JAPAN QUALITY ASSURANCE ORGANIZATION
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FCC ID : APYTCG035

TEST REPORT
FOR TV INTERFACE DEVICES UNDER FCC PART 15

Date : May 15, 1998
Issued at : TOKYO, JAPAN

JQA APPLICATION NO. : 80-71193

APPLICANT : SHARP CORPORATION
174, Hayakawa-cho, Yaita-shi, Tochigi, 329-2193 JAPAN

MANUFACTURER : SHARP CORPORATION
174, Hayakawa-cho, Yaita-shi, Tochigi, 329-2193 JAPAN

TYPE OF EQUIPMENT : Video Cassette Recorder

REGULATION APPLIED : FCC Rules and Regulations Part 15 Subpart B (1989)

MEASUREMENT PROCEDURES USED : ANSI C63.4-1992

PLACE OF MEASUREMENT : JQA EMC Engineering Department (Anechoic Chamber No.3)

Test Facility : This test site and conducted measurement facility have been fully described in report dated May 14, 1996 submitted to FCC office, and accepted in a letter dated June 7, 1996 (31040/SIT).

The test results are only applicable to the test item as described below.
This report should not be reproduced, except in full, without the approval of the JQA EMC Engineering Department.

Takaharu Hada, Manager
Testing Division
EMC Engineering Department

Model No. : XA-720
Serial No. : 803000001

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Model No. : XA-720
Serial No. : 803000001

1. Description of EUT

1.1)	Type of Device	: TV Interface Device
1.2)	Equipment Authorization	: Certification
1.3)	FCC ID	: APYTCG035
1.4)	Brand Name	: SHARP
1.5)	Model No.	: XA-720
1.6)	Serial No.	: 803000001
1.7)	Date of Manufacture	: March, 1998
1.8)	Highest Frequency Used	: 67.25 MHz
1.9)	Rating Power Supply	: AC 120 V, 60 Hz
1.10)	RF Output Channels	: Channel No.3 and Channel No.4
1.11)	RF Output Terminal	: F-type Connector / 75 ohms (Unbalanced)

2. Test Condition of EUT

2.1)	Operating Condition	: Playing Mode / Recording Mode
2.2)	Grounding	: Grounded at the plug end of the power line cord.
2.3)	Warm-up Time	: 5 minutes
2.4)	Power Supply	: AC 120 V, 60 Hz

Model No. : XA-720
Serial No. : 803000001

3. All Terminals of EUT

3.1) Input Terminals

	Description of Terminal	Type of Connector	Number of Terminals
Rear Side :	RF Terminal	F-type Connector	1
	Audio Terminal	Phono Jack	2
	Video Terminal	BNC Connector	1
	REMOTE PAUSE Terminal	Mini Jack	1
Front Side :	Audio Terminal	Phono Jack	2
	Video Terminal	Phono Jack	1

Note: Each input terminals of EUT were terminated with the terminator of specified impedances.

3.2) Output Terminals

	Description of Terminal	Type of Connector	Number of Terminals
Rear Side :	RF Terminal	F-type Connector	1
	Audio Terminal	Phono Jack	2
	Video Terminal	BNC Connector	1
	REMOTE PAUSE Terminal	Mini Jack	1

Front Side : None

Note: Each output terminals of EUT were connected to the cable terminated with the specified impedances.

Model No. : XA-720
Serial No. : 803000001

4. Type of Connected Cables

Description of Cable	Shielded	Length	Number of Cables	Supplied
RF Cable	Yes	1.0 m	1	Yes
Audio/video Cable	Yes	1.0 m	1	Yes
REMOTE PAUSE Cable	Yes	1.0 m	1	Yes

Notes: 1) Each input terminals of EUT were terminated with the terminator of specified impedances.
2) Each output terminals of EUT were connected to the cable terminated with the specified impedances.

5. Testing Signal Sources

5.1) Internal Modulation Sources : NTSC TV Signal Recording Tape

5.2) Video Modulation Sources : VITS (1 Vp-p and 5 Vp-p)

5.3) RF Modulation Sources : NTSC Colorbar (70 dB/uV at 193.25 MHz)

6. Configuration of EUT

6.1) §15.107(a) AC Powerline Conducted Emissions Measurement : Refer to Page 7.

6.2) §15.109(a) Radiated Emissions Measurement : Refer to Page 17.

6.3) §15.115(b)(1)(ii) Output Signal Level Measurement : Refer to Page 27.

6.4) §15.115(b)(2)(ii) Spurious Conducted Level Measurement : Refer to Page 31.

6.5) §15.115(c)(1)(ii) Antenna Transfer Switch Measurement : Refer to Page 45.

Model No. : XA-720
Serial No. : 803000001

Date : May 12, 1998
Temp. : 24 °C; Humi. : 42 %

8. §15.107(a) AC Powerline Conducted Emissions Measurement

Tested by : K Hayashi

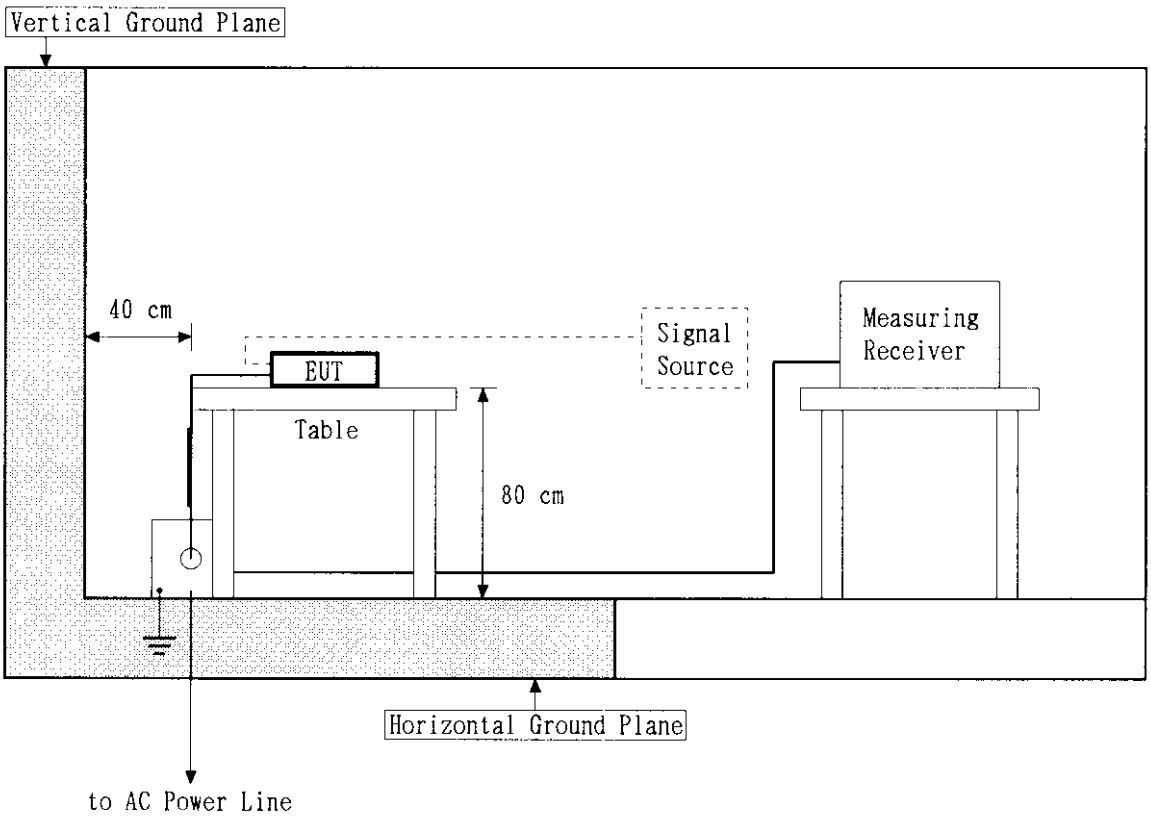
Kazuya Hayashi, Engineer
Testing Division
EMC Engineering Department

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

Configuration of EUT

Side View



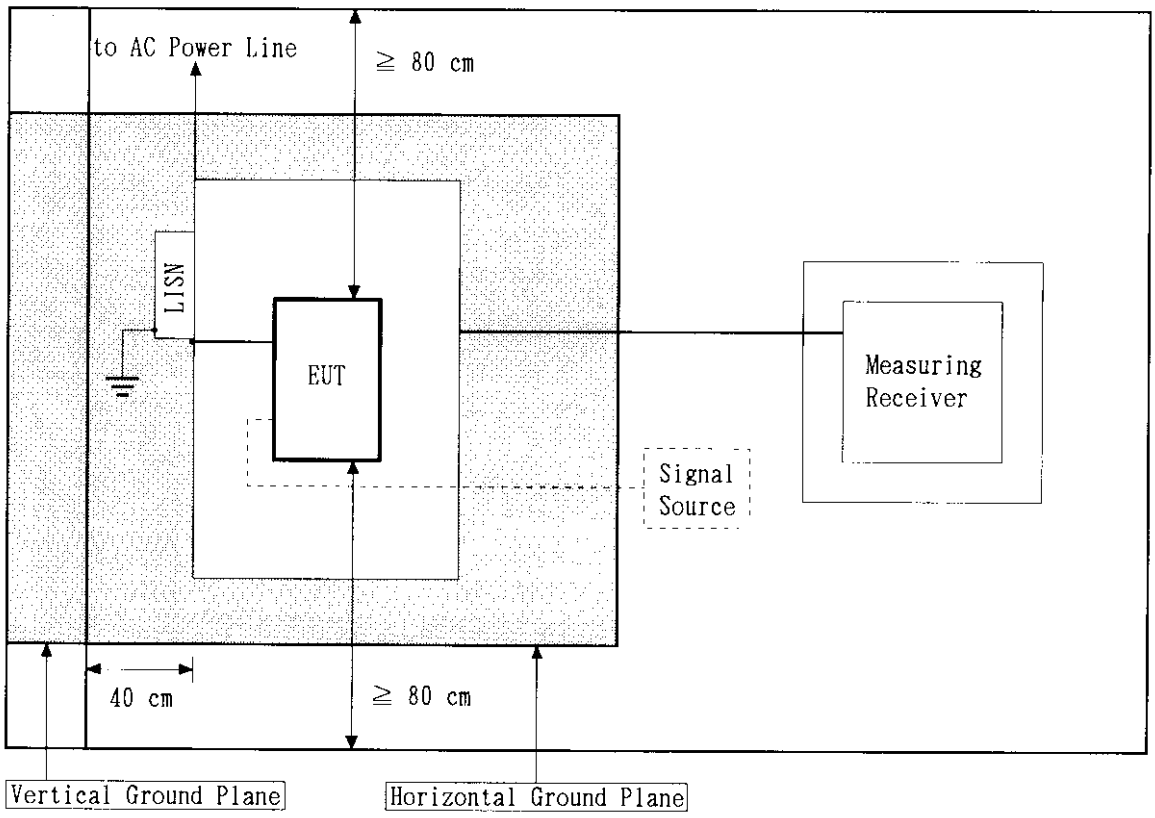
Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

Configuration of EUT

Top View



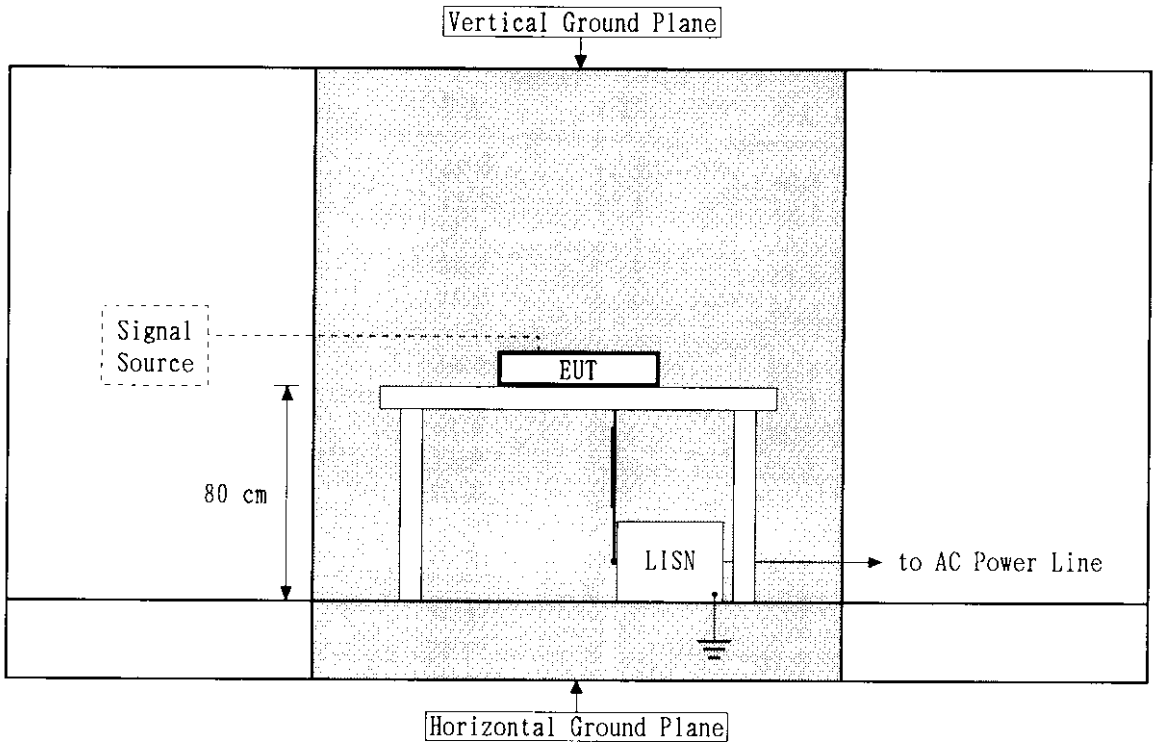
Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

