

***EMC* EMISSION - TEST REPORT**

JQA APPLICATION No. : KL8080616

Model/Type No. : VRA671AT21

Name of Product : Video Cassette Recorder (TV Interface Device)

FCC ID : ADTVRA671

Applicant : Funai Electric Co., Ltd.

Address : 7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan

Manufacturer : Funai Electric Co., Ltd.

Address : 7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan

Final Judgement : **Passed**

TEST RESULTS IN THIS REPORT are obtained in use of equipment that is traceable to Electro-technical Lab. of MITI Japan and Communications Research Lab. of PTT Japan.

THE TEST RESULTS only responds to the test sample. This test report shall not be reproduced except in full.

JAPAN QUALITY ASSURANCE ORGANIZATION (JQA)
KITA-KANSAI TESTING CENTER
EMC DIVISION



LAB CODE: 200191-0

DIRECTORY

	Page
A) Documentation	
Test report	<u>1 - 20</u>
Directory	<u>2</u>
Test Regulation / General Information	<u>3</u>
Test conditions	<u>4 - 9</u>
Configuration of EUT / Operation of EUT	<u>10 - 11</u>
EUT Modification / Responsible Party	<u>12</u>
Test results / Uncertainty	<u>13 - 14</u>
Summary	<u>15</u>
EUT-Arrangement (Drawings)	<u>16</u>
Preliminary Test and Test-setup (Drawings)	<u>17 - 19</u>
Test-setup (Photographs) at worst case	<u>20</u>
B) Test data	
Conducted Emission 450 kHz - 30 MHz	<u>21 - 23</u>
Radiated Emission (Electric Field) 30 MHz - 1000 MHz	<u>24 - 26</u>
Radiated Emission (Electric Field) 1 GHz - 2 GHz	<u>N/A</u>
Output Signal Level	<u>27</u>
Output Terminal Conducted Spurious Emission	<u>28 - 30</u>
Transfer Switch Isolation	<u>31</u>

TEST REGULATION

FCC Rules and Regulations Part 15 Subpart A and B (April 17, 1997)

- ☐ - Class A Digital Device
- ☐ - Class B Digital Device
- ☐ - TV Broadcast Receiver
- ☒ - TV Interface Device

Test procedure:

Conducted and radiated emission test were performed according to the procedures in ANSI C63.4-1992.

GENERAL INFORMATION

Test facility:

- 1) Test Facility located at Kita-Kansai : 1st and 2nd Open Sites (3 m Site)
Test Facility located at Kameoka Open Site (3, 10 and 30 m, on common plane)
FCC filing No. : 31040/SIT 1300F2
- 2) KITA-KANSAI TESTING CENTER is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance established in Title 15, Part 285 Code of Federal Regulations.
NAVLAP Lab Code: 200191-0

Description of the Equipment Under Test (EUT):

- 1) Name : Video Cassette Recorder
- 2) Model/Type No. : VRA671AT21
- 3) Brand Name : PHILIPS
- 4) Product Type : Pre Production (S/N 00003)
- 5) Category : TV Interface Device
- 6) EUT Authorization : ☐ - Verification ☒ - Certification ☐ - D.o.C
- 7) Highest frequency used/generated : 71.75 MHz
- 8) Power Rating : 120V 60Hz

Definitions for symbols used in this test report:

- ☒ - Black box indicates that the listed condition, standard or equipment is applicable for this Report.
- ☐ - Blank box indicates that the listed condition, standard or equipment is not applicable for this Report.

TEST CONDITIONS

The measurement of the Conducted Emission (Disturbance Voltage)
was performed in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

○ - On metal plane of open site

Used test instruments and sites:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
○ - ESH 3	A - 1		
● - ESH 2	A - 2	December, 1998	1 Year
○ - ESH 2	A - 3		
○ - 8568B	A - 10		
○ - 8566B	A - 13		
○ - 8593A	A - 15		
● - KNW-407	D - 6	February, 1998	1 Year
○ - KNW-242	D - 7		
○ - KNW-341C	D - 13		
○ - KNW-408	D - 14		
○ - ESH2-Z5	D - 10		
○ - ESH3-Z5	D - 12		
○ - ESH2-Z3	D - 17		
○ - VG-40A	B - 13		
● - MG318A	B - 14	May, 1998	1 Year
● - 216/1	B - 16	May, 1998	1 Year
● - Cable	H - 8	February, 1998	1 Year

Environmental conditions:

Temperature: 23 °C Humidity: 34 %

The measurement of the Radiated Emission (Electric Field)

was performed in horizontal and vertical polarization, in the frequency range of 30 MHz - 1000 MHz, in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - 1st site (3 meters)

○ - 2nd site (3 meters)

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - 3 meters

○ - 10 meters

Validation of Site Attenuation:

1) Last Confirmed Date: November 27, 1998

2) Interval : 1 Year

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - ESV/ESV-Z3	A - 7 / A - 17	December, 1998	1 Year
○ - ESV/ESV-Z3	A - 6 / A - 18		
○ - ESV/ESV-Z3	A - 5 / A - 16		
○ - ESV/ESV-Z3	A - 4 / A - 20		
○ - ESV/ESV-Z3	A - 8 / A - 19		
● - KBA-511A	C - 12	November, 1998	1 Year
● - KBA-611	C - 22	November, 1998	1 Year
● - MG318A	B - 14	May, 1998	1 Year
● - 216/1	B - 16	May, 1998	1 Year
● - Cable	H - 5	November, 1998	1 Year

Environmental conditions:

Temperature: 14 °C Humidity: 44 %

The measurement of the Radiated Emission (Electric Field)

was performed in horizontal and vertical polarization, in the frequency range of 1 GHz - 2 GHz, in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

○ - 1st site (3 meters)

○ - 2nd site (3 meters)

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - 3 meters

○ - 10 meters

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
○ - 8566B	A - 13		
○ - 8593A	A - 15		
○ - ESV	A - 5		
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
○ - WJ-6611-513	A - 23		
○ - WJ-6882-824	A - 21		
○ - 91888-2	C - 41 - 1		
○ - 91889-2	C - 41 - 2		
○ - 94613-1	C - 41 - 3		
○ - 8494H/8595H	D - 76		
○ - Cable	C - 40 - 11		
○ - Cable	C - 40 - 12		

Setting of the spectrum analyzer:

RES B.W : Video B.W :
SCALE : Sweep Time:

Environmental conditions:

