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KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

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TEST REPORT**Report No.A-005-01-C****Date: 25 May 2001**

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

All the tests necessary to show compliance to the requirements were performed and these results met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that, which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name : MITSUBISHI ELECTRIC CORP.
Kyoto Works Imaging Storage Products Department

Mailing Address : 1 Baba-Zusyo Nagaokakyo-City Kyoto 617-8550 Japan

2. Identification of Tested Device

Type of Device : TV Interface Device
Kind of Equipment Authorization : ☐: DoC ☒: Certification ☐: Verification
FCC ID : BGBHS-HD2000U
Device Name : Video Cassette Recorder (Test for RF Modulator)
Trade Name : MITSUBISHI
Model Number : HS-HD2000U
Serial Number : 0000012 ☒: Prototype ☐: Pre-production ☐: Production
Date of Manufacture : March 2001

3. Test Items and Procedure

☒: AC Power Line Conducted Emission Measurement
☒: Radiated Emission Measurement
☒: Output Signal Level Measurement
☒: Output Terminal Conducted Spurious Emission Measurement
☒: Transfer Switch Measurement
Above all tests were performed under: ANSI C63.4 – 1992
☒: without deviation, ☐: with deviation(details are found inside of this report)

4. Date of Test

Receipt of Test Sample : 2 April 2001
Test Completed on : 21 May 2001

Eizo Hariya
General Manager/ Ikoma Testing Laboratory

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0. LABORATORY ACCREDITATION AND MEASUREMENT UNCERTAINTY

0.1. Laboratory Accreditation

KEC is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the specific scope of accreditation under Lab Code: 200207-0.

When the test report concerns with the NVLAP accreditation test, the first page of the test report is signed by NVLAP Approved Signatory accompanied by the NVLAP logo.

The report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

0.2. Measurement Uncertainty

The result of a measurement is only an approximation or estimate of the value of a specific quantity. And thus the measured is complete only when a statement of uncertainty is given.

KEC quotes Measurement Uncertainty (U)

of +/- 4.9 dB for Radiated Emissions

of +/- 2.2 dB for Conducted Emissions

of +/- 1.5 dB for Output Signal Level

of +/- 2.6 dB for Output Terminal Conducted Spurious Emission and

of +/- 2.2 dB for Transfer Switch Measurement.

1. CERTIFICATION OF THE COMPLIANCE

This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

KEC evaluation criteria for compliance:

The Product complies, if

the measured results are below the specification limit by a margin more than or equal to

1/2 U (2.5 dB) for Radiated Emissions

U (2.2 dB) for Conducted Emissions

U (1.5 dB) for Output Signal Level

U (2.6 dB) for Output Terminal Conducted Spurious Emission and

U (2.2 dB) for Transfer Switch Measurement.

2. GENERAL INFORMATION

2.1. Product Description

The MITSUBISHI Model No.HS-HD2000U (referred to as the EUT in this report) is a Video Cassette Recorder containing RF modulator and Tuner.

(1) Specification

- RF Modulator Frequency : US CH. #3 Visual Carrier 61.25 MHz,
Aural Carrier 65.75 MHz
: US CH. #4 Visual Carrier 67.25 MHz,
Aural Carrier 71.75 MHz
- Type of RF Output Connector : Type "F" Connector 75Ω (Unbalanced)

(2) Provided Terminal

- ANT Input Terminal : F type
- ANT Output Terminal : F type
- i-LINK Terminal (rear side × 2) : IEEE 1394
- Audio Input Terminals (rear and front side) : RCA type
- Video Input Terminal (rear and front side) : RCA type
- Audio Output Terminals (rear side × 2) : RCA type
- Video Output Terminal (rear side × 2) : RCA type
- S-Video Input Terminal (rear and front side) : S type
- S-Video Output Terminal (rear side × 2) : S type
- Converter Box Control Terminal : monaural mini type

(3) Used Oscillating Frequencies

- 40.000 MHz : QUARTZ-CRYSTAL μ-COM Clock
- 27.000 MHz : QUARTZ-CRYSTAL μ-COM Clock
- 24.576 MHz : QUARTZ-CRYSTAL PHY Clock
- 12.000 MHz : QUARTZ-CRYSTAL μ-COM Clock
- 8.000 MHz : CERAMIC-OSC μ-COM Clock
- 4.000 MHz : CERAMIC-OSC μ-COM Clock
- 3.579545 MHz : QUARTZ-CRYSTAL CHROMA-OSC
- 32.768 kHz : QUARTZ-CRYSTAL TIMER Clock

(4) Rated Power Supply : AC 120 V, 60Hz

2.2. Description for Equipment Authorization

(1) Type of device	:	<input checked="" type="checkbox"/> TV Interface Device
(2) Reference Rule and Specification	:	FCC Rule Part 15 <input checked="" type="checkbox"/> Section 15.107 (a) <input checked="" type="checkbox"/> Section 15.109 (a)(c) and Section 15.115 (a) <input checked="" type="checkbox"/> Section 15.115 (b)(1)(ii),(b)(2)(ii) and(c)(1)(ii)
(3) Kind of Equipment Authorization	:	<input type="checkbox"/> DoC <input checked="" type="checkbox"/> Certification <input type="checkbox"/> Verification
(4) Procedure of Application	:	<input checked="" type="checkbox"/> Original Equipment <input type="checkbox"/> Modification
(5) Highest Frequency used in the Device	:	71.75 MHz
(6) Upper Frequency of Radiated Emission Measurement Range	:	<input checked="" type="checkbox"/> 1000 MHz <input type="checkbox"/> 2000 MHz <input type="checkbox"/> 5000 MHz <input type="checkbox"/> 5th harmonic of the highest frequency or 40 GHz, whichever is lower.

