



JAPAN QUALITY ASSURANCE ORGANIZATION

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JQA APPLICATION NO.: 80-90247

Issue Date : August 10, 1999

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EMI TEST REPORT

JQA APPLICATION NO. : 80-90247

Model No. : SF-F1

Type of Equipment : Smart File Finder

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : AK8SFF1

Applicant : Sony Corporation

Address : 6-7-35, Kitashinagawa, Shinagawa-ku
Tokyo 141-0001, Japan

Manufacture : Sony Corporation

Address : 6-7-35, Kitashinagawa, Shinagawa-ku
Tokyo 141-0001, Japan

Final Judgment : Passed

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to Electrotechnical Lab. of MITI Japan and Communications Research Lab. of MPT Japan.

The test results only respond to the tested sample. It is not allowed to copy this report even partly without the allowance of the JQA EMC Engineering Dept. Testing Div.

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1 DOCUMENTATION

1.1 TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and C (June 23, 1989) Intentional Radiators

Test procedure :

AC power line conducted emission, radiated emission, frequency stability and occupied bandwidth tests were performed according to the procedures in ANSI C63.4-1992.

1.2 GENERAL INFORMATION

1.2.1 Test facility :

- 1) Test Facility located at EMC Engineering Dept. Testing Div. : No.2 and 3 Anechoic Chambers(3 meters Site)

FCC filing No. : 31040/SIT 1300F2

TSURU EMC Branch: Open Site No.1, No.2, An Anechoic Chamber (3 m and 10 m, on common plane) and a Shielded Room (Date of Listing: March 30,1999)

- 2) EMC Engineering Dept. Testing Div. and TSURU EMC Branch are recognized under the National Voluntary Laboratory accreditation Program for satisfactory compliance established in title 15, Part 285 Code of Federal Regulations.

NVLAP Lab Code : 200189-0 (Effective through : June 30, 2000)

NVLAP Lab Code : 200192-0 (Effective through : June 30, 2000)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|---|
| 1) Type of Equipment | : Smart File Finder |
| 2) Product Type | : Prototype |
| 3) Category | : Low Power Communication Device
Transmitter |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : AK8SFF1 |
| 6) Trade Name | : SONY |
| 7) Model No. | : SF-F1 |
| 8) Operating Frequency Range | : 13.56 MHz |
| 9) Highest Frequency Used in the EUT | : 13.56 MHz |
| 10) Serial No. | : None |
| 11) Date of Manufacture | : - |
| 12) Power Rating | : DC 4.5V(Battery) |
| 13) EUT Grounding | : None |

1.2.3 Definitions for symbols used in this test report :

- 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 Power Line Conducted Emission

___ - was performed in the following test site.

x - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Testing Div.
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

___ - Shielded Enclosure

___ - Anechoic Chamber No. 2 (portable Type)

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
___ - Field Strength Meter	ESH-2	Rohde & Schwarz	872280/011	Sep. 1998	1 Year
___ - Field Strength Meter	ESH-2	Rohde & Schwarz	880370/016	May 1999	1 Year
___ - Field Strength Meter	ESH-3	Rohde & Schwarz	881460/016	May 1999	1 Year
___ - Field Strength Meter	ESH-3	Rohde & Schwarz	881460/030	Nov 1999	1 Year
___ - LISN	KNW-407	Kyoritsu Electrical	8-833-6	Apr. 1999	1 Year
___ - LISN	KNW-407	Kyoritsu Electrical	8-855-2	Apr. 1999	1 Year
___ - LISN	KNW-407	Kyoritsu Electrical	8-757-1	Apr. 1999	1 Year
___ - RF Cable	3D-2W	Fujikura	155-21-005	Apr. 1999	1 Year
___ - RF Cable	3D-2W	Fujikura	155-21-006	Apr. 1999	1 Year

1.3.2 The measurement of the Radiated Emission(9 kHz - 30 MHz)

 x - was performed in the following test site.

 - was not applicable.

Test location :

JQA SAFTY TESTING CENTER EMC ENGINEERING DEPT. TSURU EMC BRANCH
2096 Ohhata, Tanbozawa, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

 - Open Site No. 1 (3, 10 or 30 meters)

 x - Open Site No. 2 (3, 10 or 30 meters)

 - Anechoic Chamber(3 or 10 meters)

Validation of Site Attenuation :

1) Last Confirmed Date :May, 1999

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> x </u> - Field Strength Meter	ESH3	Rohde & Schwarz	872994/047	May 1999	1 Year
<u> </u> - Field Strength Meter	ESV	Rohde & Schwarz	872148/039	May 1999	1 Year
<u> </u> - Field Strength Meter	ESVP	Rohde & Schwarz	879783/030	May 1999	1 Year
<u> </u> - Field Strength Meter	ESVP	Rohde & Schwarz	881478/004	May 1999	1 Year
<u> </u> - Field Strength Meter	ESVP	Rohde & Schwarz	881478/005	May 1999	1 Year
<u> x </u> - Antenna	HFH2-Z2	Rohde & Schwarz	879284/14	May 1999	1 Year
<u> </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 1998	1 Year
<u> </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-170-1	Nov. 1998	1 Year
<u> </u> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 1998	1 Year
<u> </u> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 1998	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-001	Feb. 1999	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-002	Feb. 1999	1 Year

1.3.3 The measurement of the Radiated Emission(30 MHz - 1000 MHz)

 x - was performed in the following test site.

 - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Testing Div.
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

 - Anechoic Chamber No. 2 (3 meters)

 x - Anechoic Chamber No. 3 (3 meters)

Validation of Site Attenuation :

1) Last Confirmed Date :March, 1999

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Field Strength Meter	ESV	Rohde & Schwarz	872148/039	May 1999	1 Year
<u> </u> - Field Strength Meter	ESVP	Rohde & Schwarz	879783/030	May 1999	1 Year
<u> </u> - Field Strength Meter	ESVP	Rohde & Schwarz	881478/004	May 1999	1 Year
<u> x </u> - Field Strength Meter	ESVP	Rohde & Schwarz	881478/005	May 1999	1 Year
<u> x </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 1998	1 Year
<u> </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-170-1	Nov. 1998	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 1998	1 Year
<u> </u> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 1998	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-001	Feb. 1999	1 Year
<u> x </u> - RF Cable	5D-2W	Fujikura	155-21-002	Feb. 1999	1 Year

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

___ - was performed in the following test site.

X - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Testing Div.
21-25, Kinuta 1-chome, Setagaya-ku, Tokyo 157-8573, Japan

___ - No. 2 site (3 meters)

___ - No. 3 site (3 meters)

Validation of Site Attenuation :

1) Last Confirmed Date :March, 1999

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
___ - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	May 1999	1 Year
___ - Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	May 1999	1 Year
___ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 1999	1 Year
___ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Jul. 1998	1 Year
___ - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Nov. 1998	1 Year
___ - RF Cable	S 04272B	Suhner	155-21-011	May 1999	1 Year

1.3.5 The measurement of the Frequency Stability x - was performed. - was not applicable.**Used test instruments :**

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> x </u> - Frequency Counter	53131A	Hewlett Packard	3546A11807	June 1999	1 Year
<u> x </u> - Oven	-	Ohnishi Co. Ltd.	-	Aug. 1999	1 Year
<u> </u> - DC Power Supply	6628A	Hewlett Packard	3224A00284	July 1999	1 Year

1.3.6 The measurement of the Occupied Bandwidth x - was performed. - was not applicable.**Used test instruments :**

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Apr. 1999	1 Year
<u> </u> - Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	Apr. 1999	1 Year
<u> x </u> - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 1999	1 Year
<u> </u> - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Jul. 1999	1 Year
<u> </u> - Function Generator	3325A	Hewlett Packard	2512A21776	May 1999	1 Year
<u> </u> - FM Linear Detector	MS61A	Anritsu Corp.	M77486	Sep. 1998	1 Year
<u> </u> - Level Meter	ML422C	Anritsu Corp.	M87571	June 1999	1 Year



1.4 EUT MODIFICATION

- ☒ -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 :

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1.5 TEST RESULTS

AC Power Line Conducted Emission - Applicable x - NOT Applicable

The requirements are - PASSED - NOT PASSED

Remarks :

Radiated Emission [§15.225(a)(b)] x - Applicable - NOT Applicable

The requirements are x - PASSED - NOT PASSED

Remarks:

Frequency Stability [§15.225(c)] x - Applicable - NOT Applicable

The requirements are x - PASSED - NOT PASSED

Remarks:

Occupied Bandwidth [§15.225(b)] x - Applicable - NOT Applicable

The requirements are x - PASSED - NOT PASSED

Remarks:

1.6 SUMMARY

General Remarks :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and C (June 23, 1989) under the test configuration, as shown in clause 1.7 to 1.9.

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 : July 16, 1999

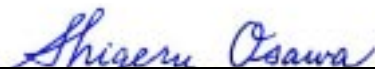
End of testing : August 4, 1999

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Signatories:



Masaaki Takahashi
Manager
JQA EMC Engineering Dept.



Shigeru Osawa
Assistant Manager
JQA EMC Engineering Dept.

1.7 TEST CONFIGURATION / OPERATION OF EUT**1.7.1 Test Configuration**

The equipment under test (EUT) consists of :

Item	Manufacturer	Model No.	FCC ID	Serial No.
Smart File Finder	Sony Corporation	SF-F1	AK8SFF1	None

1.7.2 Operating condition

Power supply Voltage : 4.5 VDC(Battery)

The tests have been carried out under the transmitting condition.

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1.8 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

1.8.1 AC Power Line Conducted Emission (450 kHz - 30 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.3.1, the AC power line preliminary conducted emissions measurements were carried out.