Temperature: _____ °C Humidity: _____ %

The measurement of the Output Signal Level
was performed in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded Room

○ - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded Room

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - 8568B	A - 10	May, 1998	1 Year
○ - 8566B	A - 13		
○ - 8593A	A - 15		
○ - 8447D	A - 25		
● - MG318A	B - 14	May, 1998	1 Year
● - 216/1	B - 16	May, 1998	1 Year
○ - MP614A	D - 56	June, 1998	1 Year
○ - 12B50/75	D - 55		
● - 12N50/75B	D - 72		
○ - 1-6	D - 32		
○ - 1-3	D - 34		
○ - 2-10	D - 40		
○ - 8201-3	D - 63		
○ - 8201-6	D - 64		
● - Cable	C - 40 - 9	June, 1998	1 Year

Environmental conditions:

Temperature: 22 °C Humidity: 40 %

The measurement of the Output Terminal Conducted Spurious Emission
was performed in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded Room

○ - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded Room

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - 8568B	A - 10	May, 1998	1 Year
○ - 8566B	A - 13		
○ - 8593A	A - 15		
● - 8447D	A - 25	June, 1998	1 Year
● - MG318A	B - 14	May, 1998	1 Year
● - 216/1	B - 16	May, 1998	1 Year
○ - MP614A	D - 56	June, 1998	1 Year
○ - 12B50/75	D - 55		
● - 12N50/75B	D - 72		
○ - 1-6	D - 32		
○ - 1-3	D - 34		
○ - 2-10	D - 40		
○ - 8201-3	D - 63	June, 1998	1 Year
● - 8201-6	D - 64		
● - Cable	C - 40 - 9	June, 1998	1 Year

Environmental conditions:

Temperature: 22 °C Humidity: 40 %

The measurement of the Transfer Switch Isolation
was performed in the following test site.

Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan

● - Shielded Room

○ - Anechoic Chamber

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded Room

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - 8568B	A - 10	May, 1998	1 Year
○ - 8566B	A - 13		
○ - 8593A	A - 15		
● - 8447D	A - 25	June, 1998	1 Year
● - MG318A	B - 14	May, 1998	1 Year
● - 216/1	B - 16	May, 1998	1 Year
○ - MP614A	D - 56	June, 1998	1 Year
○ - 12B50/75	D - 55		
● - 12N50/75B	D - 72		
○ - 1-6	D - 32		
○ - 1-3	D - 34		
○ - 2-10	D - 40	June, 1998	1 Year
● - 8201-3	D - 63		
○ - 8201-6	D - 64	June, 1998	1 Year
● - Cable	C - 40 - 9		

Environmental conditions:

Temperature: 22 °C Humidity: 40 %

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of:

Description	Applicant (Manufacturer)	Model No. (Serial No.)	FCC ID
Video Cassette Recorder	Funai Electric Co., Ltd. (Funai Electric Co., Ltd.)	VRA671AT21 (00003)	ADTVRA671

The measurement was carried out with the following equipment connected:

Description	Grantee/Distributor	Model No. (Serial No.)	FCC ID
None			

Type of Interference Cable(s) and the AC Power Cord used with the EUT:

No.	Cable	Shielded	Ferrite Core	Length
1	EUT (VIDEO INPUT (Rear)) / 75 Ω termination or VITS Generator	-- YES	-- NO	-- m 2.5m
2	EUT (VIDEO INPUT (Front)) / 75 Ω termination	--	--	-- m
3	EUT (VIDEO OUTPUT) / 75 Ω termination	YES	NO	1.0m
4	EUT (AUDIO INPUT L/R (Rear)) / No termination	--	--	-- m
5	EUT (AUDIO INPUT L/R (Front)) / No termination	--	--	-- m
6	EUT (AUDIO OUTPUT L/R) / No termination	YES	NO	1.0m
7	EUT (ANTENNA INPUT) / 75 Ω termination or Colorbar Generator	-- YES	-- NO	-- m 2.5m
8	EUT (RF OUTPUT) / 75 Ω termination	YES	NO	1.0m
9	AC Power Cord (EUT) with 2-pin plug	NO	NO	1.5m

Operation - mode of the EUT:

The equipment under test was operated under 3 modes shown as follows:

- A) Playing the internal modulation sources (NTSC TV signal recording tape)
- B) Recording the video modulation sources (VITS: 1Vp_p and 5Vp_p)
- C) Recording the RF modulation sources (NTSC Colorbar: 70dB(μ V) at 193.25 MHz)

Test system:

The EUT has ports shown as follows:

F-Type Plugs : ANTENNA IN, RF OUT
Pin Plugs : VIDEO IN (Front/Rear), AUDIO IN L/R (Front/Rear), VIDEO OUT, AUDIO OUT L/R

Special accessories:

None

The used (generated) frequency in the EUT:

Carrier Frequency
3ch Visual : 61.25 MHz
Aural : 56.75 MHz, 65.75 MHz
4ch Visual : 67.25 MHz
Aural : 62.75 MHz, 71.75 MHz

System Control : 14.3 MHz
Color Carrier : 3.58 MHz
Clock : 32 kHz

EUT Modification

- - No modifications were conducted by JQA to achieve compliance to the applied levels.
- - To achieve compliance to the applied levels, the following change(s) were made by JQA during the compliance test.

The modification(s) will be implemented in all production models of this equipment.

Applicant : N/A Date : N/A
Typed Name : N/A Position : N/A

Responsible Party

Responsible Party of Test Item(Product)

Responsibe party :

Contact Person :

Signatory

TEST RESULTS

Conducted Emission 450 kHz - 30 MHz

The requirements are

● - KEPT

○ - NOT KEPT

Min. limit margin

+ 6.6 dB at 7.16 MHz

Max. limit exceeding

_____ dB at _____ MHz

Uncertainty of measurement results

+ 2.1 dB(2 σ) - 2.1 dB(2 σ)

Remarks: _____

Radiated Emission (Electric Field) 30 MHz - 1000 MHz

The requirements are

● - KEPT

○ - NOT KEPT

Min. limit margin

+ 2.1 dB at 85.9 MHz

Max. limit exceeding

_____ dB at _____ MHz

Uncertainty of measurement results

+ 4.1 dB(2 σ) - 4.2 dB(2 σ)

