Blank Page

Don't Forget To Delete Me!

Designated by Ministry of International Trade and Industry

KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

HEAD OFFICE
6-8-7, NISHITEMMA
KITA-KU, OSAKA, 530 JAPAN

KEC

IKOMA
TESTING LABORATORY
10630, TAKAYAMA-CHO
IKOMA-CITY, NARA, 630-01 JAPAN

Corporate Juridical Person

ENGINEERING TEST REPORT

REPORT NO. A-022-98-C

Issued Date : July 10, 1998

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.

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 : Shintom Co., Ltd.

Mailing Address : 1-19-20, Shin-Yokohama, Kohoku-ku, Yokohama 222-0033 Japan

2. Identification of Tested Device

FCC ID : BFYVPC2A3NMA
Device Name : Video Cassette Player
Trade Name : Shintom
Model Number : VPC2A3NMA
Serial Number : WS-0001 ☒ Prototype ☐ Pre-production ☐ Production
Date of Manufacture : May, 1998

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

4. Date

Receipt of Test Sample : July 2, 1998
Test Completed on : July 7, 1998

CERTIFIED BY :

Fumitoshi Nagaoka
Associate Director of Ikoma Testing Laboratory

ENGINEERING TEST REPORT

Table of Contents

ENGINEERING TEST REPORT

1. GENERAL INFORMATION

1.1 Product Description

The Shintom Model No.VPC2A3NMA (referred to as the EUT in this report) is a Video Cassette Player containing RF modulator.

1) Provided Terminals
   (1) RF Input Terminal
   (2) RF Output Terminal
   (3) A/V Output Terminal
   (4) DC Input

2) 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

3) Type of RF Output Connector : Type "F" Connector 75Ω (Unbalanced)

4) Used Oscillating Frequency except Local Oscillator
   16 MHz : CPU Clock
   3.58 MHz : Y/C Clock

5) Rated Power Supply : AC 120 V, 60 Hz
   DC 12 V

1.2 Description for Equipment Authorization

1) Rules Part(s) under which Equipment operated

   FCC Rule Part 15, Subpart B ; Unintentional Radiators TV Interface Device.

2) Kind of Equipment Authorization

   (x) Certification ( ) Verification

3) Procedure of Application

   (x) Original Equipment ( ) Modification

1.3 Test Facility

All tests described in this report were performed by:

Name : KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC)
IKOMA TESTING LABORATORY
Open Test Site No.4
Shielded Room No.4

Address : 10630, Takayama-cho Ikoma-city, Nara, 630-0101 Japan

The test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992. Thelaboratory has been accredited by the NVLAP(Lab.Code:200207-0) based on ISO/IEC Guide 25. Also the laboratory has been authorized by ITI(Interference Technology Internaitonal, UK), TUV Product Service(GER) and TUV Rheinland(GER) based on their criteria for testing laboratory (EN45001).

ENGINEERING TEST REPORT

2. TESTED SYSTEM

2.1 Test Mode

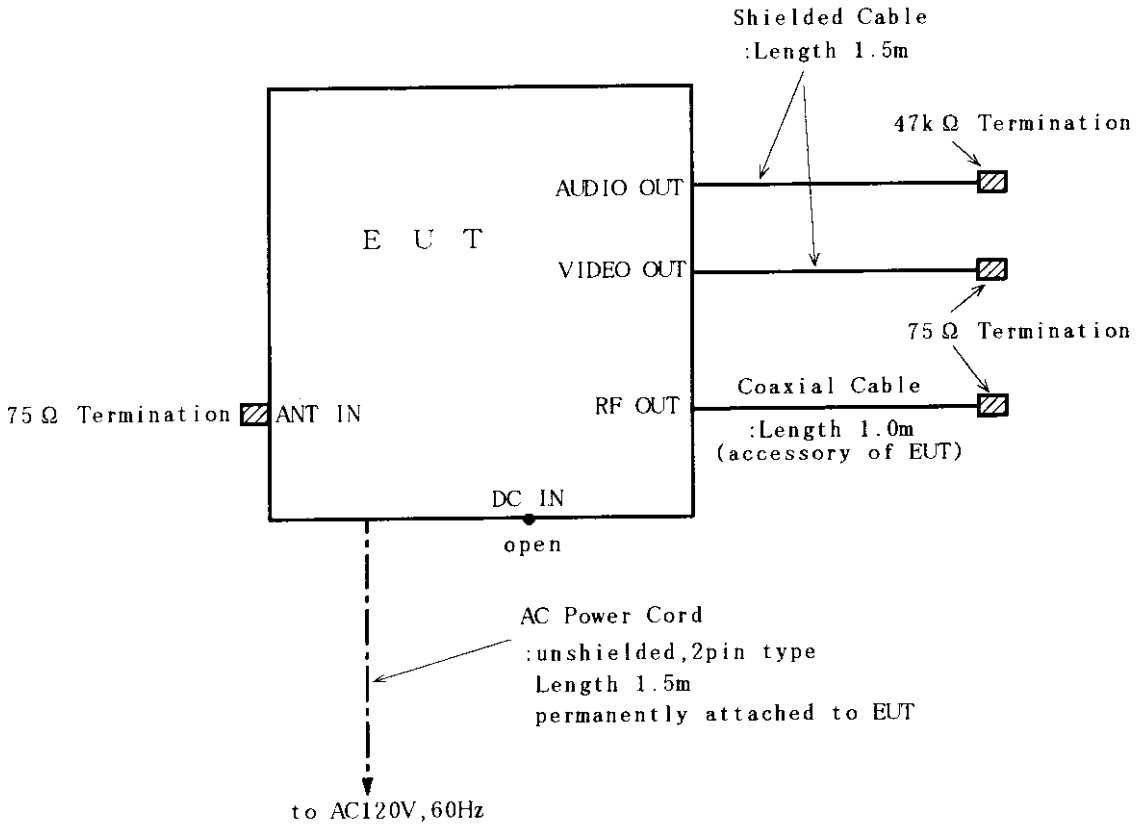
The EUT have not recording function,so the compliance tests were performed only under the "Playback mode".