Configuration of EUT

Front View

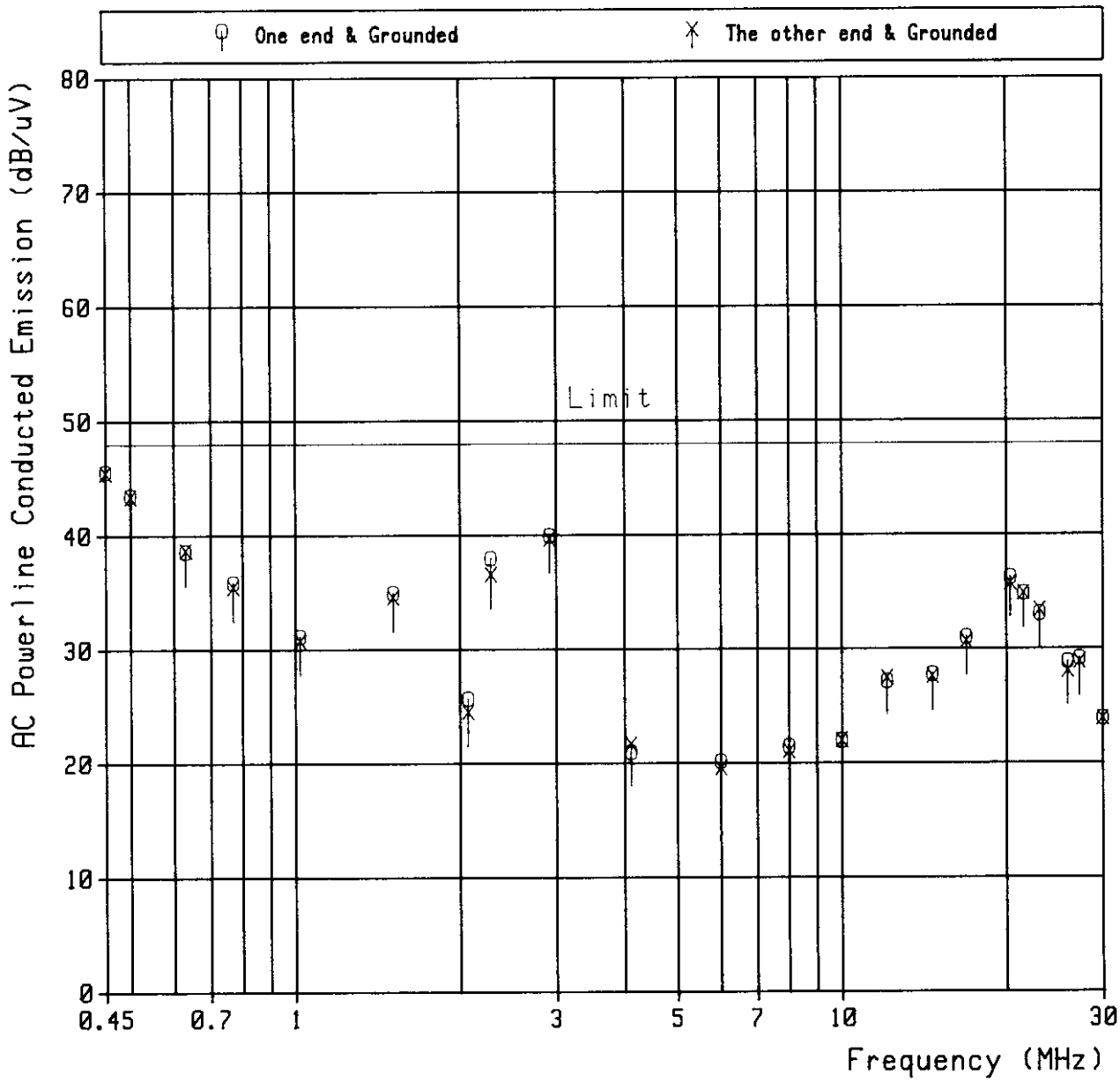


Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode



Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

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

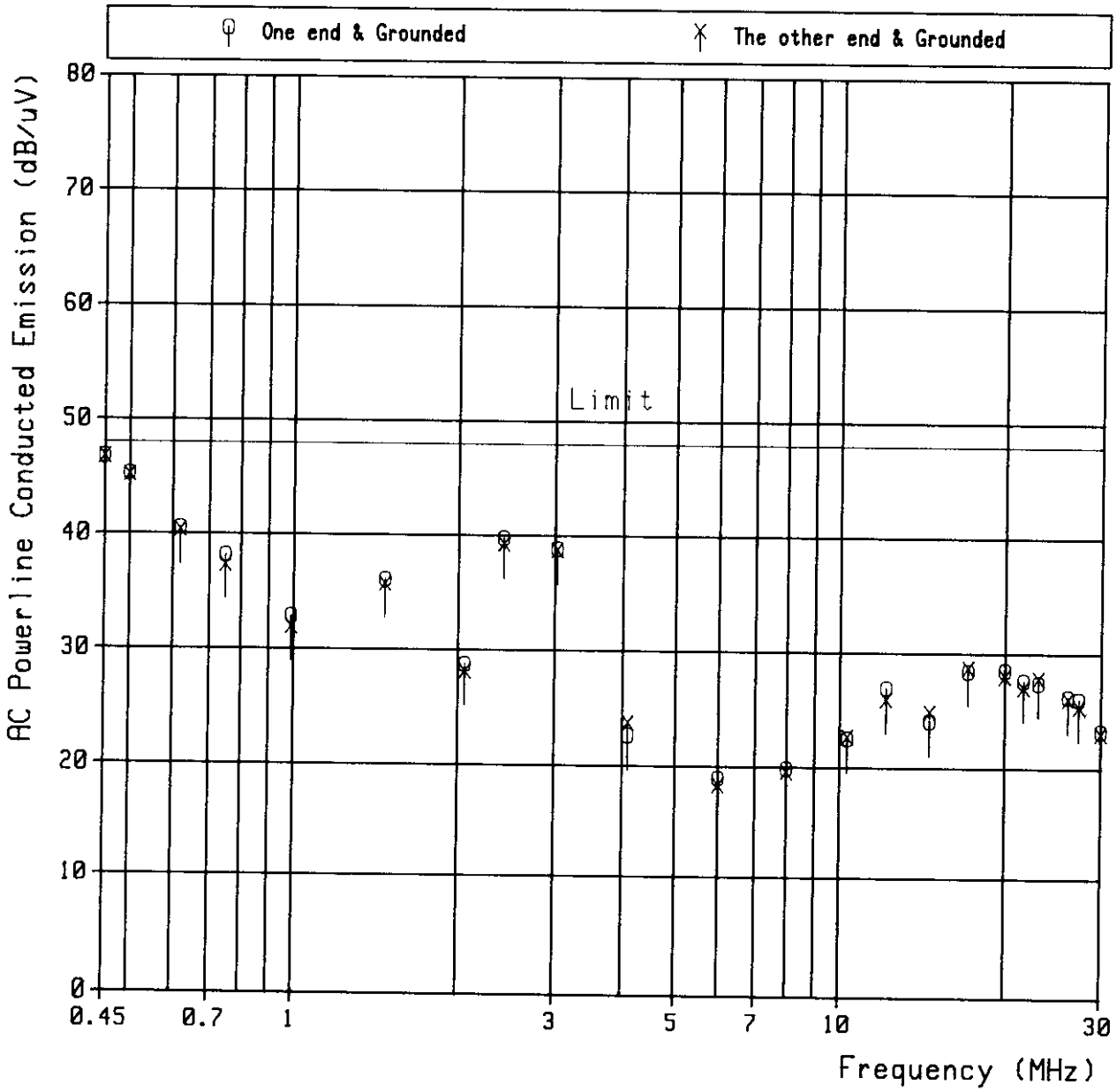
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)		Result (dB/uV)		Limit (dB/uV)
		V-A	V-B	V-A	V-B	
0.45	0.2	46.6	46.6	46.8	46.8	48.0
0.50	0.2	45.1	45.0	45.3	45.2	48.0
0.62	0.2	40.4	40.2	40.6	40.4	48.0
0.75	0.2	38.0	37.2	38.2	37.4	48.0
0.99	0.2	32.7	31.8	32.9	32.0	48.0
1.47	0.2	36.0	35.6	36.2	35.8	48.0
2.06	0.2	28.6	28.0	28.8	28.2	48.0
2.42	0.2	39.6	39.1	39.8	39.3	48.0
3.03	0.2	38.7	38.6	38.9	38.8	48.0
4.10	0.2	22.5	23.6	22.7	23.8	48.0
6.00	0.2	18.8	18.2	19.0	18.4	48.0
8.00	0.2	19.7	19.4	19.9	19.6	48.0
10.33	0.2	22.4	22.5	22.6	22.7	48.0
12.16	0.2	26.8	25.8	27.0	26.0	48.0
14.58	0.3	23.8	24.6	24.1	24.9	48.0
17.15	0.3	28.2	28.5	28.5	28.8	48.0
20.00	0.4	28.2	27.7	28.6	28.1	48.0
21.63	0.4	27.3	26.7	27.7	27.1	48.0
23.03	0.5	27.0	27.4	27.5	27.9	48.0
26.11	0.5	25.8	25.6	26.3	26.1	48.0
27.33	0.5	25.6	24.9	26.1	25.4	48.0
30.00	0.6	22.7	22.5	23.3	23.1	48.0

Notes: 1) The spectrum was checked from 0.45 MHz to 30 MHz.
2) V-A : One end & Grounded ; V-B : The other end & Grounded
3) Correction Factor includes a LISN factor and a cable (2.0 m) loss.
4) A sample calculation was made at 0.45 MHz.
Correction Factor + Meter Reading = 0.2 + 46.6 = 46.8 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

