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REPORT

TEST

JQA APPLICATION NO. : 400-00588

Model No. : RI-19BTY

Type of Equipment : Immobilizer

Regulations Applied : CFR 47 FCC Rules and Regulations Part 15

EMI

FCC ID : MOZRI-19BTY

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 : January 23, 2001

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).
 - Shielded Enclosure.

Expiration date of FCC test facility filing : June 4, 2002

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, 2001)
NVLAP Lab Code : 200192-0 (Effective through : June 30, 2001)

1.2.2 Description of the Equipment Under Test (EUT) :

1) Type of Equipment : Immobilizer2) Product Type : Production

3) Category : Low Power Communication Device

Transmitter : Certification

4) EUT Authorization : Certification 5) FCC ID : MOZRI-19BTY

6) Trade Name : -

7) Model No. : RI-19BTY
8) Operating Frequency Range : 134.2 kHz
9) Highest Frequency Used in the EUT : 134.2 kHz

10) Serial No. : - 11) Date of Manufacture : -

12) Power Rating : 12.0 VDC 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.

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1.3 TEST CONDITION

1.3.1 The measurement of the AC Power Line Conducted Emission

__ - was performed in the following test site. \underline{x} - was not applicable.

Test location:

Safety Testing Center EMC Engineering Dept. Tsuru EMC Branch 2096 Ohhata, Tanbozawa, Tsuru-shi Yamanashi-ken 402-0045, JAPAN

	-	Shiel	Lded	Room	No.1
	-	Shiel	lded	Room	No.2
	-	Anech	noic	Chamb	oer
	-	Open	Site	e No.	1
_	-	Open	Site	e No.	2

Type	Model No.	Manufacturer	Serial No.	Last	Cal.	Interval
- Test Receiver	ESH-3	Rohde & Schwarz	872992/047	May.	2000	1 Year
- Test Receiver	ESH-3	Rohde & Schwarz	881460/016	May.	2000	1 Year
 - LISN(for Peripheral)	KNW-407	Kyoritsu Electrical	8-833-5	May.	2000	1 Year
- LISN(for EUT)	KNW-407	Kyoritsu Electrical	8-680-14	May.	2000	1 Year
- LISN	KNW-243C	Kyoritsu Electrical	8-831-1	May.	2000	1 Year
- LISN	KNW-243C	Kyoritsu Electrical	8-831-2	May.	2000	1 Year
- LISN	KNW-243C	Kyoritsu Electrical	8-831-3	May.	2000	1 Year
LISN	KNW-243C	Kyoritsu Electrical	8-831-4	May.	2000	1 Year
- LISN	ESH 2-Z5	Rohde & Schwarz	879341/007	May.	2000	1 Year
- RF Cable	3D-2W	Fujikura	No.1	May.	2000	1 Year
 - RF Cable	3D-2W	Fujikura	No.2	May.	2000	1 Year
- RF Cable	3D-2W	Fujikura	No.3	May.	2000	1 Year
- 50ohm Termination	-	TDC	15406501E1	Feb.	2000	1 Year
 - 50ohm Termination	_	_	15406502E1	Feb.	2000	1 Year

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

 $\underline{\mathbf{x}}$ - was performed in the following test site.

___ - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Tsuru EMC Branch 2096 Ohhata, Tsuru-shi, Yamanashi-ken 402-0045, JAPAN

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

<u>x</u> - Open Site No. 2 (3, 10 or 30 meters)

___ - Anechoic Chamber(3 or 10 meters)

Validation of Site Attenuation :

1) Last Confirmed Date : N/A 2) Interval : N/A

	Type	Model No.	Manufacturer	Serial No.	Last	Cal.	Interval
х	- Test Receiver	ESH-3	Rohde & Schwarz	872992/047	May.	2000	1 Year
	- Test Receiver	ESH-3	Rohde & Schwarz	881460/016	May.	2000	1 Year
х	- Loop Antenna	HFH2-Z2	Rohde & Schwarz	872994/043	May.	2000	1 Year
	- Loop Antenna	6502	EMCO	8905-2347	May.	2000	1 Year
х	- RF Cable	5D-2W	Fujikura	155-21-002E0	Feb.	2000	1 Year

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

 $\underline{\mathbf{x}}$ - was performed in the following test site.

___ - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Tsuru EMC Branch 2096 Ohhata, Tsuru-shi, Yamanashi-ken 402-0045, JAPAN

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

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

x - Anechoic Chamber(3 or 10 meters)

Validation of Site Attenuation :

1) Last Confirmed Date : May, 2000 2) Interval :1 year

	Type	Model No.	Manufacturer	Serial No.	Last	Cal.	Interval	
	Test Receiver	ESV	Rohde & Schwarz	863796/015	May.	2000	1 Year	
	Test Receiver	ESVS10	Rohde & Schwarz	843744/018	May.	2000	1 Year	
<u>x</u> -	Test Receiver	ESVS10	Rohde & Schwarz	84231/004	May.	2000	1 Year	
	Biconical Antenna	BBA9106	Schwarzbeck	11905065-2	May.	2000	1 Year	
	Biconical Antenna	BBA9106	Schwarzbeck	11905065-3	May.	2000	1 Year	
x -	Biconical Antenna	BBA9106	Schwarzbeck	G4397001	May.	2000	1 Year	
	Log-Periodic Antenna	UHALP9107	Schwarzbeck	91071212	May.	2000	1 Year	
	Log-Periodic Antenna	UHALP9107	Schwarzbeck	9107915	May.	2000	1 Year	
x -	Log-Periodic Antenna	UHALP9107	Schwarzbeck	G43597003	May.	2000	1 Year	
	Dipole Antenna	KBA-511A	Kyoritsu Electrical	0-195-5	May.	2000	1 Year	
	Dipole Antenna	KBA-511A	Kyoritsu Electrical	0-230-6	May.	2000	1 Year	
	Dipole Antenna	KBA-611	Kyoritsu Electrical	0-196-8	May.	2000	1 Year	
	Dipole Antenna	KBA-611	Kyoritsu Electrical	0-228-13	May.	2000	1 Year	
	RF Cable	20D/5D-2W	Fujikura	No.1	May.	2000	1 Year	
	RF Cable	20D/5D-2W	Fujikura	No.2	May.	2000	1 Year	
x -	RF Cable	20D/5D-2W	Fujikura	No.3	May.	2000	1 Year	

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

____ - was performed in the following test site.

 \underline{x} - was not applicable.

Test location :

Safety Testing Center EMC Engineering Dept. Tsuru EMC Branch 2096 Ohhata, Tsuru-shi, Yamanashi-ken 402-0045, JAPAN

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

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

- Anechoic Chamber(3 or 10 meters)

Validation of Site Attenuation :

1) Last Confirmed Date : N/A 2) Interval : N/A

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
Spectrum Analyzer	8563E	Hewlett Packard	3438A00756	May. 2000	1 Year
- Spectrum Analyzer	R4131C	Advantest	717201249	May. 2000	1 Year
- Log-Periodic Antenna	94612-1	Rohde & Schwarz	97062301	May. 2000	1 Year
 - RF Amplifier	WJ-6611-513	Watkins-Johnson	0288	May. 2000	1 Year
- RF Amplifier	WJ-6682-834	Watkins-Johnson	0052	May. 2000	1 Year
- RF Amplifier	WJ-6870-506	Watkins-Johnson	0018	May. 2000	1 Year
 - RF Cable(7m)	SUCOFLEX 104	Suhner	52146/4	May. 2000	1 Year
- RF Cable(3m)	SUCOFLEX 104	Suhner	52053/4	May. 2000	1 Year
 - RF Cable(2m)	SUCOFLEX 104	Suhner	39934/4	May. 2000	1 Year
- RF Cable(1m)	SUCOFLEX 104	Suhner	35687/4	May. 2000	1 Year

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1.3.5 The measurement of the Frequency Stability

___ - was performed.

 \underline{x} - was not applicable.

Used test instruments:

Type	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
Frequency Counter	53131A	Hewlett Packard	3546A11807	May 2000	1 Year
- Oven	_	Ohnishi Co. Ltd.	_	Aug. 1999	1 Year
DC Power Supply	6628A	Hewlett Packard	3224A00284	July 2000	1 Year

1.3.6 The measurement of the Occupied Bandwidth

____ - was performed.

 \bar{x} - was not applicable.