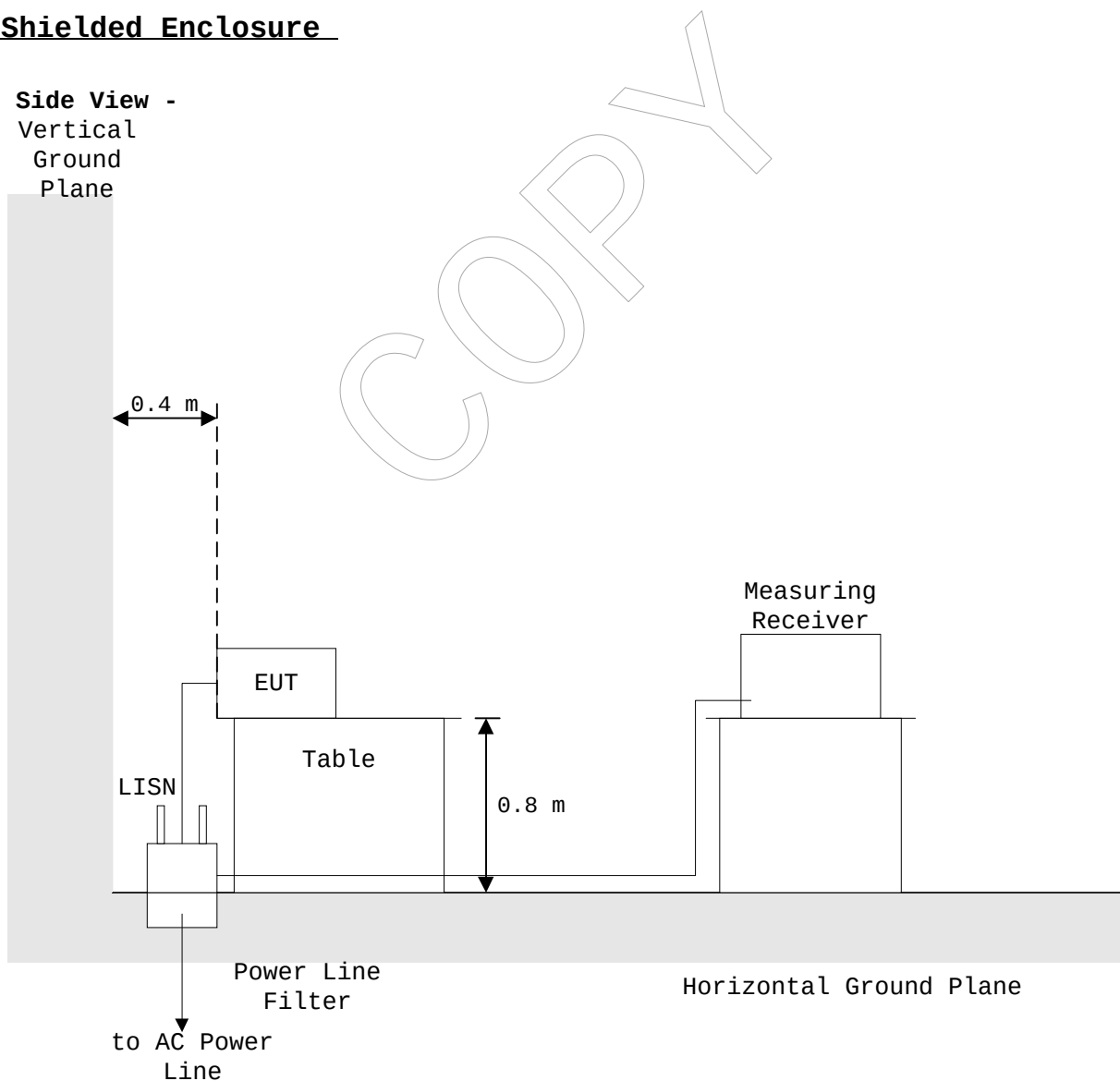
The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

