JAPAN QUALITY ASSURANCE ORGANIZATION
21-25, KINUTA 1-CHOME, SETAGAYA-KU, TOKYO 157-8573 JAPAN
PHONE (03) 3416-0111, FAX (03) 3416-9691

EMI TEST REPORT

JQA APPLICATION NO.	: 400-20814
Model No.	: B31UG
Type of Equipment	: Tuner
Regulations Applied	: CFR 47 FCC Rules and Regulations Part 15
FCC ID	: MOZB31UG
Applicant	: Tokai Rika Co., Ltd.
Address	: 260, Toyota 3-chome, Oguchi-cho, Niwa-gun, Aichi-ken 480-0195, Japan
Manufacture	: Tokai Rika Co., Ltd.
Address	: 260, Toyota 3-chome, Oguchi-cho, Niwa-gun, Aichi-ken 480-0195, Japan
Received date of EUT	: February 21, 2003
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.

TABLE OF CONTENTS

1 DOCUMENTATION

1.1 TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and B (June 23, 1989) All other Tuners subject to part 15

Test procedure :

AC power line conducted emission, radiated emission and antenna conducted power 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 : May 27, 2005

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, 2003)

1.2.2 Description of the Equipment Under Test (EUT) :

1)	Type of Equipment	: Tuner (Receiver, Single Superheterodyne)
2)	Product Type	: Production
3)	Category	: All other Tuners subject to part 15
4)	EUT Authorization	: Certification
5)	FCC ID	: MOZB31UG
6)	Trade Name	: -
7)	Model No.	: B31UG
8)	Tuning Frequency Range	: 312.15 MHz
9)	Highest Frequency Used in the EUT	: 301.45 MHz
10)	Serial No.	: None
11)	Date of Manufacture	: None
12)	Power Rating	: 5 VDC
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 Power Line Conducted Emission

___ - was performed in the following test site.
_x_ - was not applicable.

Test location :

Safety & EMC 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	**Number of test instruments (Refer to Appendix)**
Test Tuner	
Spectrum Analyzer	
Cable	
AMN(for EUT)	
AMN(for Peripheral)	
Termination	

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 & EMC 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, 2002
2) Interval :1 year

Used test instruments :

Type	**Number of test instruments (Refer to Appendix)**
Test Tuner	TR05
Antenna	AN06, AN08
Cable	CA01
RF Amplifier	N/A

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 & EMC 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	**Number of test instruments (Refer to Appendix)**
Test Tuner	
Spectrum Analyzer	
Cable	
Antenna	
RF Amplifier	

1.3.4 The measurement of the Antenna Conducted Power

___ - was performed in the following test site.
_x_ - was not applicable.

Test location :

Safety & EMC 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	**Number of test instruments (Refer to Appendix)**
Test Tuner	
Spectrum Analyzer	
Cable	
Antenna	
RF Amplifier	

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 Power Line Conducted Emission ___ **- Applicable** x **- NOT Applicable**

The requirements are ___ **- PASSED** ___ **- NOT PASSED**

Min. Limit Margin dB at MHz
Max. Limit Exceeding dB at MHz

Uncertainty of Measurement Results +/- 2.4 dB (level of confidence:95%)

Remarks :

Radiated Emission [§15.109(a)] x **- Applicable** ___ **- NOT Applicable**

The requirements are x **- PASSED** ___ **- NOT PASSED**

Min. Limit Margin More than 19.2 dB at 904.4 MHz
Max. Limit Exceeding dB at MHz

Uncertainty of Measurement Results
Biconical Antenna +/- 3.8 dB (level of confidence:95%)
Log-Periodic Antenna +/- 4.7 dB (level of confidence:95%)
Half Wave Dipole Antenna +/- 3.4 dB (level of confidence:95%)

Remarks:

Antenna Conducted Power [§15.111] ___ **- Applicable** x **- NOT Applicable**

The requirements are ___ **- PASSED** ___ **- NOT PASSED**

Min. Limit Margin dB at MHz
Max. Limit Exceeding dB at MHz

Uncertainty of Measurement Results +/- 2.1 dB (level of confidence:95%)

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 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 : February 26, 2003

End of testing : February 26, 2003

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved by:

Masaaki Takahashi
Senior Manager
JQA EMC Engineering Dept.

