : N/A

2) Interval : N/A

Used test instruments :

	Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<input type="checkbox"/> -	Spectrum Analyzer	8563E	Hewlett Packard	3438A00756	2002/5	1 Year
<input type="checkbox"/> -	Spectrum Analyzer	R4131C	Advantest	717201249	2002/5	1 Year
<input type="checkbox"/> -	Log-Periodic Antenna	94612-1	NAC CO.	97062301	2002/5	1 Year
<input type="checkbox"/> -	Pre-Amplifier	WJ-6611-513	Watkins Johnson	0288	2002/5	1 Year
<input type="checkbox"/> -	Pre-Amplifier	WJ-6682-834	Watkins Johnson	0052	2002/5	1 Year
<input type="checkbox"/> -	Pre-Amplifier	WJ-6870-506	Watkins Johnson	0018	2002/5	1 Year
<input type="checkbox"/> -	RF Cable(7m)	SUCOFLEX 104	Suhner	52146/4	2002/5	1 Year
<input type="checkbox"/> -	RF Cable(3m)	SUCOFLEX 104	Suhner	52053/4	2002/5	1 Year
<input type="checkbox"/> -	RF Cable(2m)	SUCOFLEX 104	Suhner	39934/4	2002/5	1 Year
<input type="checkbox"/> -	RF Cable(1m)	SUCOFLEX 104	Suhner	35687/4	2002/5	1 Year



1.4 EUT MODIFICATION / Deviation from Standard

1.4.1 EUT MODIFICATION

- X - No modifications were conducted by JQA to achieve compliance to Class B levels.
 - To achieve compliance to Class B levels, the following changes were made by JQA during the compliance test.

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

Applicant : _____ Date : _____

Typed Name : _____ Position : _____

1.4.2 Deviation from Standard:

- x - No deviations from the standard described in clause 1.1.
 - The following deviations were employed from the standard described in clause 1.1:



1.5 TEST RESULTS / UNCERTAINTY

AC Powerline Conducted Emissions:

☒ - Applicable☐ - NOT Applicable☐ - NOT Tested

The requirements are

☒ - PASSED☐ - NOT PASSED

Min. Limit Margin

64.0 dB at 0.04 MHz

Max. Limit Exceeding

dB at MHz

Uncertainty of Measurement Results

± 2.4 dB(2σ)

Remarks :

Radiated Emissions(Magnetic field):

☒ - Applicable☐ - NOT Applicable☐ - NOT Tested

The requirements are

☒ - PASSED☐ - NOT PASSED

Min. Limit Margin

more than 23.5 dB

Max. Limit Exceeding

dB at MHz

Uncertainty of Measurement Results

± 3.5 dB(2σ)

Remarks :

**Radiated Emission(Electric field):**☐ - Applicable☒ - NOT Applicable☐ - NOT Tested**The requirements are**☐ - PASSED☐ - NOT PASSED

Min. Limit Margin

dB

at

MHz

Max. Limit Exceeding

dB

at

MHz

Uncertainty of Measurement Results☐ - Anechoic Chamber☐ - 3 meters

30-300 MHz

 $\pm 3.8 \text{ dB}(2\sigma)$

300 - 1000 MHz

 $\pm 4.7 \text{ dB}(2\sigma)$ ☐ - 10 meters

30-300 MHz

 $\pm 3.7 \text{ dB}(2\sigma)$

300 - 1000 MHz

 $\pm 3.6 \text{ dB}(2\sigma)$ ☐ - Open Site☐ - 3 meters

30-300 MHz

 $\pm 4.0 \text{ dB}(2\sigma)$

300 - 1000 MHz

 $\pm 4.8 \text{ dB}(2\sigma)$ ☐ - 10 meters

30-300 MHz

 $\pm 4.0 \text{ dB}(2\sigma)$

300 - 1000 MHz

 $\pm 3.7 \text{ dB}(2\sigma)$ **Remarks :**

1.6 SUMMARY**General Remarks :**

The EUT was tested according to the requirements of FCC Rules and Regulations Part 18 Subpart A and C (September 27, 1985) under the test configuration, as shown in clause 1.7 to 1.10.

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

Final Judgment :

The "as received" sample;

 x - fulfill the test requirements of the regulation mentioned on clause 1.1.

 - fulfill the test requirements of the regulation mentioned on clause 1.1,
but with certain qualifications.

 - doesn't fulfill the test regulation mentioned on clause 1.1.

Begin of testing : November 15, 2002

End of testing : November 15, 2002

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved by:



Takaharu Hada
Director
Tsuru EMC Branch

Issued by:



Yuichi Fukumoto
Manager
Tsuru EMC Branch

1.7 TEST CONFIGURATION / OPERATION OF EUT

1.7.1 Test Configuration

The equipment under test (EUT) consists of :

Symbol	Item	Manufacturer	Model No.	FCC ID	Serial No.
A	Handle	Asahi Irika Co.,Ltd.	SU-1000	N/A	-
B	Charger	Asahi Irika Co.,Ltd.	SU-1000	N/A	-

The measurement was carried out with the following support equipment connected :

None

Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Length (m)
1	AC Power cable	-	NO	NO	1.2

1.7.2 Operating condition

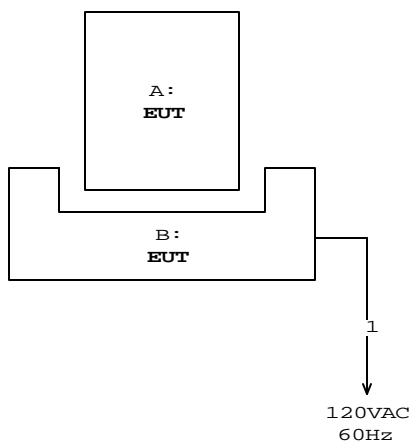
Power supply voltage :

5.0Vdc: (Stand-alone(Normal(Vibration))) mode

120VAC, 60Hz(for AC Adaptor): Charge mode

Operation condition : Stand-alone(Normal(Vibration))) mode/ Charge mode

1.8 EUT ARRANGEMENT (DRAWINGS)



1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

1.9.1 AC Powerline Conducted Emissions(10 kHz - 30 MHz) :

According to description of FCC MP-5-1985 sec.7, the AC powerline preliminary conducted emissions measurements were carried out.

