



JQA APPLICATION NO.: 400-20473
Issue Date : September 24, 2002
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EMI TEST REPORT

JQA APPLICATION NO. : 400-20473

Model No. : G8C-501M

Type of Equipment : Keyless Entry System
(Receiver)

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

FCC ID : OUCG8C-501M

Applicant : OMRON Corporation

Address : 6368 Nenjo-zaka, Okusa Komaki-city,
Aichi 485-0802, Japan

Manufacturer : OMRON Corporation

Address : 6368 Nenjo-zaka, Okusa Komaki-city,
Aichi 485-0802, Japan

Received date of EUT : September 18, 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 respond to the tested sample. This report should not be reproduced except in full, without the written approval of 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) All other receivers 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 | : Keyless Entry System
(Receiver) |
| 2) Product Type | : Pre-production |
| 3) Category | : All other receivers subject to part 15 |
| 4) EUT Authorization | : Certification |
| 5) FCC ID | : OUCG8C-501M |
| 6) Trade Name | : OMRON |
| 7) Model No. | : G8C-501M |
| 8) Tuning Frequency Range | : 313.8 MHz - 313.9 MHz |
| 9) Highest Frequency Used in the EUT | : 324.55 MHz |
| 10) Serial No. | : None |
| 11) Date of Manufacture | : None |
| 12) Power Rating | : 12 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.

☒ - 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	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
☐ - Test Receiver	ESH-2	Rohde & Schwarz	880370/016	May 2002	1 Year
☐ - Test Receiver	ESH-3	Rohde & Schwarz	881460/030	May 2002	1 Year
☐ - Test Receiver	ESHS10	Rohde & Schwarz	835871/004	May 2002	1 Year
☐ - LISN(for Peripheral)	KNW-407	Kyoritsu Electrical	8-833-6	Apr. 2002	1 Year
☐ - LISN(for EUT)	KNW-407	Kyoritsu Electrical	8-855-2	Apr. 2002	1 Year
☐ - LISN	KNW-407	Kyoritsu Electrical	8-757-1	Apr. 2002	1 Year
☐ - RF Cable	3D-2W	Fujikura	155-21-006E0	Apr. 2002	1 Year
☐ - RF Cable	3D-2W	Fujikura	155-21-007E0	Apr. 2002	1 Year
☐ - 50ohm Termination	-	SUHNER	154-06-501E0	Jan. 2002	1 Year
☐ - 50ohm Termination	-	SUHNER	154-06-502E0	Jan. 2002	1 Year

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

- ☒ - 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

- ☒ - 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	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
☐ - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2091A00933	Apr. 2002	1 Year
☐ - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2002	1 Year
☒ - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	May 2002	1 Year
☐ - Test Receiver	ESVS10	Rohde & Schwarz	832699/001	May 2002	1 Year
☐ - Antenna	KBA-511	Kyoritsu Electrical	0-170-1	Nov. 2001	1 Year
☐ - Antenna	KBA-511A	Kyoritsu Electrical	0-201-13	Nov. 2001	1 Year
☐ - Antenna	KBA-611	Kyoritsu Electrical	0-147-14	Nov. 2001	1 Year
☐ - Antenna	KBA-611	Kyoritsu Electrical	0-210-5	Nov. 2001	1 Year
☒ - Biconical Antenna	BBA9106	Schwarzbeck	VHA91031150	Nov. 2001	1 Year
☐ - Biconical Antenna	BBA9106	Schwarzbeck	11905078E0	Nov. 2001	1 Year
☒ - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905079E0	Nov. 2001	1 Year
☐ - Log-Periodic Antenna	UHALP9107	Schwarzbeck	11905110	Nov. 2001	1 Year
☒ - RF Cable	5D-2W	Fujikura	155-21-001E0	Feb. 2002	1 Year
☐ - RF Cable	5D-2W	Fujikura	155-21-002E0	Feb. 2002	1 Year