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



Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

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

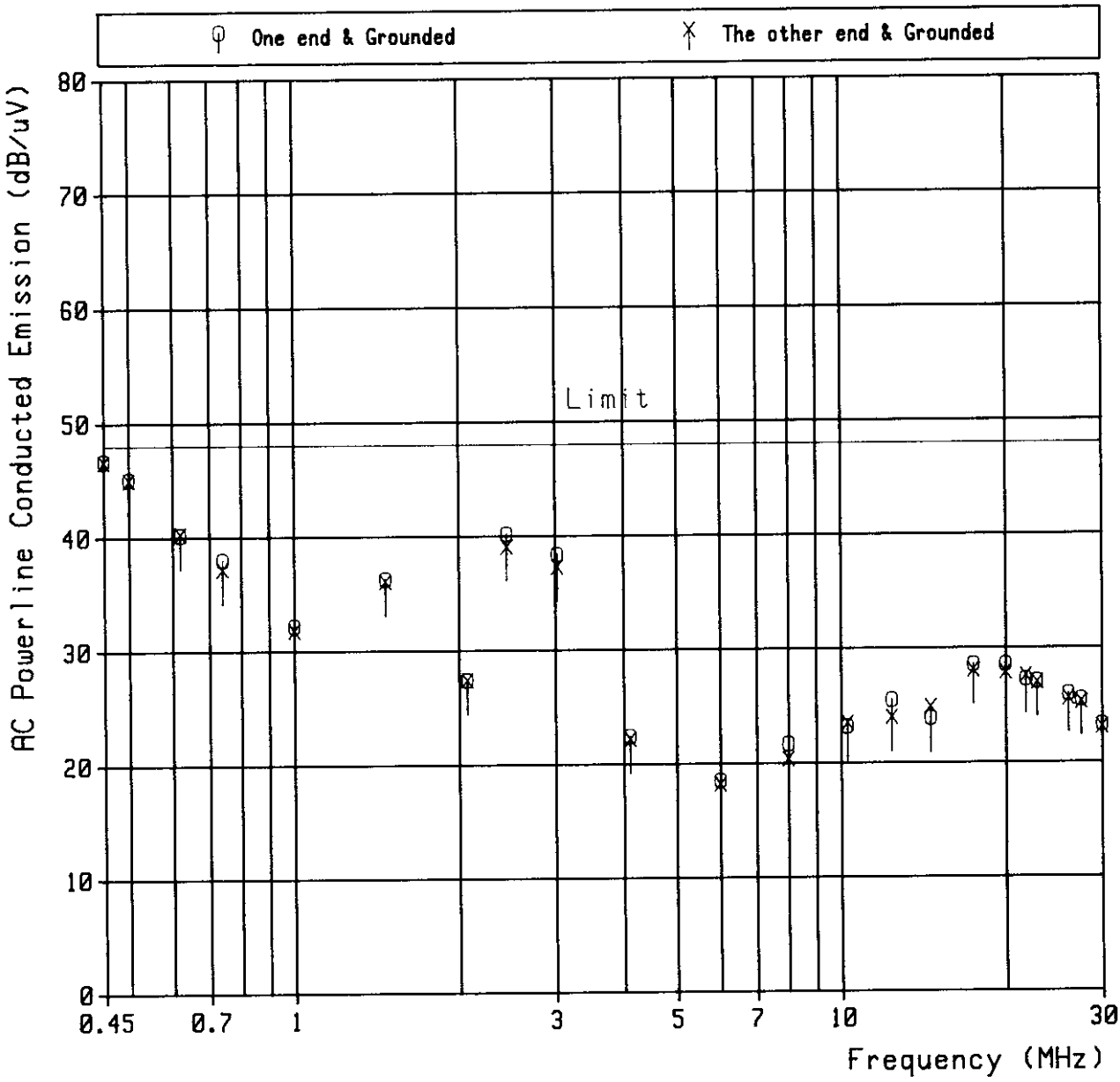
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)		Result (dB/uV)		Limit (dB/uV)
		V-A	V-B	V-A	V-B	
0.45	0.2	46.5	46.4	46.7	46.6	48.0
0.50	0.2	44.9	44.8	45.1	45.0	48.0
0.62	0.2	40.0	40.1	40.2	40.3	48.0
0.74	0.2	37.8	37.0	38.0	37.2	48.0
1.00	0.2	32.0	31.6	32.2	31.8	48.0
1.47	0.2	36.1	35.9	36.3	36.1	48.0
2.07	0.2	27.2	27.2	27.4	27.4	48.0
2.45	0.2	40.0	38.9	40.2	39.1	48.0
3.03	0.2	38.2	37.1	38.4	37.3	48.0
4.11	0.2	22.2	22.0	22.4	22.2	48.0
6.00	0.2	18.3	18.0	18.5	18.2	48.0
8.00	0.2	21.5	20.2	21.7	20.4	48.0
10.27	0.2	23.0	23.3	23.2	23.5	48.0
12.37	0.2	25.3	23.8	25.5	24.0	48.0
14.57	0.3	23.6	24.6	23.9	24.9	48.0
17.46	0.3	28.3	27.8	28.6	28.1	48.0
20.00	0.4	28.2	27.5	28.6	27.9	48.0
21.78	0.4	26.9	27.2	27.3	27.6	48.0
22.83	0.5	26.6	26.5	27.1	27.0	48.0
26.05	0.5	25.5	25.1	26.0	25.6	48.0
27.48	0.5	25.0	24.8	25.5	25.3	48.0
30.00	0.6	22.7	22.5	23.3	23.1	48.0

Notes: 1) The spectrum was checked from 0.45 MHz to 30 MHz.
2) V-A : One end & Grounded ; V-B : The other end & Grounded
3) Correction Factor includes a LISN factor and a cable (2.0 m) loss.
4) A sample calculation was made at 0.45 MHz.
Correction Factor + Meter Reading = 0.2 + 46.5 = 46.7 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.107(a) AC Powerline Conducted Emissions Measurement

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



Model No. : XA-720
Serial No. : 803000001

Date : April 22, 1998
Temp. : 25 °C; Humi. : 60 %

9. §15.109(a) Radiated Emissions Measurement

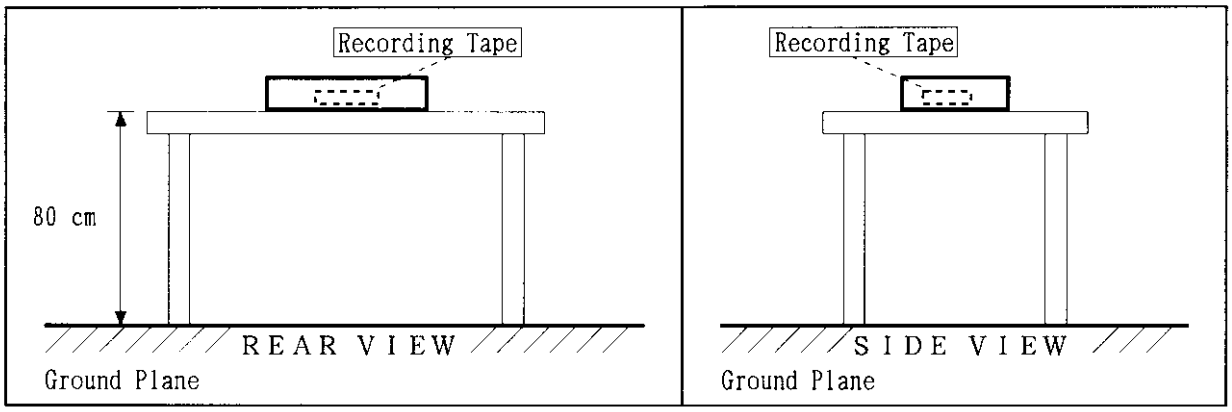
Tested by : K. Hayashi

Kazuya Hayashi, Engineer
Testing Division
EMC Engineering Department

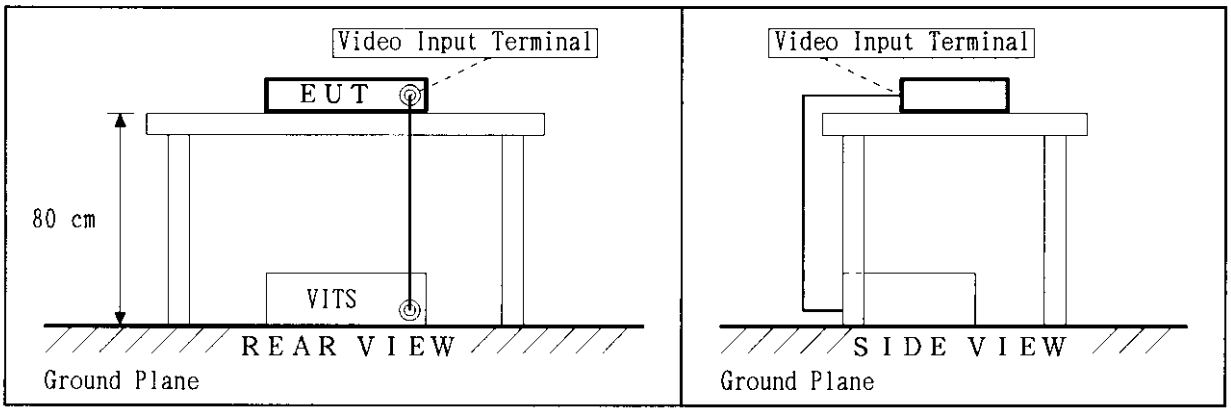
Model No. : XA-720
Serial No. : 803000001

Configuration of Testing Signal Sources

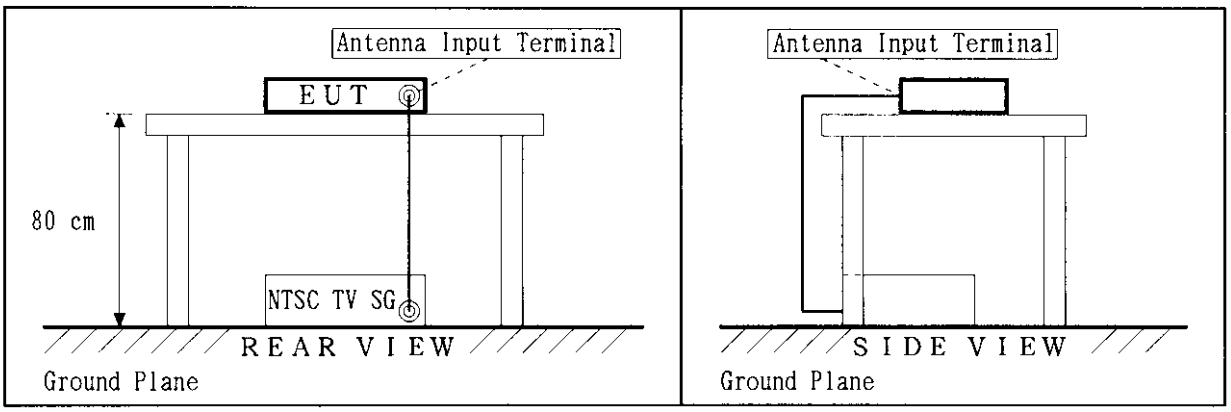
Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)



Testing Signal Sources : Video Modulation Sources (VITS : 1 Vp-p and 5 Vp-p)



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



Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

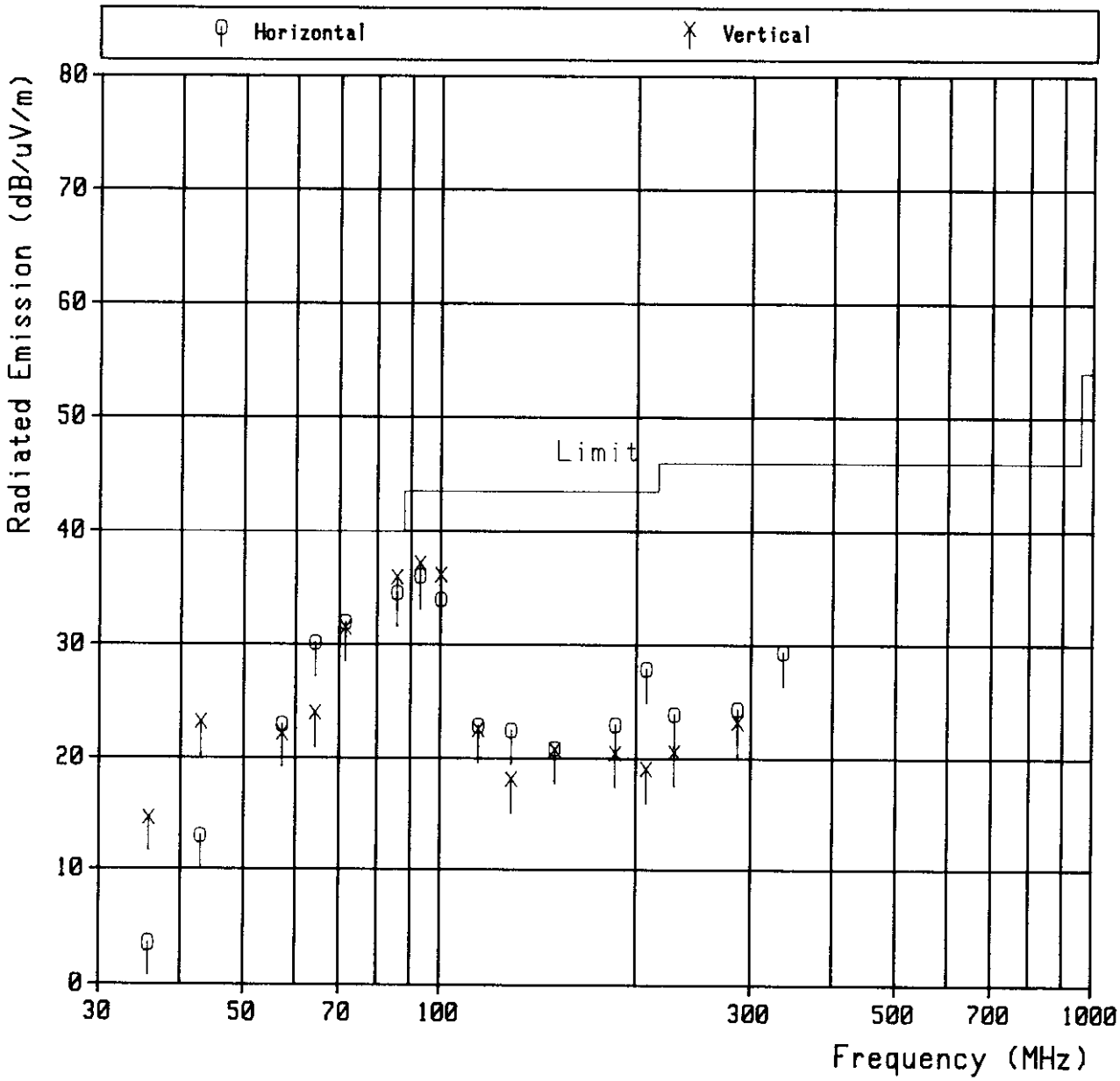
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)		Result (dB/uV/m)		Limit (dB/uV/m)
		Horizontal	Vertical	Horizontal	Vertical	
35.8	1.1	2.7	13.6	3.8	14.7	40.0
43.0	2.8	10.3	20.4	13.1	23.2	40.0
57.3	5.5	17.5	16.7	23.0	22.2	40.0
64.4	6.6	23.6	17.4	30.2	24.0	40.0
71.6	7.6	24.4	23.9	32.0	31.5	40.0
85.9	9.4	25.2	26.6	34.6	36.0	40.0
93.1	10.2	25.9	27.0	36.1	37.2	43.5
100.2	10.9	23.1	25.3	34.0	36.2	43.5
114.6	12.3	10.6	10.3	22.9	22.6	43.5
128.9	13.5	9.0	4.7	22.5	18.2	43.5
150.3	15.1	5.8	5.7	20.9	20.8	43.5
186.1	17.3	5.7	3.2	23.0	20.5	43.5
207.6	18.4	9.5	0.7	27.9	19.1	43.5
229.1	19.5	4.4	1.1	23.9	20.6	46.0
286.4	21.9	2.5	1.3	24.4	23.2	46.0
336.5	23.7	5.7	< 0.0	29.4	< 23.7	46.0
400.0	25.6	< 0.0	< 0.0	< 25.6	< 25.6	46.0
500.0	28.1	< 0.0	< 0.0	< 28.1	< 28.1	46.0
600.0	30.5	< 0.0	< 0.0	< 30.5	< 30.5	46.0
700.0	32.6	< 0.0	< 0.0	< 32.6	< 32.6	46.0
800.0	34.4	< 0.0	< 0.0	< 34.4	< 34.4	46.0
1000.0	37.4	< 0.0	< 0.0	< 37.4	< 37.4	54.0