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

Shielded Enclosure

- Side View -

Vertical
Ground
Plane

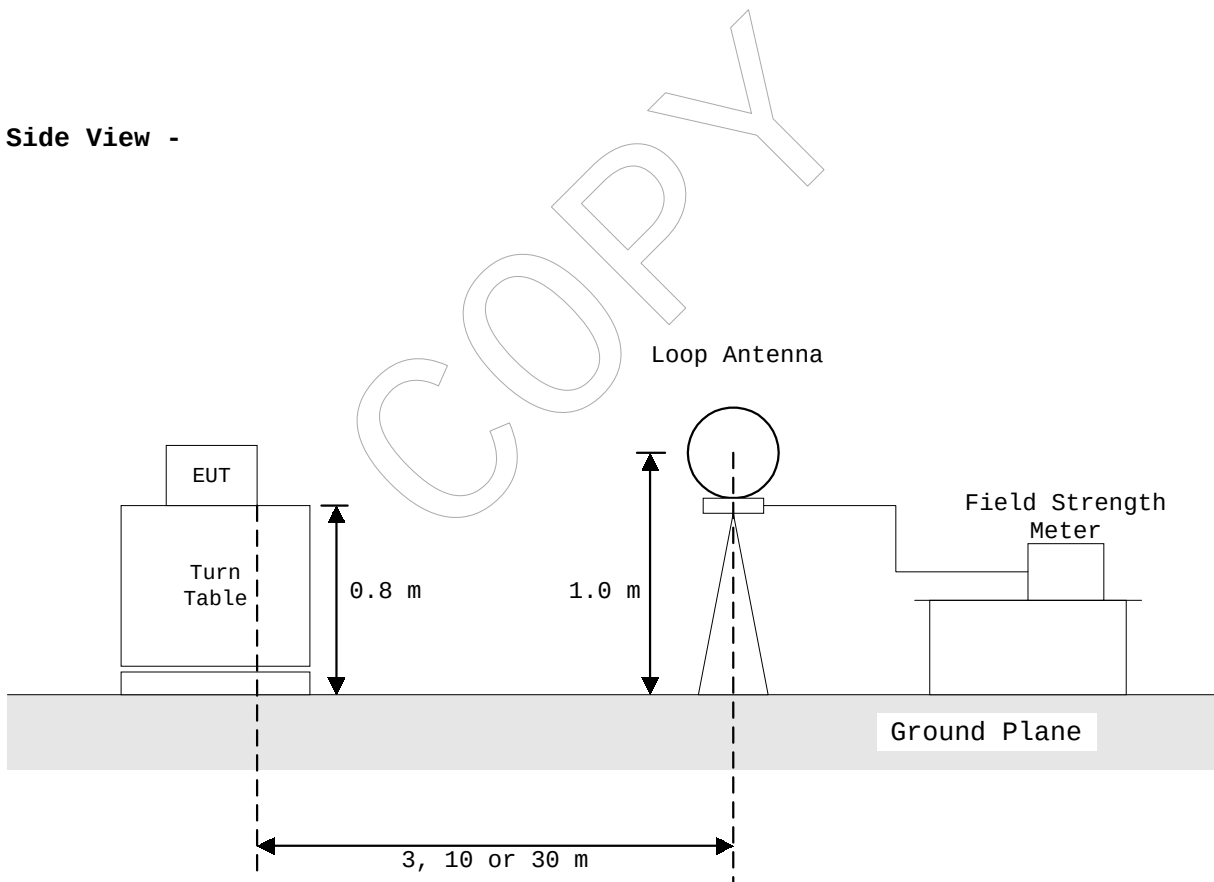


1.8.2 Radiated Emission (9 kHz - 30 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

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

- Side View -



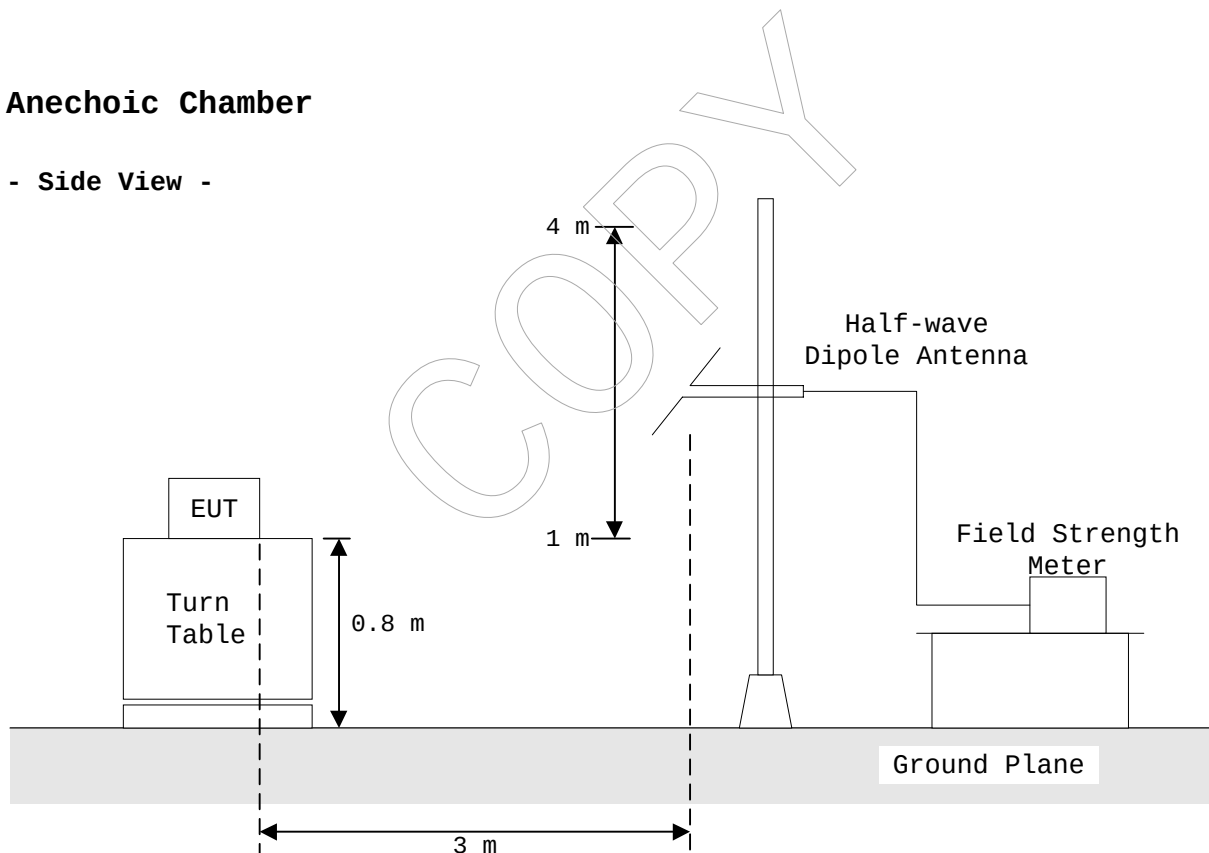
1.8.3 Radiated Emission (30 MHz - 1000 MHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

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

Anechoic Chamber

- Side View -



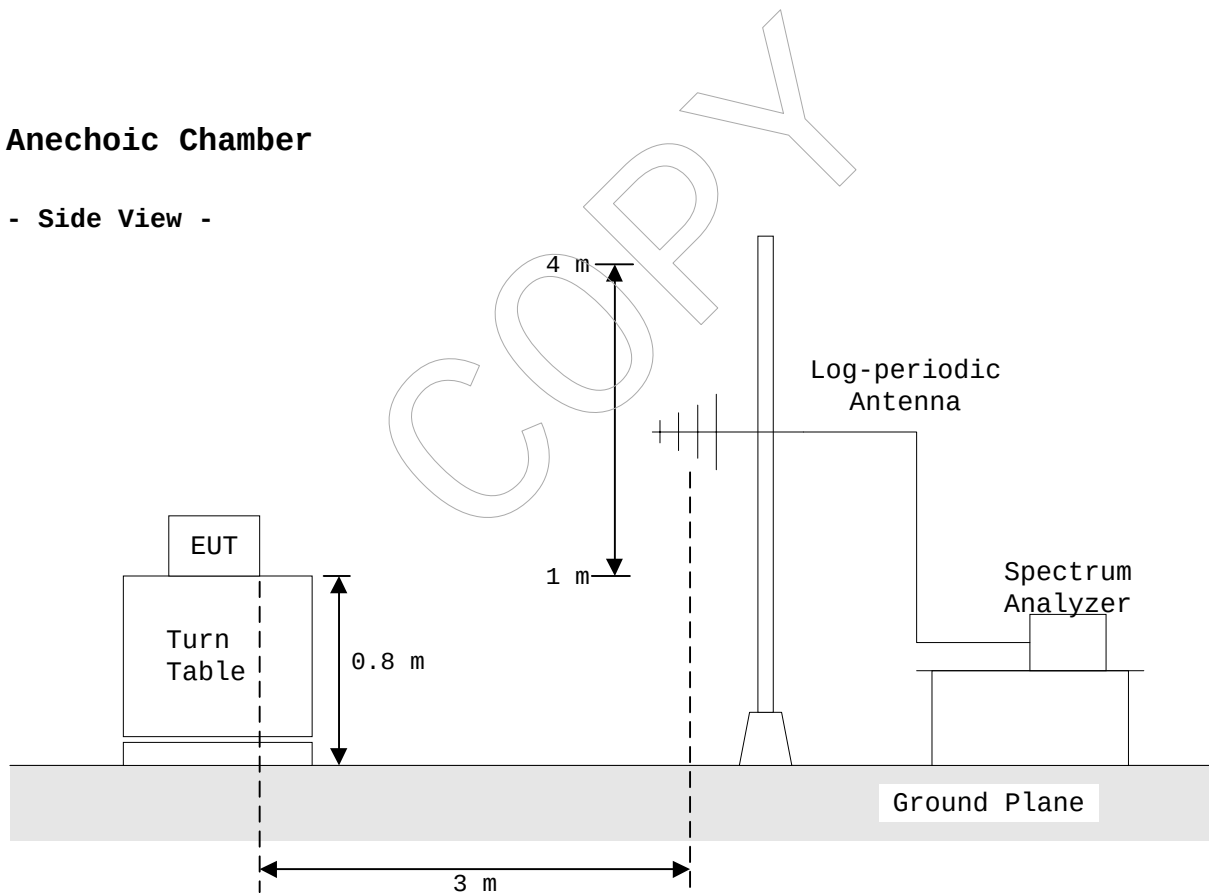
1.8.4 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-1992 sec.13.1.4.1, 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.