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

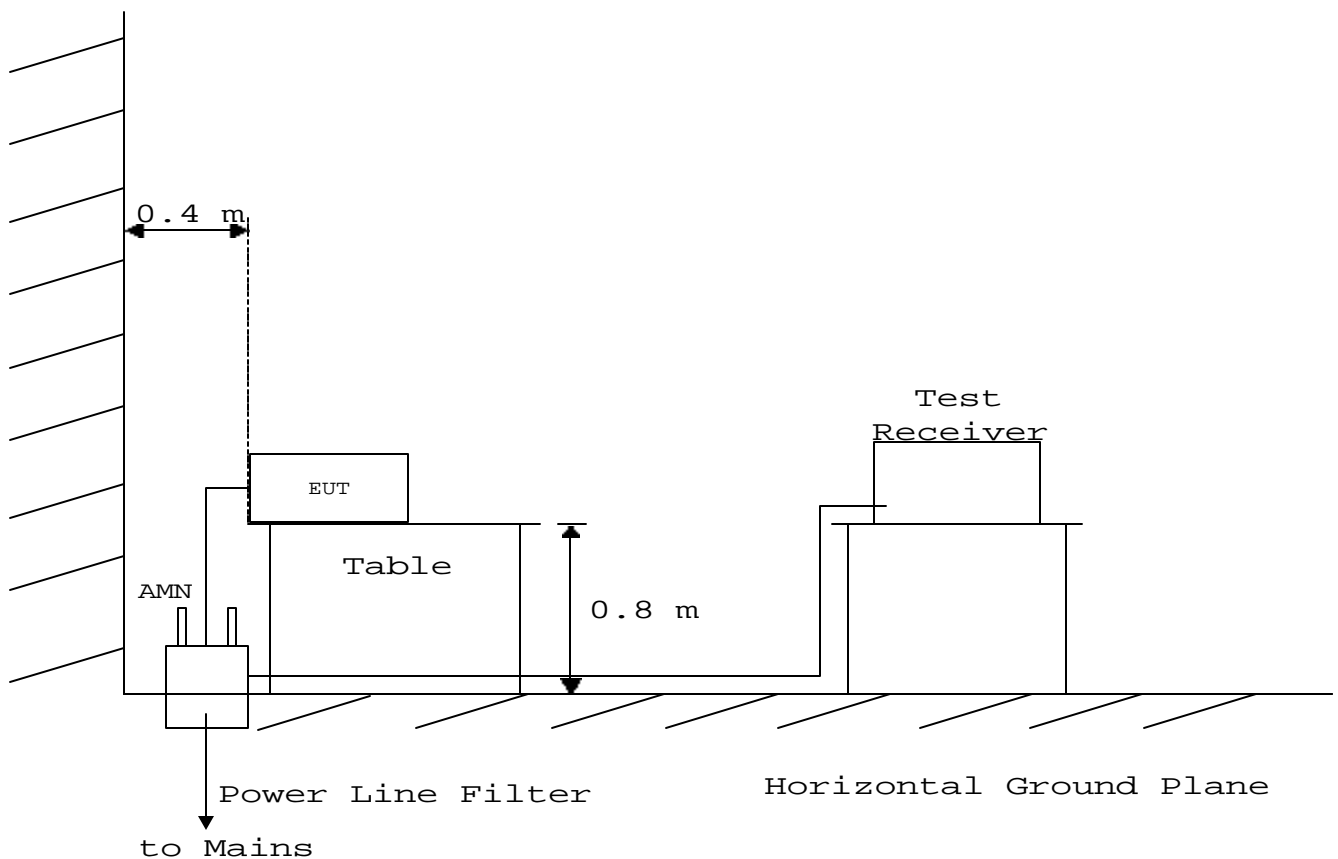
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

These configurations were used for final AC powerline conducted emissions measurements.

