



JAPAN QUALITY ASSURANCE ORGANIZATION

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JQA APPLICATION NO.: 400-00230

Issue Date : July 13, 2000

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EMI TEST REPORT

JQA APPLICATION NO. : 400-00230

Model No. : B12UE

Type of Equipment : RF Receiver

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : MOZB12UE

Applicant : TOKAI RIKI CO., LTD.

Address : 260, Toyota 3-chome, Oguchi-cho, Niwa-gun,
Aichi-ken 480-0195, Japan

Manufacture : TOKAI RIKI CO., LTD.

Address : 260, Toyota 3-chome, Oguchi-cho, Niwa-gun,
Aichi-ken 480-0195, Japan

Received date of EUT : June 30, 2000

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 B (June 23, 1989) Low Power Communication Receiver

Test procedure :

AC power line conducted emission and radiated emission 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).
- Shielded Enclosure.

Expiration date of FCC test facility filing : June 04, 2002

2) EMC Engineering Dept. Testing Div. 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 : 200189-0 (Effective through : June 30, 2001)

1.2.2 Description of the Equipment Under Test (EUT) :

- | | |
|--------------------------------------|---|
| 1) Type of Equipment | : RF Receiver |
| 2) Product Type | : Production |
| 3) Category | : Low Power Communication Device Receiver |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : MOZB12UE |
| 6) Trade Name | : - |
| 7) Model No. | : B12UE |
| 8) Tuning Frequency Range | : 314 MHz |
| 9) Highest Frequency Used in the EUT | : 303.3 MHz |
| 10) Serial No. | : None |
| 11) Date of Manufacture | : - |
| 12) Power Rating | : DC 5.0V |
| 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.

☒ - 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
☐ - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	Sep. 1999	1 Year
☐ - Test Receiver	ESH-3	Rohde & Schwarz	881460/030	June 2000	1 Year
☐ - LISN(for Peripheral)	KNW-407	Kyoritsu Electrical	8-833-6	Apr. 2000	1 Year
☐ - LISN(for EUT)	KNW-407	Kyoritsu Electrical	8-855-2	Apr. 2000	1 Year
☐ - LISN	KNW-407	Kyoritsu Electrical	8-757-1	Apr. 2000	1 Year
☐ - RF Cable	3D-2W	Fujikura	155-21-006E0	Apr. 2000	1 Year
☐ - RF Cable	3D-2W	Fujikura	155-21-007E0	Apr. 2000	1 Year
☐ - 50ohm Termination		SUHNER	154-06-501E0	Jan. 2000	1 Year
☐ - 50ohm Termination		SUHNER	154-06-502E0	Jan. 2000	1 Year

1.3.2 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

 x - Anechoic Chamber No. 2 (3 meters)

 - Anechoic Chamber No. 3 (3 meters)

Validation of Site Attenuation :

1) Last Confirmed Date :March, 2000

2) Interval :1 year

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
<u> </u> - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	Sep. 1999	1 Year
<u> </u> - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2000	1 Year
<u> </u> - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	June 2000	1 Year
<u> x </u> - Test Receiver	ESVP	Rohde & Schwarz	881487/004	May 2000	1 Year
<u> </u> - Test Receiver	ESVP	Rohde & Schwarz	881487/005	May 2000	1 Year
<u> x </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-170-1	Nov. 1999	1 Year
<u> </u> - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 1999	1 Year
<u> x </u> - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 1999	1 Year
<u> </u> - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 1999	1 Year
<u> </u> - Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	May 2000	1 Year
<u> </u> - Biconical Antenna	BBA9106	Schwarzbeck	11905078E0	May 2000	1 Year
<u> </u> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905079E0	May 2000	1 Year
<u> </u> - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905110	May 2000	1 Year
<u> x </u> - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2000	1 Year
<u> </u> - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2000	1 Year