Playback mode : Playback the video tape that is recorded 1V peak-to-peak VITS signal.

In the radiated emission meusurement,the emissions were checked under the two kinds of power operations (AC/DC). As a result,the maximum emission were reported at each frequency.

2.2 Block Diagram of EUT System for Conducted and Radiated Emission Measurements

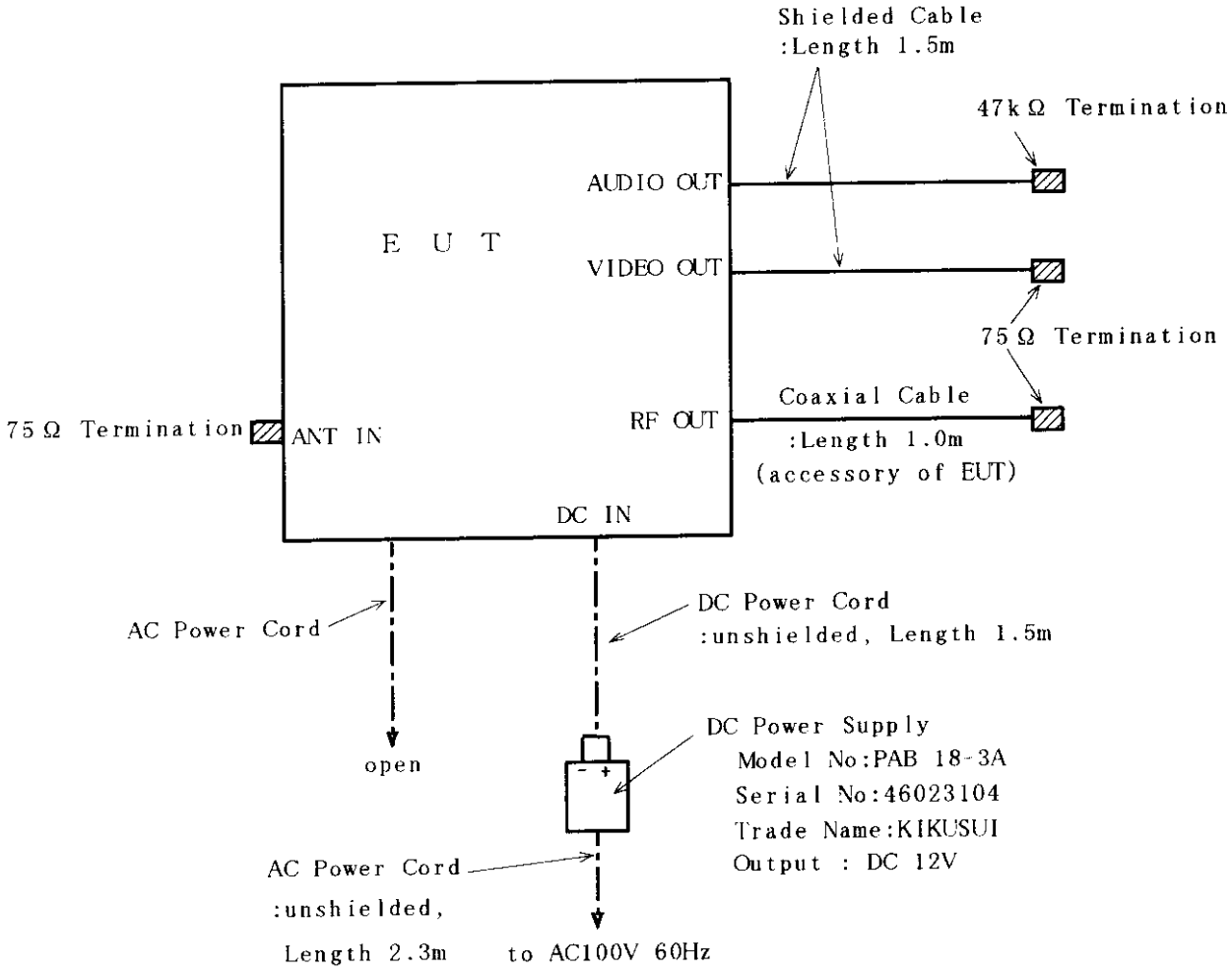
AC Power Operation Mode



ENGINEERING TEST REPORT

- Continued -

DC Power Operation Mode
(Excluding conducted Emission Measurement)



ENGINEERING TEST REPORT

3. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.107(a).

3.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 7. 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 equipment power cord are 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 require.