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

- ☐ - 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

- ☐ - 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	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2091A00933	Apr. 2002	1 Year
☐ - Log-Periodic Antenna	HL 025	Rohde & Schwarz	340182/015	Jan. 2002	1 Year
☐ - RF Amplifier	DBP-0102N5334272B	DBS Microwave Inc.	012	June 2002	1 Year
☐ - RF Amplifier	WJ-6882-814	Watkins-Johnson	0414	June 2002	1 Year
☐ - RF Amplifier	WJ-5315-556	Watkins-Johnson	106	June 2002	1 Year
☐ - RF Amplifier	WJ-5320-307	Watkins-Johnson	645	June 2002	1 Year
☐ - RF Cable(10m)	S 04272B	Suhner	155-21-011E0	May 2002	1 Year
☐ - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2002	1 Year
☐ - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2002	1 Year
☐ - RF Cable(1m)	S 04272B	Suhner	155-21-015E0	June 2002	1 Year
☐ Test Receiver	ESI26	Rohde & Schwarz	100043	Aug. 2001	1 Year
☐ - RF Amplifier	JS4-00102600-28-5A	MITEQ	669167	Apr. 2002	1 Year
☐ - RF Cable(4m)	SUCOFLEX 104	Suhner	190630	Dec. 2001	1 Year
☐ - RF Cable(1m)	SUCOFLEX 104	Suhner	182811/4	Dec. 2001	1 Year
☐ - RF Cable(10m)	F130-S1S1-394	MEGA PHASE	10510	Dec. 2001	1 Year

1.3.4 The measurement of the Antenna Conducted Power

- ☐ - 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

- ☐ - Shielded Enclosure
☐ - Anechoic Chamber No. 2 (portable Type)

Used test instruments :

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
☐ - Test Receiver	ESV	Rohde & Schwarz	872148/039	May 2002	1 Year
☐ - Test Receiver	ESVS10	Rohde & Schwarz	826148/002	May 2002	1 Year
☐ - Test Receiver	ESVS10	Rohde & Schwarz	832699/001	May 2002	1 Year
☐ - Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Nov. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Mar. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2648A00522	Oct. 2001	1 Year
☐ - Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	Apr. 2002	1 Year
☐ - RF Pre-selector	85685A	Hewlett Packard	2091A00933	Apr. 2002	1 Year
☐ - RF Cable(2m)	SUCOFLEX 104	Suhner	155-21-012E0	May 2002	1 Year
☐ - RF Cable(1m)	SUCOFLEX 104	Suhner	155-21-013E0	May 2002	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 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 Greater than 20.0 dB at 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.

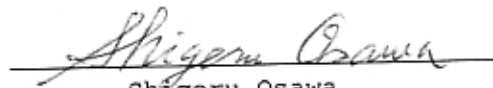
Begin of testing : September 20, 2002

End of testing : September 20, 2002

- 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	Keyless Entry System (Receiver)	OMRON Corporation	G8C-501M	OUCG8C-501M	None

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

Symbol	Item	Manufacturer	Model No.	Serial No.
B	Simulator	OMRON Corporation	None	None