Shielded Enclosure

- Side View -

Vertical Ground Plane

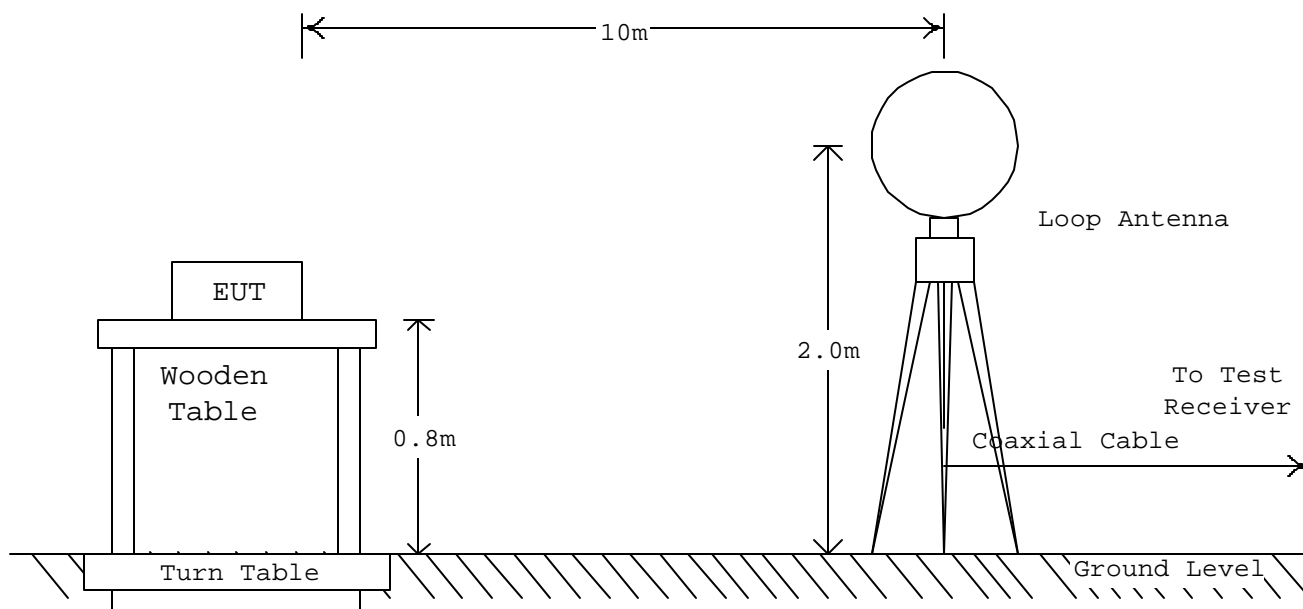


1.9.2 Radiated Emissions (Magnetic field:0.15 MHz - 30 MHz) :

According to description of FCC MP-5-1985 sec.6, the preliminary radiated emissions measurements were carried out.

The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine 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 the final radiated emissions measurements.



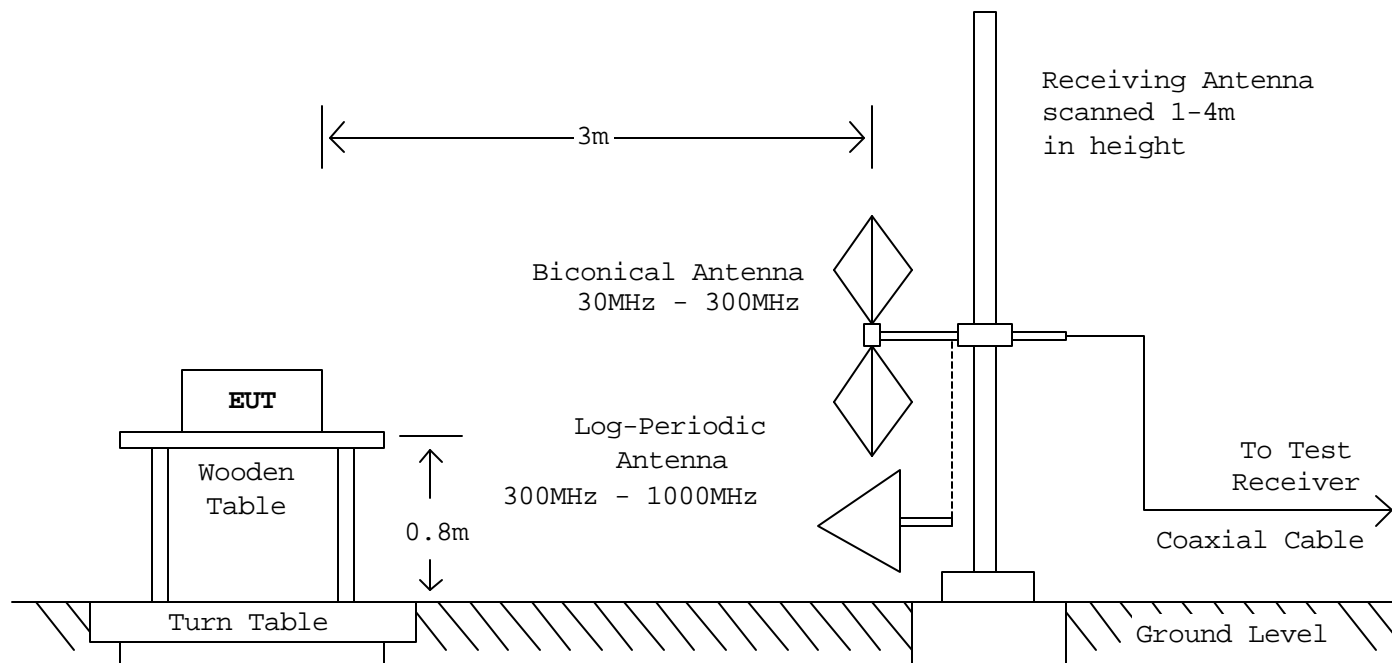
1.9.3 Radiated Emissions (30 MHz - 1000 MHz) :

According to description of FCC MP-5-1985 sec.6, the preliminary radiated emissions measurements were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

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

These configurations were used for the final radiated emissions measurements.