6) Using a calibrated coaxial cable, connect the spectrum analyzer(*1) to the mesuring port of the LISN for the EUT.

7) To find out an EUT System condition produces the maximum emission, change the position of the cables, and the EUT operation mode under normal usage of the EUT.

8) The spectrum are scanned from 450 kHz to 30 MHz and collect the minimum six highest emissions on the spectrum analyzer relative to the total limits.

9) The test receiver(*2) is connected to the LISN for the EUT, and the minimum six highest emissions recorded above are measured.

[Note]

(*1) : Spectrum Analyzer Set Up Conditions

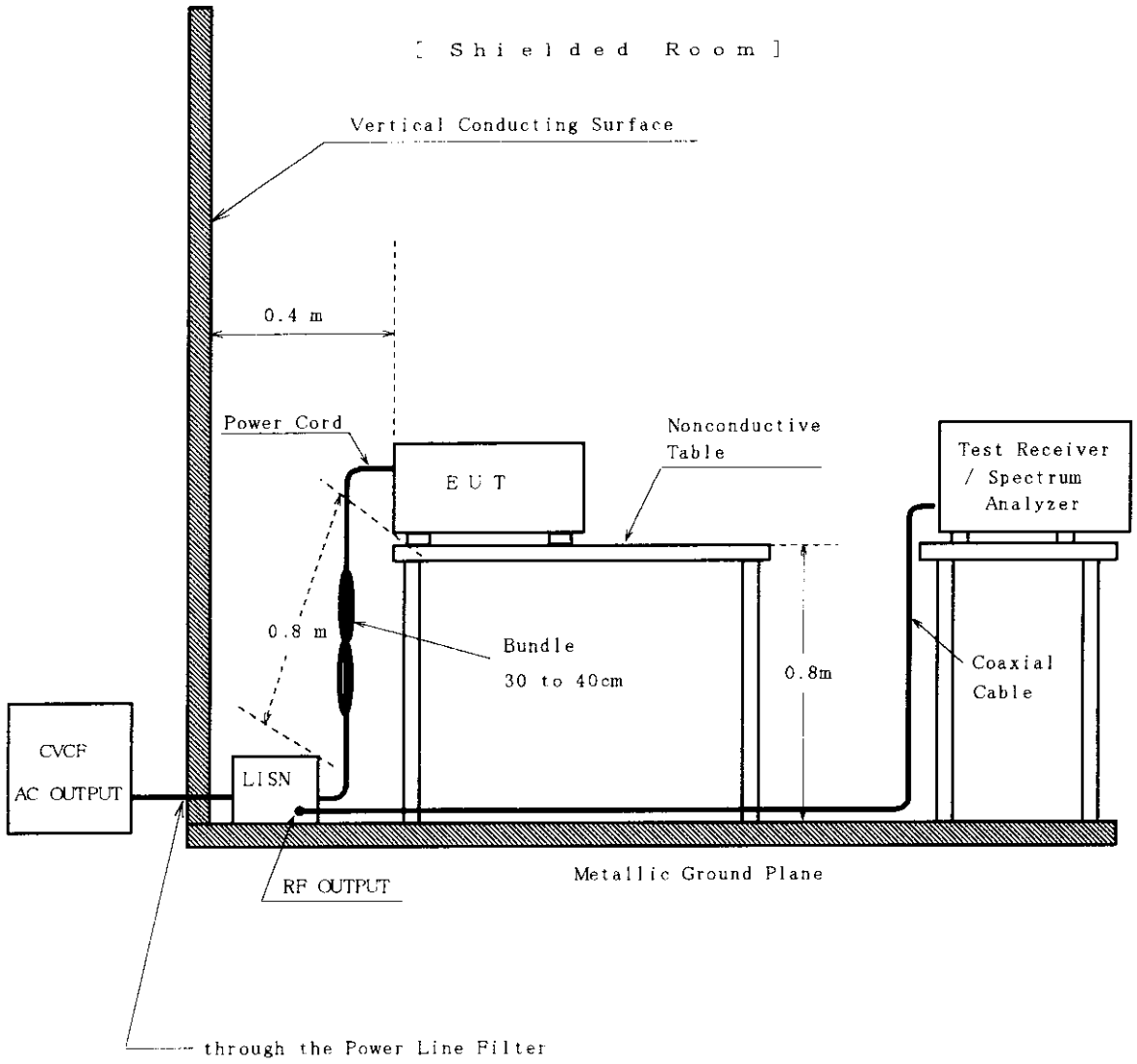
Frequency range	:	450 kHz - 30 MHz
Resolution bandwidth	:	10 kHz
Video bandwidth	:	1 MHz
Detector function	:	Peak mode