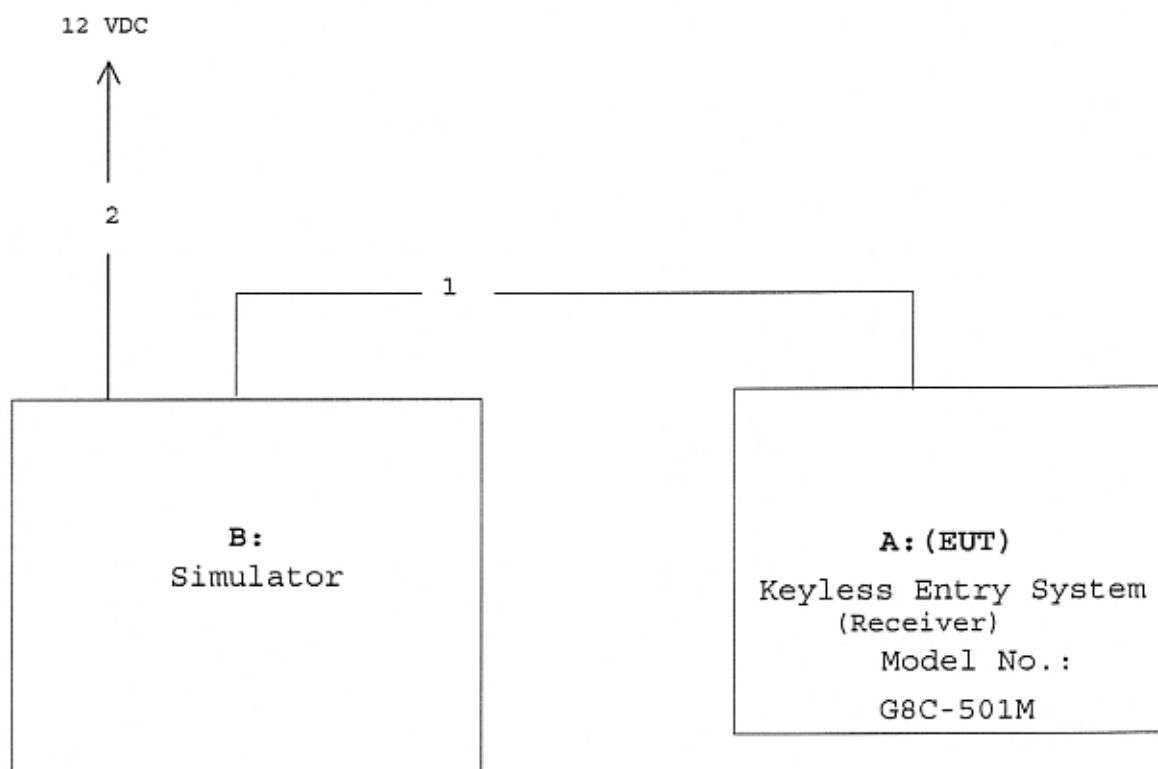
Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Connector type Shielded YES / NO	Length (m)
1	Cable	-	NO	NO	NO	1.0
2	Cable	-	NO	NO	NO	1.0

1.7.2 Operating condition

Power supply Voltage : DC 12V

The tests have been carried out under the receiving condition.

1.8 EUT ARRANGEMENT (DRAWINGS)

1.9 PRELIMINARY TEST AND TEST-SETUP (DRAWINGS)

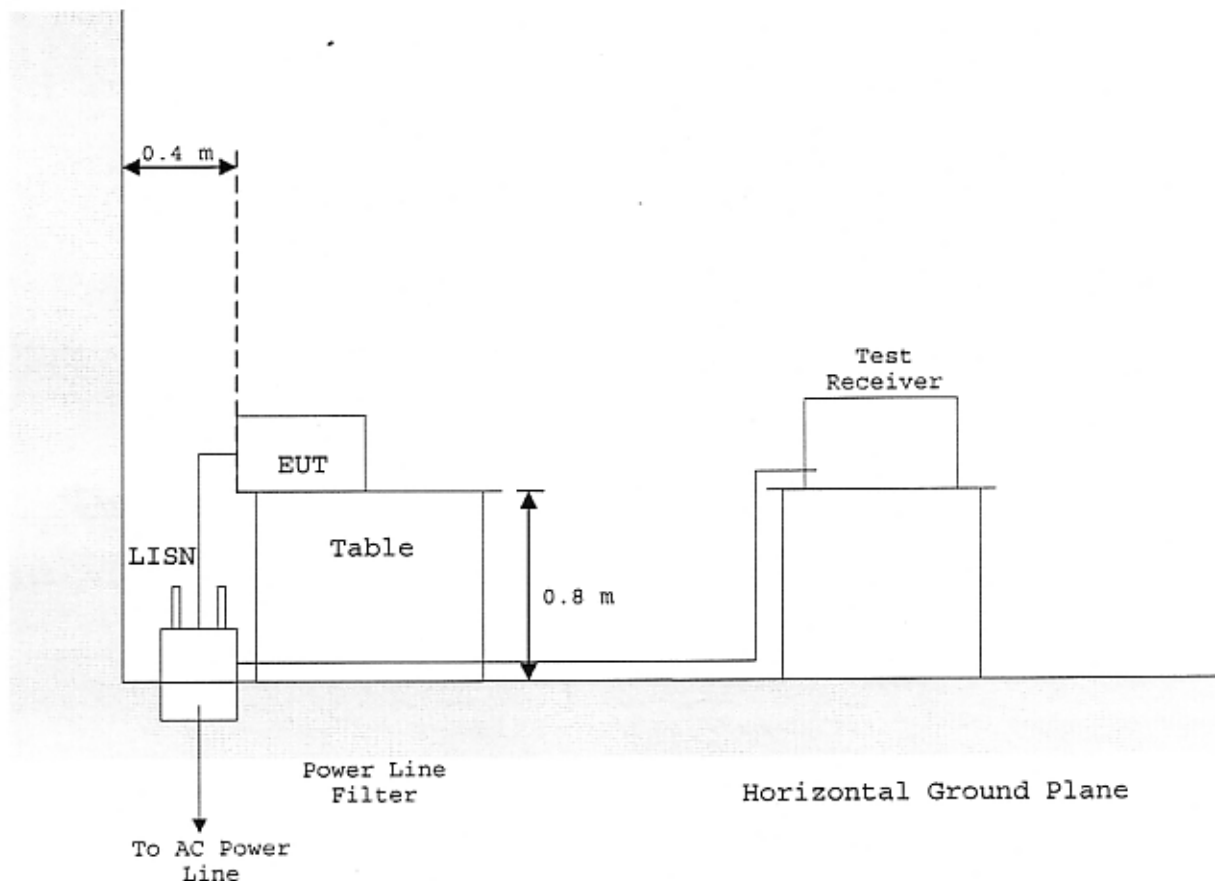
1.9.1 AC Power Line Conducted Emission (450 kHz - 30 MHz) :