Signatories:
Issued by:

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	Tuner	Tokai Rika Co., Ltd.	B31UG	MOZB31UG	None

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

Symbol	Item	Manufacturer	Model No.	Serial No.
B	Simulator	Tokai Rika Co., Ltd.	None	None
C	DC Power Supply	Kikusui	PAB18-2.5DU	30061305

Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Connector type Shielded YES / NO	Length (m)
1	Cable	-	NO	NO	NO	1.5
2	DC Cable	-	NO	NO	NO	1.5
3	DC Cable	-	NO	NO	NO	1.5
4	AC Cable	-	NO	NO	NO	1.8

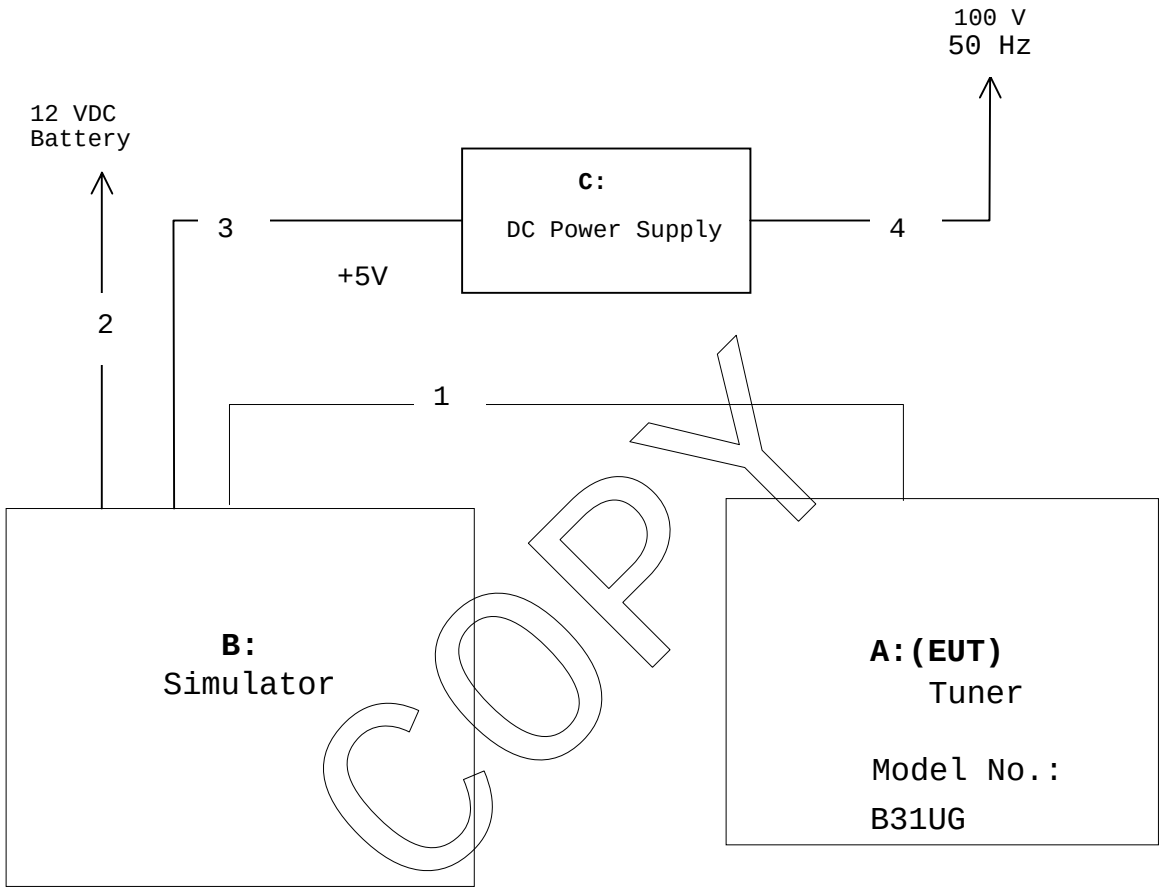
1.7.2 Operating condition

Power supply Voltage : DC 5V and 12V
The tests have been carried out under the receiving condition.