2.3. Test Facility

All tests described in this report were performed by:			
Name:	KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC) IKOMA TESTING LABORATORY		
OpenArea TestSite	<input type="checkbox"/> No.1 <input type="checkbox"/> No.2 <input type="checkbox"/> No.3 <input type="checkbox"/> No.4		
EMC M.C. Anechoic Chamber	<input checked="" type="checkbox"/> No.1		
Shielded Room	<input type="checkbox"/> No.2 <input checked="" type="checkbox"/> No.4 <input type="checkbox"/> EMC M.C. Shielded Room		
Address:	12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan		
<p>These test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992. The Open Area Test Site No.4, EMC M.C. Anechoic Chamber No.1, Shielded Room No.4 and EMC M.C. Shielded Room have been accredited by the NVLAP (Lab. Code: 200207-0) based on ISO/IEC Guide 25.</p> <p>Also the laboratory has been authorized by ITI (Interference Technology International, (UK), TUV Product Service (GER) and TUV Rheinland (GER) based on their criteria for testing laboratory (EN45001).</p>			

3. TESTED SYSTEM

3.1. Test Mode

In each measurement (excluding antenna transfer switch measurement), the compliance tests were performed under following seven EUT operation modes.

In transfer switch measurement, it was done under five modes (a – e).

- a. Playback mode
Playback the video tape that is recorded 1V peak-to-peak VITS signal.
- b. Record mode (1V VITS Signal Input)
1V peak-to-peak VITS signal is supplied through the VIDEO IN 1(rear side) terminal.
- c. Record mode (5V VITS Signal Input)
5V peak-to-peak VITS signal is supplied through the VIDEO IN 1(rear side) terminal.
- d. Record mode (1V VITS Signal Input)
1V peak-to-peak VITS signal is supplied through the VIDEO IN 1(front side) terminal.
- e. Record mode (5V VITS Signal Input)
5V peak-to-peak VITS signal is supplied through the VIDEO IN 1(front side) terminal.
- f. Record mode (0 dBmV NTSC TV Signal Input)
NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal.
[Note]
 - 1) Visual Carrier (0 dBmV at 211.25 MHz) is modulated by 1V peak-to-peak VITS signal.
 - 2) Aural Carrier (-10 dBmV at 215.75 MHz) is not modulated.
- g. Record mode (25 dBmV NTSC TV Signal Input)
NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal.
[Note]
 - 1) Visual Carrier (25 dBmV at 211.25 MHz) is modulated by 1V peak-to-peak VITS signal.
 - 2) Aural Carrier (15 dBmV at 215.75 MHz) is not modulated.

In each mode, the spectrum was checked and the data of the maximum EUT operation was reported.