Notes: 1) Measured Distance : 3.0 m
2) The spectrum was checked from 30 MHz to 1000 MHz.
3) The symbol of '<' means 'or less'.
4) Correction Factor includes an antenna factor and a cable (14.0 m) loss.
5) A sample calculation was made at 85.9 MHz.
Correction Factor + Meter Reading = 9.4 + 26.6 = 36.0 dB/uV/m

Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode



Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

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

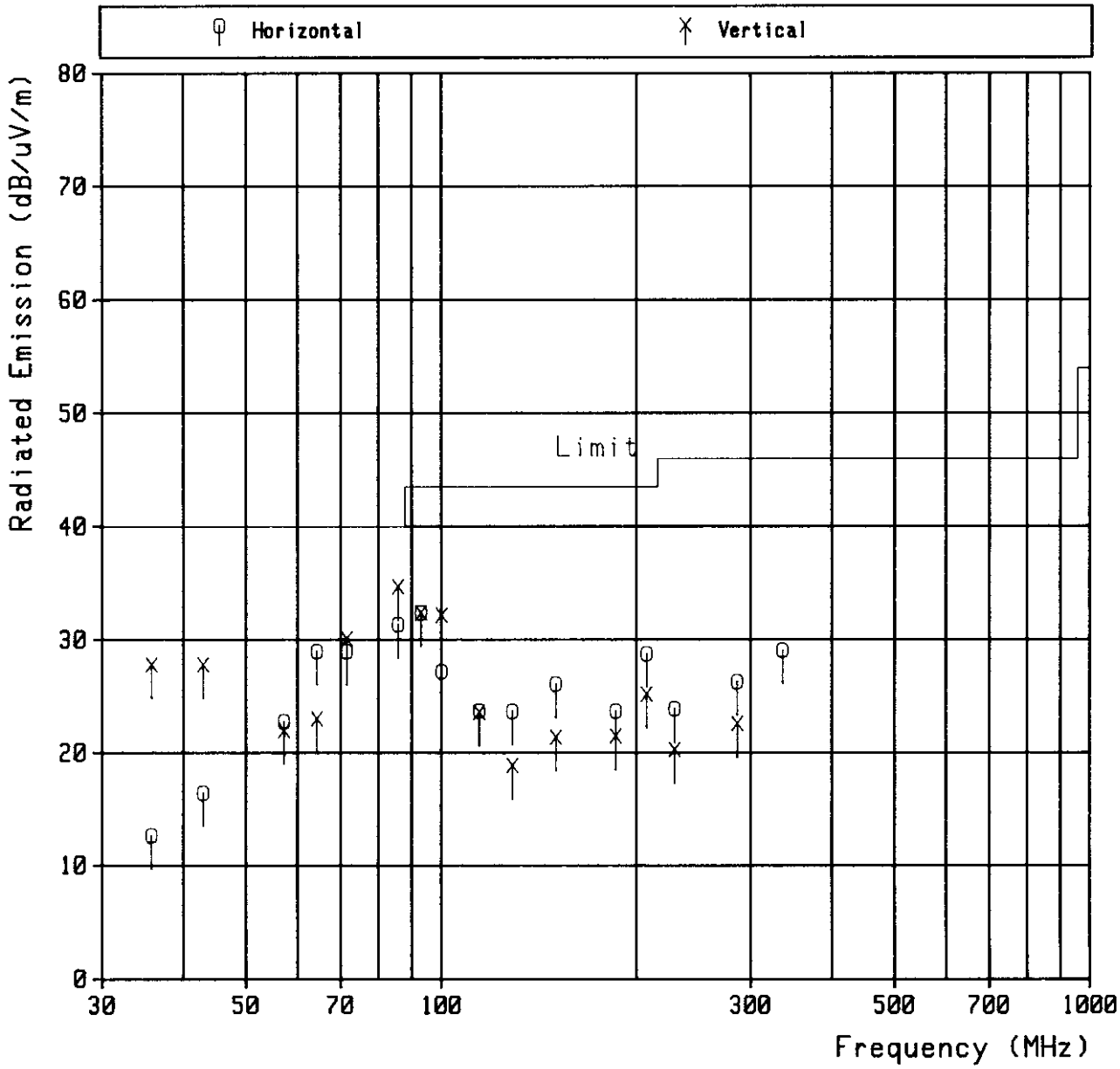
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)		Result (dB/uV/m)		Limit (dB/uV/m)
		Horizontal	Vertical	Horizontal	Vertical	
35.8	1.1	11.6	26.7	12.7	27.8	40.0
43.0	2.8	13.7	25.0	16.5	27.8	40.0
57.3	5.5	17.3	16.5	22.8	22.0	40.0
64.4	6.6	22.4	16.4	29.0	23.0	40.0
71.6	7.6	21.4	22.5	29.0	30.1	40.0
85.9	9.4	22.0	25.3	31.4	34.7	40.0
93.1	10.2	22.2	22.2	32.4	32.4	43.5
100.2	10.9	16.3	21.3	27.2	32.2	43.5
114.6	12.3	11.4	11.3	23.7	23.6	43.5
128.9	13.5	10.2	5.4	23.7	18.9	43.5
150.4	15.1	11.0	6.3	26.1	21.4	43.5
186.1	17.3	6.4	4.2	23.7	21.5	43.5
207.6	18.4	10.4	6.8	28.8	25.2	43.5
229.1	19.5	4.4	0.8	23.9	20.3	46.0
286.4	21.9	4.4	0.7	26.3	22.6	46.0
336.5	23.7	5.4	< 0.0	29.1	< 23.7	46.0
400.0	25.6	< 0.0	< 0.0	< 25.6	< 25.6	46.0
500.0	28.1	< 0.0	< 0.0	< 28.1	< 28.1	46.0
600.0	30.5	< 0.0	< 0.0	< 30.5	< 30.5	46.0
700.0	32.6	< 0.0	< 0.0	< 32.6	< 32.6	46.0
800.0	34.4	< 0.0	< 0.0	< 34.4	< 34.4	46.0
1000.0	37.4	< 0.0	< 0.0	< 37.4	< 37.4	54.0

Notes: 1) Measured Distance : 3.0 m
2) The spectrum was checked from 30 MHz to 1000 MHz.
3) The symbol of '<' means 'or less'.
4) Correction Factor includes an antenna factor and a cable (14.0 m) loss.
5) A sample calculation was made at 85.9 MHz.
Correction Factor + Meter Reading = 9.4 + 25.3 = 34.7 dB/uV/m

Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

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



Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

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

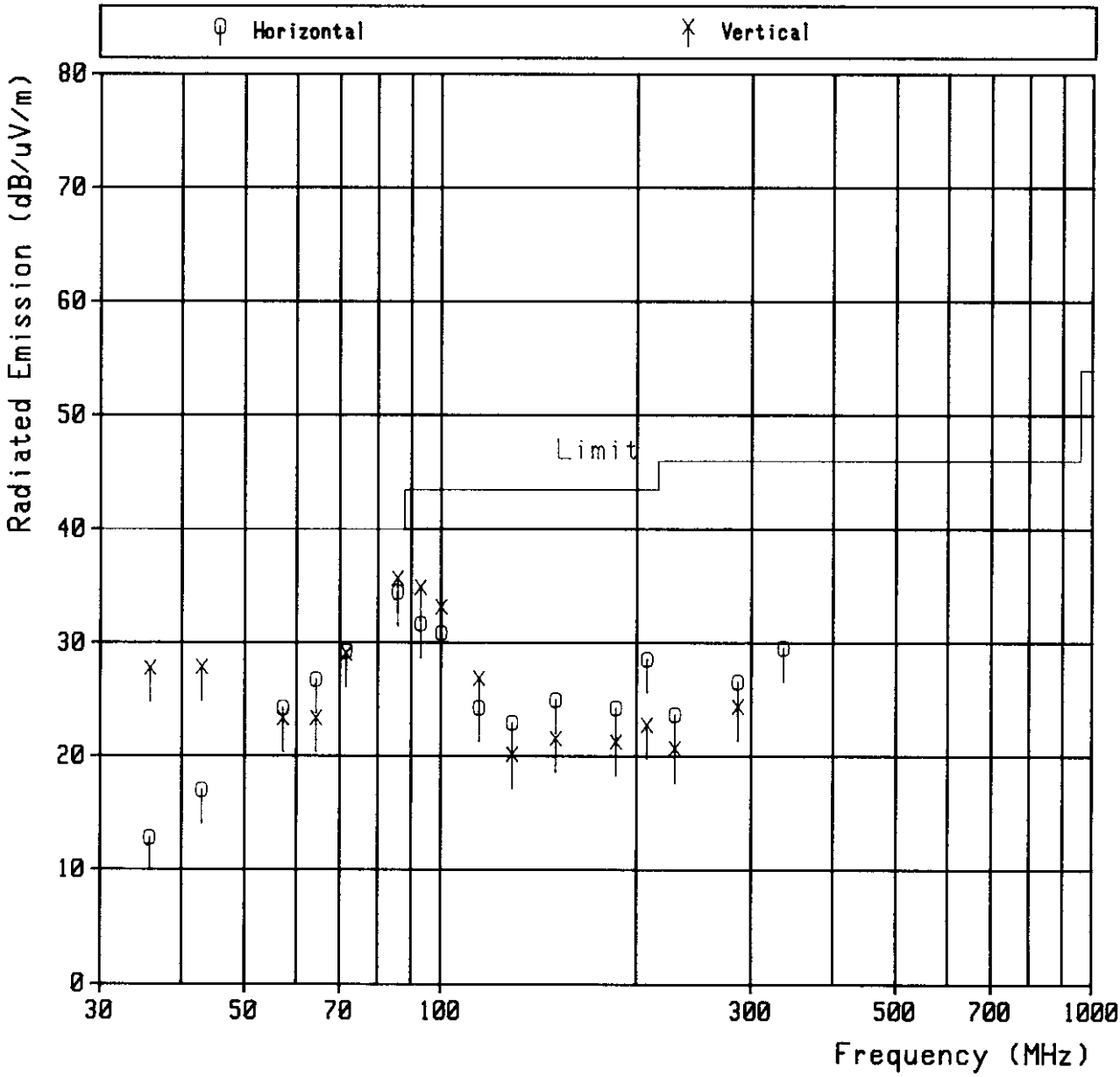
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)		Result (dB/uV/m)		Limit (dB/uV/m)
		Horizontal	Vertical	Horizontal	Vertical	
35.8	1.1	11.8	26.7	12.9	27.8	40.0
43.0	2.8	14.3	25.1	17.1	27.9	40.0
57.3	5.5	18.8	17.9	24.3	23.4	40.0
64.4	6.6	20.2	16.8	26.8	23.4	40.0
71.6	7.6	21.7	21.5	29.3	29.1	40.0
85.9	9.4	25.1	26.3	34.5	35.7	40.0
93.1	10.2	21.5	24.7	31.7	34.9	43.5
100.2	10.9	20.0	22.3	30.9	33.2	43.5
114.6	12.3	12.0	14.6	24.3	26.9	43.5
128.9	13.5	9.5	6.7	23.0	20.2	43.5
150.3	15.1	9.9	6.5	25.0	21.6	43.5
186.1	17.3	7.0	4.0	24.3	21.3	43.5
207.6	18.4	10.2	4.4	28.6	22.8	43.5
229.1	19.5	4.2	1.2	23.7	20.7	46.0
286.3	21.9	4.7	2.5	26.6	24.4	46.0
336.5	23.7	5.9	< 0.0	29.6	< 23.7	46.0
400.0	25.6	< 0.0	< 0.0	< 25.6	< 25.6	46.0
500.0	28.1	< 0.0	< 0.0	< 28.1	< 28.1	46.0
600.0	30.5	< 0.0	< 0.0	< 30.5	< 30.5	46.0
700.0	32.6	< 0.0	< 0.0	< 32.6	< 32.6	46.0
800.0	34.4	< 0.0	< 0.0	< 34.4	< 34.4	46.0
1000.0	37.4	< 0.0	< 0.0	< 37.4	< 37.4	54.0