	Туре	Model No.	Manufacturer	Serial No.	Last Cal.	Interval
	Spectrum Analyzer	8560E	Hewlett Packard	3240A00189	Sep. 1999	1 Year
	Spectrum Analyzer	8563E	Hewlett Packard	3221A00201	May. 2000	1 Year
	Spectrum Analyzer	8566B	Hewlett Packard	2140A01091	Apr. 2000	1 Year
	Spectrum Analyzer	8566B	Hewlett Packard	2747A05855	May. 2000	1 Year
	Function Generator	3325A	Hewlett Packard	2512A21776	May. 2000	1 Year
	FM Linear Detector	MS61A	Anritsu Corp.	M77486	Sep. 1999	1 Year
_	Level Meter	ML422C	Anritsu Corp.	M87571	June 2000	1 Year

1.4 EUT MODIFICATION / Deviation from Standard

|--|

Х	-No	modifica	ations	were	cor	nducted	d b	y JQA	to	ach	nieve	comp	liance	to	Clas	ss B	leve	:ls.
	-To	achieve	compli	iance	to	Class	В	level	s,	the	follo	owing	chang	es '	were	made	by	JQA
	dui	ring the	compl	iance	tes	st.												

The modifications will be imp	lemented in all production models of	this equipment.
Applicant :	Date :	
Typed Name :	Position :	

1.4.2 Deviation from Standard:

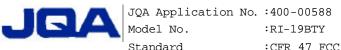
х	:	No	deviations	from	the	stand	dard	desc	ribed	in	clause 1.1.			
	'	The	following	deviat	ions	were	emp]	Loyed	from	the	standard described	in	clause	1.1:

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⊥.⊃	TEST	KESULIS	

Remarks:

AC Power Line Conducted Emission	- Applicable	x - NOT Applicable
The requirements are	PASSED	- NOT PASSED
Remarks :		
Radiated Emission [§15.209(a)(b)]	x - Applicable	NOT Applicable
The requirements are	x - PASSED	- NOT PASSED
Remarks:		
Frequency Stability	Applicable	x - NOT Applicable
The requirements are	PASSED	NOT PASSED
Remarks:		
Occupied Bandwidth	Applicable	x - NOT Applicable
The requirements are	PASSED	NOT PASSED



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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

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;

- \underline{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 1, 2001

End of testing : February 1, 2001

- JAPAN QUALITY ASSURANCE ORGANIZATION -Approved by:

Signatories: Issued by:

Takaharu Hada Director

Tsuru EMC Branch

JQA EMC Engineering Dept.

Yuichi Fukumoto

Manager

Tsuru EMC Branch

JQA EMC Engineering Dept.

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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	Immobilizer	TOKAI RIKA CO., LTD.	RI-19BTY	MOZRI-19BTY	-

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

Symbo 1	Item	Manufacturer	Model No.	FCC ID	Serial No.
В	DC Power Supply	KIKUSUI ELECTRONICS	PAB 18-2.5DU	N/A	30079912

Type of Cable :

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Connector type Shielded YES / NO	Length (m)
1	DC Power Cable(for EUT)	-	NO	NO	NO	1.0
2	AC Power Cable	-	NO	NO	NO	1.8

1.7.2 Operating condition

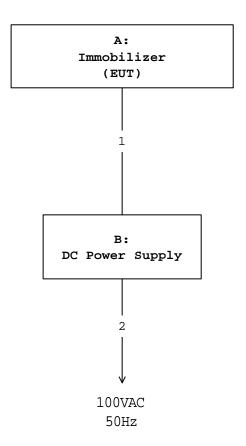
Power supply Voltage: 12.0 VDC(from DC Power Supply)
The tests have been carried out under the transmitting condition.

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1.8 EUT ARRANGEMENT (DRAWINGS)



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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.13.1.3.1, the AC power line preliminary conducted emissions measurements were carried out.