3.2. Operation of EUT System

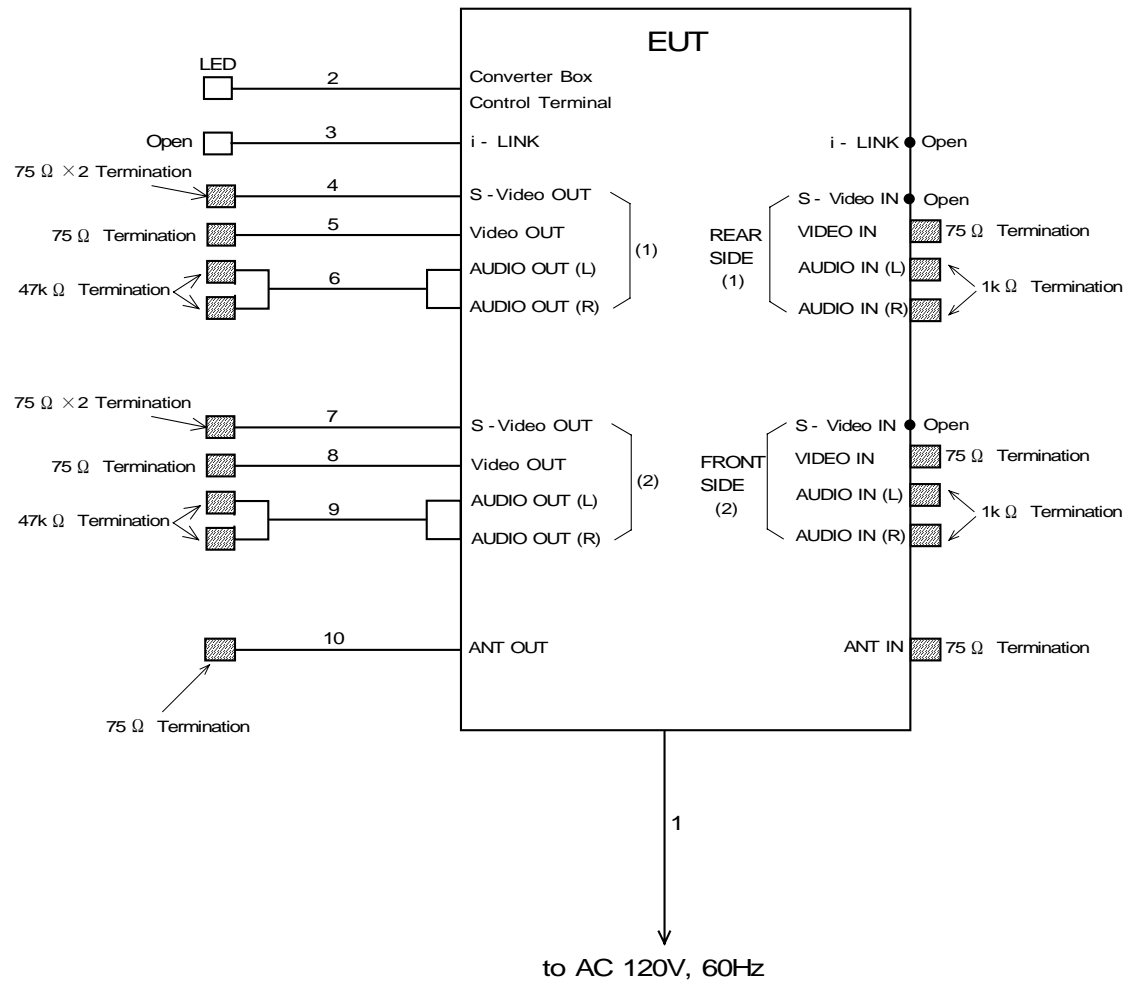
- 1) Playback mode
Playback the video tape that is recorded 1V peak-to-peak VITS signal.
- 2) Record mode (1V / 5V VITS Signal Input)
1V/5V peak-to-peak VITS signal is supplied through the VIDEO IN terminal, if applicable.
- 3) Record mode (0 dBmV / 25 dBmV NTSC TV Signal Input)
NTSC TV U.S. channel 13 (consist of visual carrier and aural carrier) is supplied through the ANTENNA IN terminal, if applicable.

3.3. Characterization and condition of EUT System

☒ : normal , ☐ : not normal (that is)

3.4. Block Diagram of EUT System
(for Conducted and Radiated Emission Measurements)

(1) Playback mode (Test mode a)



(2) Record mode (Test mode b~g)

Test mode b~g was based on test mode a, and changed only the condition of the VIDEO IN and ANT IN from mode a.
Test condition of each Recording mode are as follows.

Terminal Test Mode	REAR SIDE VIDEO IN	FRONT SIDE VIDEO IN	ANT IN
b, c	VITS Signal Generator	75Ω Termination	75Ω Termination
d, e	75Ω Termination	VITS Signal Generator	75Ω Termination
f, g	75Ω Termination	75Ω Termination	NTSC TV Signal Generator

[Note]
See 3.5 List of Cables.

3.5. List of Cables

No	Cable Name	Shielded (Y/N)	Length (m)	Note	Remark
1	AC PowerCord of EUT	N	1.85	2pin type	(1)
2	Converter Box Control Cable	Y	1.9	monaural mini jack \Leftrightarrow LED	(2)
3	i-LINK Cable	Y	1.0	IEEE 1394 \Leftrightarrow IEEE 1394 one-end open	(2)
4	S-Video Cable	Y	1.45	one-end $75\Omega \times 2$ Termination	(2)
5	Video Cable	Y	1.0	one-end 75Ω Termination	
6	Audio Cable	Y	1.8	one-end $47k\Omega$ Termination	(2)
7	S-Video Cable	Y	1.45	one-end $75\Omega \times 2$ Termination	
8	Video Cable	Y	1.0	one-end 75Ω Termination	
9	Audio Cable	Y	1.0	one-end $47k\Omega$ Termination	
10	RF Cable	Y	1.75	Coaxial type, one-end 75Ω Termination	

[Remark]

(1): Permanently attached to EUT

(2): Accessory of EUT

4. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Test Procedure

(1)	Configure the EUT System in accordance with ANSI C63.4-1992 section 7. <input checked="" type="checkbox"/> : without deviation, <input type="checkbox"/> : with deviation(details are found below) See also the block diagram and the photographs of EUT System configuration in this report.
(2)	Connect the EUT's AC power cord to one Line Impedance Stabilization Network (LISN).
(3)	Any other power cord of other equipment is connected to a LISN different from the LISN used for the EUT.
(4)	Warm up the EUT System.
(5)	Activate the EUT System and run the software prepared for the test, if necessary.
(6)	Connect the spectrum analyzer (*1) to the measuring port of the LISN for the EUT, using a calibrated coaxial cable.
(7)	To find out an EUT System condition, which produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode, are changed under normal usage of the EUT.
(8)	The spectrums are scanned from 450 kHz to 30 MHz and collect the six highest emissions minimum on the spectrum analyzer relative to the limits in the whole range.
(9)	The test receiver (*2) is connected to the LISN for the EUT, and the six highest emissions minimum recorded above are measured.
[Note]	
(*1)	Spectrum Analyzer Set Up Conditions Frequency range : 450 kHz - 30 MHz Resolution bandwidth : 10 kHz Video bandwidth : 1 MHz Detector function : Peak mode
(*2)	Test Receiver Set Up Conditions Detector function : Quasi-Peak/ Average (if necessary) IF bandwidth : 10 kHz