Anechoic Chamber

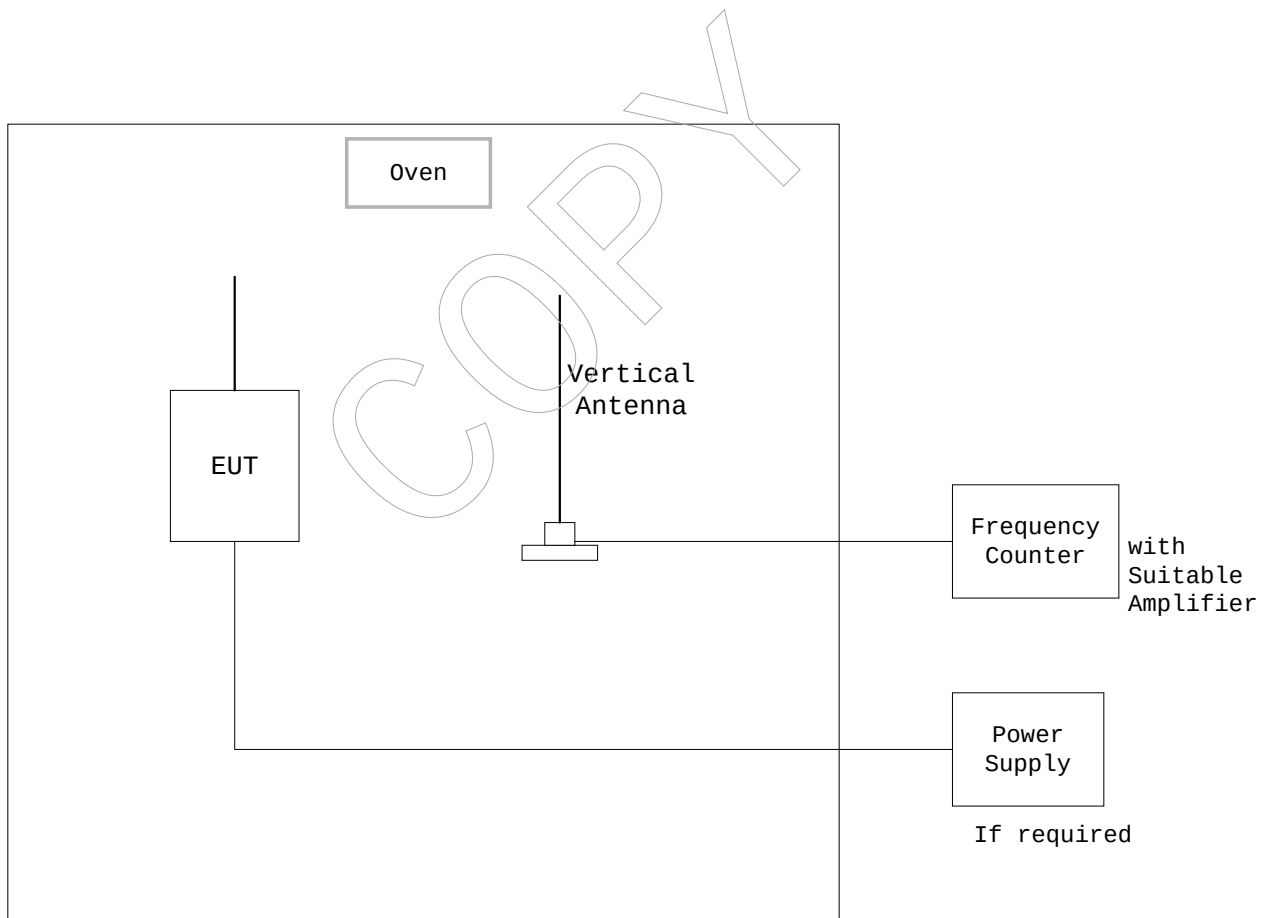
- Side View -



1.8.5 Frequency Stability :

According to description of ANSI C63.4-1992 sec.13.1.5 and sec.13.1.6, 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 $+20^{\circ}\text{C}$.