1.3.3 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 :N/A

2) Interval :N/A

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
___ - Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	May 2000	1 Year
___ - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Sep. 1999	1 Year
___ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2000	1 Year
___ - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Apr. 2000	1 Year
___ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	June 2000	1 Year
___ - RF Pre-selector	85685A	Hewlett Packard	2091A00933	June 2000	1 Year
___ - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Nov. 1999	1 Year
___ - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	Jun. 1999	1 Year
___ - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	June 2000	1 Year
___ - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	June 2000	1 Year
___ - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	June 2000	1 Year
___ - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 2000	1 Year
___ - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2000	1 Year
___ - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2000	1 Year



1.4 EUT MODIFICATION / Deviation from Standard

1.4.1 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 :

1.4.2 Deviation from Standard:

- ☒ - 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 Power Line Conducted Emission ☐ - Applicable ☒ - NOT Applicable

The requirements are ☐ - PASSED ☐ - NOT PASSED

Min. Limit Margin	dB	at	MHz
Max. Limit Exceeding	dB	at	MHz
Uncertainty of Measurement Results	+ 2.3 dB		- 2.3 dB

Remarks :

Radiated Emission [§15.109(a)] ☒ - Applicable ☐ - NOT Applicable

The requirements are ☒ - PASSED ☐ - NOT PASSED

Min. Limit Margin	4.3 dB	at	303.30 MHz
Max. Limit Exceeding	dB	at	MHz
Uncertainty of Measurement Results	+ 3.2 dB		- 3.2 dB

Remarks:

1.6 SUMMARY

General Remarks :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and B (June 23, 1989) 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;

- ☒ - 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 11, 2000

End of testing : July 11, 2000

- JAPAN QUALITY ASSURANCE ORGANIZATION -
Approved by:

Signatories:
Issued by:



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 :

Symbol	Item	Manufacturer	Model No.	FCC ID	Serial No.
A	RF Receiver	TOKAI RIKA CO., LTD.	B12UE	MOZB12UE	-

The measurements was carried out with the following supported connected :

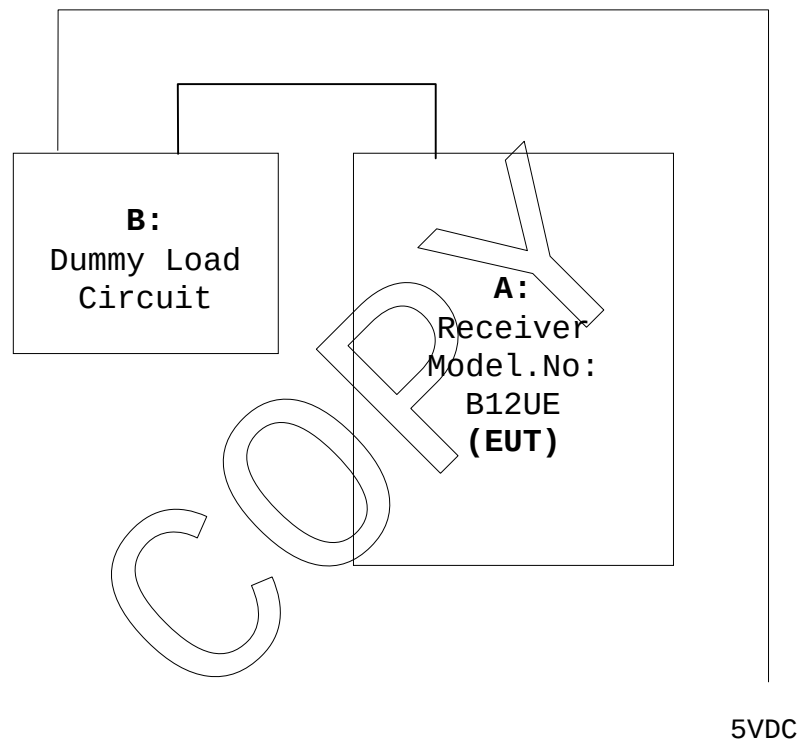
Symbol	Item	Manufacturer	Model No.	Serial No.
B	Dummy Load Circuit	TOKAI RIKA CO., LTD.	-	-

1.7.2 Operating condition

Power supply Voltage : DC 5.0V

The tests have been carried out under the receiving condition.