Remarks: _____

Radiated Emission (Electric Field) 1 GHz - 2 GHz

The requirements are

○ - KEPT

○ - NOT KEPT

Min. limit margin

_____ dB at _____ MHz

Max. limit exceeding

_____ dB at _____ MHz

Uncertainty of measurement results

_____ dB(2 σ) _____ dB(2 σ)

Remarks: Not Applicable

Output Signal Level

The requirements are

● - KEPT ○ - NOT KEPT

Min. limit margin + 2.8 dB at 61.25 MHz

Max. limit exceeding _____ dB at _____ MHz

Uncertainty of measurement results + 2.3 dB(2σ) - 2.3 dB(2σ)

Remarks: _____

Output Terminal Conducted Spurious Emission 30 MHz - 1000 MHz

The requirements are

● - KEPT ○ - NOT KEPT

Min. limit margin +15.8 dB at 122.25 MHz

Max. limit exceeding _____ dB at _____ MHz

Uncertainty of measurement results + 2.3 dB(2σ) - 2.3 dB(2σ)

Remarks: _____

Transfer Switch Isolation

The requirements are

● - KEPT ○ - NOT KEPT

Min. limit margin + 5.3 dB at 67.25 MHz

Max. limit exceeding _____ dB at _____ MHz

Uncertainty of measurement results + 2.3 dB(2σ) - 2.3 dB(2σ)

Remarks: _____

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and B (April 17, 1997) under the test configuration, as shown in page 16.

The conclusion for the test items of which are required by the applied regulation is indicated under the final judgement.

FINAL JUDGEMENT :

The "as received" sample;

- - fulfill the test requirements of the regulation mentioned on page 3.
- - fulfill the test requirements of the regulation mentioned on page 3, but with certain qualifications.
- - doesn't fulfill the test regulation mentioned on page 3.

Begin of testing : December 18, 1998

End of testing : January 7, 1999

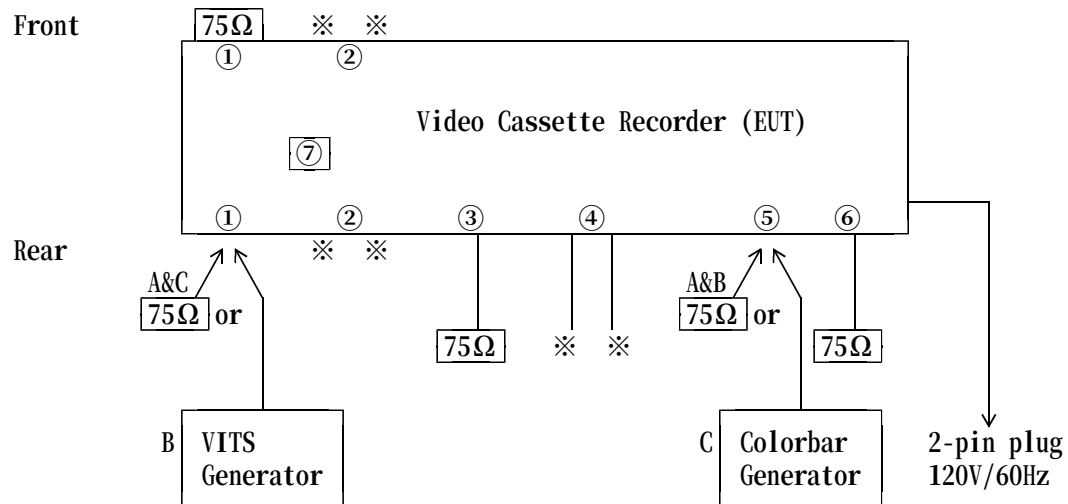
- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved Signatory :

T.Yamanaka
Takashi Yamanaka
Manager
EMC Div.
JQA KITA-KANSAI Testing Center

A.Hosoda
Akio Hosoda
Project Manager
EMC Div.
JQA KITA-KANSAI Testing Center

Test System-Arrangement (Drawings)



Note)

※ - No termination

① - VIDEO INPUT

② - AUDIO INPUT L/R

③ - VIDEO OUTPUT

④ - AUDIO OUTPUT L/R

⑤ - ANTENNA INPUT

⑥ - RF OUTPUT

⑦ - Channel Selector Switch (3ch and 4ch)

A - Playing the internal modulation sources

B - Recording the video modulation sources

C - Recording the RF modulation sources

Preliminary Test and Test-setup(Drawings)

Conducted Emission 450 kHz - 30 MHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.7.2.3 (Preliminary AC Powerline Conducted Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests). The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.

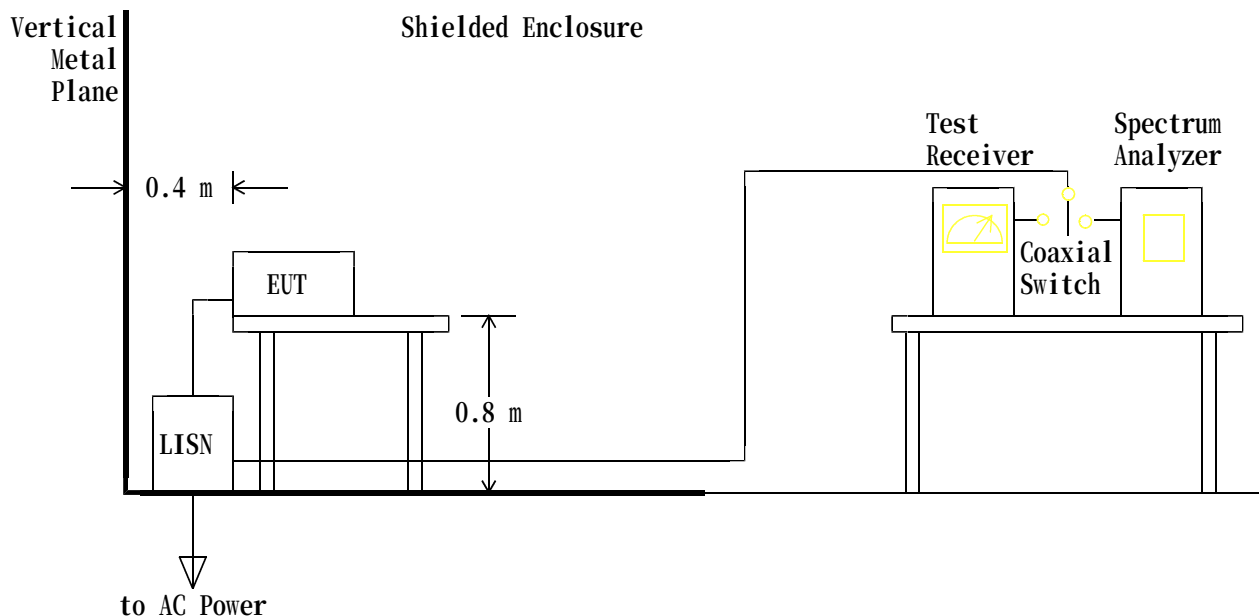
Step 1: One operation mode of the test system was setting.