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



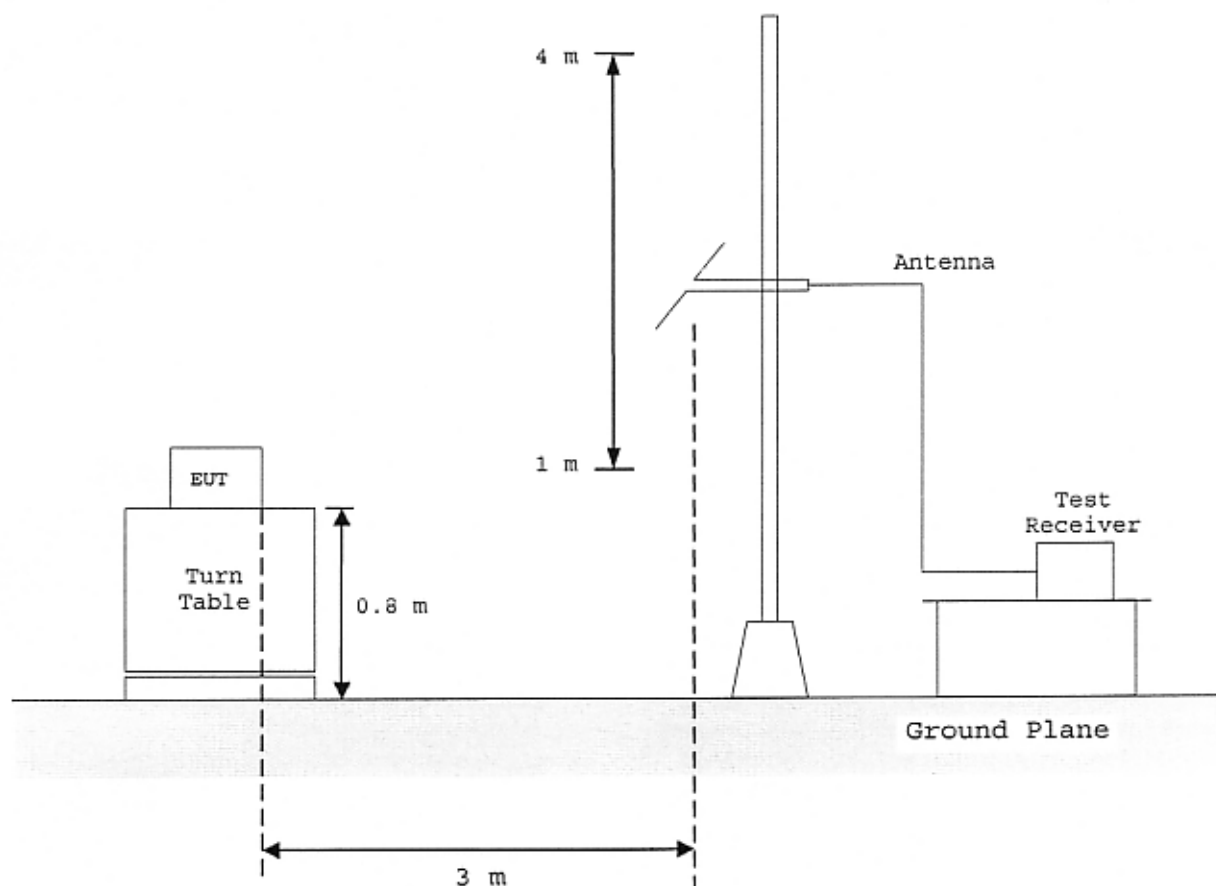
1.9.2 Radiated Emission (30 MHz - 1000 MHz) :