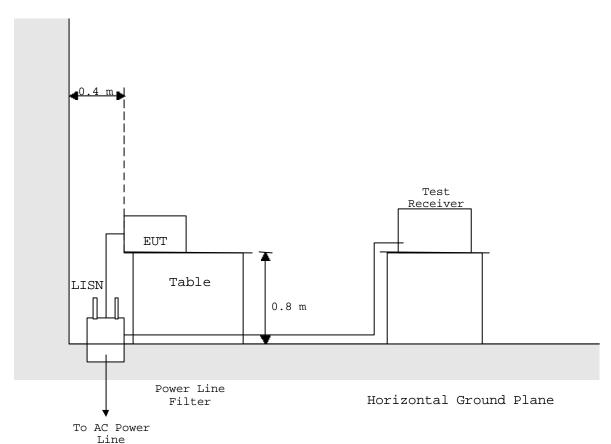
The preliminary conducted measurements were performed using the spectrum analyzer to observe the emission characteristics of the EUT.

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



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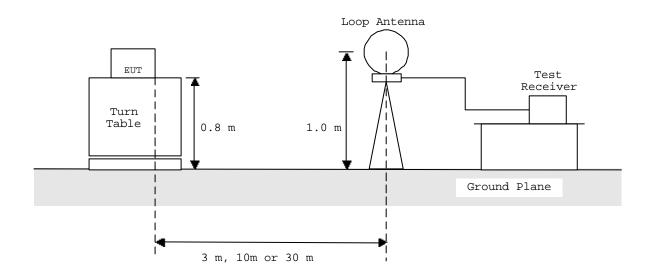
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1.9.2 Radiated Emission (9 kHz - 30 MHz):

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 -



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1.9.3 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 -Biconical Antenna (30 to 300 MHz) scan from 1 m to 4 m Log-periodic Antenna (300 to 1000 MHz) Test Receiver EUT Turn 0,8m Table Ground Plane 3 m

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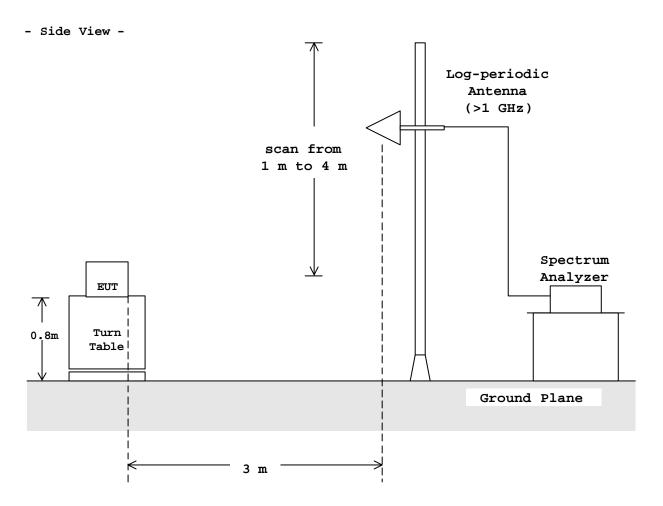
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1.9.4 Radiated Emission (Above 1 GHz):

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



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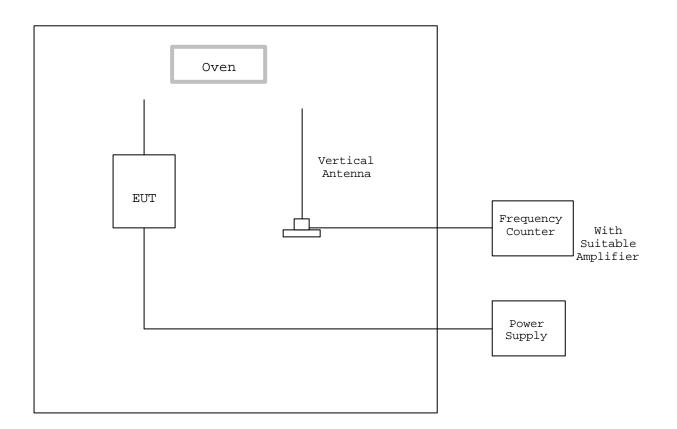
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1.9.5 Frequency Stability:

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 $-20\,^{\circ}\text{C}$ 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 measurementswere carried out after allow sufficient time (approximately 1 hour) for the temperature of the chamber to stabilize.