1.7.3 Generating and Operating frequency of EUT

60.29 MHz and 301.45 MHz

1.8 EUT ARRANGEMENT (DRAWINGS)



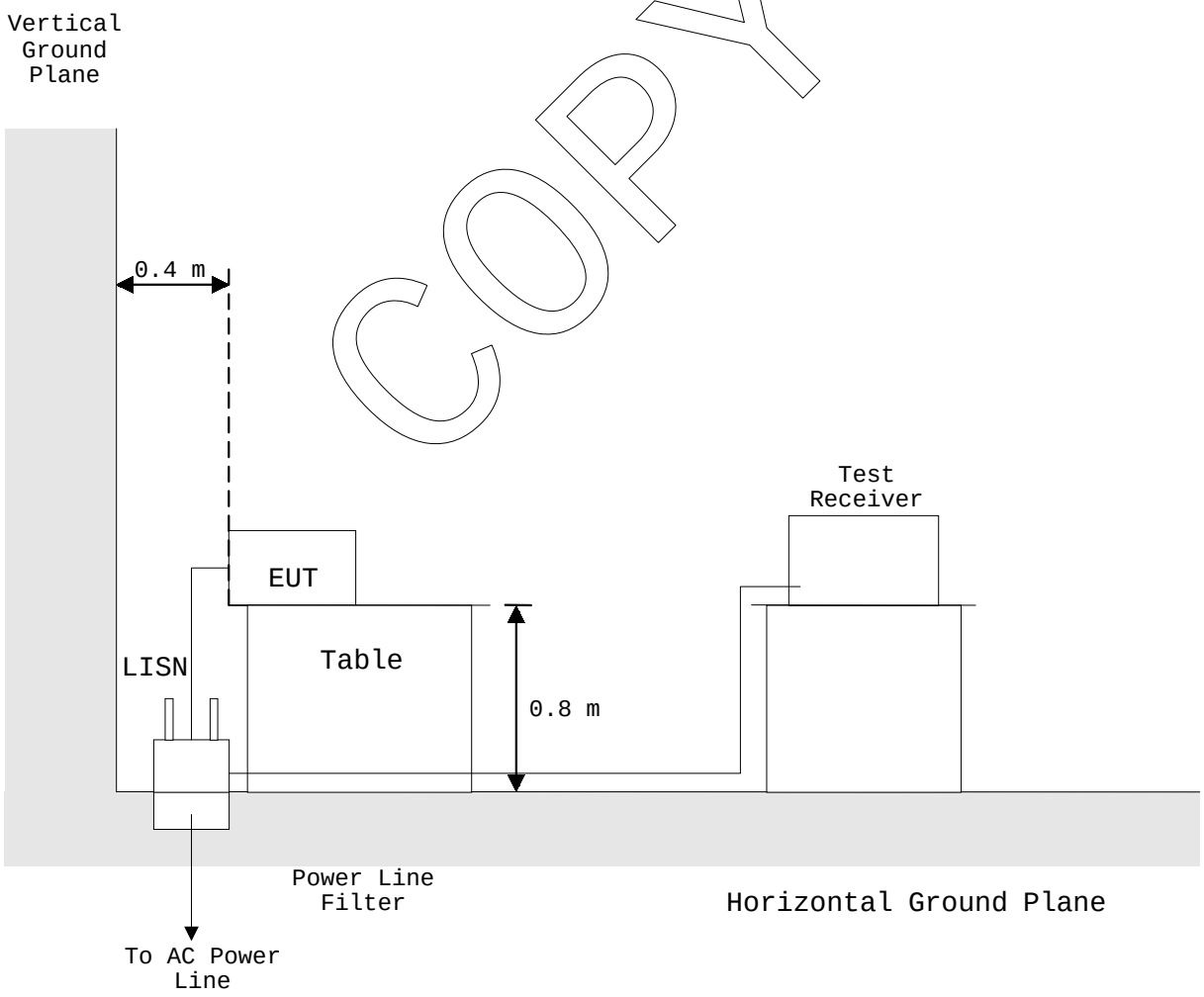
1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