COPY

1.8 EUT ARRANGEMENT (DRAWINGS)

1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

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

According to description of ANSI C63.4-1992 sec.7.2.3, the AC power line preliminary conducted emissions measurements were carried out.

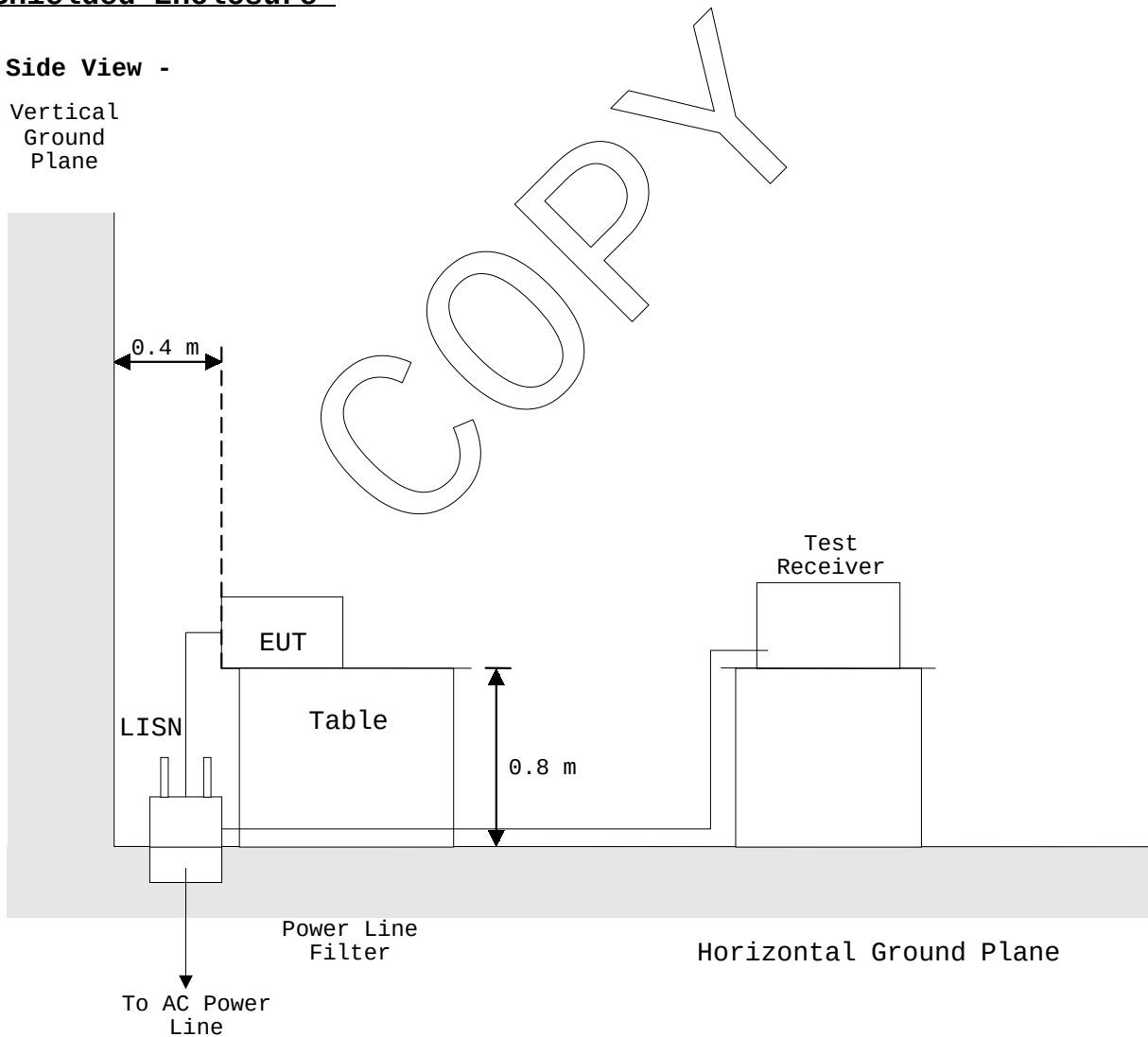
The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