Notes: 1) Measured Distance : 3.0 m
2) The spectrum was checked from 30 MHz to 1000 MHz.
3) The symbol of '<' means 'or less'.
4) Correction Factor includes an antenna factor and a cable (14.0 m) loss.
5) A sample calculation was made at 85.9 MHz.
Correction Factor + Meter Reading = 9.4 + 26.3 = 35.7 dB/uV/m

Model No. : XA-720
Serial No. : 803000001

§15.109(a) Radiated Emissions Measurement

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



Model No. : XA-720
Serial No. : 803000001

Date : May 13, 1998
Temp. : 24 °C; Humi. : 42 %

10. §15.115(b)(1)(ii) Output Signal Level Measurement

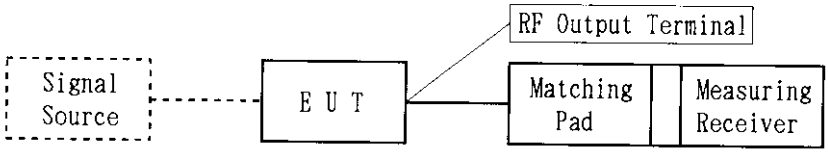
Tested by : K. Hayashi

Kazuya Hayashi, Engineer
Testing Division
EMC Engineering Department

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(1)(ii) Output Signal Level Measurement

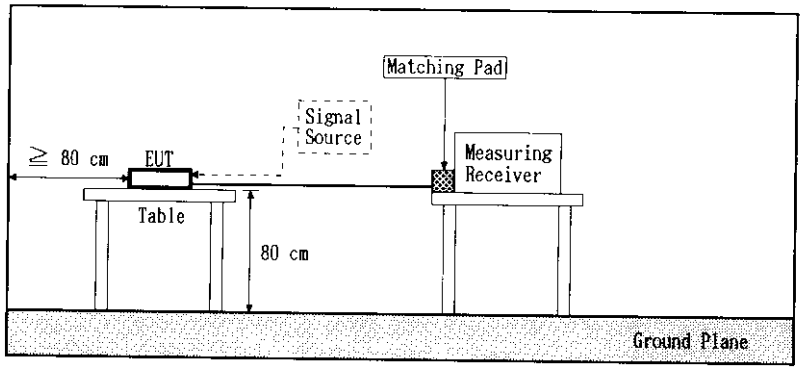
Block Diagram



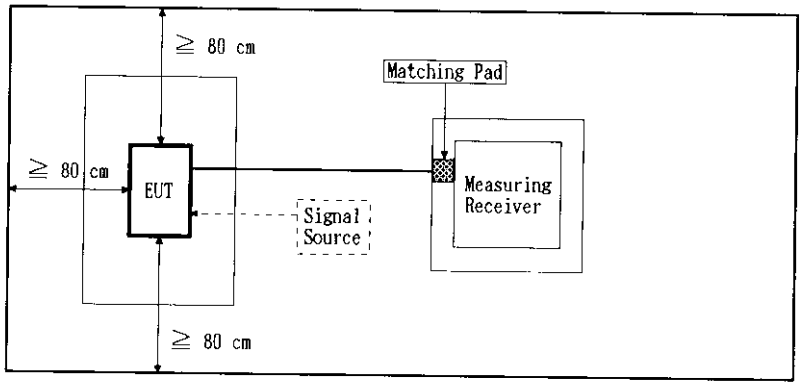
Note: Antenna input terminal of EUT was terminated with the terminator of specified impedances.

Configuration of EUT

Side View



Top View



Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(1)(ii) Output Signal Level Measurement (Visual)

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	61.25	7.8	59.7	67.5	69.5
4	67.26	7.8	59.8	67.6	69.5

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

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	61.24	7.8	59.8	67.6	69.5
4	67.25	7.8	59.7	67.5	69.5

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

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	61.24	7.8	59.8	67.6	69.5
4	67.26	7.8	59.8	67.6	69.5

Notes: 1) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
2) Impedance at the RF output terminal : 75 ohms (Unbalanced)
3) A sample calculation was made at 67.26 MHz.
Matching Pad Loss + Meter Reading = 7.8 + 59.8 = 67.6 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(1)(ii) Output Signal Level Measurement (Aural)

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	65.82	7.8	44.1	51.9	56.5
4	71.84	7.8	44.2	52.0	56.5

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

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	65.80	7.8	44.4	52.2	56.5
4	71.82	7.8	44.2	52.0	56.5

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

RF Output Channel	Frequency (MHz)	Matching Pad Loss (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	65.80	7.8	44.2	52.0	56.5
4	71.82	7.8	44.2	52.0	56.5

Notes: 1) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
2) Impedance at the RF output terminal : 75 ohms (Unbalanced)
3) A sample calculation was made at 65.80 MHz.
Matching Pad Loss + Meter Reading = 7.8 + 44.4 = 52.2 dB/uV

Model No. : XA-720
Serial No. : 803000001

Date : May 13, 1998
Temp. : 24 °C; Humi. : 42 %

11. §15.115(b)(2)(ii) Spurious Conducted Level Measurement

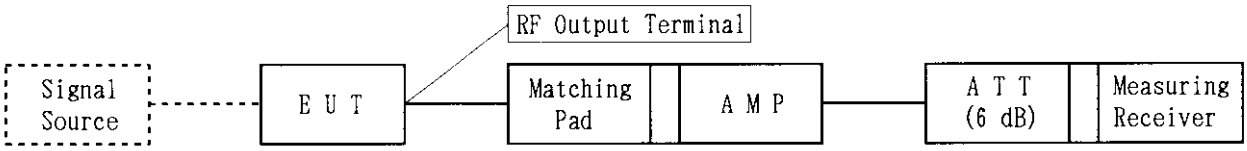
Tested by : K. Hayashi

Kazuya Hayashi, Engineer
Testing Division
EMC Engineering Department

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

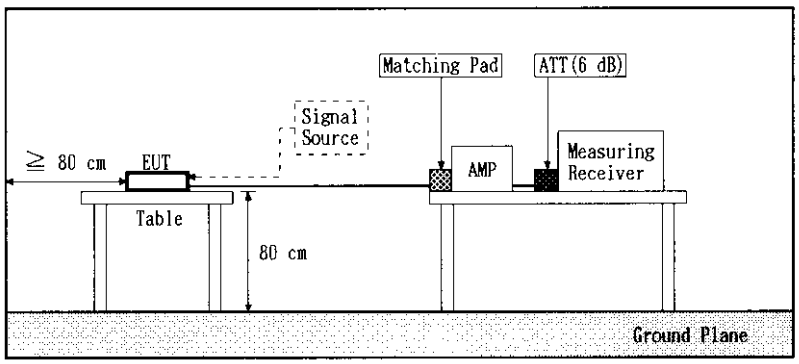
Block Diagram



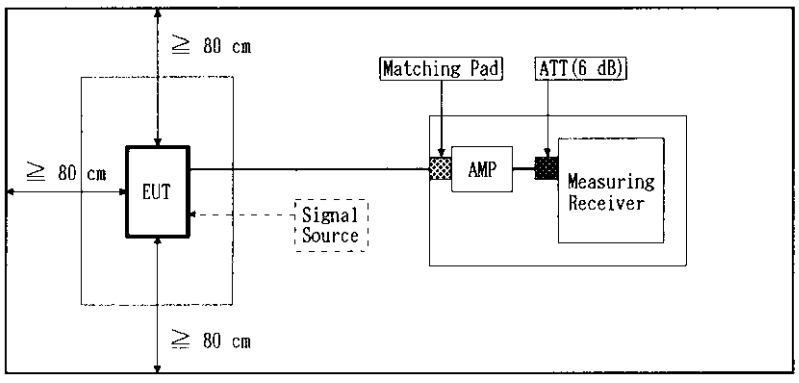
Note: Antenna input terminal of EUT was terminated with the terminator of specified impedances.

Configuration of EUT

Side View



Top View



Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

RF Output Channel : No.3

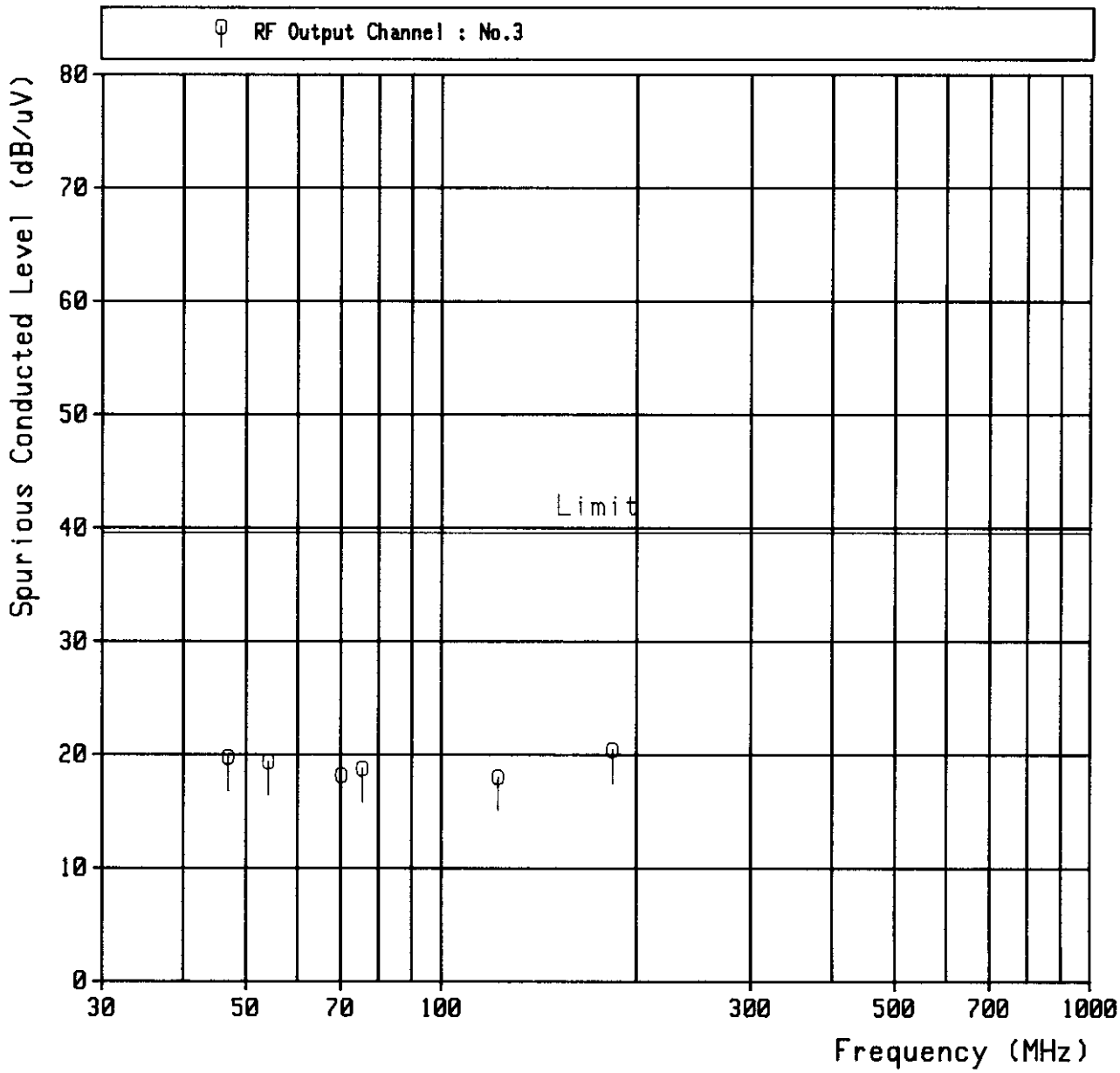
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
47.0	-13.2	33.0	19.8	39.6
54.2	-13.2	32.6	19.4	39.6
56.7	-13.2	< 30.0	< 16.8	39.6
70.2	-13.2	31.4	18.2	39.6
75.6	-13.2	32.0	18.8	39.6
122.5	-13.1	31.2	18.1	39.6
183.8	-13.0	33.5	20.5	39.6
245.0	-12.9	< 30.0	< 17.1	39.6
306.3	-12.9	< 30.0	< 17.1	39.6
367.5	-12.8	< 30.0	< 17.2	39.6
428.8	-12.8	< 30.0	< 17.2	39.6
490.0	-12.8	< 30.0	< 17.2	39.6
551.3	-12.7	< 30.0	< 17.3	39.6
612.5	-12.6	< 30.0	< 17.4	39.6
673.8	-12.4	< 30.0	< 17.6	39.6
735.0	-12.2	< 30.0	< 17.8	39.6
796.3	-12.0	< 30.0	< 18.0	39.6
857.5	-12.1	< 30.0	< 17.9	39.6
918.8	-12.4	< 30.0	< 17.6	39.6
980.0	-12.6	< 30.0	< 17.4	39.6