1.9.1 AC Power Line Conducted Emission (150 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 -

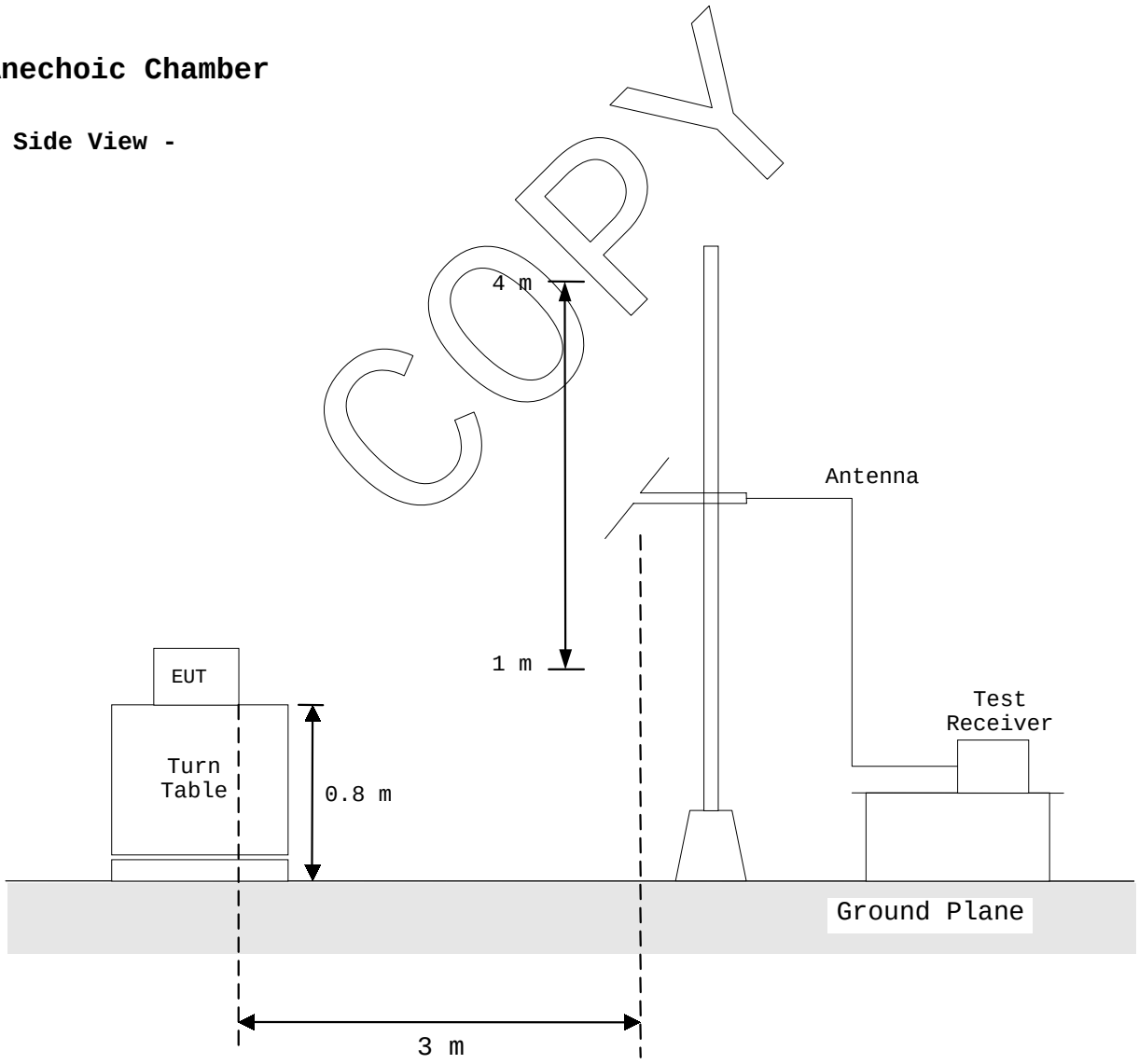


1.9.2 Radiated Emission (30 MHz – 1000 MHz) :

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 -

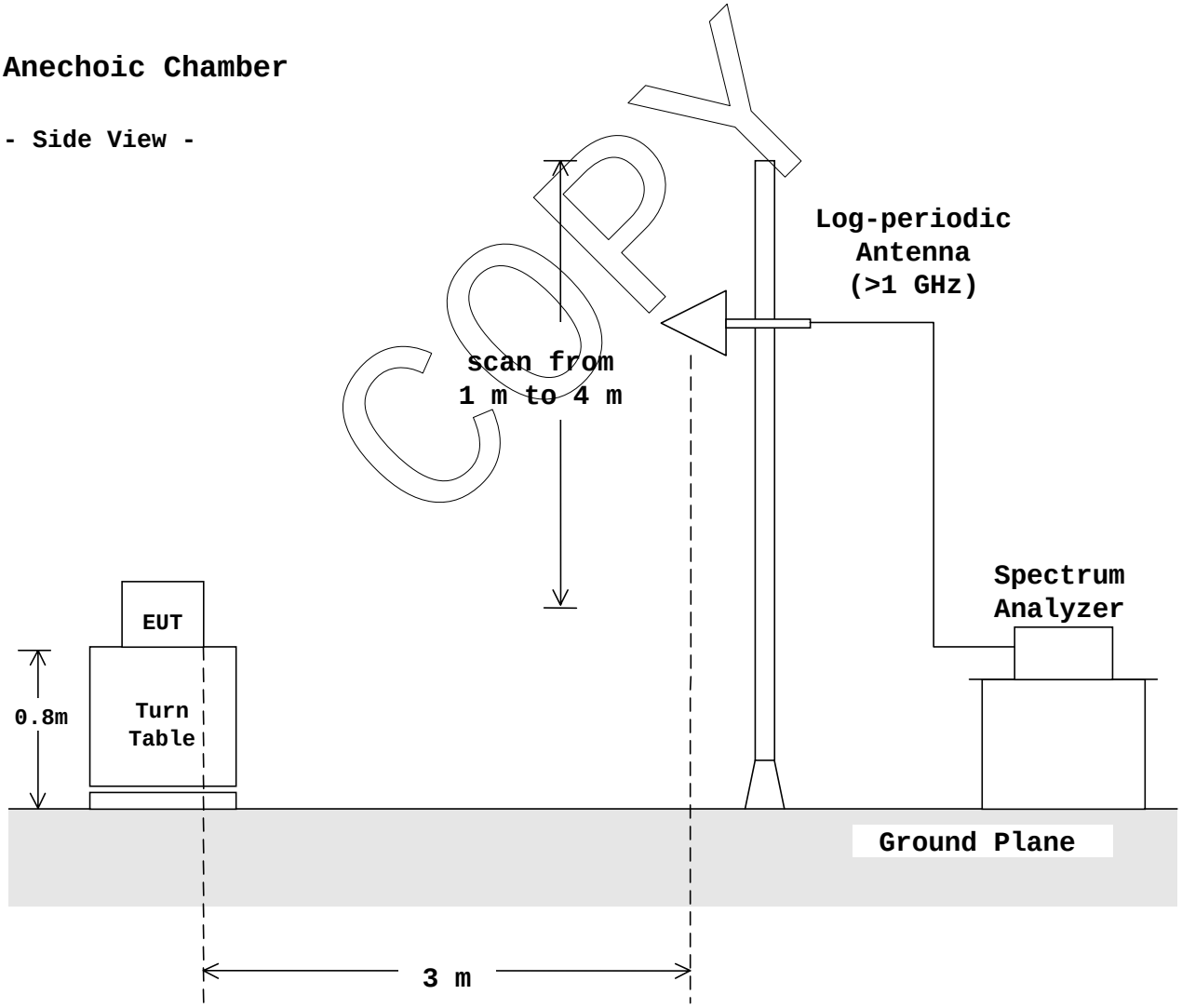


1.9.3 Radiated Emission (Above 1 GHz) :

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 -

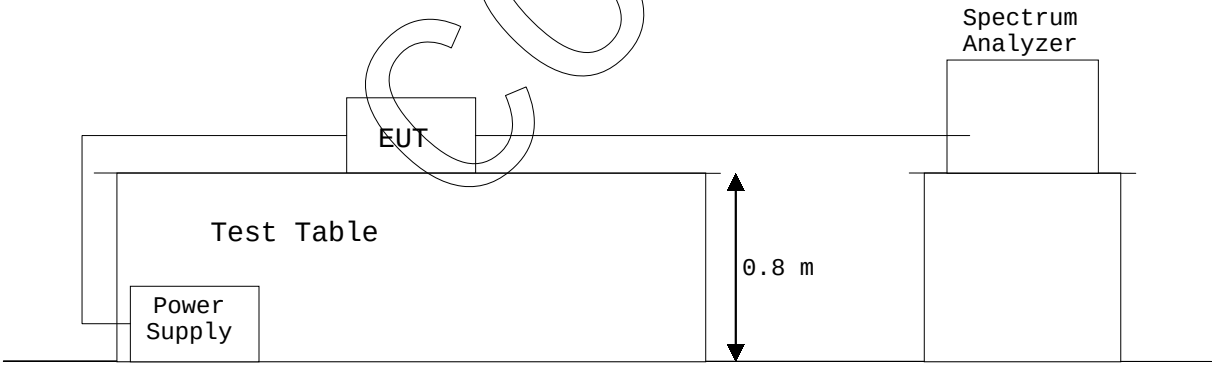


1.9.4 Antenna Conducted Power :

According to description of ANSI C63.4-1992 sec.12.1.5, the antenna conducted power measurements were carried out.
Antenna-conducted power measurements shall be performed with the EUT antenna terminals connected directly to either a spectrum analyzer or another measuring instrument, if the antenna impedance matches the impedance of the measuring instrument. Otherwise, use a balun or impedance-matching network to connect the measuring instrument to antenna terminals of the EUT. Losses in decibels in any balun or impedance-matching network used shall be added to the measured value in dBμV.

Shielded Enclosure

- Side View -



1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission

TEST DATA