- Side View -



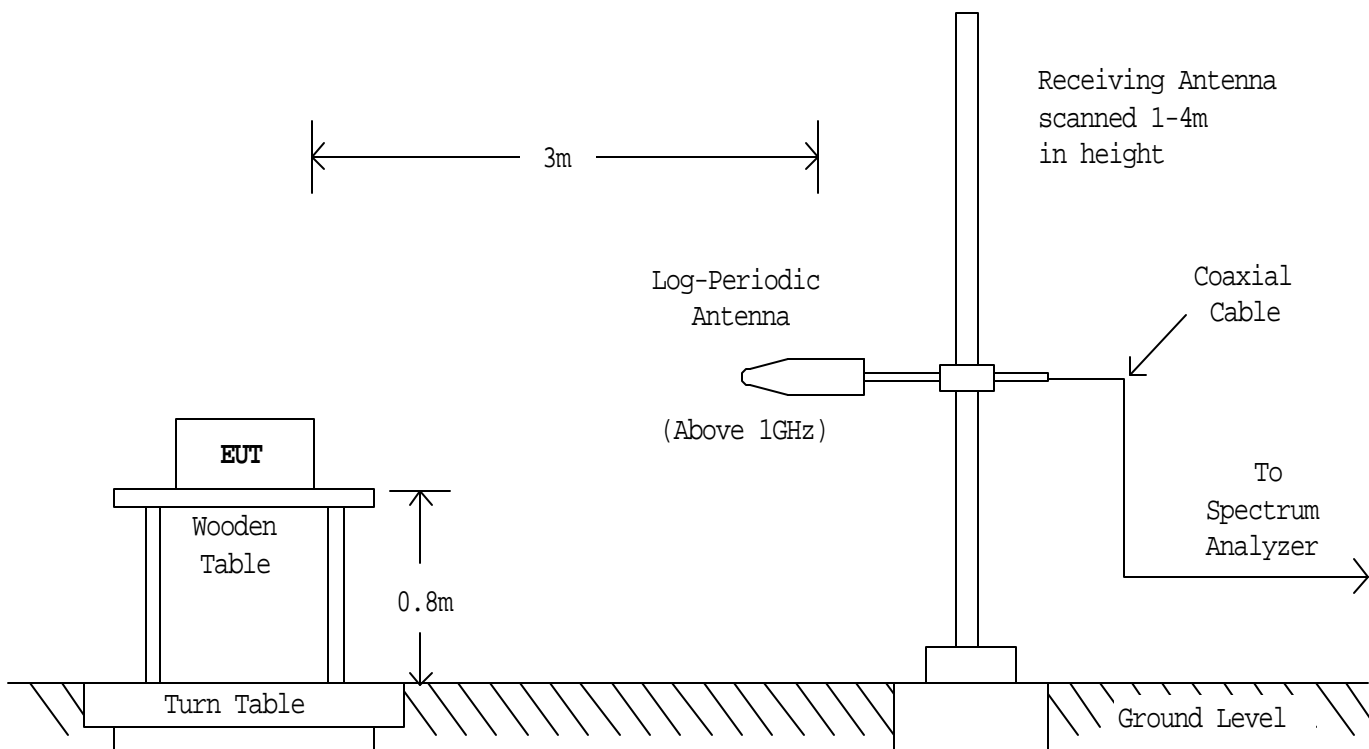
1.9.4 Radiated Emissions (Above 1 GHz) :

The preliminary equivalent radiated emissions measurements were carried out. The preliminary equivalent radiated measurements were performed at the measurement distance that specified for compliance to determine the emissions characteristics of the EUT.

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

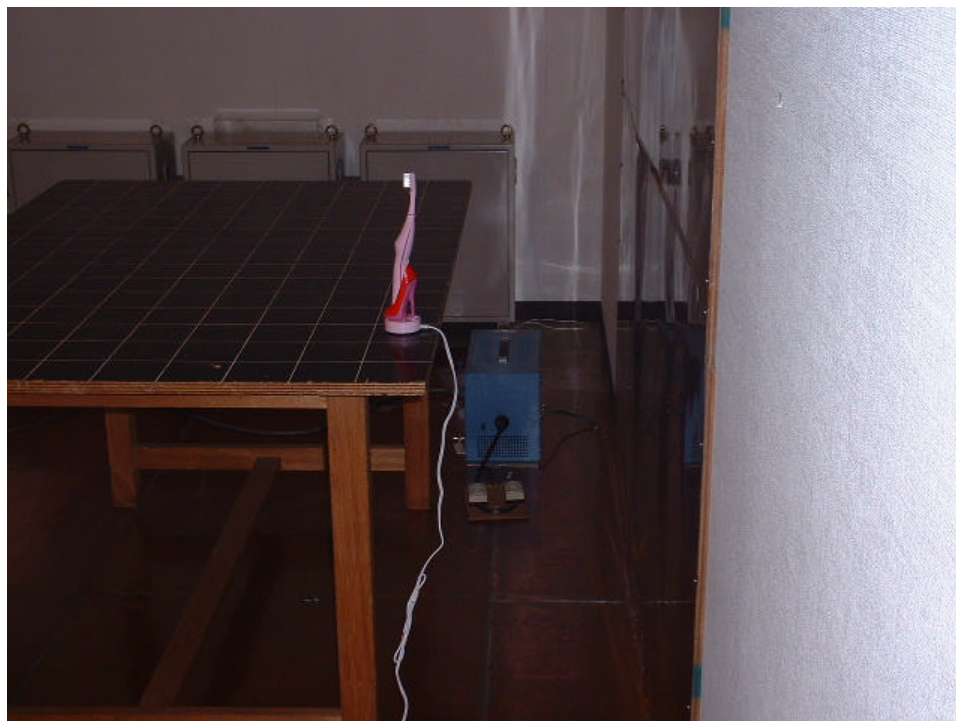
This configurations was used for the final equivalent radiated emissions measurements