4.2. Test Results

Measured Frequency (MHz)	LISN Factor (dB)	Meter Reading		Maximum RF Voltage (dBuV)	Limits (dBuV)	Margin for Limits (dB)
		Va (dBuV)	Vb (dBuV)			
0.450	0.4	44.4	44.3	44.8	48.0	3.2
0.486	0.4	44.9	45.0	45.4	48.0	2.6
17.626	0.9	40.0	38.8	40.9	48.0	7.1
18.374	0.9	42.4	41.3	43.3	48.0	4.7
19.125	0.9	42.1	41.1	43.0	48.0	5.0
19.875	1.0	40.1	38.1	41.1	48.0	6.9

[Note]

- (1) LISN Correction Factor includes the cable loss.
- (2) The emissions at channel #3 were nearly equal to channel #4.
- (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum RF Voltage (dBμV)

= Meter Reading (at maximum level of Va, Vb) + LISN Factor (dB)

[Environment]

Temperature 24°C

Humidity 49%

[Tested Date / Tester]

21 May 2001

Signature



Yoshiko Kotani

4.3. Photographs of EUT System Configuration

a. Playback Mode

FRONT VIEW



SIDE VIEW



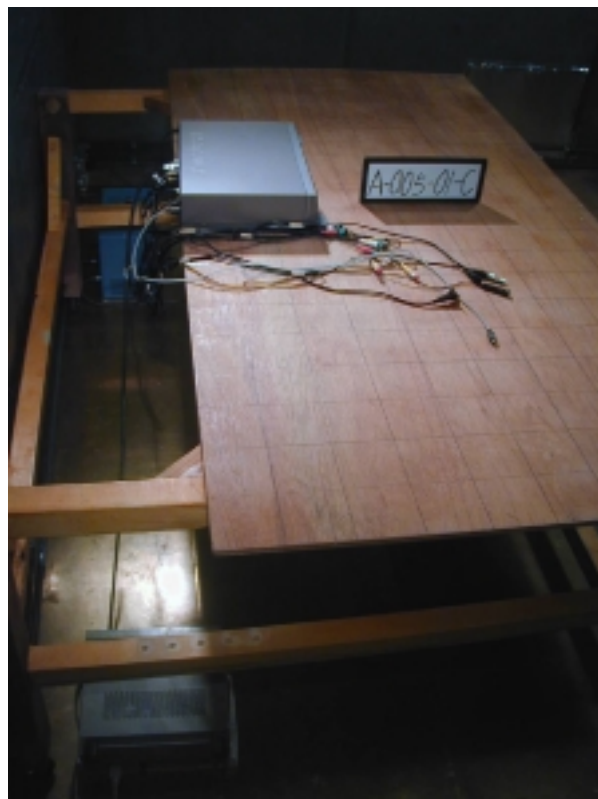
- Continued -

- b. Record mode (1V VITS Signal Input)
- c. Record mode (5V VITS Signal Input)

FRONT VIEW



SIDE VIEW



- Continued -

d. Record mode (1V VITS Signal Input)

e. Record mode (5V VITS Signal Input)

FRONT VIEW



SIDE VIEW



- Continued -

f. Record mode (0 dBmV NTSC TV Signal Input)

g. Record mode (25 dBmV NTSC TV Signal Input)