2.1 AC Power Line Conducted Emissions

Note : This test was not applicable.

2.2 Radiated Emissions Measurement

Tuning Frequency : 312.15 MHz
Distance of Measurement : 3.0 meters

Date : February 26, 2003
Temp. : 23 °C Humi. : 47 %

Frequency (MHz)	P-A Factor (dB)	Antenna Factor (dB)	Polarization	Meter Reading (dBuV) QP	AV	Peak	Limits (dBuV/m) QP/AV	Peak	Emission Levels (dBuV/m) QP/AV	Peak	Margins (dB) QP/AV	Peak
301.5	0.0	18.2	<	0.0	-	-	46.0	-	< 18.2	-	> 27.8	-
602.9	0.0	23.3	<	0.0	-	-	46.0	-	< 23.3	-	> 22.7	-
904.4	0.0	26.8	<	0.0	-	-	46.0	-	< 26.8	-	> 19.2	-

Notes :
1) The spectrum was checked from 30 MHz to 1000 MHz.
2) The cable loss is included in the antenna factor.
3) The symbol of "<"means "or less".
4) The symbol of ">"means "or greater".
5) A sample calculation(QP/AV) was made at 301.45 (MHz).
PA + Af + Mr = 0 + 18.2 + 0 = 18.2 (dBuV/m)
PA = Peak to Average Factor(P-A Factor)
Af = Antenna Factor
Mr = Meter Reading
6) Measuring Instrument Setting :

Detector function	Resolution Bandwidth	Video Bandwidth
Quasi-peak(QP)	120 kHz	-
Average(AV)	1 MHz	10 Hz
Peak	1 MHz	1 MHz

7) Frequency range of radiated emissions is based on section 15.33(b)(3).