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 -



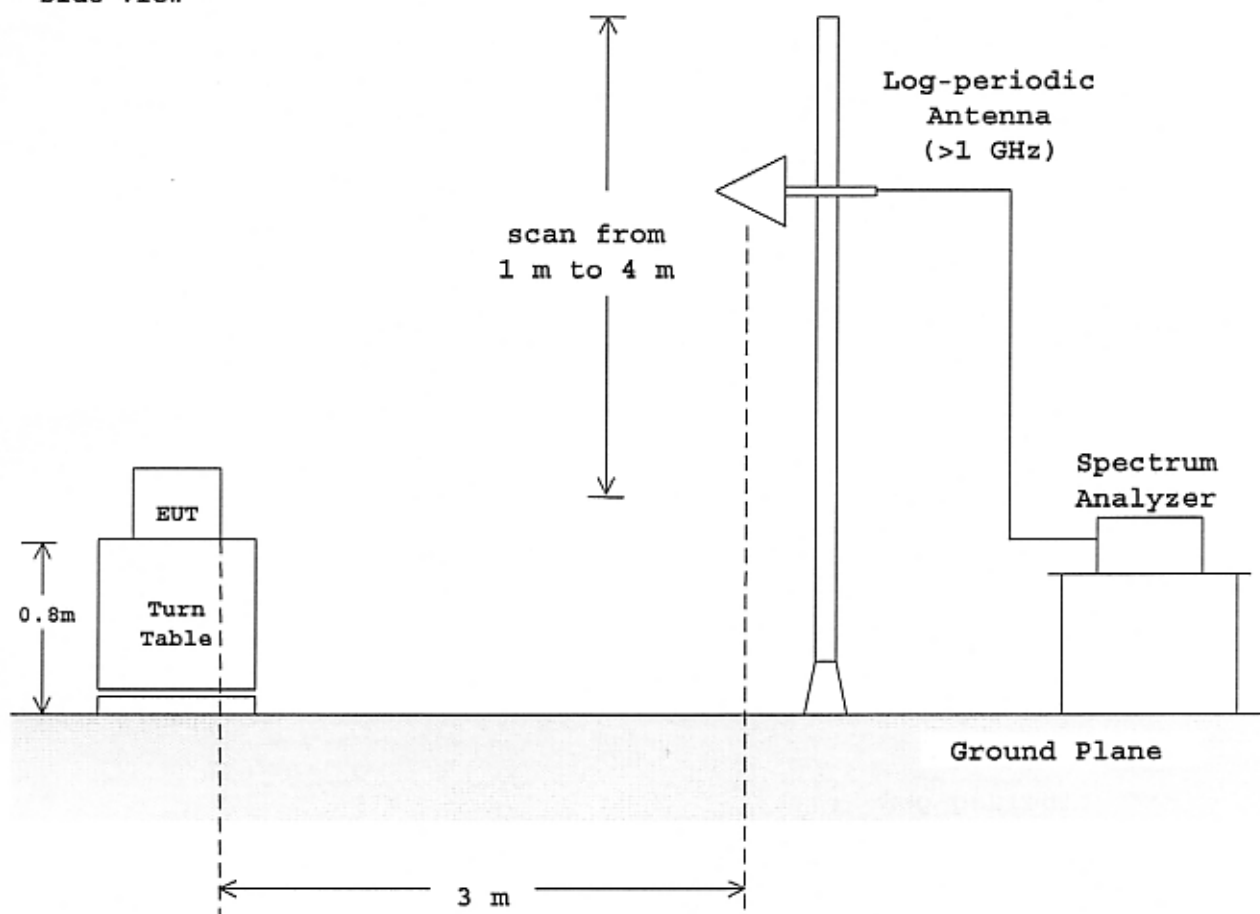
1.9.3 Radiated Emission (Above 1 GHz) :