- Side View -



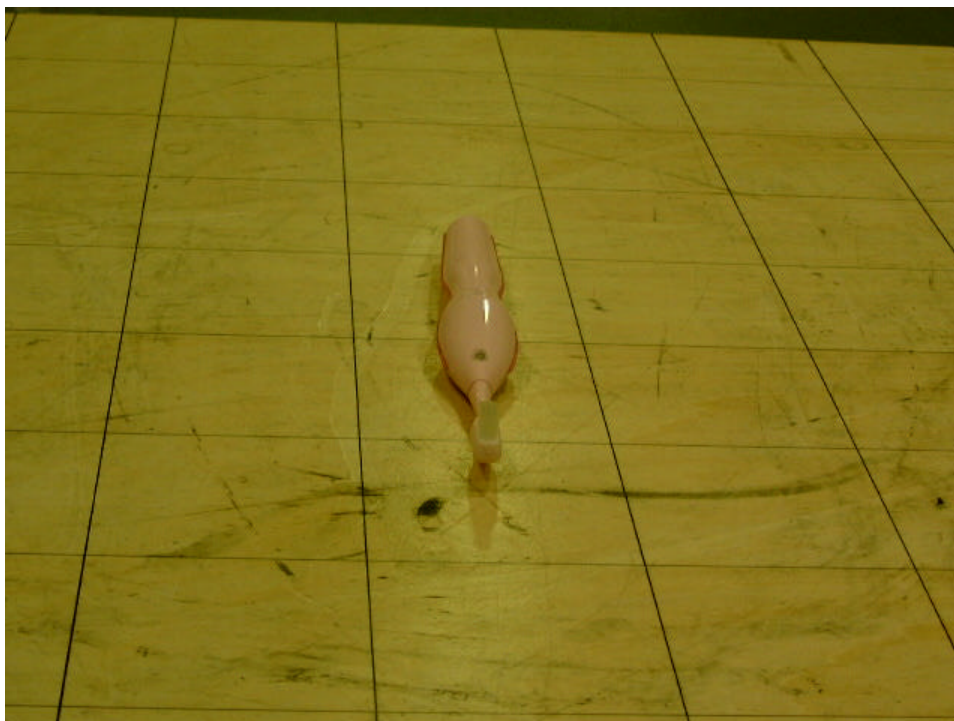
1.10 TEST ARRANGEMENT (PHOTOGRAPHS)**PHOTOGRAPHS OF EUT CONFIGURATION FOR CONDUCTED DISTURBANCE MEASUREMENT**

Photograph present configuration with maximum emission

Charge mode**- Front View -****- Side View -**

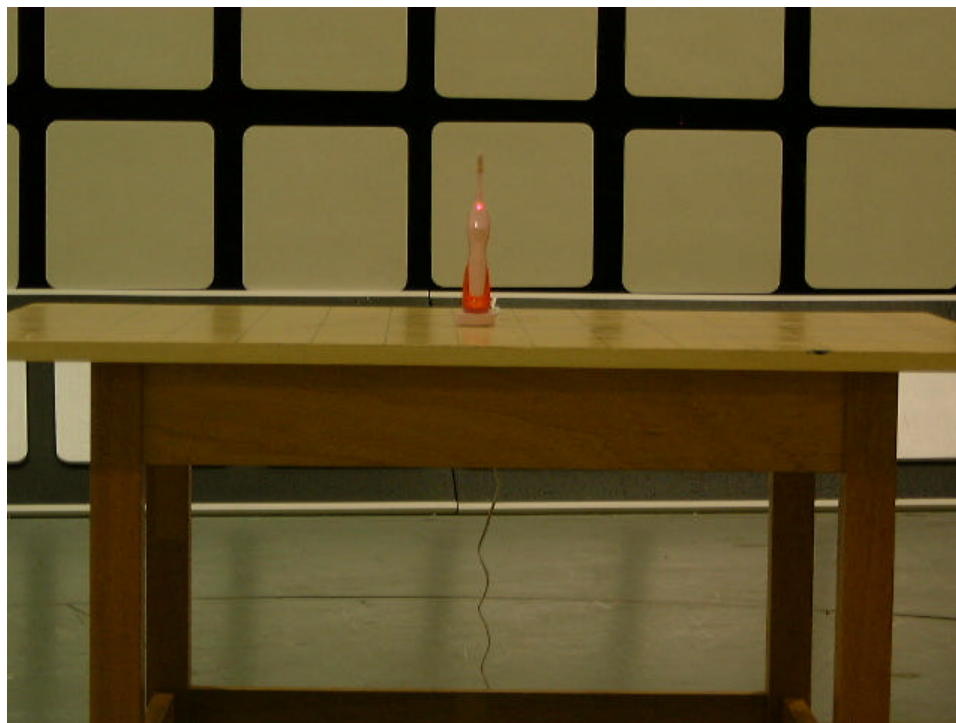
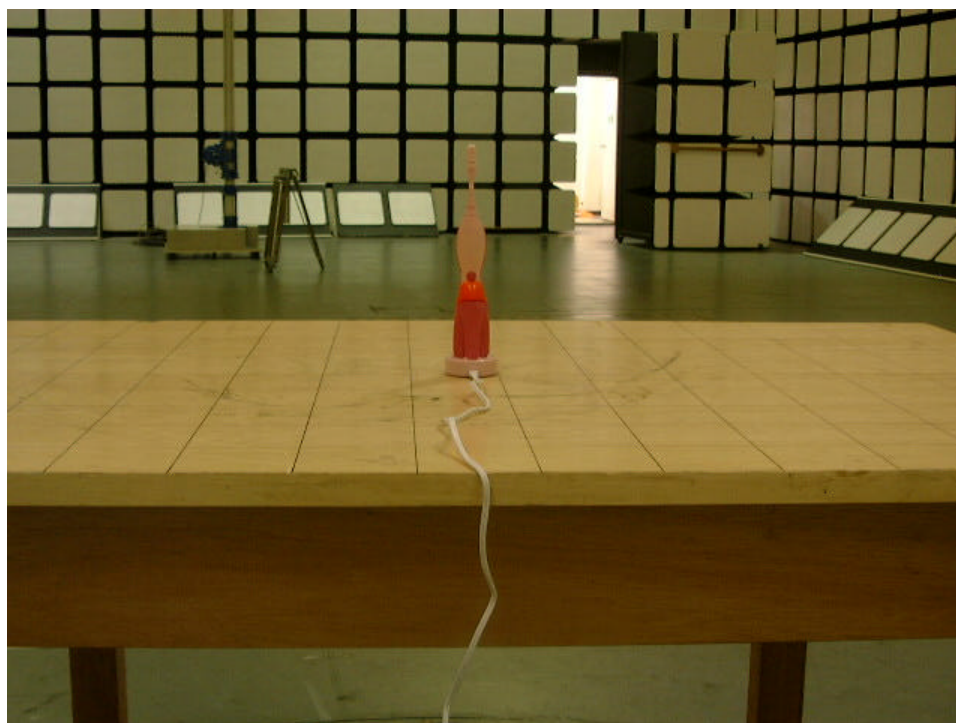
PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED DISTURBANCE MEASUREMENT