Tested by : Y. Nakajima
Yoichi Nakajima
Testing Engineer

2.3 Antenna Conducted Power Measurement

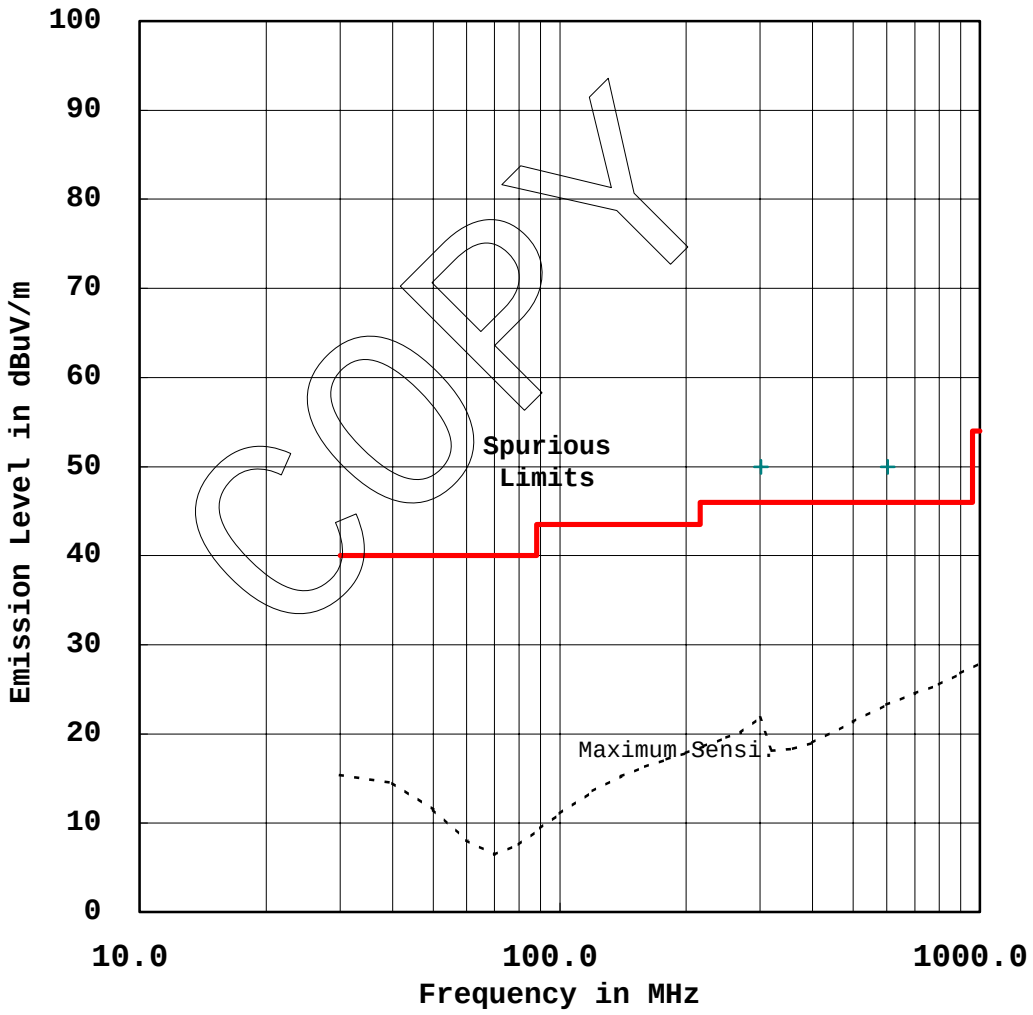
Note : This test was not applicable

RADIATED EMISSION MEASUREMENT

Model No. : B31UG

Standard : CFR 47 FCC Rules Part 15 O QP/AV

Tuning Frequency(MHz) : 312.15



Appendix

Test Instruments List

February 12, 2003

Test Tuners

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
TR01	Test Tuner	ESH2	Rohde & Schwarz	880370/016	119-01-503E0	May 2002	1 Year
TR02	Test Tuner	ESH3	Rohde & Schwarz	881460/030	119-01-023E0	May 2002	1 Year
TR03	Test Tuner	ESHS10	Rohde & Schwarz	835871/004	119-01-505E0	May 2002	1 Year
TR04	Test Tuner	ESV	Rohde & Schwarz	872148/039	119-03-008E0	May 2002	1 Year
TR05	Test Tuner	ESVS10	Rohde & Schwarz	826148/002	119-03-504E0	May 2002	1 Year
TR06	Test Tuner	ESVS10	Rohde & Schwarz	832699/001	119-03-506E0	May 2002	1 Year
TR07	Test Tuner	ESI26	Rohde & Schwarz	100043	119-04-511E0	Aug. 2002	1 Year

Spectrum Analyzers

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
SA01	Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	122-02-504E0	Oct. 2002	1 Year
SA02	Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	122-02-501E0	Oct. 2002	1 Year
SA03	RF Pre-selector	85685A	Hewlett Packard	2648A00522	122-02-503E0	Oct. 2002	1 Year
SA04	Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	122-02-517E0	Apr. 2002	1 Year
SA05	RF Pre-selector	85685A	Hewlett Packard	2901A00933	122-02-519E0	Apr. 2002	1 Year
SA06	Spectrum Analyzer	8568A	Hewlett Packard	1743A00140	122-02-508E0	Jun. 2002	1 Year
SA07	Spectrum Analyzer	R3132	ADVANTEST	120500072	122-02-520E0	Sep. 2002	1 Year

Antennas

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AN01	Loop Antenna	HFH2-Z2	Rohde & Schwarz	881058/61	119-05-036E0	Jun. 2002	1 Year
AN02	Dipole Antenna	KBA-511	Kyoritsu	0-170-1	119-05-506E0	Nov. 2002	1 Year
AN03	Dipole Antenna	KBA-511A	Kyoritsu	0-201-13	119-05-504E0	Nov. 2002	1 Year