Step 2: Using both of a spectrum analyzer and a test receiver, the emission's circumstance from the system was monitored in one of ten divided frequency bands of the specified frequency range (450 kHz - 30 MHz). The maximum emission in the band was found by changing the typical cable positions or cable manipulation under a typical system configuration and by selecting of current-carrying conductor. The level and the frequency at the one point which are regarded as relative high emission in the band was measured and recorded. This step was repeated until the ending frequency band.

Step 3: Return to step 1, if the other operation mode was possible to be setting.

Step 4: Based on the collected results, the operation mode produced the maximum emission was selected. The final test on the selected operation mode was performed. But if it was difficult to select the operation mode, the final tests on all operation modes were performed.

Step 5: Based on the same data, as result if the final measurement, at the worst point that has the highest amplitude relative to the limit the repeatability of the worst was reconfirmed. The photographs of the test system setup on the worst point were taken and recorded.



Radiated Emission (Electric Field) 30 MHz - 1000 MHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.8.3.1.1 (Preliminary Radiated Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests).

The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.

Step 1: One operation mode of the test system was setting.

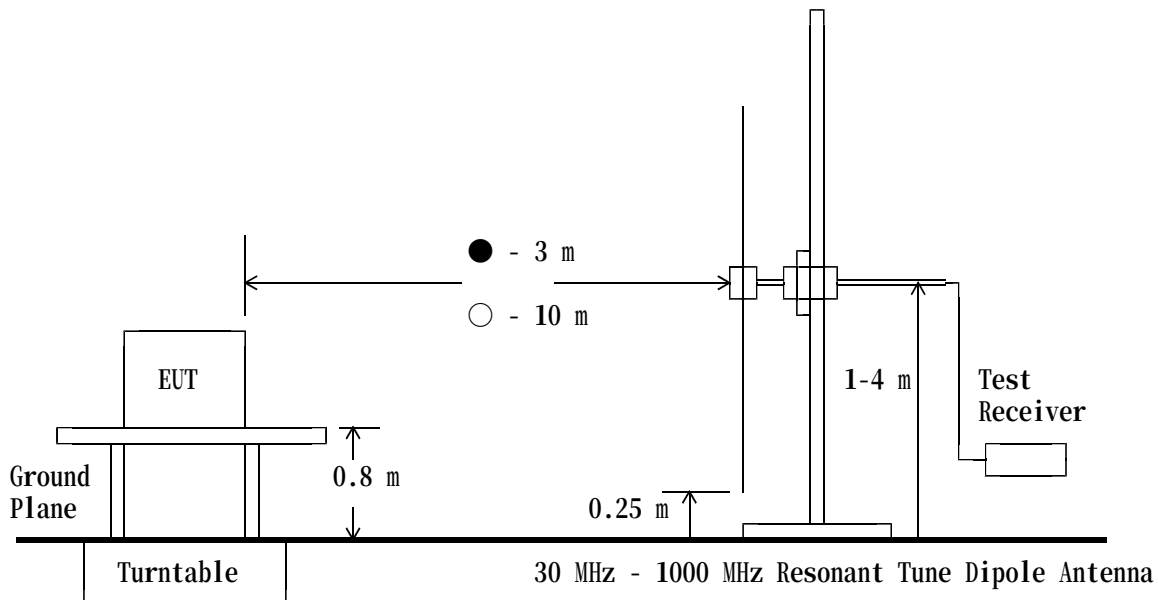
Step 2: Using a test receiver and a test antenna probe, the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded every one of 22 divided bands in the specified frequency band (30 MHz - 1000 MHz).

Step 3: Using a test receiver and a resonant tuned dipole antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-1992 Sec.8.3.1.2 (Final Radiated Emissions Tests) at each frequency which was found the higher emission referred to level vs. frequency on the list and which was measured by the resonant tuned dipole antenna. The maximum emission was found by changing the cable positions or cable manipulation under a typical system configuration.

Step 4: Return to step 1, if the other operation mode was possible to be setting.

Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.

At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the the worst point were taken and recorded.



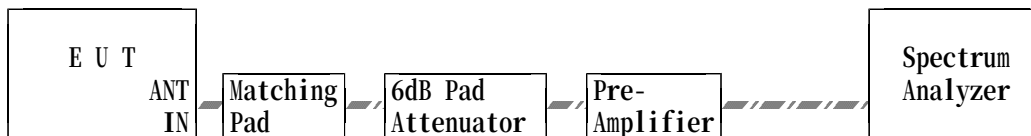
Output Signal Level and Spurious Emission 30 MHz - 1000 MHz:

The test was performed according to the description of ANSI C63.4-1992 Sec.12.2.5 (Output and Spurious Conducted Level Measurements).

1. Output Signal Level



2. Output Terminal Conducted Spurious Emission



Spectrum Analyzer Setting:

RES BW	100 kHz
VIDEO BW	300 kHz
SPAN	10 MHz

Transfer Switch Isolation Measurements:

The test was performed according to the description of ANSI C63.4-1992 Sec.12.2.6 (Antenna Transfer Switch Measurements for Unintentional Radiators).