FRONT VIEW



SIDE VIEW



5. RADIATED EMISSION MEASUREMENT

5.1. Test Procedure

(1)	Configure the EUT System in accordance with ANSI C63.4-1992 section 8. <input checked="" type="checkbox"/> : without deviation, <input type="checkbox"/> : with deviation(details are found below) See also the block diagram and the photographs of EUT System configuration in this report.
(2)	If the EUT system is connected to a public power network, all power cords for the EUT System are connected the receptacle on the turntable.
(3)	Warm up the EUT System.
(4)	Activate the EUT System and run the prepared software for the test, if necessary.
(5)	To find out the emissions of the EUT System, preliminary radiated measurement are performed at a closer distance than that specified for final radiated measurement using the spectrum analyzer (*1) and the broad band antenna. In the frequency above 1 GHz, it is performed using the spectrum analyzer (*2) and the horn antenna.
(6)	To find out an EUT System condition, which produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode, are changed under normal usage of the EUT.
(7)	The spectrums are scanned from 30 MHz to the upper frequency of measurement range, and collect the six highest emissions minimum on the spectrum analyzer relative to the limits in the whole range.
(8)	In final compliance test, the six highest emissions minimum, recorded above, are measured at the specified distance using the broad band antenna or the tuned dipole antenna and the test receiver (*3). In the frequency above 1 GHz, the measurements are performed by the horn antenna and <input type="checkbox"/> the test receiver (*4). <input type="checkbox"/> the spectrum analyzer(*2) with pre-amplifier.
	<div data-bbox="352 1209 427 1240">[Note]</div> <div data-bbox="252 1240 1374 1812"> <div data-bbox="252 1240 304 1272">(*1)</div> <div data-bbox="352 1240 938 1366"> Spectrum Analyzer Set Up Conditions Frequency range : 30 - 1000 MHz Resolution bandwidth : 100 kHz Detector function : Peak mode </div> <div data-bbox="252 1373 304 1404">(*2)</div> <div data-bbox="352 1373 1310 1559"> Spectrum Analyzer Set Up Conditions Frequency range : 1 GHz - Upper frequency of measurement range Resolution bandwidth : 1 MHz Video bandwidth : 1 MHz Attenuator : 10 dB Detector function : Peak mode </div> <div data-bbox="252 1565 304 1597">(*3)</div> <div data-bbox="352 1565 938 1691"> Test Receiver Set Up Conditions Frequency range : 30 - 1000 MHz Detector function : Quasi-Peak IF bandwidth : 120 kHz </div> <div data-bbox="252 1697 304 1729">(*4)</div> <div data-bbox="352 1697 1310 1812"> Test Receiver Set Up Conditions Frequency range : 1 GHz - Upper frequency of measurement range Detector function : Average IF bandwidth : 1 MHz </div> </div>

5.2. Test Results

Measurement Distance ☒: 3m ☐: 10m

Measured Frequency	Antenna Factor	Meter Reading		Maximum Field Strength	Limits	Margin for Limits
		Horizontal Polarization	Vertical Polarization			
(MHz)	(dB/m)	(dBμV)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Test Channel #3						
61.25	9.2	7.6	5.8	16.8	40.0	23.2
65.75	8.7	5.6	8.4	17.1	40.0	22.9
122.50	15.9	<0.0	<0.0	<15.9	43.5	>27.6
245.00	21.4	<0.0	<0.0	<21.4	46.0	>24.6
Test Channel #4						
67.25	8.5	6.3	9.7	18.2	40.0	21.8
71.75	8.4	9.5	12.3	20.7	40.0	19.3
134.50	17.1	<0.0	<0.0	<17.1	43.5	>26.4
201.75	20.1	<0.0	<0.0	<20.1	43.5	>23.4
Other emissions						
*33.36	1.0	20.5	32.3	33.3	40.0	6.7
74.24	8.6	22.1	26.3	34.9	40.0	5.1
81.00	9.4	26.0	27.3	36.7	40.0	3.3
196.60	19.9	20.1	20.0	40.0	43.5	3.5
216.00	20.5	19.7	16.3	40.2	43.5	3.3
229.10	20.9	19.0	19.2	40.1	46.0	5.9
270.00	22.6	18.6	16.6	41.2	46.0	4.8
294.91	23.9	16.2	8.0	40.1	46.0	5.9
458.21	23.4	16.2	13.8	39.6	46.0	6.4
786.41	28.3	14.5	14.0	42.8	46.0	3.2

[Note]

- (1) Antenna Factor includes the cable loss.
 (2) * mark in Measured Frequency : Measured with the tuned dipole antenna.
 no mark in Measured Frequency : Measured with the broadband antenna.
 (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum Field Strength (dBμV/m)
 = Meter Reading (at maximum level of Horizontal or Vertical) (dBμV) + Antenna Factor (dB/m)

[Environment]

Temperature: 25 °C

Humidity: 61 %

[Tested Date/ Tester]

14 May 2001

Signature



Yoshiko Kotani

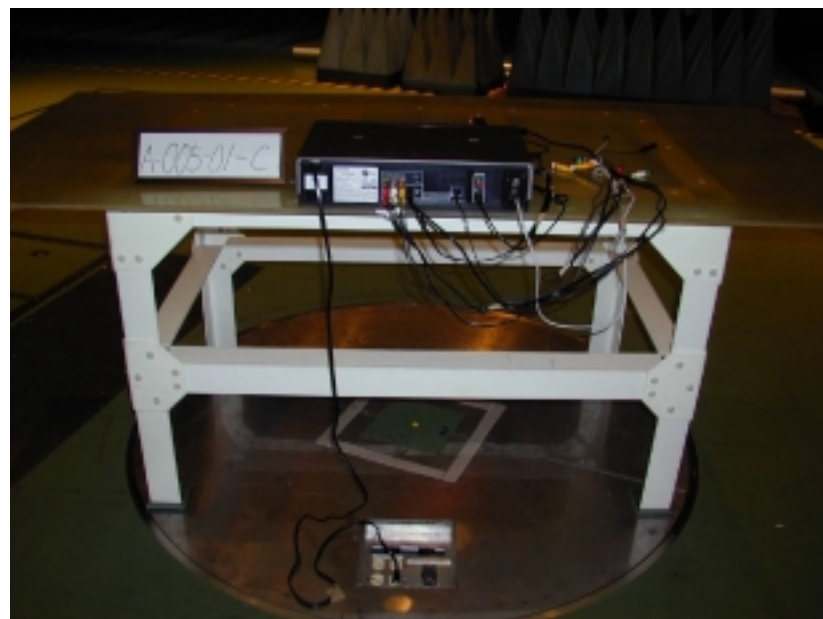
5.3. Photographs of EUT System Configuration