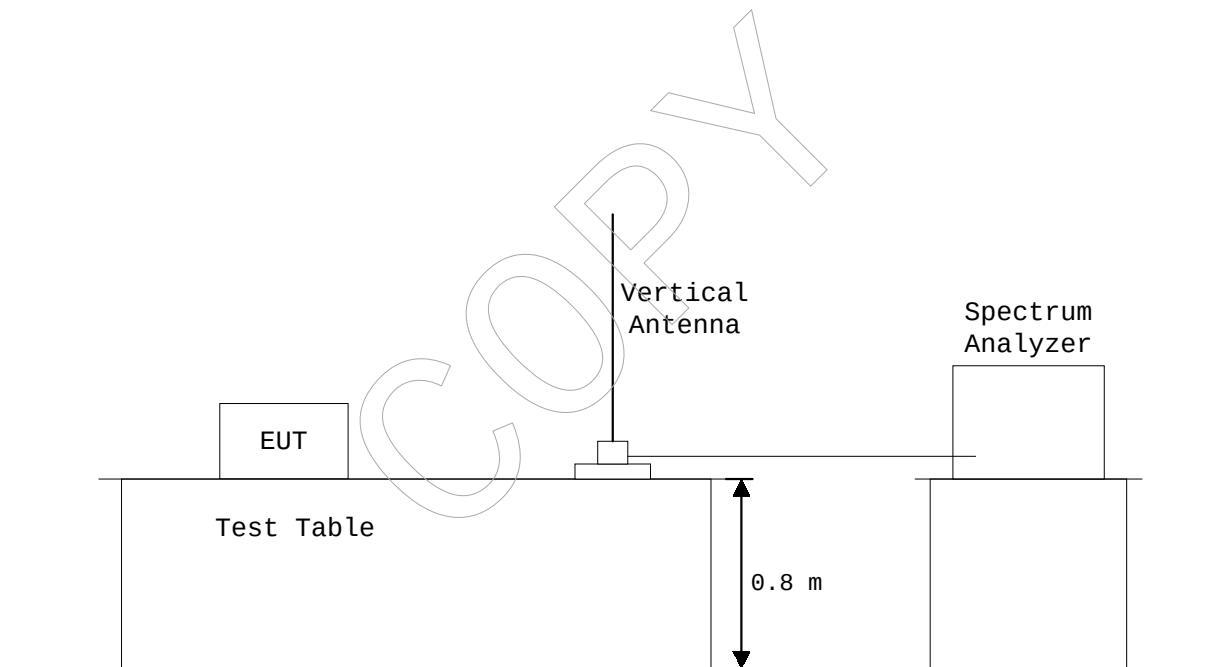
These measurements were carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.



1.8.6 Occupied Bandwidth :

According to description of ANSI C63.4-1992 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.



1.9 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT
 Photograph present configuration with maximum emission





TEST DATA

2.2 Radiated Emissions Measurement(9 kHz - 1000 MHz)

Date : July 16, 1999

Operating Frequency : 13.56 MHz
Distance of Measurement : 30 meters

Frequency (MHz)	Field Strength (dBμV/m)
Fundamental	
13.56	< 27.0
Harmonic Frequency	
27.12	< 27.0

The distance of measurements was reduced to 10 meters.

Operating Frequency : 13.56 MHz
Distance of Measurement : 10 meters

Frequency (MHz)	Field Strength (dBμV/m)
Fundamental	
13.56	32.3
Harmonic Frequency	
27.12	< 27.0

Note: 1. Meter reading value shows field strength, because the value includes antenna factor.

2. The symbol of "<" means "or less".

3. Measuring Instrument Setting:

Detector Function : CISPR Quasi-peak Peak
IF Band width : 9 kHz

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).

Calculation :

$$\begin{aligned}
 32.3 \text{ dB}\mu\text{V/m} - 20\log_{10}((30/10)^2) &= 32.3 - 19.1 \\
 &= 13.2 \text{ dB}\mu\text{V/m at 30 meters}
 \end{aligned}$$

$$\text{Limits for fundamental}(\S 15.225(a)) = 20\log_{10}(10000) = 80 \text{ dB}\mu\text{V/m}$$

Date : July 23, 1999

Temp.: 23 °C Humi.: 80 %

Operating Frequency : 13.560 MHz

Distance of Measurement : 3.0 meters

	Antenna	Meter Reading		Field Strength at 3 m		
Frequency	Factor	Horiz.	Vert.	Limits	Horiz.	Vert.
(MHz)	(dB/m)	(dBμV)	(dBμV)	(dBμV/m)	(dBμV/m)	(dBμV/m)
Harmonics & other Frequency components						
40.680	1.7	2.7	6.1	40.0	4.4	7.8
54.240	4.3	9.2	6.9	40.0	13.5	11.2
67.800	6.4	< 0.0	1.2	40.0	< 6.4	7.6
80.839	8.0	9.1	9.9	40.0	17.1	17.9
81.360	8.0	5.4	6.8	40.0	13.4	14.8
94.920	9.5	8.8	10.6	43.5	18.3	20.1
108.480	10.7	12.4	9.7	43.5	23.1	20.4
122.040	11.8	6.1	3.4	43.5	17.9	15.2
135.600	12.8	16.1	12.4	43.5	28.9	25.2
149.160	13.7	0.8	< 0.0	43.5	14.5	< 13.7
162.720	14.5	10.5	6.9	43.5	25.0	21.4
176.280	15.2	4.9	< 0.0	43.5	20.1	< 15.2
189.840	15.9	5.0	< 0.0	43.5	20.9	< 15.9
203.400	16.6	1.7	< 0.0	43.5	18.3	< 16.6
216.960	17.2	4.3	< 0.0	46.0	21.5	< 17.2
230.520	17.8	< 0.0	< 0.0	46.0	< 17.8	< 17.8
244.080	18.3	4.8	1.3	46.0	23.1	19.6
250.589	18.6	9.5	6.1	46.0	28.1	24.7
257.640	18.9	< 0.0	< 0.0	46.0	< 18.9	< 18.9
266.757	19.2	9.7	6.3	46.0	28.9	25.5
271.200	19.4	5.4	2.6	46.0	24.8	22.0
282.927	19.8	8.0	6.6	46.0	27.8	26.4
284.760	19.8	0.4	< 0.0	46.0	20.2	< 19.8
298.320	20.3	6.3	3.7	46.0	26.6	24.0
299.084	20.3	8.4	7.6	46.0	28.7	27.9
311.880	20.7	3.1	0.8	46.0	23.8	21.5
315.285	20.8	9.7	7.6	46.0	30.5	28.4
325.440	21.1	6.5	4.7	46.0	27.6	25.8
331.428	21.3	9.7	8.2	46.0	31.0	29.5
339.000	21.5	3.5	3.1	46.0	25.0	24.6
352.560	21.9	9.3	8.3	46.0	31.2	30.2