Spectrum Analyzer Setting:

RES BW	AUTO
VIDEO BW	AUTO
SPAN	20 kHz

Test-Setup (Photographs) at worst case

Conducted Emission 450kHz - 30MHz:



Front View



Rear View

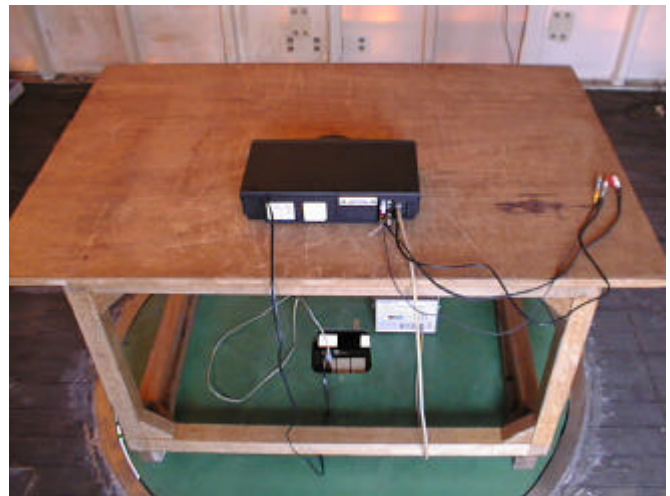


Side View

Radiated Emission 30MHz - 1000MHz:



Front View



Rear View

Mains terminal Disturbance Measurement

TV Interface Device

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)

Operating Condition : Playing Mode

RF Output Channels : #3 and #4

Test Date: December 18, 1998

Temp.: 23 °C ; Humi.: 34 %

Frequency [MHz]	Correction Factor [dB]	Meter Readings dB(μV)				Limits dB(μV)	Results dB(μV)		Margin [dB]	Remarks (Note 2)
		VA-QP	VA-AV	VB-QP	VB-AV		QP	AV		
0.45	0.1	40.0	-	40.0	-	48.0	40.1	-	+ 7.9	A
0.81	0.1	33.0	-	32.0	-	48.0	33.1	-	+14.9	A
1.28	0.2	36.0	-	34.0	-	48.0	36.2	-	+11.8	A
2.18	0.2	25.0	-	24.0	-	48.0	25.2	-	+22.8	A
3.85	0.3	18.0	-	17.0	-	48.0	18.3	-	+29.7	A
14.32	0.6	27.0	-	25.0	-	48.0	27.6	-	+20.4	A
21.48	0.8	17.0	-	14.0	-	48.0	17.8	-	+30.2	A
26.00	0.9	21.0	-	18.0	-	48.0	21.9	-	+26.1	A
28.64	0.9	38.0	-	35.0	-	48.0	38.9	-	+ 9.1	A
29.98	0.9	25.0	-	22.0	-	48.0	25.9	-	+22.1	A

Sample of calculated result at 0.45 MHz, as the Minimum Margin point:

Cable Loss = 0.1 dB

+) Meter Reading = 40.0 dB(μV)

Result = 40.1 dB(μV)

Minimum Margin : 48.0 - 40.1 = 7.9(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

1.The correction factors includes the LISN insertion loss and the cable loss.

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	9 kHz
B	Average	10 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : Video Modulation Sources (VITS: 1Vp_p and 5Vp_p)
Operating Condition : Recording Mode

RF Output Channels : #3 and #4

Test Date: December 18, 1998
Temp.: 23 °C ; Humi.: 34 %

Frequency [MHz]	Correction Factor [dB]	Meter Readings dB(μV)				Limits dB(μV)	Results dB(μV)		Margin [dB]	Remarks (Note 2)
		VA-QP	VA-AV	VB-QP	VB-AV		QP	AV		
0.45	0.1	40.0	-	40.0	-	48.0	40.1	-	+ 7.9	A
0.80	0.1	33.0	-	33.0	-	48.0	33.1	-	+14.9	A
1.20	0.1	34.0	-	34.0	-	48.0	34.1	-	+13.9	A
3.00	0.3	24.0	-	24.0	-	48.0	24.3	-	+23.7	A
4.09	0.3	29.0	-	29.0	-	48.0	29.3	-	+18.7	A
5.86	0.4	39.0	-	39.0	-	48.0	39.4	-	+ 8.6	A
7.16	0.4	41.0	-	41.0	-	48.0	41.4	-	+ 6.6	A
14.32	0.6	21.0	-	18.0	-	48.0	21.6	-	+26.4	A
23.00	0.8	20.0	-	17.0	-	48.0	20.8	-	+27.2	A
28.64	0.9	33.0	-	31.0	-	48.0	33.9	-	+14.1	A

Sample of calculated result at 7.16 MHz, as the Minimum Margin point:

Cable Loss = 0.4 dB
+) Meter Reading = 41.0 dB(μV)
Result = 41.4 dB(μV)
Minimum Margin : 48.0 - 41.4 = 6.6(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

1.The correction factors includes the LISN insertion loss and the cable loss.

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	9 kHz
B	Average	10 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : RF Modulation Sources (NTSC Colorbar: 70dB(μV) at 193.25 MHz)
Operating Condition : Recording Mode

RF Output Channels : #3 and #4

Test Date: December 28, 1998
Temp.: 19 °C ; Humi.: 34 %

Frequency [MHz]	Correction Factor [dB]	Meter Readings dB(μV)				Limits dB(μV)	Results dB(μV)		Margin [dB]	Remarks (Note 2)
		VA-QP	VA-AV	VB-QP	VB-AV		QP	AV		
0.45	0.1	41.0	-	41.0	-	48.0	41.1	-	+ 6.9	A
0.80	0.1	33.0	-	33.0	-	48.0	33.1	-	+14.9	A
1.25	0.2	30.0	-	30.0	-	48.0	30.2	-	+17.8	A
3.00	0.3	17.0	-	19.0	-	48.0	19.3	-	+28.7	A
4.30	0.3	20.0	-	20.0	-	48.0	20.3	-	+27.7	A
7.16	0.4	27.0	-	27.0	-	48.0	27.4	-	+20.6	A
14.32	0.6	23.0	-	22.0	-	48.0	23.6	-	+24.4	A
23.00	0.8	11.0	-	< 10.0	-	48.0	11.8	-	+36.2	A
28.64	0.9	27.0	-	24.0	-	48.0	27.9	-	+20.1	A
29.87	0.9	15.0	-	12.0	-	48.0	15.9	-	+32.1	A

Sample of calculated result at 0.45 MHz, as the Minimum Margin point:

Cable Loss = 0.1 dB
+) Meter Reading = 41.0 dB(μV)
Result = 41.1 dB(μV)
Minimum Margin : 48.0 - 41.1 = 6.9(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

1.The correction factors includes the LISN insertion loss and the cable loss.