a. Playback Mode

FRONT VIEW



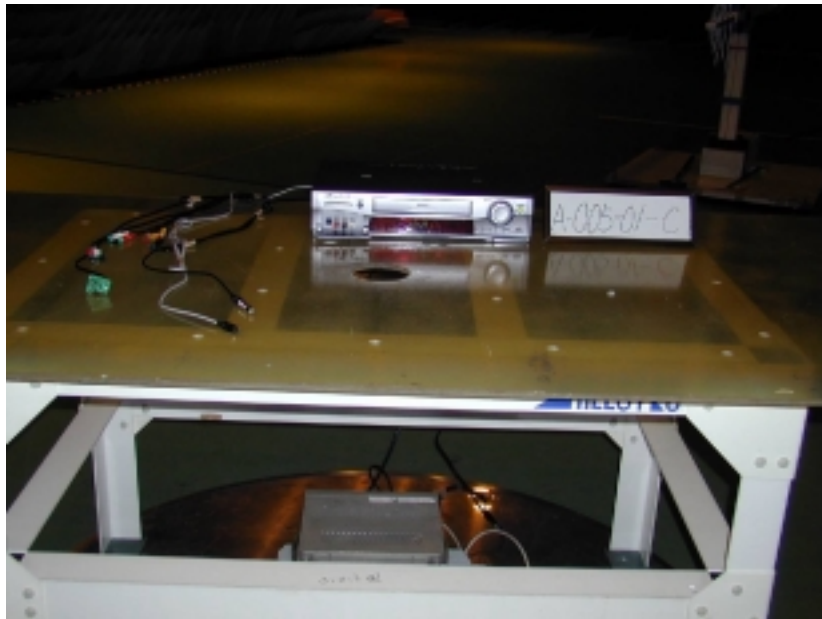
REAR VIEW



- Continued -

- b. Record mode (1V VITS Signal Input)
- c. Record mode (5V VITS Signal Input)

FRONT VIEW



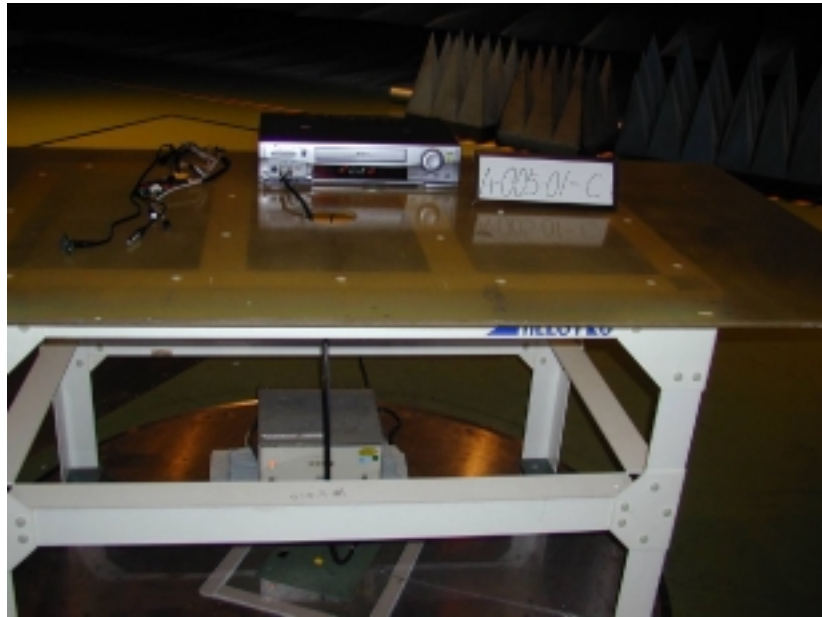
REAR VIEW



- Continued -

- d. Record mode (1V VITS Signal Input)
- e. Record mode (5V VITS Signal Input)