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



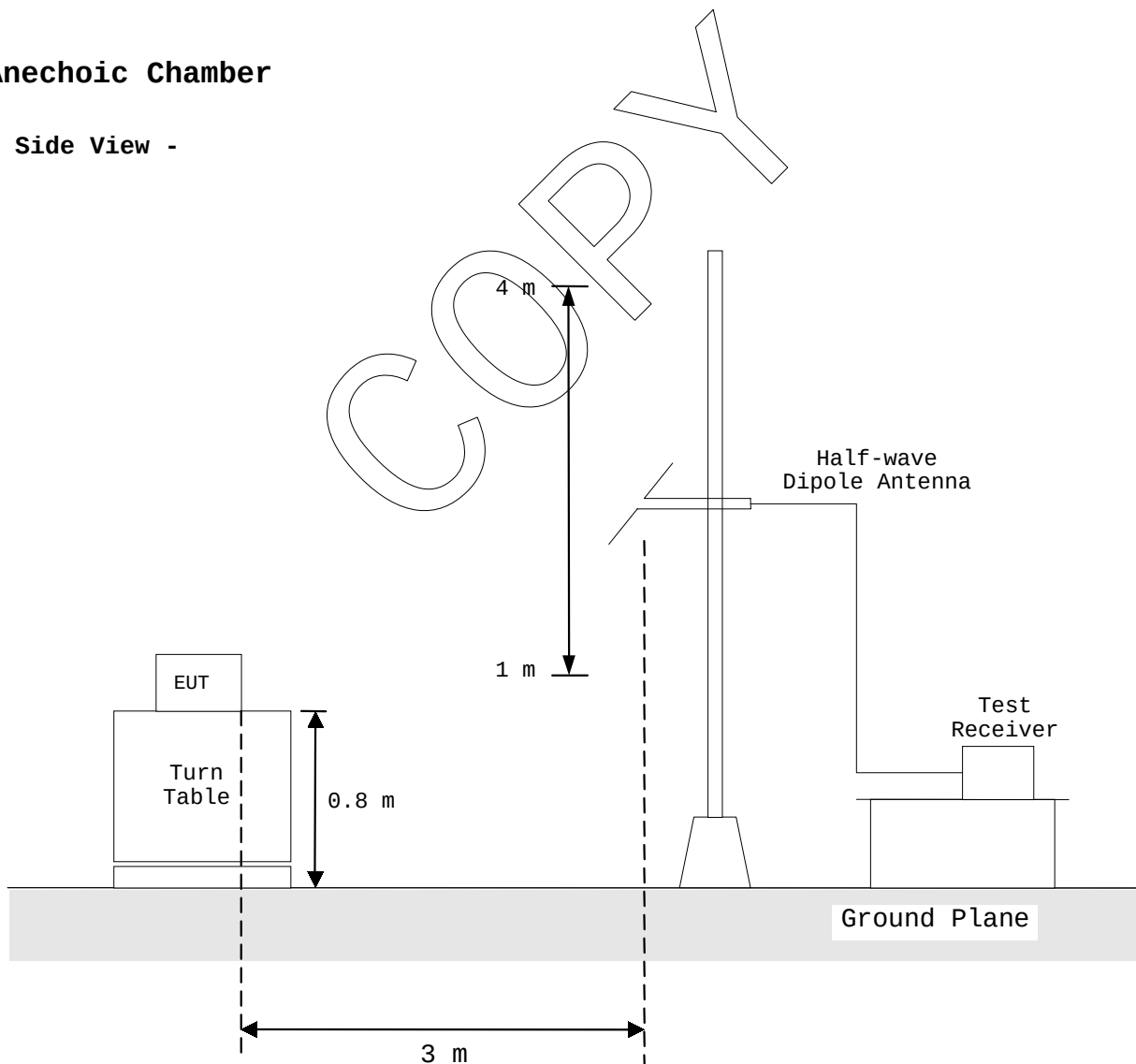
1.9.2 Radiated Emission (30 MHz - 1000 MHz) :