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	9 kHz
B	Average	10 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Electromagnetic Radiation Disturbance Measurement

TV Interface Device

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)

Operating Condition : Playing Mode

RF Output Channels : #3 and #4

Test Date: January 4, 1999

Temp.: 19 °C ; Humi.: 36 %

Frequency [MHz]	Antenna Factor dB(1/m)	Cable Loss [dB]	Meter Readings dB(μV)		Limits dB(μV/m)	Results dB(μV/m)		Margin [dB]	Remarks (Note 2)
			Hori.	Vert.		Hori.	Vert.		
43.0	1.6	1.3	18.0	15.0	40.0	20.9	17.9	+19.1	A
71.6	6.0	1.6	22.0	17.0	40.0	29.6	24.6	+10.4	A
85.9	7.6	1.8	28.0	21.0	40.0	37.4	30.4	+ 2.6	A
114.6	10.1	2.0	16.0	13.0	43.5	28.1	25.1	+15.4	A
143.2	12.0	2.3	13.0	11.0	43.5	27.3	25.3	+16.2	A
200.5	14.9	2.8	13.0	9.0	43.5	30.7	26.7	+12.8	A
214.8	15.5	2.9	5.0	< 0.0	43.5	23.4	< 18.4	+20.1	A
272.0	17.6	3.4	7.0	< 7.0	46.0	28.0	< 28.0	+18.0	A
300.7	18.4	3.6	6.0	1.0	46.0	28.0	23.0	+18.0	A
372.3	20.5	4.0	1.0	<-5.0	46.0	25.5	< 19.5	+20.5	A

Sample of calculated result at 85.9 MHz, as the Minimum Margin point:

Antenna Factor = 7.6 dB(1/m)

Cable Loss = 1.8 dB

+) Meter Reading = 28.0 dB(μV)

Result = 37.4 dB(μV/m)

Minimum Margin : 40.0 - 37.4 = 2.6(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

1)The highest frequency generated or used in the EUT: 71.75 MHz

2)The upper frequency of measurement range : 1GHz

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	120 kHz
B	Average	120 kHz
C	Average	12 kHz
D	Average	7.5 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : Video Modulation Sources (VITS: 1Vp_p and 5Vp_p)
Operating Condition : Recording Mode

RF Output Channels : #3 and #4

Test Date: January 5, 1999
Temp.: 11 °C ; Humi.: 58 %

Frequency [MHz]	Antenna Factor dB(1/m)	Cable Loss [dB]	Meter Readings dB(μV)		Limits dB(μV/m)	Results dB(μV/m)		Margin [dB]	Remarks (Note 2)
			Hori.	Vert.		Hori.	Vert.		
43.0	1.6	1.3	18.0	17.0	40.0	20.9	19.9	+19.1	A
71.6	6.0	1.6	21.0	14.0	40.0	28.6	21.6	+11.4	A
85.9	7.6	1.8	28.0	22.0	40.0	37.4	31.4	+ 2.6	A
114.6	10.1	2.0	18.0	13.0	43.5	30.1	25.1	+13.4	A
143.2	12.0	2.3	14.0	10.0	43.5	28.3	24.3	+15.2	A
200.5	14.9	2.8	12.0	6.0	43.5	29.7	23.7	+13.8	A
257.8	17.1	3.3	10.0	1.0	46.0	30.4	21.4	+15.6	A
272.1	17.6	3.4	9.0	< 9.0	46.0	30.0	< 30.0	+16.0	A
300.7	18.4	3.6	4.0	1.0	46.0	26.0	23.0	+20.0	A
372.3	20.5	4.0	1.0	<-5.0	46.0	25.5	< 19.5	+20.5	A

Sample of calculated result at 85.9 MHz, as the Minimum Margin point:

Antenna Factor = 7.6 dB(1/m)
Cable Loss = 1.8 dB
+) Meter Reading = 28.0 dB(μV)
Result = 37.4 dB(μV/m)

Minimum Margin : 40.0 - 37.4 = 2.6(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

- 1)The highest frequency generated or used in the EUT: 71.75 MHz
- 2)The upper frequency of measurement range : 1GHz

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	120 kHz
B	Average	120 kHz
C	Average	12 kHz
D	Average	7.5 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : RF Modulation Sources (NTSC Colorbar: 70dB(μV) at 193.25 MHz)
Operating Condition : Recording Mode

RF Output Channels : #3 and #4

Test Date: January 5, 1999
Temp.: 14 °C ; Humi.: 44 %

Frequency [MHz]	Antenna Factor dB(1/m)	Cable Loss [dB]	Meter Readings dB(μV)		Limits dB(μV/m)	Results dB(μV/m)		Margin [dB]	Remarks (Note 2)
			Hori.	Vert.		Hori.	Vert.		
43.0	1.6	1.3	19.0	19.0	40.0	21.9	21.9	+18.1	A
71.6	6.0	1.6	21.0	19.0	40.0	28.6	26.6	+11.4	A
85.9	7.6	1.8	28.5	23.0	40.0	37.9	32.4	+ 2.1	A
114.6	10.1	2.0	19.0	14.0	43.5	31.1	26.1	+12.4	A
143.2	12.0	2.3	21.0	22.0	43.5	35.3	36.3	+ 7.2	A
200.5	14.9	2.8	13.0	9.0	43.5	30.7	26.7	+12.8	A
214.8	15.5	2.9	10.0	5.0	43.5	28.4	23.4	+15.1	A
257.8	17.1	3.3	11.0	< 3.0	46.0	31.4	< 23.4	+14.6	A
272.0	17.6	3.4	6.0	< 6.0	46.0	27.0	< 27.0	+19.0	A
315.0	18.9	3.7	7.0	2.0	46.0	29.6	24.6	+16.4	A

Sample of calculated result at 85.9 MHz, as the Minimum Margin point:

Antenna Factor = 7.6 dB(1/m)
Cable Loss = 1.8 dB
+) Meter Reading = 28.5 dB(μV)
Result = 37.9 dB(μV/m)

Minimum Margin : 40.0 - 37.9 = 2.1(dB)

The point shown on "____" is the Minimum Margin Point.