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading		Limits (dBμV/m)	Field Strength at 3 m	
		Horiz. (dBμV)	Vert. (dBμV)		Horiz. (dBμV/m)	Vert. (dBμV/m)
366.120	22.3	3.4	2.6	46.0	25.7	24.9
379.680	22.6	10.2	9.8	46.0	32.8	32.4
393.240	23.0	< 0.0	< 0.0	46.0	< 23.0	< 23.0
406.800	23.3	7.9	8.9	46.0	31.2	32.2
420.360	23.6	5.4	8.0	46.0	29.0	31.6
433.920	24.0	6.5	9.8	46.0	30.5	33.8
447.480	24.3	7.5	8.3	46.0	31.8	32.6
461.040	24.6	5.7	6.6	46.0	30.3	31.2
474.600	24.9	7.2	4.0	46.0	32.1	28.9
488.160	25.1	1.3	0.8	46.0	26.4	25.9
501.720	25.4	5.6	8.3	46.0	31.0	33.7
515.280	25.7	< 0.0	< 0.0	46.0	< 25.7	< 25.7
528.840	25.9	4.7	7.7	46.0	30.6	33.6
541.636	26.2	4.1	6.6	46.0	30.3	32.8
542.400	26.2	0.8	3.4	46.0	27.0	29.6
549.719	26.3	3.2	5.7	46.0	29.5	32.0
555.960	26.4	1.0	2.3	46.0	27.4	28.7
565.888	26.6	5.1	7.1	46.0	31.7	33.7
569.520	26.7	2.1	3.1	46.0	28.8	29.8
582.058	26.9	6.2	8.6	46.0	33.1	35.5
583.080	27.0	1.3	2.3	46.0	28.3	29.3
596.640	27.2	1.0	2.6	46.0	28.2	29.8
598.226	27.2	7.0	9.0	46.0	34.2	36.2
610.200	27.4	1.2	0.8	46.0	28.6	28.2
614.350	27.5	5.9	8.5	46.0	33.4	36.0
623.760	27.7	0.6	1.3	46.0	28.3	29.0
630.518	27.8	4.5	6.2	46.0	32.3	34.0
637.320	27.9	0.6	2.5	46.0	28.5	30.4
646.709	28.1	5.0	3.8	46.0	33.1	31.9
650.880	28.2	0.9	0.3	46.0	29.1	28.5
662.878	28.4	6.4	5.3	46.0	34.8	33.7
664.440	28.4	< 0.0	< 0.0	46.0	< 28.4	< 28.4
678.000	28.6	0.8	0.4	46.0	29.4	29.0
679.049	28.7	6.6	4.8	46.0	35.3	33.5
691.560	28.9	2.1	2.1	46.0	31.0	31.0
695.221	28.9	5.7	5.0	46.0	34.6	33.9
705.120	29.1	0.3	1.3	46.0	29.4	30.4
711.390	29.2	4.6	3.5	46.0	33.8	32.7

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading		Limits (dBμV/m)	Field Strength at 3 m	
		Horiz. (dBμV)	Vert. (dBμV)		Horiz. (dBμV/m)	Vert. (dBμV/m)
718.680	29.3	2.7	1.8	46.0	32.0	31.1
727.562	29.5	2.8	2.3	46.0	32.3	31.8
732.240	29.5	2.6	2.1	46.0	32.1	31.6
745.800	29.8	1.8	< 0.0	46.0	31.6	< 29.8
759.360	30.0	2.3	2.2	46.0	32.3	32.2
772.920	30.2	0.9	< 0.0	46.0	31.1	< 30.2
786.480	30.4	1.4	2.4	46.0	31.8	32.8
800.040	30.6	0.3	< 0.0	46.0	30.9	< 30.6
813.600	30.9	< 0.0	1.3	46.0	< 30.9	32.2
827.160	31.1	2.4	1.7	46.0	33.5	32.8
840.720	31.3	< 0.0	0.1	46.0	< 31.3	31.4
854.280	31.5	3.1	4.1	46.0	34.6	35.6
867.840	31.7	< 0.0	< 0.0	46.0	< 31.7	< 31.7
881.400	31.9	4.5	5.2	46.0	36.4	37.1
894.960	32.1	< 0.0	< 0.0	46.0	< 32.1	< 32.1
908.520	32.3	0.5	2.6	46.0	32.8	34.9
922.080	32.5	< 0.0	< 0.0	46.0	< 32.5	< 32.5
935.640	32.7	2.8	6.4	46.0	35.5	39.1
949.200	32.9	< 0.0	< 0.0	46.0	< 32.9	< 32.9
962.760	33.1	5.4	7.0	54.0	38.5	40.1
976.320	33.3	< 0.0	< 0.0	54.0	< 33.3	< 33.3
989.880	33.5	3.4	4.9	54.0	36.9	38.4

Note: 1. The spectrum was checked from 30 MHz to 1000 MHz.

All emissions not listed were found to be more than 20 dB below the limits.