(*2) : Test Receiver Set Up Conditions

Detector function	:	Quasi-Peak / Average (if necessary)
IF bandwidth	:	9 kHz

ENGINEERING TEST REPORT

3.3 Test Configuration



ENGINEERING TEST REPORT

3.5 Test Results

Emission Frequency [MHz]	LISN Corr. Factor [dB]	Meter Reading: One-end to Ground [dBμV]	Meter Reading: Other-end to Ground [dBμV]	Maximum RF Voltage [dBμV]	Limit [dBμV]
Test Channel #3					
7.999	0.3	18.9	20.6	20.9	48.0
16.00	0.7	29.7	32.7	33.4	48.0
19.42	0.9	15.3	19.3	20.2	48.0
20.57	0.9	15.6	18.9	19.8	48.0
24.00	1.1	28.3	27.5	29.4	48.0
29.76	1.3	18.6	17.0	19.9	48.0

[Environment]

Temperature : 22 ℃ Humidity : 66 %

[Note]

1) LISN Correction Factor includes the cable loss.

2) The emissions at channel #3 were nearly equal to channel #4.

[Sample calculation]

Frequency : 7.999 [MHz]
Meter Reading : 20.6 [dBμV] (at Other-end to Ground)
LISN Corr. Factor : 0.3 [dB]

Then, RF voltage is calculated as follows.

RF Voltage = 20.6 + 0.3 = 20.9 [dBμV]

[Summary of Test Results]

Minimum margin was 14.6 dB at 16.00 MHz,other-end to ground.

Tested Date : July 6, 1998

Signature Y. Kotani
Yoshiko Kotani

ENGINEERING TEST REPORT

4. RADIATED EMISSION MEASUREMENT

4.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.109(a),(c) and 15.115(a).

4.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 8. 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 turn floor.

3) Warm up the EUT System.

4) Activate the EUT System and run the prepared software for the test, if require.

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.

6) To find out an EUT System condition produces the maximum emission, change the position of the cables, and the EUT operation mode under normal usage of the EUT.

7) The spectrum are scanned from 30 MHz to 1 GHz and collect the minimum six highest emissions on the spectrum analyzer relative to the total limits.

8) In final compliance test, the minimum six highest emissions recorded above are measured at the specified distance using the broad band antenna or the tuned dipole antenna and the test receiver(*2).

[Note]