Notes: 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 183.8 MHz.
Correction Factor + Meter Reading = -13.0 + 33.5 = 20.5 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode



Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

RF Output Channel : No.4

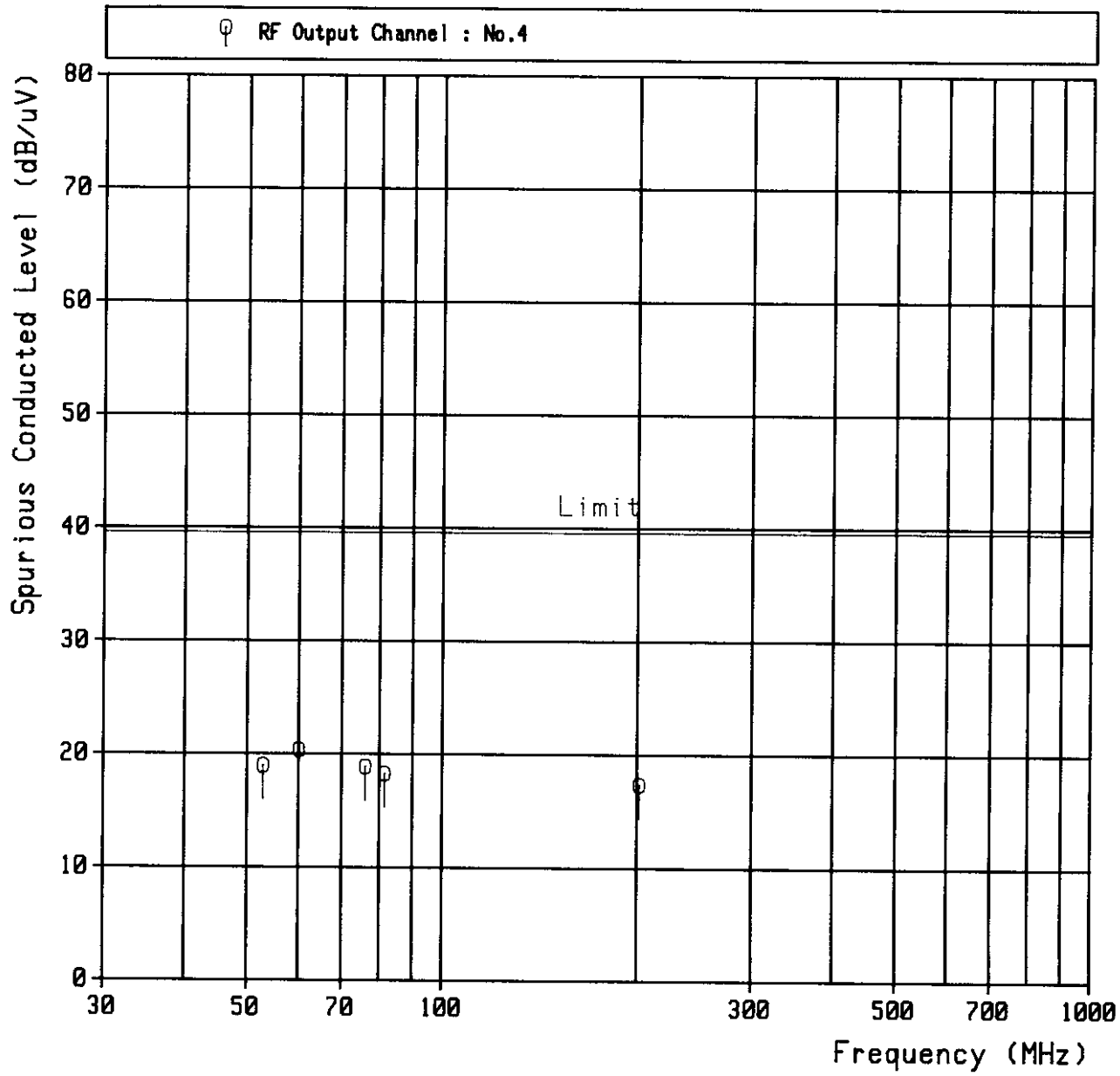
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
35.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
53.0	-13.2	32.2	19.0	39.6
60.2	-13.2	33.6	20.4	39.6
62.7	-13.2	< 30.0	< 16.8	39.6
76.2	-13.2	32.1	18.9	39.6
81.6	-13.2	31.5	18.3	39.6
134.5	-13.1	< 30.0	< 16.9	39.6
201.8	-13.0	30.4	17.4	39.6
269.0	-12.9	< 30.0	< 17.1	39.6
336.3	-12.9	< 30.0	< 17.1	39.6
403.5	-12.8	< 30.0	< 17.2	39.6
470.8	-12.8	< 30.0	< 17.2	39.6
538.0	-12.7	< 30.0	< 17.3	39.6
605.3	-12.7	< 30.0	< 17.3	39.6
672.5	-12.4	< 30.0	< 17.6	39.6
739.8	-12.2	< 30.0	< 17.8	39.6
807.0	-11.9	< 30.0	< 18.1	39.6
874.3	-12.2	< 30.0	< 17.8	39.6
941.5	-12.5	< 30.0	< 17.5	39.6

Notes: 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 60.2 MHz.
Correction Factor + Meter Reading = -13.2 + 33.6 = 20.4 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode



Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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

RF Output Channel : No.3

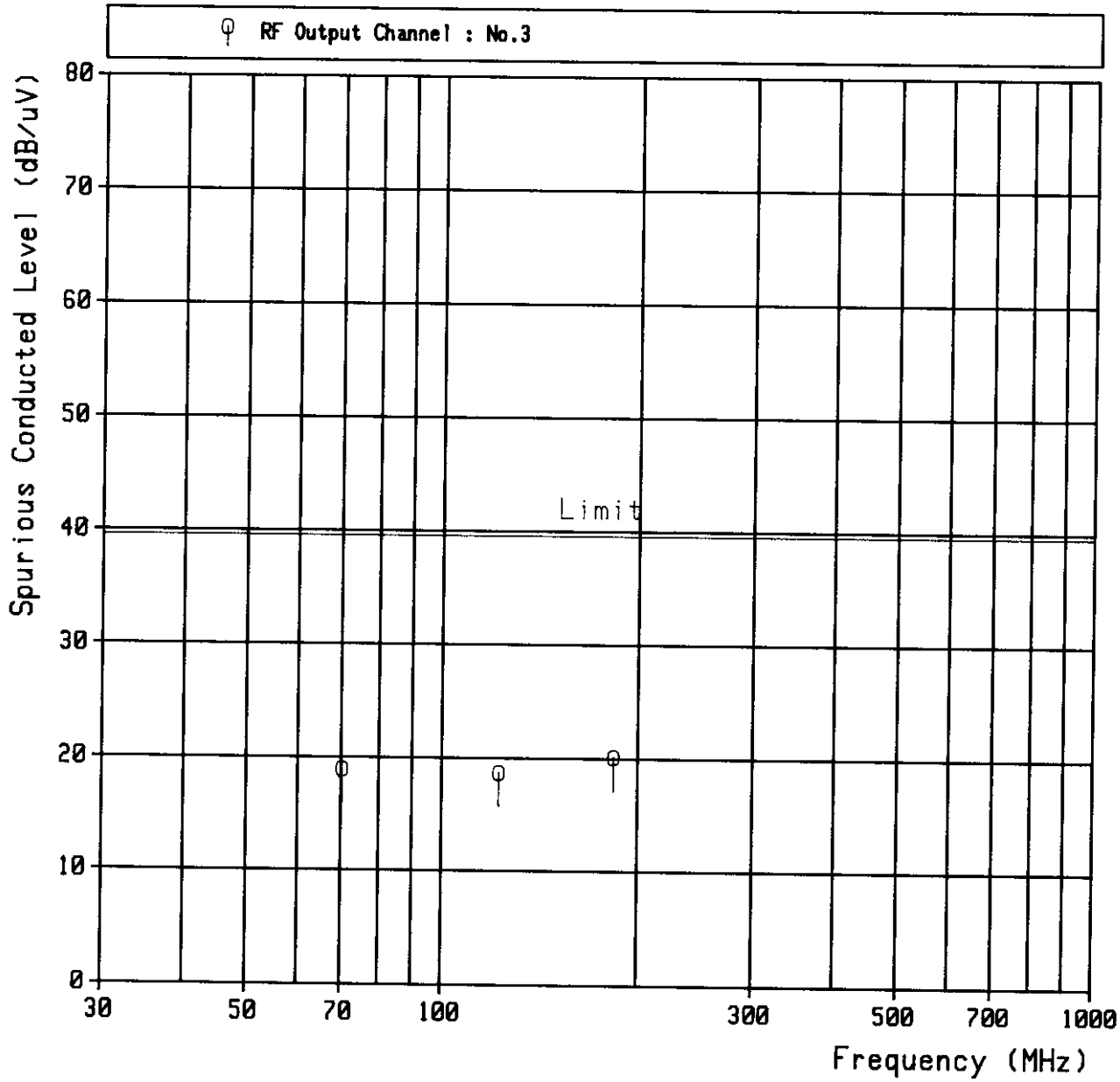
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
46.9	-13.2	< 30.0	< 16.8	39.6
54.0	-13.2	< 30.0	< 16.8	39.6
56.7	-13.2	< 30.0	< 16.8	39.6
70.3	-13.2	32.2	19.0	39.6
75.6	-13.2	< 30.0	< 16.8	39.6
122.5	-13.1	31.9	18.8	39.6
183.8	-13.0	33.2	20.2	39.6
245.0	-12.9	< 30.0	< 17.1	39.6
306.3	-12.9	< 30.0	< 17.1	39.6
367.5	-12.8	< 30.0	< 17.2	39.6
428.8	-12.8	< 30.0	< 17.2	39.6
490.0	-12.8	< 30.0	< 17.2	39.6
551.3	-12.7	< 30.0	< 17.3	39.6
612.5	-12.6	< 30.0	< 17.4	39.6
673.8	-12.4	< 30.0	< 17.6	39.6
735.0	-12.2	< 30.0	< 17.8	39.6
796.3	-12.0	< 30.0	< 18.0	39.6
857.5	-12.1	< 30.0	< 17.9	39.6
918.8	-12.4	< 30.0	< 17.6	39.6
980.0	-12.6	< 30.0	< 17.4	39.6

Notes: 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 183.8 MHz.
Correction Factor + Meter Reading = -13.0 + 33.2 = 20.2 dB/uV

Model No. : XR-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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



Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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