Note 1:

- 1)The highest frequency generated or used in the EUT: 71.75 MHz
- 2)The upper frequency of measurement range : 1GHz

Remarks:

Note 2	Detector Function	IF Bandwidth
A	CISPR QP	120 kHz
B	Average	120 kHz
C	Average	12 kHz
D	Average	7.5 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Output Signal Level Measurement

TV Interface Device

Test Date: January 7, 1999

Temp.: 22 °C ; Humi.: 40 %

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)

Operating Condition : Playing Mode

RF Output Channel	Carrier Frequency [MHz]		Matching Pad Loss [dB]	Meter Readings [dBm]		Limits(*) [dBm]		Results [dBm]		Margin [dB]
	Visual	Aural		Visual	Aural	Visual	Aural	Visual	Aural	
3	61.25	65.75	6.0	-48.3	-63.6	-39.2	-52.2	-42.3	-57.6	+ 3.1
4	67.25	71.75	6.0	-49.0	-64.3	-39.2	-52.2	-43.0	-58.3	+ 3.8

Testing Signal Sources : Video Modulation Sources (VITS: 1Vp_p and 5Vp_p)

Operating Condition : Recording Mode

RF Output Channel	Carrier Frequency [MHz]		Matching Pad Loss [dB]	Meter Readings [dBm]		Limits(*) [dBm]		Results [dBm]		Margin [dB]
	Visual	Aural		Visual	Aural	Visual	Aural	Visual	Aural	
3	61.25	65.75	6.0	-48.0	-63.3	-39.2	-52.2	-42.0	-57.3	+ 2.8
4	67.25	71.75	6.0	-48.2	-63.7	-39.2	-52.2	-42.2	-57.7	+ 3.0

Testing Signal Sources : RF Modulation Sources (NTSC Colorbar: 70dB(μV) at 193.25 MHz)

Operating Condition : Recording Mode

RF Output Channel	Carrier Frequency [MHz]		Matching Pad Loss [dB]	Meter Readings [dBm]		Limits(*) [dBm]		Results [dBm]		Margin [dB]
	Visual	Aural		Visual	Aural	Visual	Aural	Visual	Aural	
3	61.25	65.75	6.0	-48.2	-63.1	-39.2	-52.2	-42.2	-57.1	+ 3.0
4	67.25	71.75	6.0	-48.2	-63.9	-39.2	-52.2	-42.2	-57.9	+ 3.0

Sample of calculated result at 61.25 MHz, as the Minimum Margin point:

$$\begin{array}{rcl}
 \text{Matching Pad Loss} & = & 6.0 \text{ dB} \\
 +) \text{Meter Reading} & = & -48.0 \text{ dBm} \\
 \hline
 \text{Result} & = & -42.0 \text{ dBm}
 \end{array}$$

Minimum Margin : $-39.2 - (-42.0) = 2.8(\text{dB})$

The point shown on "____" is the Minimum Margin Point.

※) Conversion of applied limits (refer to §15.115(b)(1)(ii))

$$\text{Visual : } \sqrt{75} \times 346.4 \text{ } [\mu\text{V}] = -90 + 20\log(346.4) \text{ [dBm]}$$

$$\text{Aural : } \sqrt{75} \times 77.5 \text{ } [\mu\text{V}] = -90 + 20\log(77.5) \text{ [dBm]}$$

Remarks:

Detector Function	RES. B.W	V.B.W	Sweep Time	Span
Peak (Spectrum Analyzer)	100 kHz	300 kHz	20 msec	10 MHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Output Terminal Conducted Spurious Emission Measurement

TV Interface Device

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)

Operating Condition : Playing Mode

Test Date: January 7, 1999

Temp.: 22 °C ; Humi.: 40 %

RF Output Channel	Frequency [MHz]	Matching Pad Loss [dB]	Pre-Amp. Gain [dB]	Attenuation Pad Loss [dB]	Meter Readings [dBm]	Limits (※) [dBm]	Results [dBm]	Margin [dB]
3	56.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	68.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	122.50	6.0	26.0	6.0	-71.0	-69.2	-85.0	+15.8
	183.75	6.0	25.8	6.0	-72.3	-69.2	-86.1	+16.9
	245.00	6.0	25.5	6.0	<-80.0	-69.2	<-93.5	>+24.3
	306.25	6.0	25.7	6.0	<-80.0	-69.2	<-93.7	>+24.5
	367.50	6.0	26.1	6.0	-79.4	-69.2	-93.5	+24.3
4	428.75	6.0	26.4	6.0	<-80.0	-69.2	<-94.4	>+25.2
	62.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	74.65	6.0	26.2	6.0	<-80.0	-69.2	<-94.2	>+25.0
	134.50	6.0	26.0	6.0	-79.3	-69.2	-93.3	+24.1
	201.75	6.0	25.7	6.0	-73.2	-69.2	-86.9	+17.7
	269.00	6.0	25.4	6.0	<-80.0	-69.2	<-93.4	>+24.2
	336.25	6.0	25.9	6.0	-76.3	-69.2	-90.2	+21.0
	403.50	6.0	26.3	6.0	-79.5	-69.2	-93.8	+24.6
	470.75	6.0	26.6	6.0	<-80.0	-69.2	<-94.6	>+25.4

Sample of calculated result at 122.50 MHz, as the Minimum Margin point:

Matching Pad Loss	=	6.0 dB
Pre-Amp. Gain	=	-26.0 dB
Attenuation Pad Loss	=	6.0 dB
+) Meter Reading	=	-71.0 dBm
Result	=	-85.0 dBm

Minimum Margin : -69.2 - (-85.0) = 15.8(dB)

The point shown on "____" is the Minimum Margin Point.

※) Conversion of applied limits (refer to §15.115(b)(2)(ii))

$$\sqrt{75} \times 10.95 \text{ [}\mu\text{V]} = -90 + 20\log(10.95) \text{ [dBm]}$$

Remarks:

Detector Function	RES. B.W	V.B.W	Sweep Time	Span
Peak (Spectrum Analyzer)	100 kHz	300 kHz	20 msec	10 MHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : Video Modulation Sources (VITS: 1Vp_p and 5Vp_p)
Operating Condition : Recording Mode

Test Date: January 7, 1999
Temp.: 22 °C ; Humi.: 40 %

RF Output Channel	Frequency [MHz]	Matching Pad Loss [dB]	Pre-Amp. Gain [dB]	Attenuation Pad Loss [dB]	Meter Readings [dBm]	Limits (※) [dBm]	Results [dBm]	Margin [dB]
3	56.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	68.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	122.50	6.0	26.0	6.0	-71.2	-69.2	-85.2	+16.0
	183.75	6.0	25.8	6.0	-71.5	-69.2	-85.3	+16.1
	245.00	6.0	25.5	6.0	<-80.0	-69.2	<-93.5	>+24.3
	306.25	6.0	25.7	6.0	<-80.0	-69.2	<-93.7	>+24.5
	367.50	6.0	26.1	6.0	-79.2	-69.2	-93.3	+24.1
4	428.75	6.0	26.4	6.0	-79.0	-69.2	-93.4	+24.2
	62.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	74.65	6.0	26.2	6.0	<-80.0	-69.2	<-94.2	>+25.0
	134.50	6.0	26.0	6.0	-78.9	-69.2	-92.9	+23.7
	201.75	6.0	25.7	6.0	-71.9	-69.2	-85.6	+16.4
	269.00	6.0	25.4	6.0	<-80.0	-69.2	<-93.4	>+24.2
	336.25	6.0	25.9	6.0	-75.4	-69.2	-89.3	+20.1
	403.50	6.0	26.3	6.0	-79.5	-69.2	-93.8	+24.6
	470.75	6.0	26.6	6.0	<-80.0	-69.2	<-94.6	>+25.4