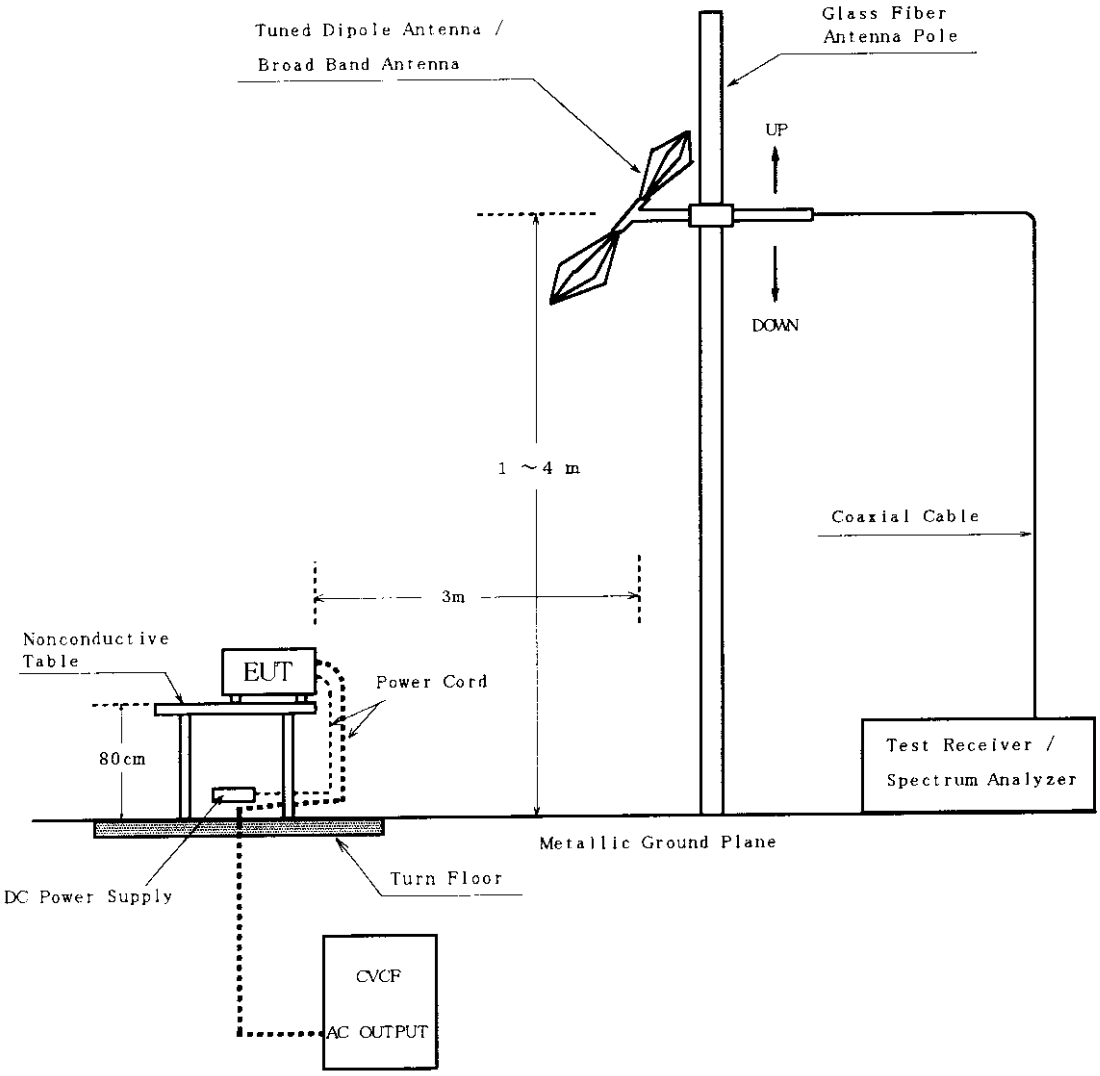
(*1) : Spectrum Analyzer Set Up Conditions
Frequency range : 30 - 1000 MHz
Resolution bandwidth : 100 kHz
Detector function : Peak mode

(*2) : Test Receiver Set Up Conditions
Detector function : Quasi-Peak
IF bandwidth : 120 kHz

ENGINEERING TEST REPORT

4.3 Test Configuration

[Open Site]



ENGINEERING TEST REPORT

4.5 Test Results

[Distance : 3 m]

Emission Frequency [MHz]	Antenna Factor [dB]	Meter Reading: Horizontal Polarization [dBμV]	Meter Reading: Vertical Polarization [dBμV]	Maximum Field Strength [dBμV/m]	Limits [dBμV/m]
Test Channel #3					
61.25	9.1	<0.0	<5.0	<14.1	40.0
65.75	8.5	<3.0	<5.0	<13.5	40.0
122.50	15.1	<0.0	<0.0	<15.1	43.5
245.00	20.2	<0.0	<0.0	<20.2	46.0
Test Channel #4					
67.25	8.4	<2.0	<3.0	<11.4	40.0
71.75	8.0	<2.0	<2.0	<10.0	40.0
134.50	16.2	<0.0	<0.0	<16.2	43.5
201.75	18.9	<0.0	<0.0	<18.9	43.5
Other Emissions					
48.00	12.1	5.0	15.6	27.7	40.0
85.90	9.0	9.6	16.8	25.8	40.0
114.57	14.2	8.3	8.8	23.0	43.5
200.45	18.9	3.5	0.8	22.4	43.5
216.00	19.3	4.4	2.4	23.7	43.5
344.00	17.9	4.6	4.0	22.5	46.0
376.03	18.7	5.6	4.1	24.3	46.0

ENGINEERING TEST REPORT

- Continued -

[Environment]

Temperature : 23 ℃ Humidity : 59 %

[Note]

Antenna factor includes the cable loss.

[Sample calculation]

Frequency : 48.00 [MHz] (Other Emission)
Meter Reading : 15.6 [dBμV] (at Vertical Polarization)
Antenna Factor : 12.1 [dB]

Then, Field Strength is calculated as follows.