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 -



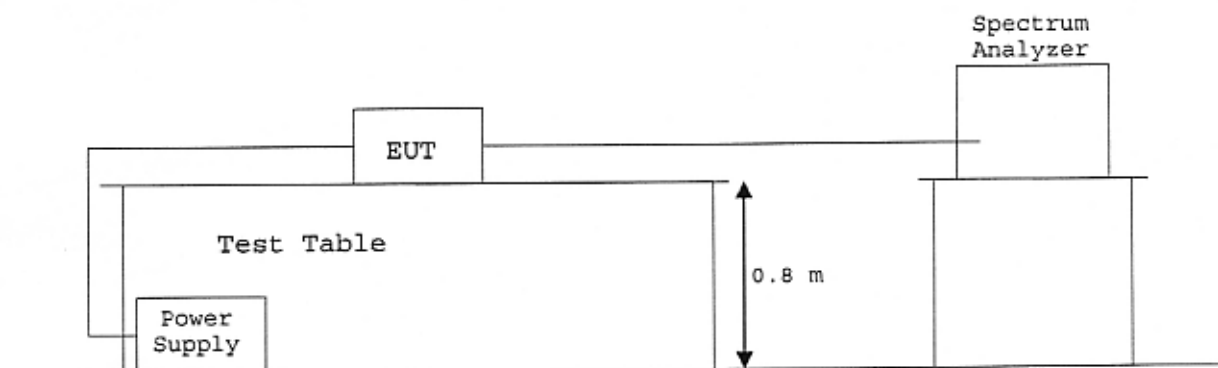
1.9.4 Antenna Conducted Power :

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 dB μ V.