Sample of calculated result at 122.25 MHz, as the Minimum Margin point:

Matching Pad Loss = 6.0 dB
Pre-Amp. Gain = -26.0 dB
Attenuation Pad Loss = 6.0 dB
+) Meter Reading = -71.2 dBm
Result = -85.2 dBm

Minimum Margin : -69.2 - (-85.2) = 16.0(dB)

The point shown on "____" is the Minimum Margin Point.

※) Conversion of applied limits (refer to §15.115(b)(2)(ii))

$$\sqrt{75} \times 10.95 \text{ } [\mu\text{V}] = -90 + 20\log(10.95) \text{ } [\text{dBm}]$$

Remarks:

Detector Function	RES. B.W	V.B.W	Sweep Time	Span
Peak (Spectrum Analyzer)	100 kHz	300 kHz	20 msec	10 MHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Testing Signal Sources : RF Modulation Sources (NTSC Colorbar: 70dB(μV) at 193.25 MHz)
Operating Condition : Recording Mode

Test Date: January 7, 1999
Temp.: 22 °C ; Humi.: 40 %

RF Output Channel	Frequency [MHz]	Matching Pad Loss [dB]	Pre-Amp. Gain [dB]	Attenuation Pad Loss [dB]	Meter Readings [dBm]	Limits (※) [dBm]	Results [dBm]	Margin [dB]
3	56.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	68.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	122.50	6.0	26.0	6.0	-71.2	-69.2	-85.2	+16.0
	183.75	6.0	25.8	6.0	-71.5	-69.2	-85.3	+16.1
	245.00	6.0	25.5	6.0	<-80.0	-69.2	<-93.5	>+24.3
	306.25	6.0	25.7	6.0	<-80.0	-69.2	<-93.7	>+24.5
	367.50	6.0	26.1	6.0	-79.2	-69.2	-93.3	+24.1
4	428.75	6.0	26.4	6.0	-79.0	-69.2	-93.4	+24.2
	62.65	6.0	26.3	6.0	<-80.0	-69.2	<-94.3	>+25.1
	74.65	6.0	26.2	6.0	<-80.0	-69.2	<-94.2	>+25.0
	134.50	6.0	26.0	6.0	-78.9	-69.2	-92.9	+23.7
	201.75	6.0	25.7	6.0	-71.9	-69.2	-85.6	+16.4
	269.00	6.0	25.4	6.0	<-80.0	-69.2	<-93.4	>+24.2
	336.25	6.0	25.9	6.0	-75.4	-69.2	-89.3	+20.1
	403.50	6.0	26.3	6.0	-79.5	-69.2	-93.8	+24.6
	470.75	6.0	26.6	6.0	<-80.0	-69.2	<-94.6	>+25.4

Sample of calculated result at 122.25 MHz, as the Minimum Margin point:

Matching Pad Loss = 6.0 dB
Pre-Amp. Gain = -26.0 dB
Attenuation Pad Loss = 6.0 dB
+) Meter Reading = -71.2 dBm
Result = -85.2 dBm

Minimum Margin : -69.2 - (-85.2) = 16.0(dB)

The point shown on "____" is the Minimum Margin Point.

※) Conversion of applied limits (refer to §15.115(b)(2)(ii))

$$\sqrt{75} \times 10.95 \text{ } [\mu\text{V}] = -90 + 20\log(10.95) \text{ } [\text{dBm}]$$

Remarks:

Detector Function	RES. B.W	V.B.W	Sweep Time	Span
Peak (Spectrum Analyzer)	100 kHz	300 kHz	20 msec	10 MHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda

Transfer Switch Isolation Measurement

TV Interface Device

Test Date: January 7, 1999

Temp.: 22 °C ; Humi.: 40 %

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)

Operating Condition : Playing Mode

RF Output Channel	Carrier Frequency [MHz]	Matching Pad Loss [dB]	Pre-Amp. Gain [dB]	Attenuation Pad Loss [dB]	Meter Readings [dBm]	Limits (※) [dBm]	Results [dBm]	Margin [dB]
3	61.25	6.0	26.3	3.0	-89.4	-99.2	-106.7	+ 7.5
4	67.25	6.0	26.3	3.0	-87.4	-99.2	-104.7	+ 5.5

Testing Signal Sources : Video Modulation Sources (VITS: 1Vp_p and 5Vp_p)

Operating Condition : Recording Mode

RF Output Channel	Carrier Frequency [MHz]	Matching Pad Loss [dB]	Pre-Amp. Gain [dB]	Attenuation Pad Loss [dB]	Meter Readings [dBm]	Limits (※) [dBm]	Results [dBm]	Margin [dB]
3	61.25	6.0	26.3	3.0	-89.2	-99.2	-106.5	+ 7.3
4	67.25	6.0	26.3	3.0	-87.2	-99.2	-104.5	+ 5.3

Sample of calculated result at 67.25 MHz, as the Minimum Margin point:

Matching Pad Loss	=	6.0 dB
Pre-Amp. Gain	=	-26.3 dB
Attenuation Pad Loss	=	3.0 dB
+) Meter Reading	=	-87.2 dBm
Result	=	-104.5 dBm

Minimum Margin : -99.2 - (-104.5) = 5.3(dB)

The point shown on "____" is the Minimum Margin Point.

※) Conversion of applied limits (refer to §15.115(c)(1)(ii))

$$\sqrt{75} \times 0.346 \text{ } [\mu\text{V}] = -90 + 20\log(0.346) \text{ } [\text{dBm}]$$

Remarks:

Detector Function	RES. B.W	V.B.W	Sweep Time	Span
Peak (Spectrum Analyzer)	AUTO	AUTO	30 msec	20 kHz

Tester Signature : A.Hosoda

Type Name : Akio Hosoda