Field Strength = 15.6 + 12.1 = 27.7 [dBμV/m]

[Summary of Test Results]

Minimum margin was 12.3 dB at 48.00 MHz, other emissions : vertical polarization.

Tested Date : July 7, 1998

Signature Y. Kotani
Yoshiko Kotani

ENGINEERING TEST REPORT

5. OUTPUT SIGNAL LEVEL MEASUREMENT

5.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.115(b)(1)(ii).

5.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 12.2.

2) Unused RF input/output terminals are terminated in the proper impedance.

3) Activate the EUT system.

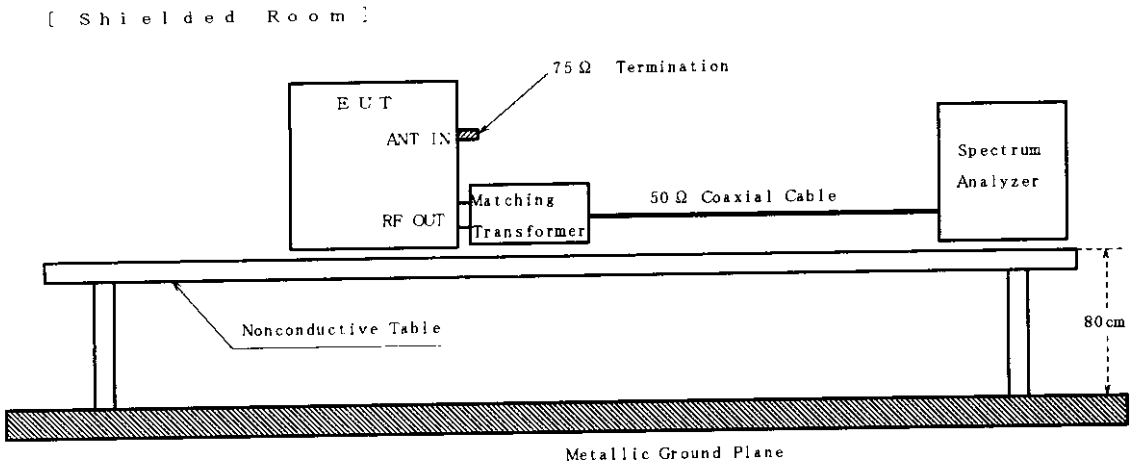
4) Set the spectrum analyzer as follows.

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 ohms coaxial cable.

6) Then, the RF output signal level is measured under the EUT condition produced the maximum signal level.

5.3 Test Configuration



ENGINEERING TEST REPORT

5.5 Test Results

Emission Frequency [MHz]	Corr. Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limits [dBμV/75Ω]
Test Channel #3				
61.25	2.3	63.0	65.3	69.5
65.75	2.3	46.9	49.2	56.5
Test Channel #4				
67.25	2.3	62.8	65.1	69.5
71.75	2.3	46.7	49.0	56.5

[Environment]

Temperature : 22 ℃ Humidity : 66 %

[Note]

1) The emission were checked under two power supply mode (AC power supply and DC power supply), and maximum emission were reported at each frequencies.

2) The correction factor consist of the voltage loss of the impedance matching transformer and the coaxial cable used for the test.

[Sample Calculation]

Frequency : 61.25 [MHz] (Test Channel #3)
Meter Reading : 63.0 [dBμV/50Ω]
Correction Factor : 2.3 [dB]

Then, the output signal level is calculated as follows.

Signal Level = 63.0 + 2.3 = 65.3 [dBμV/75Ω]

[Summary of Test Results]

Minimum margin was 4.2 dB at 61.25 MHz, test channel #3.

Tested Date : July 6, 1998 Signature Y. Kotani
Yoshiko Kotani

ENGINEERING TEST REPORT

6. OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENT

6.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.115(b)(2)(ii).

6.2 Test Procedure

1) The EUT system and measuring instrument are set up in the same manner of the output signal measurement.

2) Unused RF input/output terminals are terminated in the proper impedance.

3) Activate the EUT system.