RF Output Channel : No.4

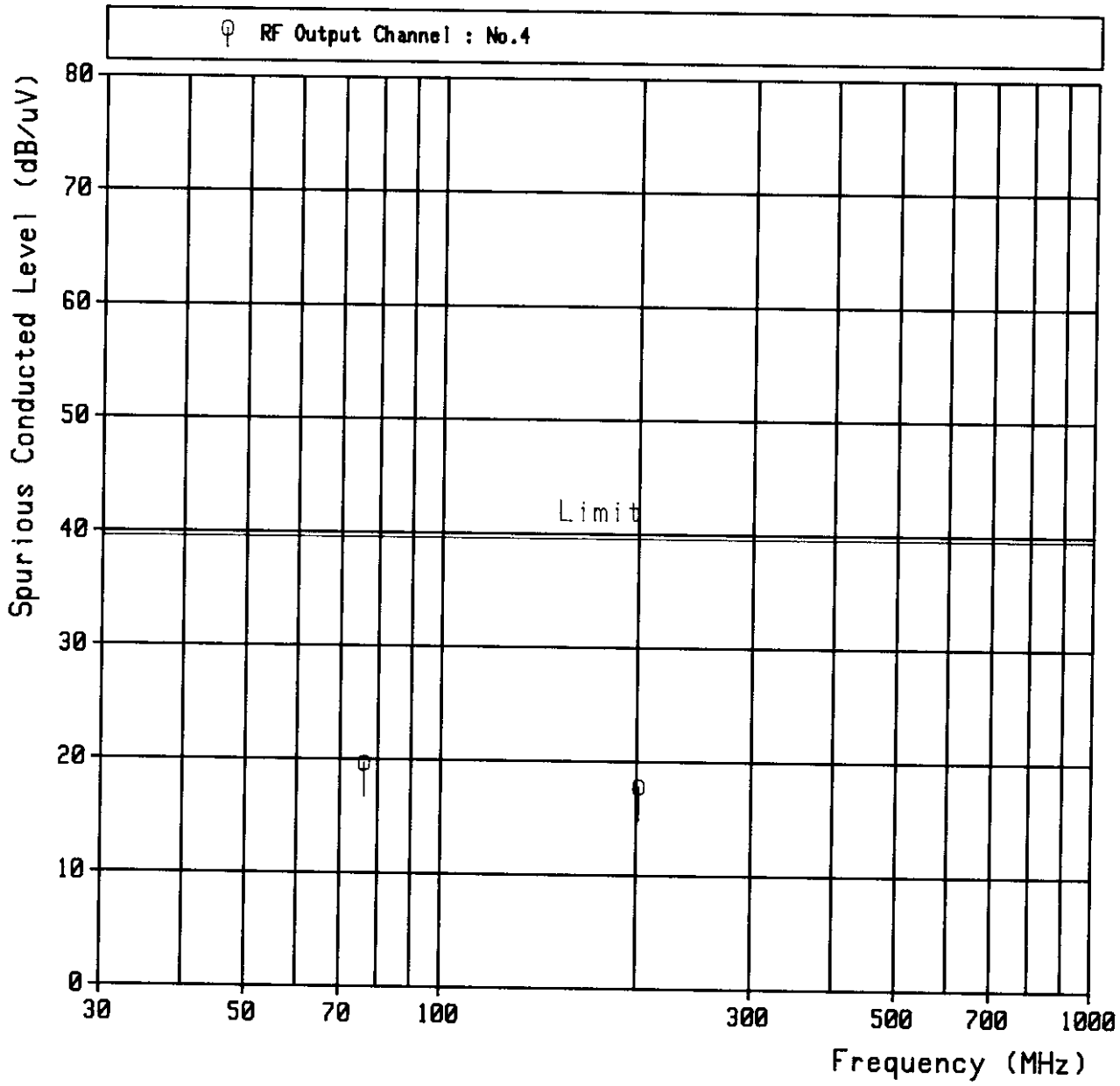
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
35.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
52.9	-13.2	< 30.0	< 16.8	39.6
60.0	-13.2	< 30.0	< 16.8	39.6
62.7	-13.2	< 30.0	< 16.8	39.6
76.3	-13.2	32.9	19.7	39.6
81.6	-13.2	< 30.0	< 16.8	39.6
134.5	-13.1	< 30.0	< 16.9	39.6
201.8	-13.0	30.8	17.8	39.6
269.0	-12.9	< 30.0	< 17.1	39.6
336.3	-12.9	< 30.0	< 17.1	39.6
403.5	-12.8	< 30.0	< 17.2	39.6
470.8	-12.8	< 30.0	< 17.2	39.6
538.0	-12.7	< 30.0	< 17.3	39.6
605.3	-12.7	< 30.0	< 17.3	39.6
672.5	-12.4	< 30.0	< 17.6	39.6
739.8	-12.2	< 30.0	< 17.8	39.6
807.0	-11.9	< 30.0	< 18.1	39.6
874.3	-12.2	< 30.0	< 17.8	39.6
941.5	-12.5	< 30.0	< 17.5	39.6

Notes: 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 76.3 MHz.
Correction Factor + Meter Reading = -13.2 + 32.9 = 19.7 dB/uV

Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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



Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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

RF Output Channel : No.3

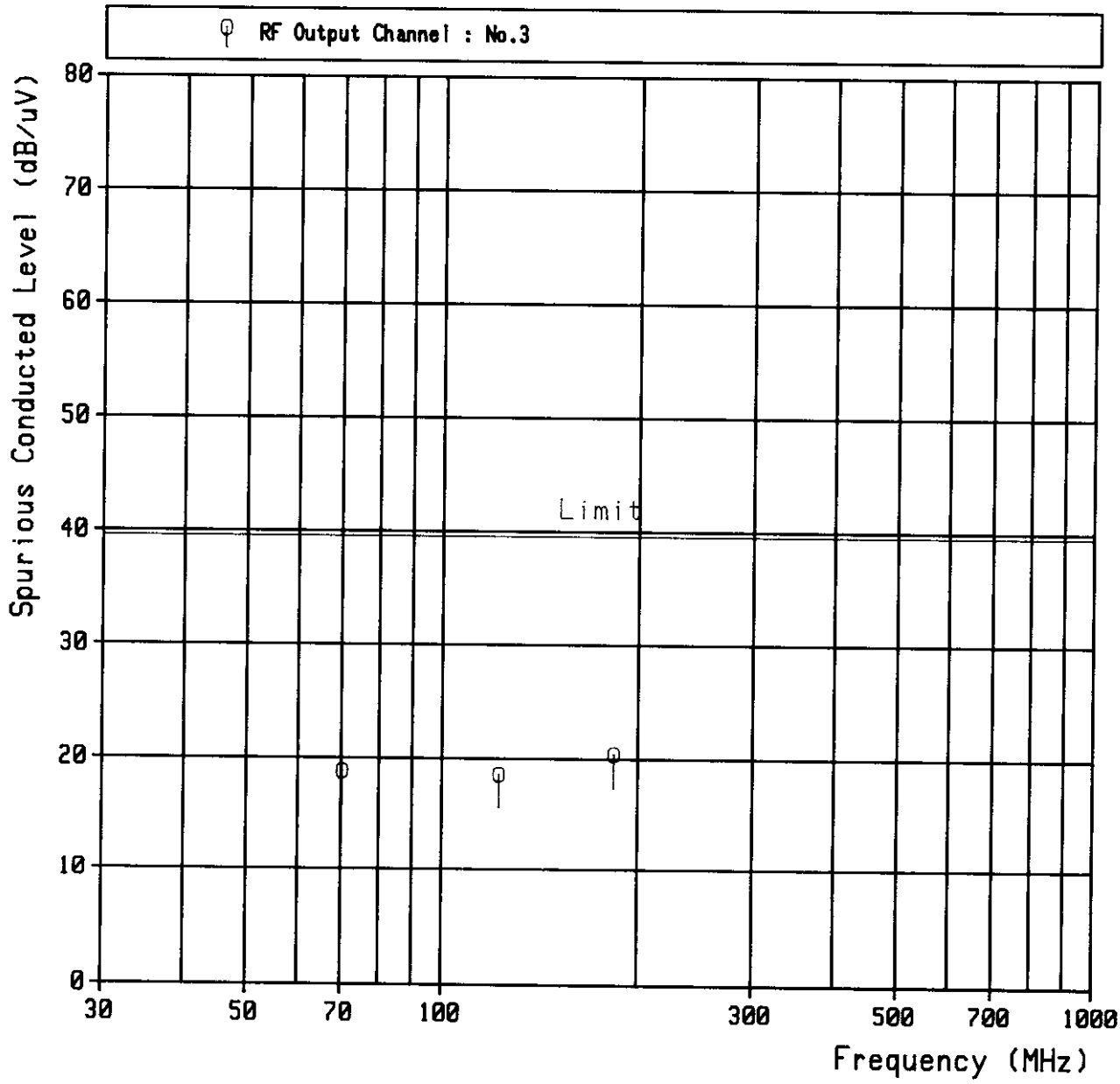
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
46.9	-13.2	< 30.0	< 16.8	39.6
54.0	-13.2	< 30.0	< 16.8	39.6
56.7	-13.2	< 30.0	< 16.8	39.6
70.3	-13.2	32.1	18.9	39.6
75.6	-13.2	< 30.0	< 16.8	39.6
122.5	-13.1	31.8	18.7	39.6
183.8	-13.0	33.5	20.5	39.6
245.0	-12.9	< 30.0	< 17.1	39.6
306.3	-12.9	< 30.0	< 17.1	39.6
367.5	-12.8	< 30.0	< 17.2	39.6
428.8	-12.8	< 30.0	< 17.2	39.6
490.0	-12.8	< 30.0	< 17.2	39.6
551.3	-12.7	< 30.0	< 17.3	39.6
612.5	-12.6	< 30.0	< 17.4	39.6
673.8	-12.4	< 30.0	< 17.6	39.6
735.0	-12.2	< 30.0	< 17.8	39.6
796.3	-12.0	< 30.0	< 18.0	39.6
857.5	-12.1	< 30.0	< 17.9	39.6
918.8	-12.4	< 30.0	< 17.6	39.6
980.0	-12.6	< 30.0	< 17.4	39.6

Notes: 1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 183.8 MHz.
Correction Factor + Meter Reading = -13.0 + 33.5 = 20.5 dB/uV

Model No. : XR-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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



Model No. : XA-720
Serial No. : 803000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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

RF Output Channel : No.4

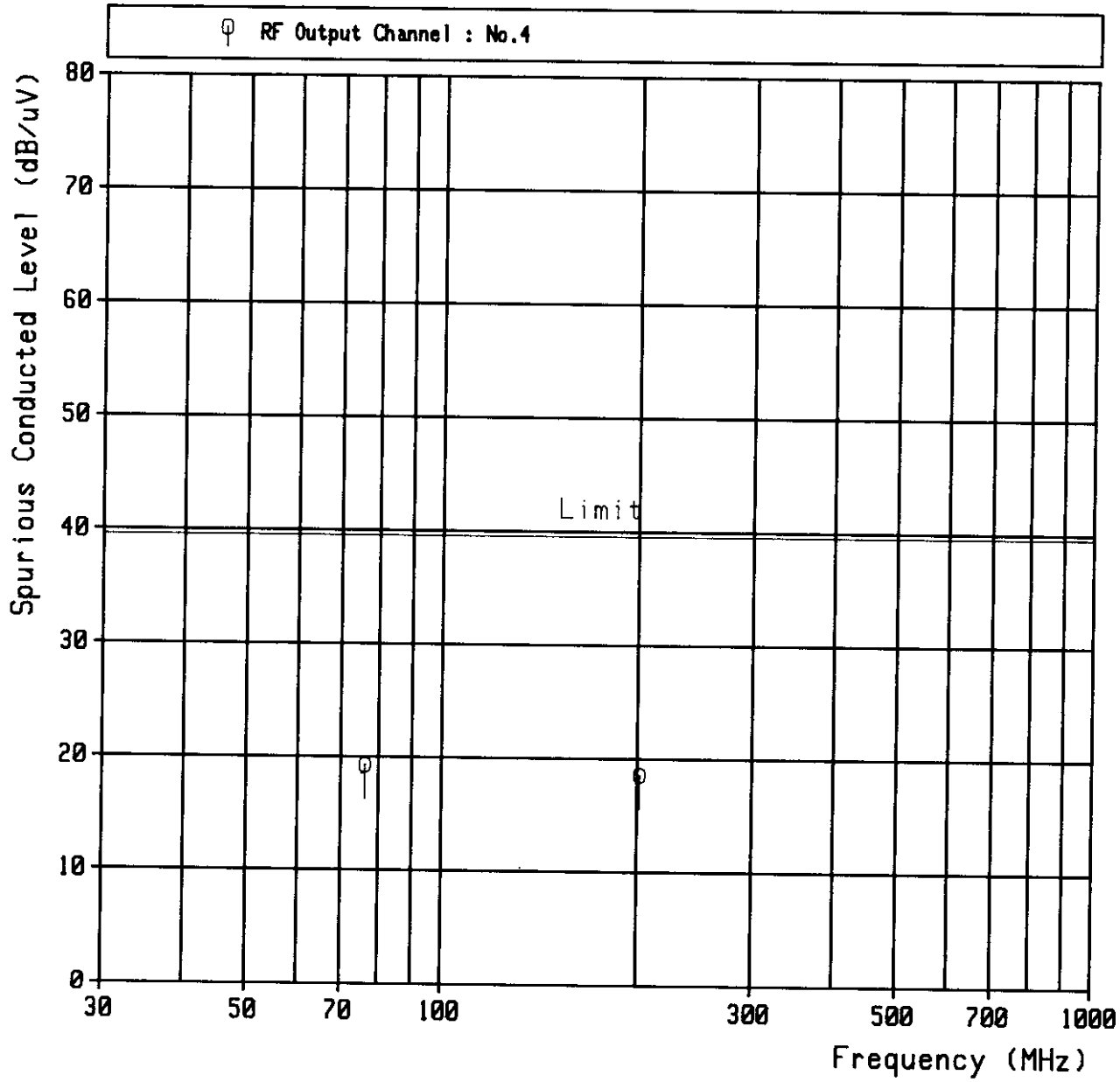
Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
30.0	-13.2	< 30.0	< 16.8	39.6
35.0	-13.2	< 30.0	< 16.8	39.6
40.0	-13.2	< 30.0	< 16.8	39.6
53.0	-13.2	< 30.0	< 16.8	39.6
60.0	-13.2	< 30.0	< 16.8	39.6
62.7	-13.2	< 30.0	< 16.8	39.6
76.3	-13.2	32.5	19.3	39.6
81.6	-13.2	< 30.0	< 16.8	39.6
134.5	-13.1	< 30.0	< 16.9	39.6
201.8	-13.0	31.6	18.6	39.6
269.0	-12.9	< 30.0	< 17.1	39.6
336.3	-12.9	< 30.0	< 17.1	39.6
403.5	-12.8	< 30.0	< 17.2	39.6
470.8	-12.8	< 30.0	< 17.2	39.6
538.0	-12.7	< 30.0	< 17.3	39.6
605.3	-12.7	< 30.0	< 17.3	39.6
672.5	-12.4	< 30.0	< 17.6	39.6
739.8	-12.2	< 30.0	< 17.8	39.6
807.0	-11.9	< 30.0	< 18.1	39.6
874.3	-12.2	< 30.0	< 17.8	39.6
941.5	-12.5	< 30.0	< 17.5	39.6