Photograph present configuration with maximum emission

Standalone mode**- Front View -****- Rear View -**

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED DISTURBANCE MEASUREMENT

Photograph present configuration with maximum emission

Charge mode**- Front View -****- Rear View -**

2. TEST DATA

2.1. AC Powerline Conducted Emissions Measurements (0.15 MHz - 30 MHz)

Date November 15, 2002

Temp. : 15°C Humi.: 30%

Frequency (MHz)	AMN		Meter Reading (dBμV)				Limits		Emission Level		Margin		Comment		
	Factor (dB)	<	V-A		V-B		(dBμV)		(dBμV)		(dB)				
			Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE	Q.P	AVE			
0.01	4.2	<	10.0	-	<	10.0	-	110.0	-	<	14.2	-	>	95.8	-
0.04	0.7	<	45.3	-	<	43.3	-	110.0	-	<	46.0	-	>	64.0	-
0.08	0.3	<	10.0	-	<	10.0	-	86.3	-	<	10.3	-	>	76.0	-
0.10	0.2	<	10.0	-	<	10.0	-	83.7	-	<	10.2	-	>	73.5	-
0.19	0.1	<	10.0	-	<	10.0	-	64.8	54.8	<	10.1	-	>	54.7	-
0.27	0.1	<	10.0	-	<	10.0	-	63.0	53.0	<	10.1	-	>	52.9	-
0.35	0.1	<	10.0	-	<	10.0	-	61.6	51.6	<	10.1	-	>	51.5	-
0.50	0.1	<	10.0	-	<	10.0	-	59.8	46.0	<	10.1	-	>	49.7	-
1.00	0.1	<	10.0	-	<	10.0	-	56.0	46.0	<	10.1	-	>	45.9	-
3.00	0.2	<	10.0	-	<	10.0	-	56.0	46.0	<	10.2	-	>	45.8	-
5.00	0.3	<	10.0	-	<	10.0	-	56.0	46.0	<	10.3	-	>	45.7	-
7.00	0.4	<	10.0	-	<	10.0	-	60.0	50.0	<	10.4	-	>	49.6	-
10.00	0.5	<	10.0	-	<	10.0	-	60.0	50.0	<	10.5	-	>	49.5	-
15.00	0.8	<	10.0	-	<	10.0	-	60.0	50.0	<	10.8	-	>	49.2	-
20.00	0.9	<	10.0	-	<	10.0	-	60.0	50.0	<	10.9	-	>	49.1	-
25.00	0.8	<	10.0	-	<	10.0	-	60.0	50.0	<	10.8	-	>	49.2	-
30.00	0.8	<	10.0	-	<	10.0	-	60.0	50.0	<	10.8	-	>	49.2	-

- Notes: 1) Test Location : Shielded Room
 2) The spectrum was checked from 0.15 MHz to 30 MHz
 3) AMN(Artificial Mains Network) factor includes the cable loss for 5 meter.
 4) The symbol of "<" means "or less".
 5) The symbol of ">" means "more than".
 6) The symbol of "-" means "Not applicable".
 7) V-A : One end & Ground V-B : The other end & Ground
 8) Q.P : Quasi-Peak Detector AVE : Average Detector
 9) A sample calculation was made at 0.01 MHz

$$\text{Amn} + \text{Mr} = 4.2 + 10.0 = 14.2 \text{ dBuV}$$

$$\text{Amn} : \text{AMN Factor} \quad \text{Mr} : \text{Meter Reading}$$

 10) Setting of measuring instrument :
 Detector Function : CISPR Quasi-Peak / Average
 IF Bandwidth : 9 kHz / 10 kHz (0.15 MHz - 30 MHz)