Shielded Enclosure

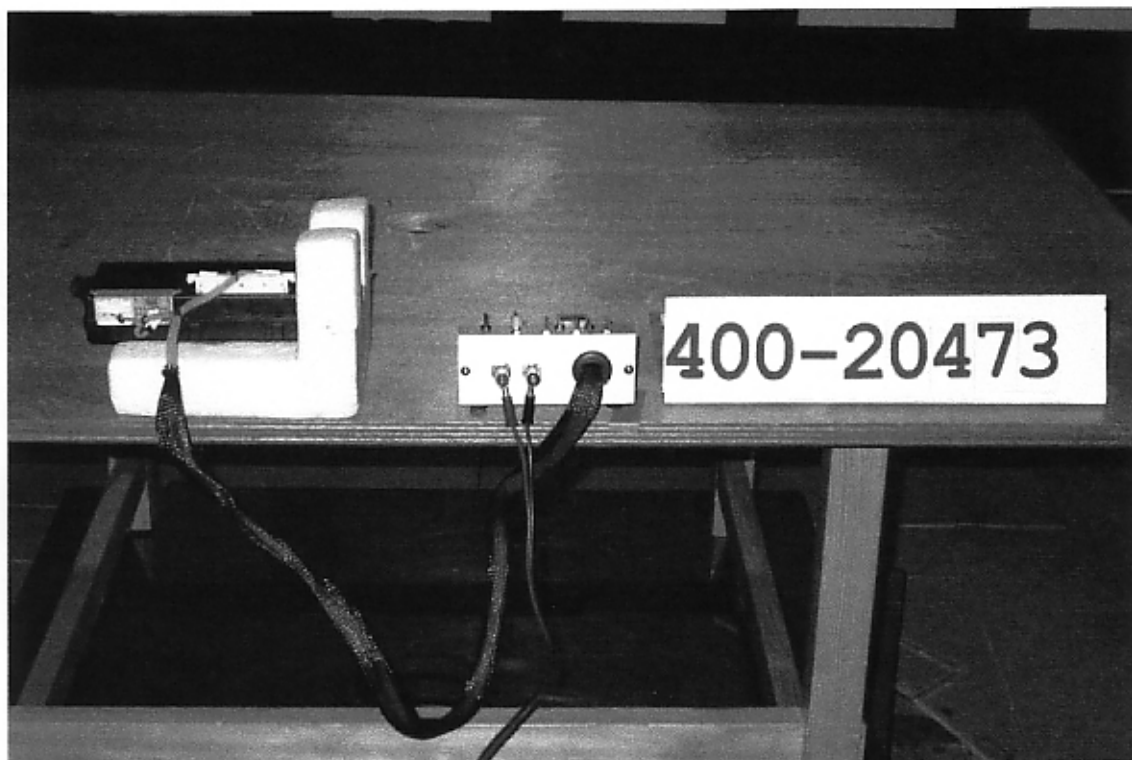
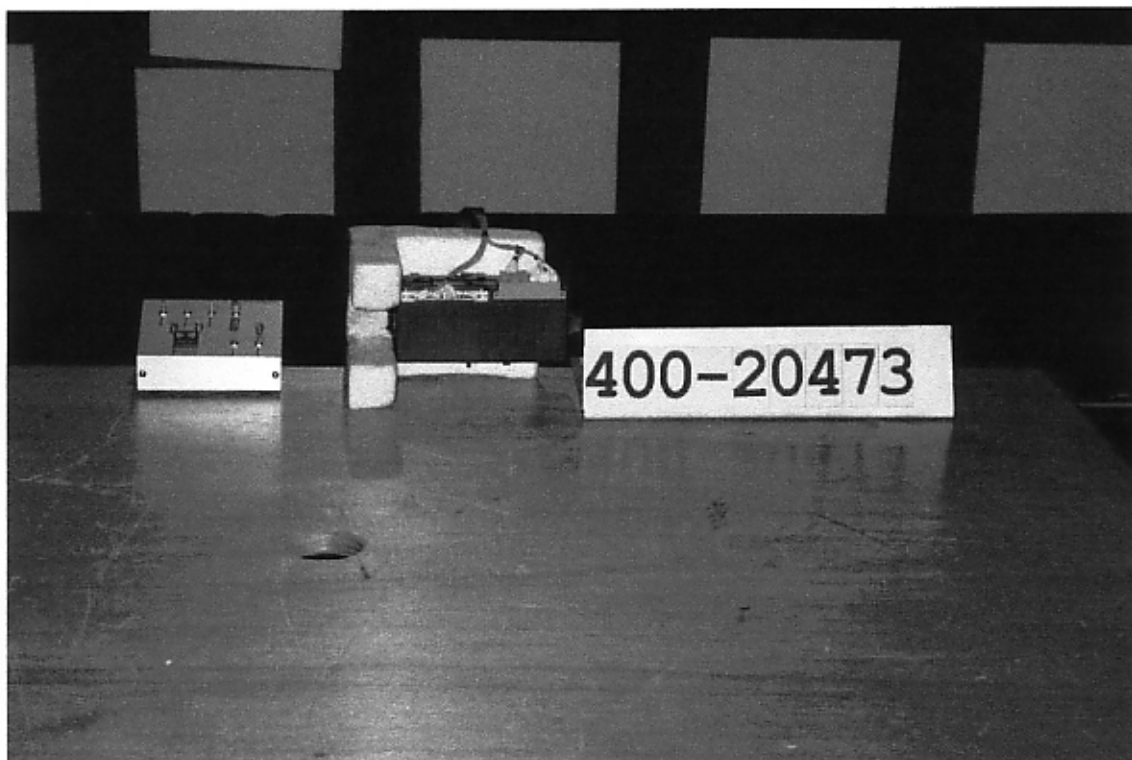
- Side View -



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

Photograph present configuration with maximum emission







JQA Application No. :400-20473
Model No. :G8C-501M
Standard :CFR 47 FCC Rules Part 15

FCC ID :OUCG8C-501M
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TEST DATA

2.2 Radiated Emissions Measurement

Tuning Frequency : 313.85 MHz
Distance of Measurement : 3.0 meters

No spurious emissions in the range 20 dB below the limit.

Notes : 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Measuring Instrument Setting :

<u>Detector function</u>	<u>Resolution Bandwidth</u>	<u>Video Bandwidth</u>
Quasi-peak(QP)	120 kHz	-

Tested by : Y. Nakajima
Yoichi Nakajima
Testing Engineer