FRONT VIEW



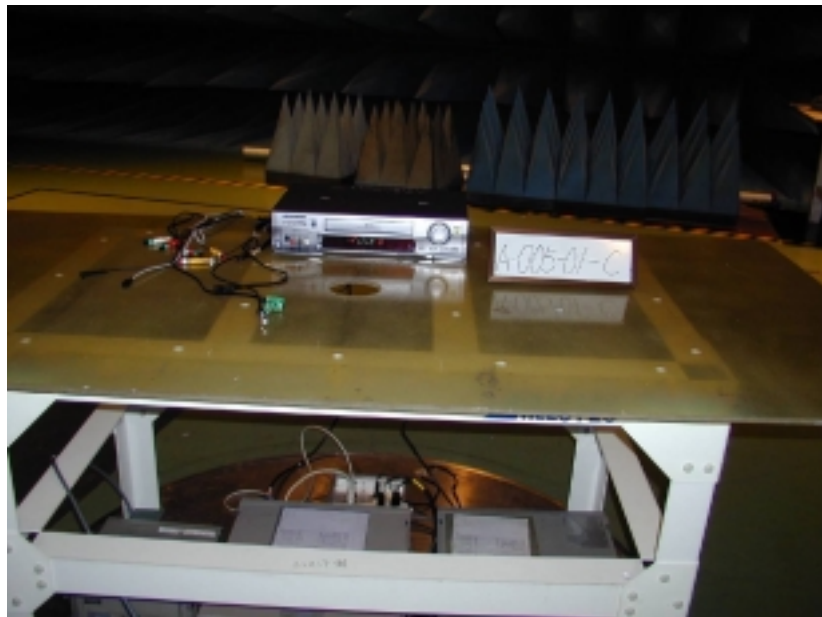
REAR VIEW



- Continued -

- f. Record mode (0 dBmV NTSC TV Signal Input)
- g. Record mode (25 dBmV NTSC TV Signal Input)

FRONT VIEW



REAR VIEW



6. OUTPUT SIGNAL LEVEL MEASUREMENT

6.1. Test Procedure

- (1) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.
☒ : without deviation, ☐ : with deviation(details are found below)
See also the block diagram and the photographs of EUT System configuration in this report.
- (2) Unused RF input/output terminals are terminated in the proper impedance.
- (3) Activate the EUT system.
- (4) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode
- (5) The RF output terminal is connected to the spectrum analyzer through the matching transformer with a calibrated 50 Ω coaxial cable.
- (6) Then, the RF output signal level is measured under the EUT condition produced the maximum signal level.

6.2. Test Results

Emission Frequency [MHz]	Correction Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limits [dBμV/75Ω]
<u>Test Channel #3</u>				
61.25	6.1	59.4	65.5	69.5
65.75	6.1	43.5	49.6	56.5
<u>Test Channel #4</u>				
67.25	6.1	58.7	64.8	69.5
71.75	6.2	43.3	49.5	56.5

[Note]

- (1) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test.
- (2) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.
- (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum Signal Level (dBμV/75Ω)
= Meter Reading (dBμV/50Ω) + Correction Factor (dB)

[Environment]

Temperature: 28°C

Humidity: 48%

[Summary of Test Results]

Minimum margin was 4.0 dB at 61.25 MHz, test channel #3

[Tested Date/ Tester]

21 May 2001

Signature



Yoshiko Kotani

6.3. Photographs of EUT System Configuration

REAR VIEW

a. Playback Mode



b. Record mode (1V VITS Signal Input)

c. Record mode (5V VITS Signal Input)



- Continued -

REAR VIEW

- d. Record mode (1V VITS Signal Input)
- e. Record mode (5V VITS Signal Input)



- f. Record mode (0 dBmV NTSC TV Signal Input)
- g. Record mode (25 dBmV NTSC TV Signal Input)



7. OUTPUT TERMINAL CONDUCTED SOURIOUS EMISSION MEASUREMENT

7.1. Test Procedure

- (1) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.
☒ : without deviation, ☐ : with deviation(details are found below)
See also the block diagram and the photographs of EUT System configuration in this report.
- (2) Unused RF input/output terminals are terminated in the proper impedance.
- (3) Activate the EUT system.
- (4) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode
- (5) The RF output terminal is connected to the spectrum analyzer through the matching transformer with a calibrated 50 Ω coaxial cable.
- (6) The spectrum was scanned from 30 MHz to more than 4.6 MHz below the visual carrier frequency, and from more than 7.4 MHz above the visual carrier frequency to 1000 MHz, and the three highest emissions are selected under the EUT condition produced the maximum signal level at each frequency range.
- (7) Then, the RF output terminal conducted spurious emission level is measured under the EUT condition produced the maximum signal level.

7.2. Test Results

Emission Frequency [MHz]	Correction Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limits [dBμV/75Ω]
<u>Test Channel #3</u>				
47.75	6.1	8.0	14.1	39.5
55.36	6.1	14.4	20.5	39.5
56.65	6.1	33.7	39.8	39.5
74.74	6.2	5.5	11.7	39.5
122.51	6.2	8.1	14.3	39.5
612.57	6.3	4.4	10.7	39.5
** 56.65	6.1	6.3	12.4	39.5
<u>Test Channel #4</u>				
53.74	6.1	8.0	14.1	39.5
61.36	6.1	13.9	20.0	39.5
62.65	6.1	35.3	41.4	39.5
80.74	6.2	5.0	11.2	39.5
134.48	6.2	6.7	12.9	39.5
537.90	6.3	5.0	11.3	39.5
** 62.65	6.1	7.1	13.2	39.5

[Note]

- (1) **: To except the effect of lower sideband of sound sub-carrier frequency component, if set the resolution bandwidth of spectrum analyzer to 30 kHz, these interference become to this value.
- (2) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test. And the meter readings described above are corrected by the gain of pre-amplifier.
- (3) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.
- (4) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum Signal Level (dBμV/75Ω)
= Meter Reading (dBμV/50Ω) + Correction Factor (dB)

[Environment]

Temperature: 28C

Humidity: 48%

[Summary of Test Results]

Minimum margin was 19.0 dB at 55.36 MHz, test channel #3

[Tested Date/ Tester]

21 May 2001

Signature



Yoshiko Kotani

7.3. Photographs of EUT System Configuration

The tested device configuration is the same as the output signal level measurement.
(See 6.3 Photographs of EUT System Configuration.)