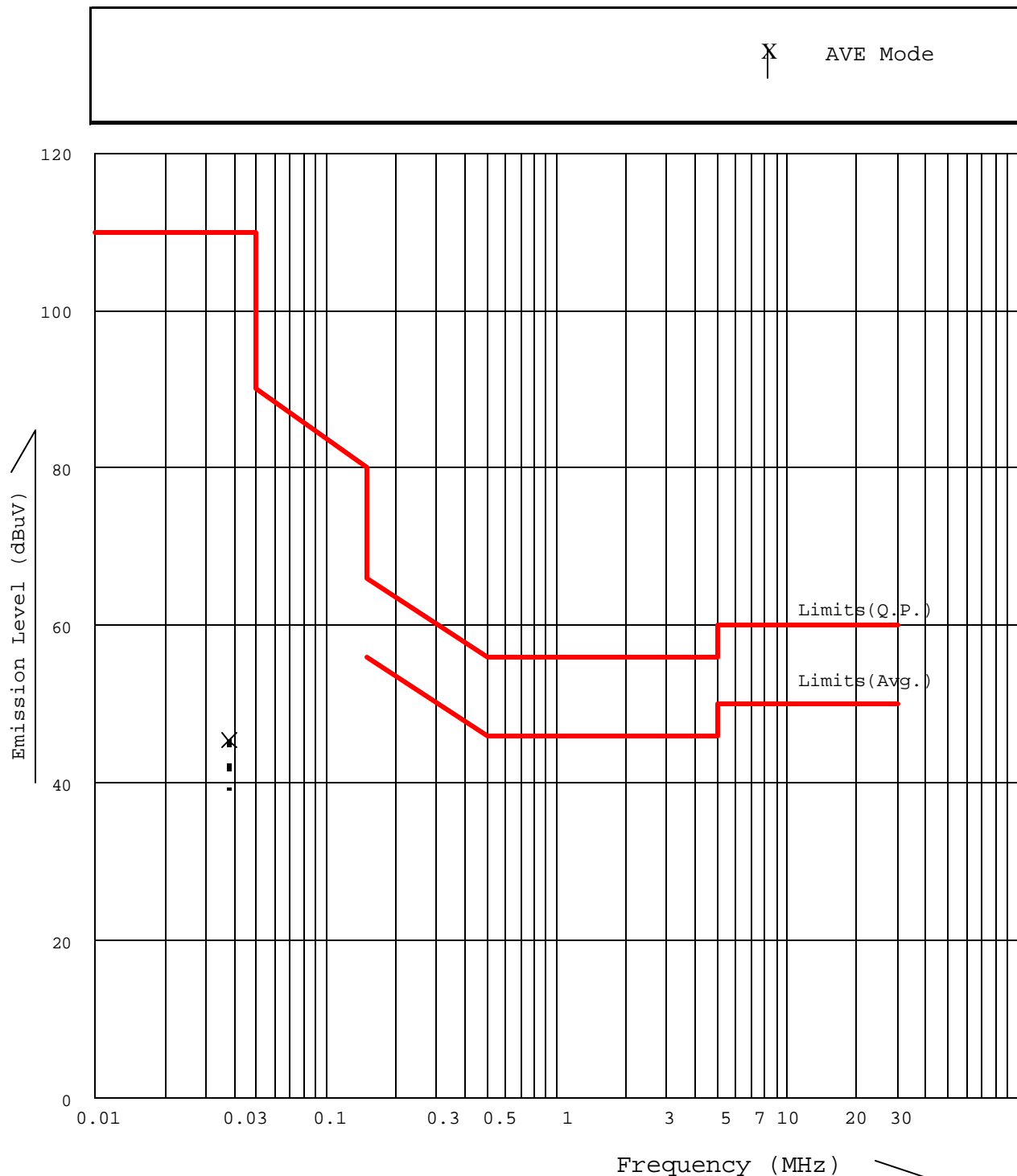
Tested by :



Kazuhisa Fukagawa

AC Powerline Conducted Emission Measurement (0.01 MHz - 30 MHz)

Operating Condition : Charge mode



2.2.1. Radiated Emissions Measurement (0.01 MHz - 30 MHz)

Operating Condition : Stand-alone mode

Date : November 15, 2002

Temp. : 15°C Humi.: 30%

Frequency (MHz)	Antenna Factor (dB/m)	Meter at 10 m (dBμV)	Conver Factor (dB)	Limits (dBμV/m)	Emission Level at 30 m (dBμV/m)	Margin (dB)	Comment
0.02	-	38.4	59.1	23.52	< 0.0	> 23.5	
0.03	-	< 31.6	59.1	23.52	< 0.0	> 23.5	
0.05	-	< 27.5	59.1	23.52	< 0.0	> 23.5	
0.06	-	< 24.6	59.1	23.52	< 0.0	> 23.5	
0.08	-	< 22.4	59.1	23.52	< 0.0	> 23.5	
0.30	-	< 32.7	59.1	23.52	< 0.0	> 23.5	
0.95	-	32.6	59.1	23.52	< 0.0	> 23.5	
3.38	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
6.55	-	32.7	59.1	23.52	< 0.0	> 23.5	
8.00	-	31.9	59.1	23.52	< 0.0	> 23.5	
9.03	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
10.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
15.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
20.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
25.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
30.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	

- Notes:
- 1) Test Location : Anechoic Chamber
 - 2) Measuring Distance : 10 m
 - 3) The spectrum was checked from 0.01 MHz to 30 MHz.
 - 4) Measurement were made at only one closer fixed distance (10m), therefore the permissible field strength limits were adjusted using $1/d^2$ (59.1dB) as an attenuation factor.
 - 5) The symbol of "<" means "or less".
 - 6) The symbol of ">" means "more than".
 - 7) A sample calculation was made at 0.02 MHz
 $Af + Mr - Cov = Af + 38.4 - 59.1 = -20.7 \text{ dB}\mu\text{V/m}$
Af: Antenna Factor Mr : Meter Reading Cov : Conversion Factor
 - 8) Setting of measuring instrument :
Detector Function : Average
IF Bandwidth : 200 Hz (0.01 MHz - 0.15 MHz)
IF Bandwidth : 10 kHz (0.15 MHz - 30 MHz)

Tested by :