According to description of ANSI C63.4-1992 sec.8.3.1.1, 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 -



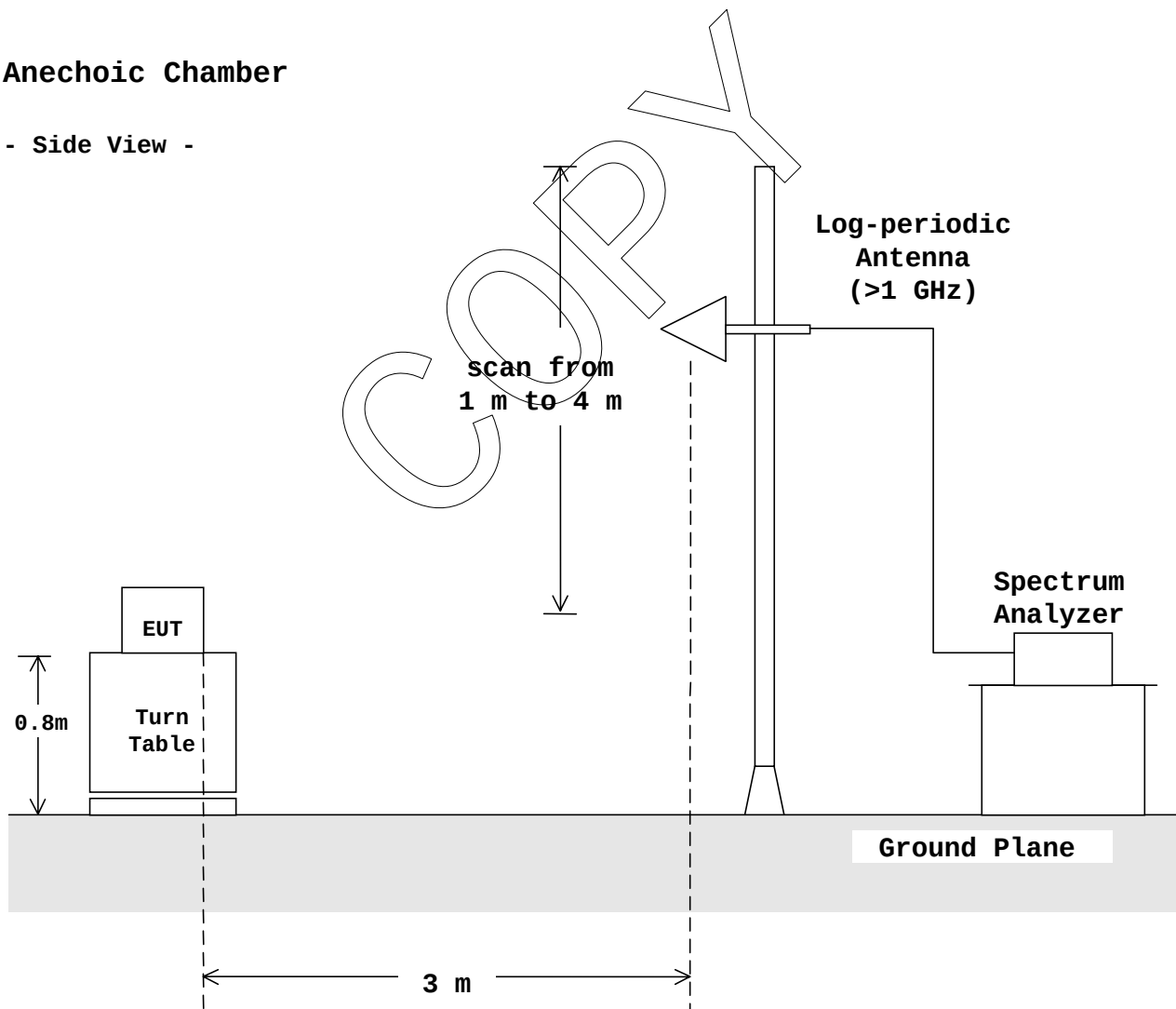
1.9.3 Radiated Emission (Above 1 GHz) :