8. TRANSFER SWITCH MEASUREMENT

8.1. Test Procedure

- (1) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.2.
☒ : without deviation, ☐ : with deviation(details are found below)
See also the block diagram and the photographs of EUT System configuration
In this report.
- (2) Unused RF input/output terminals are terminated in the proper impedance.
- (3) Activate the EUT system.
- (4) Set the spectrum analyzer as follows.

Frequency Span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode
- (5) The antenna input terminal is connected to the input of pre-amplifier through the matching transformer with a calibrated 50 Ω coaxial cable. And the output of pre-amplifier is connected to the spectrum analyzer.
- (6) Then, the signal level on the antenna input terminal is measured under the EUT condition produced the maximum signal level.

8.2. Test Results

Emission Frequency [MHz]	Correction Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limits [dBμV/75Ω]
<u>Test Channel #3</u>				
61.25	2.2	3.8	6.0	9.5
<u>Test Channel #4</u>				
67.25	2.2	0.2	2.4	9.5

[Note]

- (1) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test. And the meter readings descrived above are corrected by the gain of pre-amplifier.
- (2) The spectrum was checked in each test mode and operation mode, and the data of the maximum EUT operation was reported.

[Calculation method]

Maximum Signal Level (dBμV/75Ω)
= Meter Reading (dBμV/50Ω) + Correction Factor (dB)

[Environment]

Temperature: 24°C

Humidity: 48%

[Summary of Test Results]

Minimum margin was 3.5 dB at 61.25 MHz, test channel #3

[Tested Date/ Tester]

21 May 2001

Signature



Yoshiko Kotani

8.3. Photographs of EUT System Configuration

REAR VIEW

a. Playback Mode



b. Record mode (1V VITS Signal Input)

c. Record mode (5V VITS Signal Input)



- Continued -

REAR VIEW

- d. Record mode (1V VITS Signal Input)
- e. Record mode (5V VITS Signal Input)



9. USED TEST EQUIPMENTS AND CALIBRATION STATUS

Equipment	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESHS10	Frequency Range 9kHz-30MHz	FS-67	1	2000/12	2001/12
		ESVS10	Frequency Range 20MHz-1GHz	FS-60	2	2000/5	2001/5
Spectrum Analyzer	Rohde & Schwarz	FSA	Frequency Range 100 Hz-1.8 GHz	SA-35	2	2001/3	2002/3
	Hewlett Packard	8568B	Frequency Range 100 Hz-1.5 GHz	FS-46-3	1,3,4,5	2001/5	2002/5
Pre-amplifier	Anritsu	MH648A	Frequency Range 100 Hz-1.2 GHz	AM-28	4,5	2000/11	2001/11
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30MHz-300MHz	AN-219	2	2001/2	2002/2
Log-Periodic Antenna	Schwarzbeck	UHALP 9108A	Frequency Range 300MHz-1GHz	AN-218	2	2001/2	2002/2
Tuned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25MHz-500MHz	AN-132	2	2001/2	2002/2
		KBA-611S	Frequency Range 500MHz-1GHz	AN-115	N/A	2001/2	2002/2
LISN	Kyoritsu	KNW-407	Frequency Range 150kHz-30MHz	FL-106	1	2001/4	2002/4
Impeadance Transformer	NMC	MB-009	Frequency Range 10MHz-2GHz 50Ω: 75 Ω	AX-61	3,4	2000/11	2001/11
Matching Transfomer	Anritsu	MG614A	Frequency Range 10MHz-1.2GHz 50 Ω: 75 Ω	AX-28-4	5	2000/11	2001/11

- Continued -

Instrument	Manufacturer	Model No.	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Video Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-41	1,2,3,4	2000/9	2001/9
Audio Part Signal Generator	Anritsu	MG3601A	Frequency Range 100kHz - 1.04GHz	SG-48	1,2,3,4	2000/9	2001/9
Multiburst Signal Generator	Anritsu	MG318A	According to ANSI C63.4(1992) Section 12 Fig.15	MG-35	1,2,3,4,5	2000/12	2001/12
Matching Trans Former	Anritsu	MG614A	Frequency Range 10MHz - 1.2GHz	AX-28-2	1,2,3,4	2000/11	2001/11
Four-Port Junction Pad	Anritsu	MP659A	Frequency Range 40MHz - 1GHz	AX-16	1,2,3,4	2000/11	2001/11

[Note]

Test Item (*):

- 1: Conducted Emission Measurement
- 2: Radiated Emission Measurement
- 3: Output Signal level Measurement
- 4: Output Terminal Conducted Spurious Measurement
- 5: Transfer Switch Measurement

N/A: Not Applicable

The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.