AN04	Dipole Antenna	KBA-611	Kyoritsu	0-147-14	119-05-507E0	Nov. 2002	1 Year
AN05	Dipole Antenna	KBA-611	Kyoritsu	0-201-5	119-05-505E0	Nov. 2002	1 Year
AN06	Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	119-05-111E0	Nov. 2002	1 Year
AN07	Biconical Antenna	BBA9106	Schwarzbeck	-	119-05-078E0	Nov. 2002	1 Year
AN08	Log-peri. Antenna	UHALP9107	Schwarzbeck	-	119-05-079E0	Nov. 2002	1 Year
AN09	Log-peri. Antenna	UHALP9107	Schwarzbeck	-	119-05-110E0	Nov. 2002	1 Year
AN10	Log-peri. Antenna	HL025	Rohde & Schwarz	340182/015	119-05-100E0	Jan. 2003	1 Year
AN11	Horn Antenna	3115	EMC Test Systems	6442	119-05-514E0	Jan. 2003	1 Year
AN12	Horn Antenna	3116	EMC Test Systems	2547	119-05-515E0	May 2002	1 Year

Networks

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
NE01	LISN	KNW-407	Kyoritsu	8-833-6	149-04-052E0	Apr. 2002	1 Year
NE02	LISN	KNW-407	Kyoritsu	8-855-2	149-04-055E0	Apr. 2002	1 Year
NE03	LISN	KNW-407	Kyoritsu	8-1130-6	149-04-062E0	Apr. 2002	1 Year
NE04	LISN	KNW-242C	Kyoritsu	8-837-13	149-04-054E0	Apr. 2002	1 Year

Cables

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
CA01	RF Cable	5D-2W	Fujikura	-	155-21-001E0	Feb. 2003	1 Year
CA02	RF Cable	5D-2W	Fujikura	-	155-21-002E0	Feb. 2003	1 Year
CA03	RF Cable	3D-2W	Fujikura	-	155-21-005E0	Apr. 2002	1 Year
CA04	RF Cable	3D-2W	Fujikura	-	155-21-006E0	Apr. 2002	1 Year
CA05	RF Cable	3D-2W	Fujikura	-	155-21-007E0	Apr. 2002	1 Year
CA06	RF Cable	RG-213/U	Rohde & Schwarz	-	155-21-010E0	Apr. 2002	1 Year
CA07	RF Cable(10m)	S 04272B	Suhner	-	155-21-011E0	May 2002	1 Year
CA08	RF Cable(2m 18GHz)	SUCOFLEX 104	Suhner	-	155-21-012E0	May 2002	1 Year
CA09	RF Cable(1m 18GHz)	SUCOFLEX 104	Suhner	-	155-21-013E0	May 2002	1 Year
CA10	RF Cable(1m N)	S 04272B	Suhner	-	155-21-015E0	May 2002	1 Year
CA11	RF Cable(1m 26GHz)	SUCOFLEX 104	Suhner	182811/4	155-21-016E0	Dec. 2002	1 Year
CA12	RF Cable(4m 26GHz)	SUCOFLEX 104	Suhner	190630	155-21-017E0	Dec. 2002	1 Year
CA13	RF Cable(10m)	F130-S1S1-394	MEGA PHASE	10510	155-21-018E0	Dec. 2002	1 Year