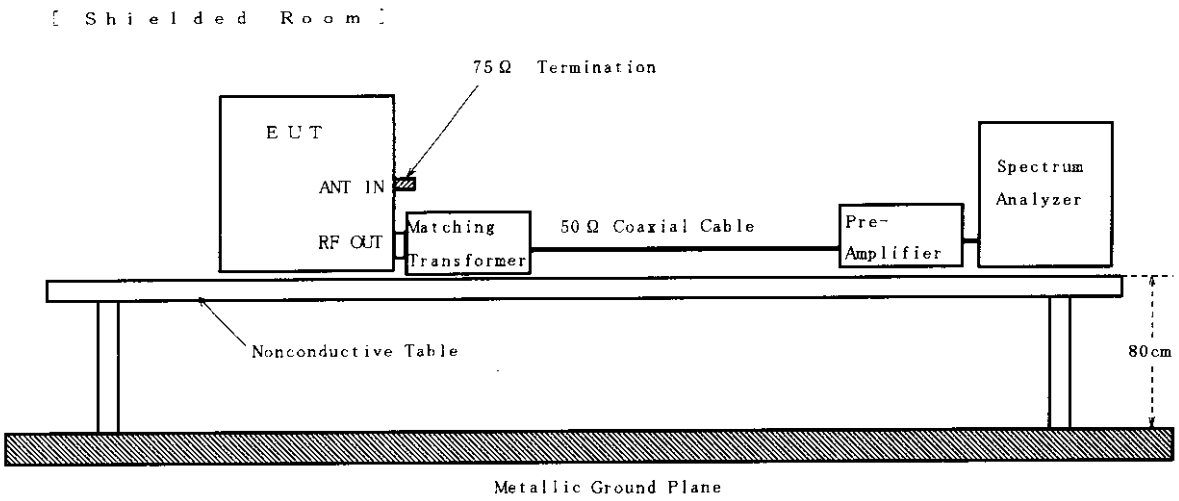
4) The spectrum was scanned from 30 MHz to more than 4.6 MHz below the visual carrier frequency, and from more than 7.4 MHz above the visual carrier frequency to 1000 MHz, and the three highest emissions are selected under the EUT condition produced the maximum signal level at each frequency range.

5) The selected emissions are measured.
The spectrum analyzer is set as follow.

Frequency span	: 1 MHz
Resolution bandwidth	: 100 kHz
Video bandwidth	: 3 MHz
Detector function	: Peak mode

ENGINEERING TEST REPORT

6.3 Test Configuration



6.4 Photographs of EUT System Configuration

The tested device configuration is the same as the output signal level measurement.(See 5.4 Photographs of EUT System Configuration.)

ENGINEERING TEST REPORT

6.5 Test Results

Emission Frequency [MHz]	Corr. Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limit [dBμV/75Ω]
Test Channel #3				
47.80	2.3	17.3	19.6	39.5
52.81	2.3	13.4	15.7	39.5
56.65	2.3	30.0	32.3	39.5
74.80	2.3	16.3	18.6	39.5
83.80	2.3	7.9	10.2	39.5
122.60	2.3	18.6	20.9	39.5
** 56.65	2.3	4.7	7.0	39.5
Test Channel #4				
52.81	2.3	14.2	16.5	39.5
53.80	2.3	19.7	22.0	39.5
62.65	2.3	30.3	32.6	39.5
80.79	2.3	15.5	17.8	39.5
134.59	2.3	15.0	17.3	39.5
201.88	2.3	7.2	9.5	39.5
** 62.65	2.3	6.4	8.7	39.5

ENGINEERING TEST REPORT

- Continued -

[Environment]

Temperature : 22 ℃ Humidity : 66 %

[Note]

1) The emission were checked under two power supply mode (AC power supply and DC power supply), and maximum emission were reported at each frequencies.

2)** : 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.

3) 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.

[Sample Calculation]

Frequency	:	47.80	[MHz] (Test Channel #3)
Meter Reading	:	17.3	[dBμV/50Ω]
Correction Factor	:	2.3	[dB]

Then, the emission level is calculated as follows.

Signal Level = 17.3 + 2.3 = 19.6 [dBμV/75Ω]

[Summary of Test Results]

Minimum margin was 17.5 dB at 53.80 MHz, test channel #4.

Tested Date : July 6, 1998

Signature Y. Kotani
Yoshiko Kotani

ENGINEERING TEST REPORT

7. TRANSFER SWITCH MEASUREMENT

7.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.115(c)(1)(ii).

7.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 12.2.

2) Activate the EUT system.

3) Unused RF output terminal is terminated in the proper impedance.