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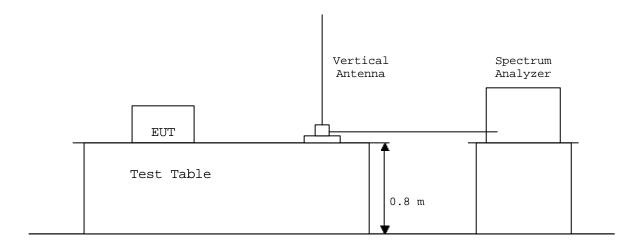
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1.9.6 Occupied Bandwidth:

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.



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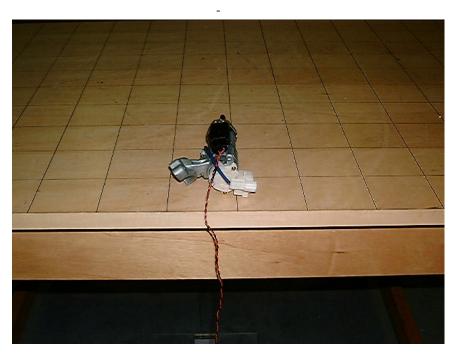
1.10 TEST ARRANGEMENT (PHOTOGRAPHS)

PHOTOGRAPHS OF EUT CONFIGURATION FOR RADIATED EMISSIONS MEASUREMENT

Photograph present configuration with maximum emission - Front View -



Rear View -



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TEST DATA

2.1 AC Power Line Conducted Emission Measurement(0.45 MHz - 30 MHz)

Note: This test was not applicable.

2.2 Radiated Emissions Measurement(9 kHz - 30 MHz)

Date: February 1, 2001

Temp.: 12 °C Humi.: 30 %

Operating Frequency : 134.2 kHz
Distance of Measurement : 30 meters

Frequency	Meter	Reading	Field Strength
(MHz)	(dB	μV/m)	(dBµV/m)
Fundamental			
0.1340	<	30.0	< 30.0
Harmonic Freq	uency		
0.2680	<	33.2	< 33.2
0.4020	<	31.4	< 31.4
0.5360	<	30.1	< 30.1
0.6700	<	29.0	< 29.0
0.8040	<	28.1	< 28.1
0.9380	<	27.3	< 27.3
1.0720	<	27.0	< 27.0
1.2060	<	27.0	< 27.0
1.3400	<	27.0	< 27.0

Note: The fundamental field strength was found undetectable weak of the field strength meter.

Tested by :

Yoichi Nakajima Testing Engineer JQA Application No. :400-00588
Model No. :RI-19BTY

tandard :CFR 47 FCC Rules Part 15

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The distance of measurements was reduced to 3 meters.

Date: February 1, 2001

Temp.: 12 °C Humi.: 30 %

Operating Frequency : 134.2 kHz
Distance of Measurement : 10 meters

Frequency	Meter Reading	Field Strength
(MHz)	(dBµV/m)	(dBµV/m)
Fundamental		
0.1340	43.0	43.0
Harmonic Frequ	ency	
0.2680	< 33.2	< 33.2
0.4020	< 31.4	< 31.4
0.5360	< 30.1	< 30.1
0.6700	< 29.0	< 29.0
0.8040	< 28.1	< 28.1
0.9380	< 27.3	< 27.3
1.0720	< 27.0	< 27.0
1.2060	< 27.0	< 27.0
1.3400	< 27.0	< 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:

Frequency Range : 110 kHz to 490 kHz

Detector Function : Average IF Band width : 10 kHz

Frequency Range : 536.8 kHz to 1345 kHz
Detector Function : CISPR Quasi-peak Peak

IF Band width : 9 kHz

For fundamental, the measured field strength was extrapolated to distance 300 meters, using the formula that field strength varies as the inverse distance square(40 dB per decade of distance).