According to description of ANSI C63.4-1992 sec.8.3.1.1, 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.

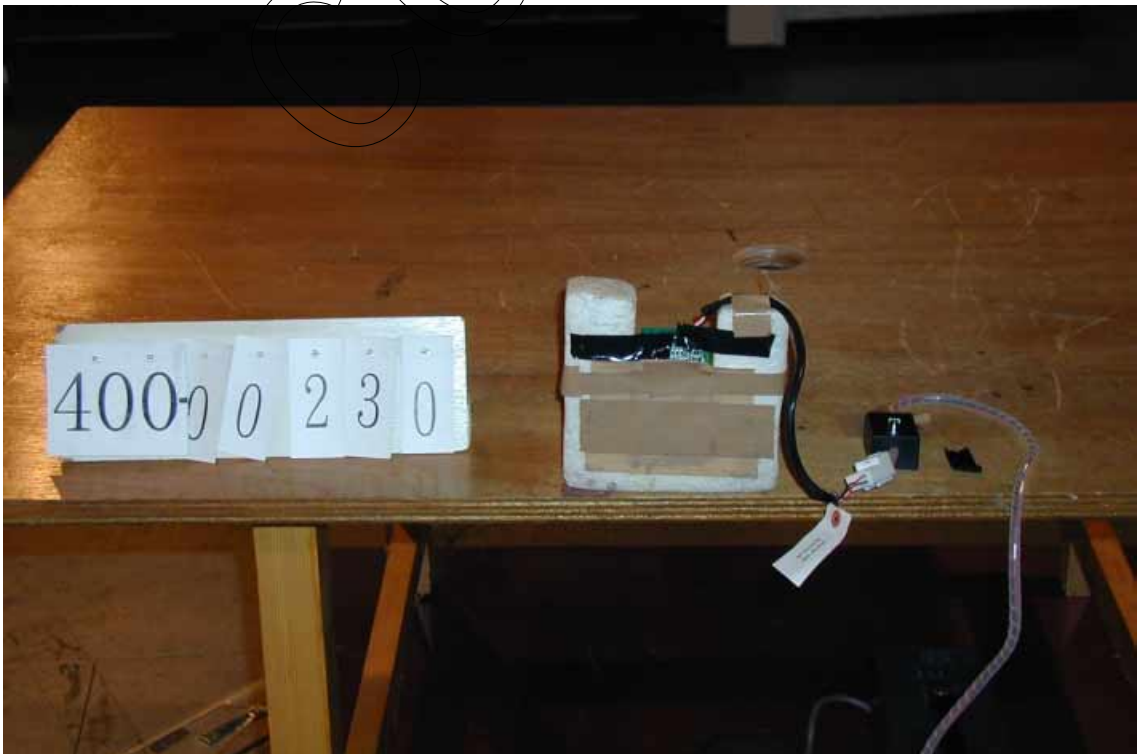
Anechoic Chamber

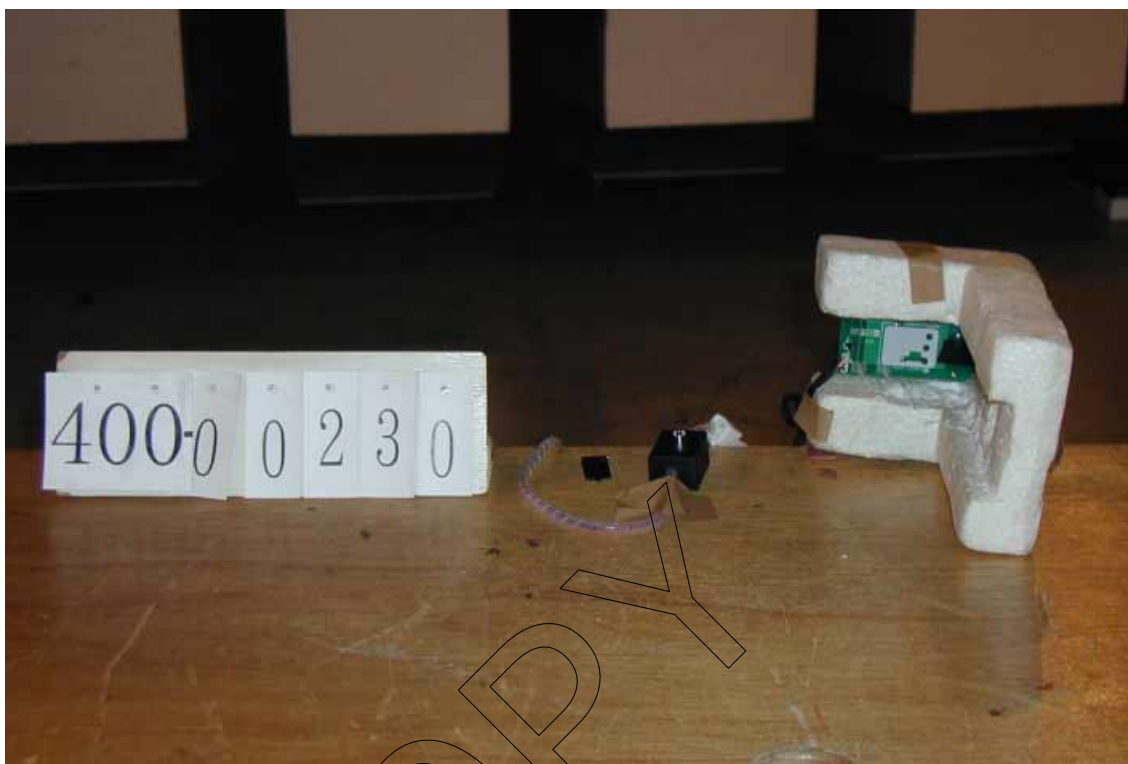
- Side View -



1.10 TEST ARRANGEMENT (PHOTOGRAPHS)**PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT**

Photograph present configuration with maximum emission





TEST DATA

2.2 Radiated Emissions Measurement(30 MHz - 1000 MHz)

Date : July 11, 2000

Temp.: 24 °C Humi.: 66 %

Tuning Frequency : 314 MHz

Distance of Measurement : 3.0 meters

Frequency (MHz)	Antenna Factor (dB/m)	Meter Reading		Limits (dBμV/m)	Field Strength at 3 m		Margins	
		Horiz. (dBμV)	Vert. (dBμV)		Horiz. (dBμV/m)	Vert. (dBμV/m)	Horiz. (dB)	Vert. (dB)
303.30	20.4	21.3	17.3	46.0	41.7	37.7	4.3	8.3
606.60	27.4	< 0.0	< 0.0	46.0	< 27.4	< 27.4	> 18.6	> 18.6
909.90	32.3	< 0.0	< 0.0	46.0	< 32.4	< 32.4	> 13.6	> 13.6

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 303.30 MHz

$$Af + Mr = 20.4 + 21.3 = 41.7 \text{ dB}\mu\text{V/m}$$

Where,

Af = Antenna Factor including the cable loss.

Mr = Meter Reading

5. Measuring Instrument Setting:

Detector function : CISPR quasi-peak

IF Bandwidth : 120 kHz

Tested by :



Shigeru Osawa

Testing Engineer

Radiated Spurious Emissions

FCC ID : MOZB12UE

Tuning Frequency : 314 MHz

Test Condition :