Amplifiers

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AM01	AF Amplifier	P-500L	Accuphase	BOY806	127-01-501E0	Feb. 2003	1 Year
AM02	RF Amplifier	8447D	Hewlett Packard	1937A02168	127-01-065E0	May 2002	1 Year
AM03	RF Amplifier	8447D	Hewlett Packard	2944A07289	127-01-509E0	May 2002	1 Year
AM05	RF Amplifier	DBP-0102N553	DBS Microwave	012	127-02-504E0	Jun. 2002	1 Year
AM06	RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	127-04-017E0	Jun. 2002	1 Year
AM07	RF Amplifier	WJ-5315-556	Watkins-Johnson	106	127-04-006E0	Jun. 2002	1 Year
AM08	RF Amplifier	WJ-5320-307	Watkins-Johnson	645	127-04-005E0	Jun. 2002	1 Year
AM09	RF Amplifier	JS4-00102600 -28-5A	MITEQ	669167	127-04-502E0	Apr. 2002	1 Year

Signal Generators

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
SG01	Function Generator	3325B	Hewlett Packard	2847A03284	118-08-124E0	Jul. 2002	1 Year
SG02	Function Generator	VP-7422A	Matsushita Communication	050351E122	118-08-503E0	Jul. 2002	1 Year
SG03	Signal Generator	8664A	Hewlett Packard	3035A00140	118-03-014E0	Jul. 2002	1 Year
SG04	Signal Generator	8664A	Hewlett Packard	3438A00756	118-04-502E0	Jul. 2002	1 Year
SG05	Signal Generator	6061A	Gigatronics	5130593	118-04-024E0	May 2002	1 Year

Auxiliary Equipment

No.	Type	Model	Manufacturer	Serial	ID	Last Cal.	Interval
AU01	Termination(50)	-	Suhner	-	154-06-501E0	Jan. 2003	1 Year
AU02	Termination(50)	-	Suhner	-	154-06-502E0	Jan. 2003	1 Year
AU03	Power Meter	436A	Hewlett Packard	1725A01930	100-02-501E0	Apr. 2002	1 Year
AU04	Power Sensor	8482A	Hewlett Packard	1551A01013	100-02-501E0	Apr. 2002	1 Year
AU05	Power Sensor	8485A	Hewlett Packard	2942A08969	100-04-021E0	Apr. 2002	1 Year
AU06	FM Linear Detector	MS61A	Anritsu	M77486	123-02-008E0	Oct. 2002	1 Year
AU07	Level Meter	ML422C	Anritsu	M87571	114-02-501E0	Jun. 2002	1 Year
AU08	Measuring Amplifier	2636	B & K	1614851	082-01-502E0	Jun. 2002	1 Year
AU09	Microphone	4134	B & K	1269477	147-01-503E0	May 2002	1 Year
AU10	Preamplifier	2639	B & K	1268763	127-01-504E0	May 2002	1 Year
AU11	Pistonphone	4220	B & K	1165008	147-02-501E0	Mar. 2002	1 Year
AU12	Artificial Mouth	4227	B & K	1274869	-	N/A	N/A
AU13	Frequency Counter	53131A	Hewlett Packard	3546A11807	102-02-075E0	May 2002	1 Year
AU14	Oven	-	Ohnishi	-	023-02-018E0	May 2002	1 Year
AU15	DC Power Supply	6628A	Hewlett Packard	3224A00284	072-05-503E0	Jun. 2002	1 Year
AU16	Band Reject Filter	BRM12294	Micro-tronics	003	149-01-501E0	Jan. 2003	1 Year
AU17	High Pass Filter	F-100-4000-5-R	RLC Electronics	0149	149-01-502E0	Feb. 2003	1 Year
AU18	Attenuator	43KC-10	Anritsu	-	148-03-506E0	Feb. 2003	1 Year
AU19	Attenuator	43KC-20	Anritsu	-	148-03-507E0	Feb. 2003	1 Year
AU20	Attenuator	355D	Hewlett Packard	219-10782	148-03-065E0	Apr. 2002	1 Year
AU21	FFT Analyzer	R9211C	Advantest	02020253	122-02-506E0	June 2002	1 Year
AU22	Noise Meter	MN-446	Meguro	53030478	082-01-144E0	May 2002	1 Year