Calculation :

 $43.0 \text{ dB}\mu\text{V/m} - 20\log_{10}((300/10)^2) = 43.0 - 59.1$

= -16.1 $dB\mu V/m$ at 300 meters

Limits for fundamental(§15.209(a)) = $20\log_{10}(2400/134.0)$ = 25.1 dB μ V/m

Tested by :

Yoichi Nakajima Testing Engineer

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2.3 Radiated Emissions Measurement(30 MHz - 1000 MHz)

Date: February 1, 2001 19 °C Humi.: 30 % Temp.:

Frequency	Antenna Factor (dB/m)	(dBuV)	Limits (dBuV/m)	Emission Level (dBuV/m) Horiz. Ver.	(dB)
30.5 42.7 51.4 55.5 65.1 73.8 85.6 91.6 105.6	19.4 14.9 12.3 10.9 8.6 7.7 8.6 9.9	<pre>< -2.0 0.7 < -2.0 4.6 9.1 24.4 1.5 13.6 1.2 16.6 2.9 17.0 0.5 16.1 < -2.0 11.3 < -2.0 3.9</pre>	40.0 40.0 40.0 40.0 40.0 40.0 43.5	<pre>< 17.4 20.1 < 12.9 19.5 21.4 36.7 12.4 24.5 9.8 25.2 10.6 24.7 9.1 24.7 < 7.9 21.2 < 10.3 16.2</pre>	> 22.6
103.6 120.0 140.0 171.4 205.7 239.9 270.0	13.9 15.7 17.4 18.2	<pre><-2.0</pre>	43.5 43.5 43.5 43.5 46.0	< 11.9 < 11.9 < 13.7 < 13.7 < 21.2 20.3	> 31.6 > 31.6 > 29.8 > 29.8 22.3 23.2 25.2 23.2
308.6 400.0 500.0 600.0 800.0	22.1 24.3 27.2	5.6 5.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0 < -2.0	46.0 46.0 46.0 46.0	24.0 23.4 < 17.9 < 17.9 < 20.1 < 20.1 < 22.3 < 22.3 < 25.2 < 25.2 < 28.1 < 28.1	> 25.9 > 25.9 > 23.7 > 23.7 > 20.8 > 20.8

Notes: 1) Test Location : Anechoic Chamber

- 2) Test Distance : 3 m
- 3) Test spectram was checked from 30 MHz to 1000 MHz.
- 4) Antenna factor includes the cable loss for 33 meter.
- 5) The symbol of "<" means "or less".6) The symbol of ">" means "more than"
- 7) A sample calculation was made at 30.5 MHz

Af + Mr = 19.4 + 0.7 = 20.1 dBuV/m

Af : Antenna Factor Mr : Meter Reading

8) Setting of measuring instrument :

Detector Function : CISPR Quasi-Peak

IF Bandwidth : 120 kHz

Tested by : _

Yoichi Nakajima Testing Engineer

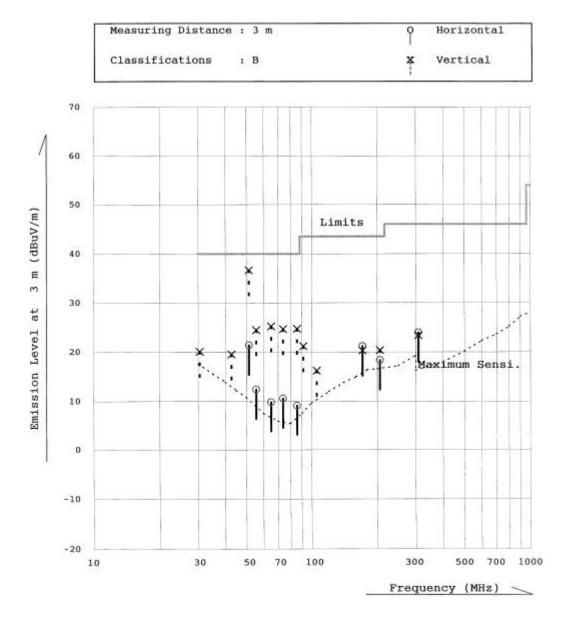
J. hakajima

FCC ID :MOZRI-19BTY

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Radiated Emissions Measurements (30 MHz - 1000 MHz)



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2.4 Radiated Emissions Measurement(Above 1 GHz)

Note: This test was not applicable.

2.5 Frequency Stability Measurement

Note: This test was not applicable.

2.6 Occupied Bandwidth Measurement

Note: This test was not applicable.