2. The symbol of "<" means "or less".

3. The cable loss was included in the antenna factor.

4. Sample calculation :

at 40.680 MHz

$$Af + Mr = 1.7 + 6.1 = 7.8 \text{ dB}\mu\text{V/m}$$

Where,

Af = Antenna Factor including the cable loss.

Mr = Meter Reading

5. Measuring Instrument Setting:

Harmonics & other Frequency components

Detector function : CISPR quasi-peak

IF Bandwidth : 120 kHz

Tested by :

Shigeru Osawa

Shigeru Osawa

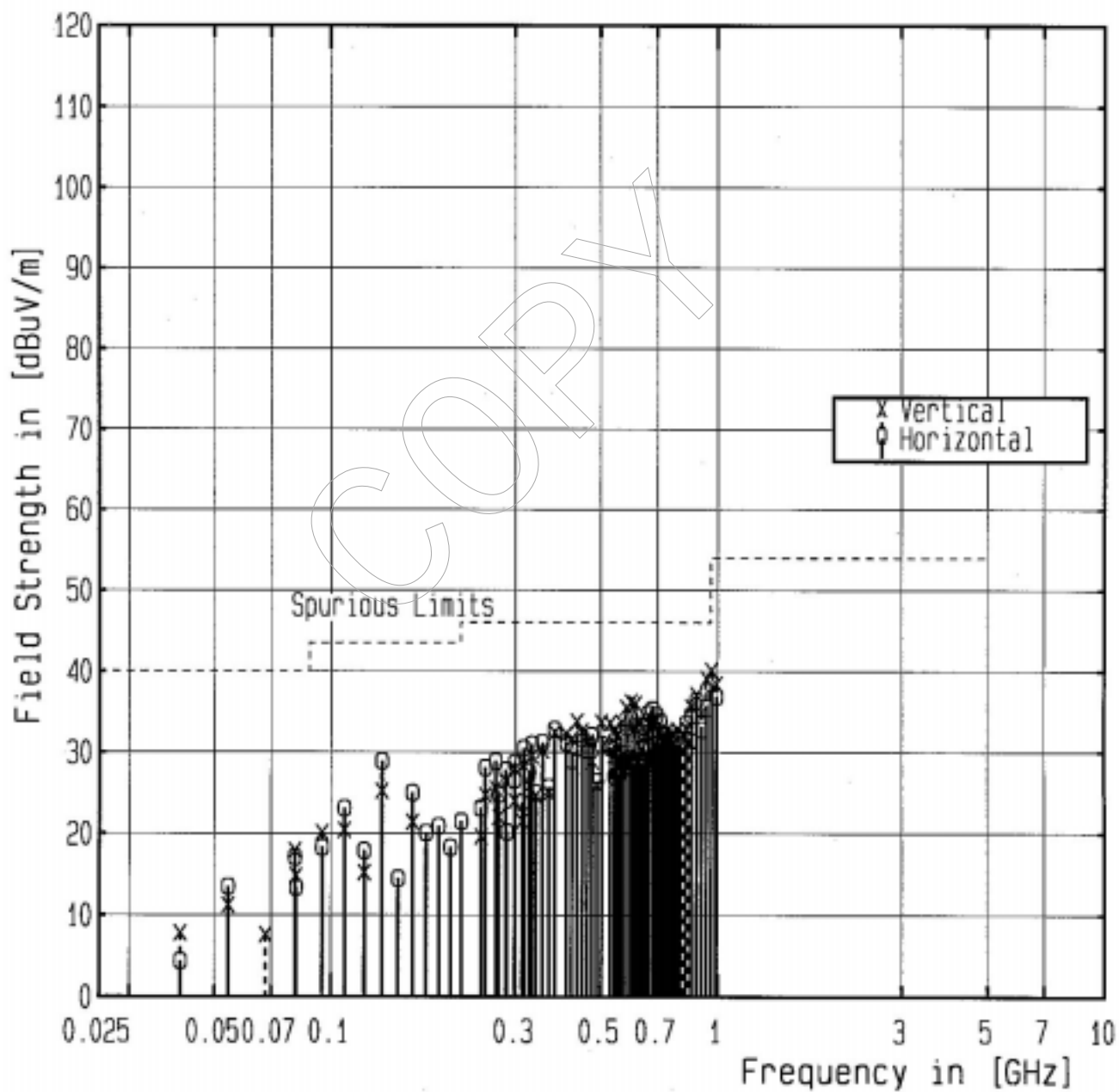
Testing Engineer

Radiated Spurious Emissions

Model No. : SF-F1

Operating Frequency : 13.56 MHz

Test Condition :





2.3 Frequency Stability Measurement

Date : August 4, 1999
Temp.: 24 °C Humi.: 70 %

OPERATING FREQUENCY : 13.56 MHz

Ambient Temperature (°C)	Frequency tolerance with time elapse(%)			
	0 minute	2 minutes	5 minutes	10 minutes
-20	+0.00014	+0.00016	+0.00018	+0.00021
+20	+0.00135	+0.00136	+0.00137	+0.00137
+50	+0.00160	+0.00163	+0.00165	+0.00167

Power Supply : 4.5VDC(Battery)
Specified Limit $\pm 0.01\%$

Tested by :

Shigeru Osawa

Shigeru Osawa
Testing Engineer



JQA Application No. :80-90247

Model No. :SF-F1

Standard :CFR 47 FCC Rules Part 15

FCC ID :AK8SFF1

Issue Date :August 10, 1999

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2.4 Occupied Bandwidth Measurement

Date : August 4, 1999

Temp.: 25 °C Humi.: 60 %

Measurements Results : Refer to the attached graphs.

Tested by :

Shigeru Osawa

Shigeru Osawa

Testing Engineer

COPY

Emission Limitation

FCC ID : AK8SFF1
 Model : SF-F1

Mode of EUT : Transmit
 Internal modulation