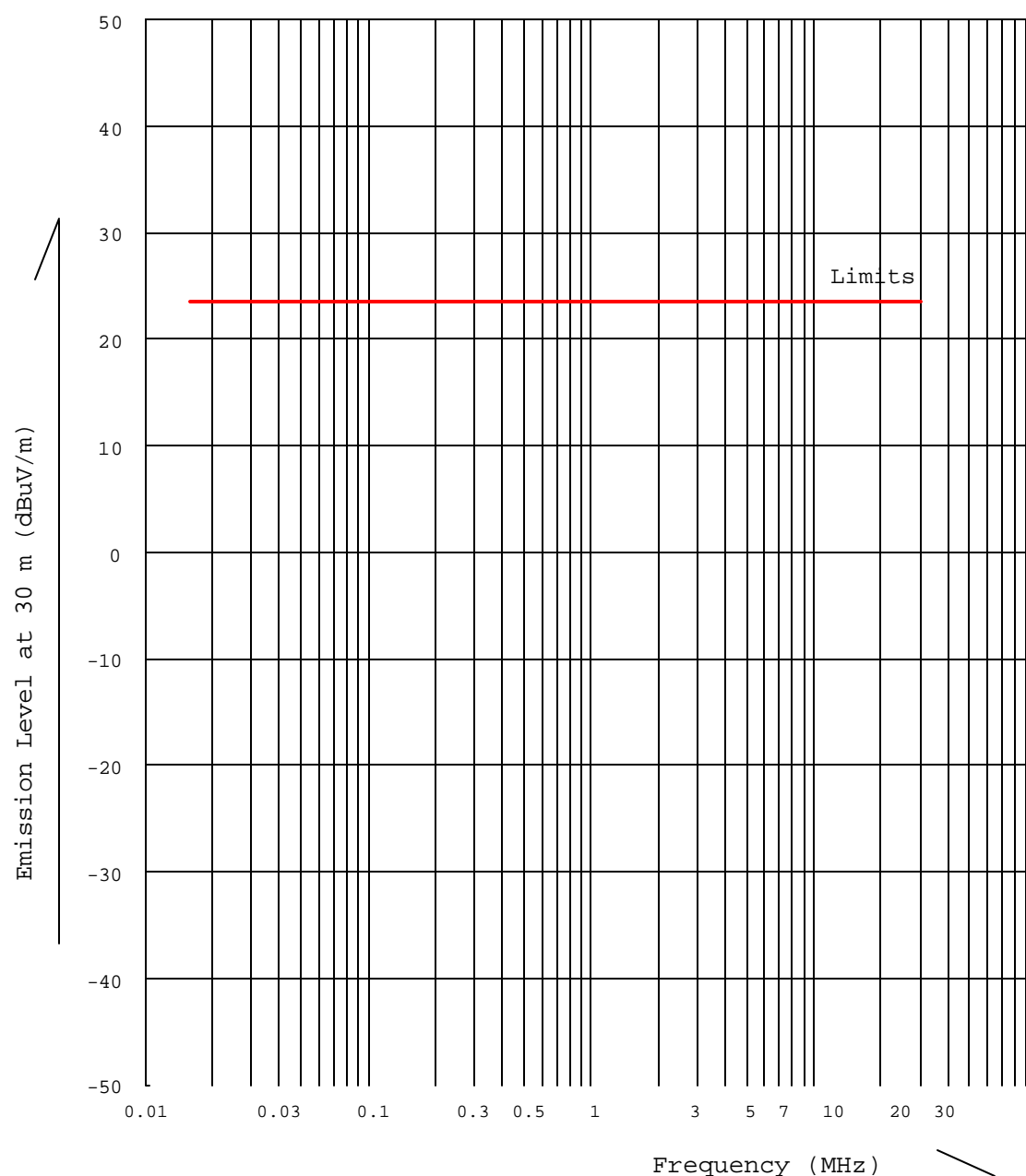
Kazuhisa Fukagawa

Radiated Emissions Measurement (0.01 MHz - 30 MHz)

Operating Condition : Stand-alone mode

Measuring Distance : 10 m

φ AVE Mode



2.2.2. Radiated Emissions Measurement (0.01 MHz - 30 MHz)

Operating Condition : Charge mode

Date : November 15, 2002

Temp. : 15°C Humi.: 30%

Frequency (MHz)	Antenna Factor (dB/m)	Meter at 10 m (dBμV)	Conver Factor (dB)	Limits (dBμV/m)	Emission Level at 30 m (dBμV/m)	Margin (dB)	Comment
0.02	-	38.4	59.1	23.52	< 0.0	> 23.5	
0.03	-	< 31.4	59.1	23.52	< 0.0	> 23.5	
0.04	-	< 29.4	59.1	23.52	< 0.0	> 23.5	
0.05	-	< 27.5	59.1	23.52	< 0.0	> 23.5	
0.06	-	< 24.6	59.1	23.52	< 0.0	> 23.5	
0.08	-	< 22.4	59.1	23.52	< 0.0	> 23.5	
0.30	-	< 32.7	59.1	23.52	< 0.0	> 23.5	
0.95	-	32.5	59.1	23.52	< 0.0	> 23.5	
3.38	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
6.54	-	32.8	59.1	23.52	< 0.0	> 23.5	
8.00	-	30.4	59.1	23.52	0.0	23.5	
9.03	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
10.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
15.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
20.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
25.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	
30.00	-	< 27.0	59.1	23.52	< 0.0	> 23.5	

- Notes:
- 1) Test Location : Anechoic Chamber
 - 2) Measuring Distance : 10 m
 - 3) The spectrum was checked from 0.01 MHz to 30 MHz.
 - 4) Measurement were made at only one closer fixed distance (10m), therefore the permissible field strength limits were adjusted using $1/d^2$ (59.1dB) as an attenuation factor.
 - 5) The symbol of "<" means "or less".
 - 6) The symbol of ">" means "more than".
 - 7) A sample calculation was made at 0.02 MHz
 $Af + Mr - Cov = Af + 38.4 - 59.1 = -20.7 \text{ dB}\mu\text{V/m}$
 Af: Antenna Factor Mr : Meter Reading Cov : Conversion Factor
 - 8) Setting of measuring instrument :
 Detector Function : Average
 IF Bandwidth : 200 Hz (0.01 MHz - 0.15 MHz)
 IF Bandwidth : 10 kHz (0.15 MHz - 30 MHz)

Tested by :



Kazuhisa Fukagawa

Radiated Emissions Measurement (0.01 MHz - 30 MHz)

Operating Condition : Charge mode

Measuring Distance : 10 m

φ AVE Mode