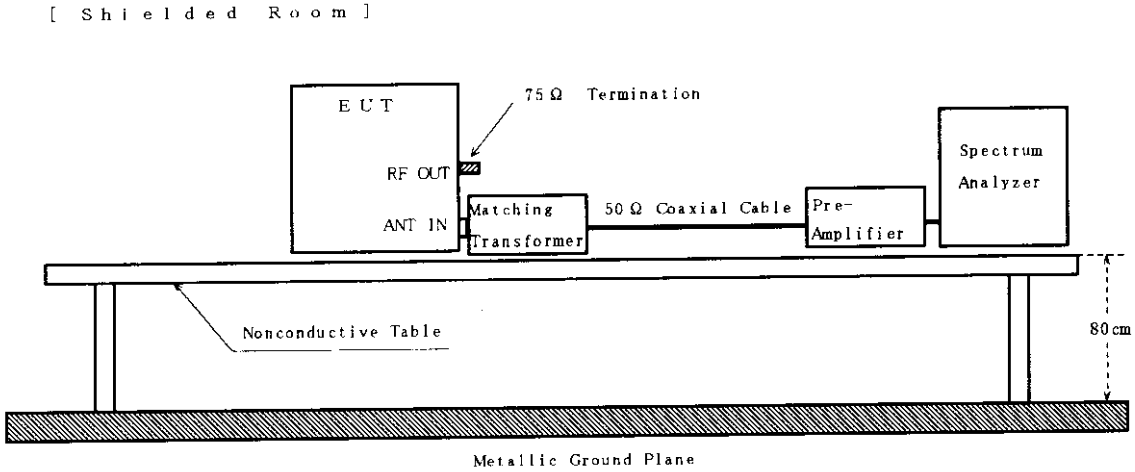
4) Set the spectrum analyzer as follows.

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 ohms 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.

7.3 Test Configuration



ENGINEERING TEST REPORT

7.5 Test Results

Emission Frequency [MHz]	Corr. Factor [dB]	Meter Reading [dBμV/50Ω]	Maximum Signal Level [dBμV/75Ω]	Limit [dBμV/75Ω]
Test Channel #3				
61.25	2.3	<0.0	<2.3	9.5
Test Channel #4				
67.25	2.3	<0.0	<2.3	9.5

[Environment]

Temperature : 22 ℃ Humidity : 66 %

[Note]

1) The emission were checked under two power supply mode (AC power supply and DC power supply), and maximum emission were reported at each frequencies.

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 descrived above are corrected by the gain of pre-amplifier.

[Sample Calculation]

Frequency : 61.25 [MHz]
Meter Reading : <0.0 [dBμV/50Ω]
Correction Factor : 2.3 [dB]

Then, the signal level is calculated as follows.

Signal Level = <0.0 + 2.3 = <2.3 [dBμV/75Ω]

[Summary of Test Results]

Minimum margin was >7.2 dB.

Tested Date : July 6, 1998

Signature Y. Kotani
Yoshiko Kotani

ENGINEERING TEST REPORT

8. LIST OF TEST INSTRUMENTS

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	Test Item	Last Cal.	Next Cal.
Test Receiver	Kyoritsu	KNM-2403	Frequency Range 9 kHz - 30 MHz	FS-70	3	1998/4	1999/4
	Rohde & Schwarz	ESVS10	Frequency Range 20 MHz - 1 GHz	FS-82	4	1998/2	1999/2
Spectrum Analyzer	Hewlett Packard	8568B	Frequency Range 50 Hz - 1.5 GHz	FS-46-3	3,5, 6,7	1998/6	1999/6
	Advantest	R3261C	Frequency Range 9 kHz - 2.6 GHz	SA-41	4	1997/8	1998/8
Pre-Amplifier	Anritsu	MH648A	Frequency Range 100 kHz - 1.2 GHz	AM-28	6,7	1998/6	1999/6
Line Impedance Stabiliza-tion Network	Kyoritsu	KNW-407	Frequency Range 150 kHz - 30 MHz Impedance 50 Ω / 50 μH Capacity AC250V, 15A	FL-107	3	1998/4	1999/4
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30 MHz - 300 MHz	AN-94	4	1998/2	1999/2
Log-Periodic Antenna	Schwarzbeck	UHALP 9108A	Frequency Range 300 MHz - 1 GHz	AN-217	4	1998/2	1999/2
Turned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25 MHz - 500 MHz	AN-135	—	1998/2	1999/2
		KBA-611S	Frequency Range 500 MHz - 1 GHz	AN-137	—	1998/2	1999/2
Matching Trans-former	Anritsu	MG614A	Frequency Range 10 MHz - 1.2 GHz	AX-28-2	5,6,7	1997/11	1998/11

June 5, 1998
BFYVPC2A3NMA

Attachment to Application
of FCC Certification
TV Interface Device

A Brief Explanation on the Circuit Operation

After fine playback video signal being input in a prerecorded tape is picked up by the video heads and amplified with Y/C - Audio Process IC (IC201). It is demodulated to the video signal.

The demodulated video signal (Comp Out) is separated into two signals as indicated below. One is fed to the RF Modulator (MDD01) to be modulated to RF signals for CH3 or CH4 and supplied to TV. Another signal is directly supplied to the Video output jack.

The audio signal being input is picked up by A/C head and amplified by Y/C - Audio Process IC (IC201), then supplied to RF Modulator and Audio output jack in the same manner as the video signals described above.