Notes:
1) The spectrum was checked from 30 MHz to 1000 MHz.
2) Spectrum Analyzer ; SPAN : 10 MHz, RES BW : 100 kHz, VBW : 300 kHz, SWP : 20 msec
3) Impedance at the RF output terminal : 75 ohms (Unbalanced)
4) The symbol of '<' means 'or less'.
5) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
6) A sample calculation was made at 76.3 MHz.
Correction Factor + Meter Reading = -13.2 + 32.5 = 19.3 dB/uV

Model No. : XA-720
Serial No. : 883000001

§15.115(b)(2)(ii) Spurious Conducted Level Measurement

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



Model No. : XA-720
Serial No. : 803000001

Date : May 13, 1998
Temp. : 24 °C; Humi. : 42 %

12. §15.115(c)(1)(ii) Antenna Transfer Switch Measurement

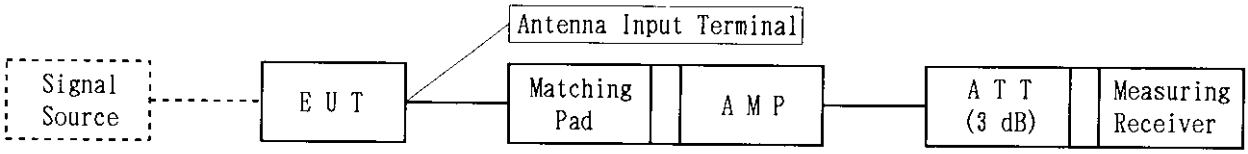
Tested by : K. Hayashi

Kazuya Hayashi, Engineer
Testing Division
EMC Engineering Department

Model No. : XA-720
Serial No. : 803000001

§15.115(c)(1)(ii) Antenna Transfer Switch Measurement

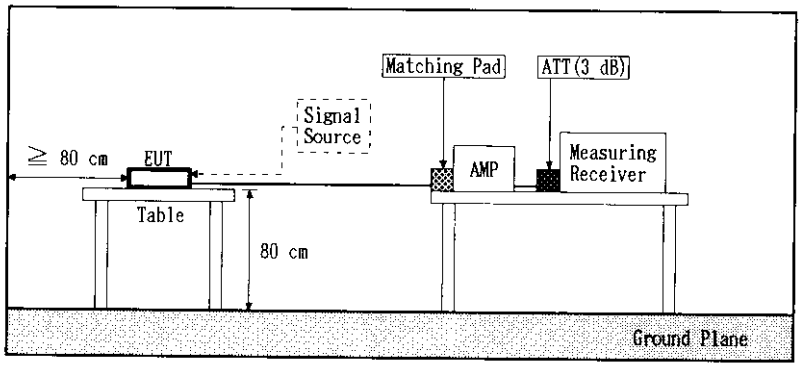
Block Diagram



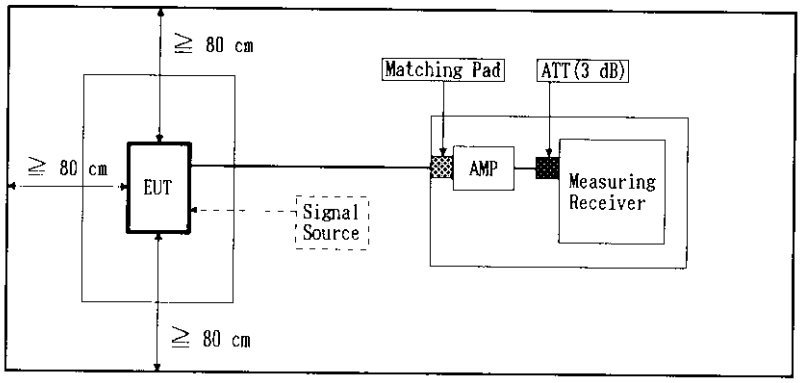
Note: RF output terminal of EUT was connected to the cable terminated with the specified impedances.

Configuration of EUT

Side View



Top View



Note: The same configuration of cables and terminators which were connected to VCR was applied to all applicable measurements, shown as photograph in page 19 and 20.

Model No. : XA-720
Serial No. : 803000001

§15.115(c)(1)(ii) Antenna Transfer Switch Measurement

Testing Signal Sources : Internal Modulation Sources (NTSC TV Signal Recording Tape)
Operating Condition : Playing Mode

RF Output Channel	Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	61.25	-16.2	23.0	6.8	9.5
4	67.25	-16.2	< 15.0	< -1.2	9.5

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

RF Output Channel	Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)
3	61.24	-16.2	22.8	6.6	9.5
4	67.25	-16.2	< 15.0	< -1.2	9.5

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

RF Output Channel	Frequency (MHz)	Correction Factor (dB)	Meter Reading (dB/uV)	Result (dB/uV)	Limit (dB/uV)

Not Applicable

Notes: 1) Spectrum Analyzer ; SPAN : 1 MHz, RES BW : 10kHz, VBW : 10kHz, SWP : 30 msec
2) Impedance at the Antenna input terminal : 75 ohms (Unbalanced)
3) The symbol of '<' means 'or less'.
4) Correction Factor includes a gain of preamplifier, a matching pad loss and an attenuation pad loss.
5) A sample calculation was made at 61.25 MHz.
Correction Factor + Meter Reading = -16.2 + 23.0 = 6.8 dB/uV

Model No. : XA-720
Serial No. : 803000001

13. Test Equipment Used

Equipment	Manufacturer	Model No. [Serial No.]	Last Cal. [Cal. Interval]
Measuring Receiver	Rohde & Schwarz	ESH 3 [872994/035]	May, 1998 [1 year]
Measuring Receiver	Rohde & Schwarz	ESVP [881487/004]	May, 1998 [1 year]
Spectrum Analyzer	Hewlett Packard	8566B [2140A01091]	April, 1998 [1 year]
Line Impedance Stabilized Network	Kyoritsu Electrical Works	KNW-407 [8-1130-6]	April, 1998 [1 year]
Dipole Antenna	Kyoritsu Electrical Works	KBA-511 [0-170-1]	November, 1997 [1 year]
Dipole Antenna	Kyoritsu Electrical Works	KBA-611 [0-147-14]	November, 1997 [1 year]
Preamplifier	Hewlett Packard	8447D [1937A02168]	July, 1997 [1 year]
Vertical Internal Test Signal Generator (VITS)	Anritsu	MG318A [M08128]	June, 1997 [1 year]
Color TV Pattern Generator	Philips Consumer Electronics	PM 5418 TNSI [LO 609096]	June, 1997 [1 year]
Matching Pad	Wiltron	12N50/75B [90400]	June, 1997 [1 year]
6 dB Attenuation Pad	Weinschel	1 [AD8054]	June, 1997 [1 year]
3 dB Attenuation Pad	Weinschel	1 [AD9615]	June, 1997 [1 year]

3. Explanation of Model No.XA-720 with Supplemental Photo

(1) The full name and complete address of the manufacturer of the device.

(a) Name

SHARP CORPORATION

(B) Adress

174 Hayakawa-cho, Yaita-shi, Tochigi, 329-21, Japan.

(2) Trade name, if any, under which the device will be marketed.

SHARP

(3) Model number

XA-720

(4) List any additional model number and/or trade names under which the device will be marketed.

N/A

(5) For a device other than an FM or TV brodecast receiver, attach a copy of the installation and operating instructions furnished to the user.

Attached

(6) For a device used in decoding the Emergency Brodecast System Attention Signals defined in "73.906" the value of the necessary voltage (RMS) or range of voltages of the attention signal to be applied to the input terminals of the decorder which will cause the desired response of the device shall be submitted to the commission with the certification data.

Attached

(7) This model has converter so that playback is possible through ordinary TV sets without any additional accessory.

* Refer to photo 1 ····· a : RF Converter of Type No. VTUENG56701-1

(This tuner and the RF converter are built in one body.)

(a) "VHF OUT" channel selection

RF converter channel selection is pre-set to channel 3 at factory.
Reset the channel to 4 if channel 3 is used for the TV broadcasting in your area.

* Refer to photo 2 ····· a : RF Converter Channel Select Switch

(b) "TV/VCR" Select Switch
The select VIDEO (VCR) mode or TV mode can be made by "TV/VCR" that is provided at the remote control unit, and further, when play mode key is pushed, it selects automatically the VIDEO (VCR) mode.

* Refer to photo 3 ····· a : TV/VCR Selector

(c) Antenna circuit block diagram

* Refer to Attachment 1

(d) RF Converter block diagram

* Refer to Attachment 2 ····· RF Converter Type No. VTUENG56701-1

(8) RF Converter (Type No.: VTUENG56701-1, Mfr's name: Matsushita Elec.)
(This tuner and the RF converter are built in one body.)

(a) Type of emission

Video Modulation Type : A5
Polarity of Video modulation : Negative
Audio Modulation Type : F3, ±25 kHz, 75 μsec preemphasis
Color Standard : NTSC Standard

(b) Frequency range

US CH. No. 3 : 60 MHz - 66 MHz
US CH. No. 4 : 66 MHz - 72 MHz

(c) Range of operating power and description of means provided for variation of operating power

: Not Application

(d) Maximum power rating as defined in applicable rules :

US CH. No. 3 : 69.5 dB μ
US CH. No. 4 : 69.5 dB μ

(e) The Voltage and Current to Converter : 5 V DC 40 mA

(f) Function of each electrontube, semiconductor or other active circuit device :

Q1 - Q3 : Switching ..... 2SC4965 (Hitachi Ltd.)
2SC4774 (Rohm Co., Ltd.)

IC1 : Video Clamper ..... AN3117SA (Matsushita Elec.)

Video carrier OSC.
Video carrier Limiter
Video Modulation
Audio CH. Converter
Audio Amplifier
4.5 MHz OSC. (Frequency Modulation)
CH. Switching

Description of circuit function

Refer to Attachment and RF converter circuit diagram. Video signal comes from the "VIDEO IN" terminal, which then passes through the resistance devider (R10) and goes into pin No.16 on IC1. The pin No.16 on IC1 is an input gate for Video als; the Video signal hence passes through the clamper and white clip, and is supplies to the Video-modulator.
The Video carrier is made by the oscillator (a transistor for which is in cooperated to the IC1), using the SAW Resonator(X1).

The Video Carrier is supplied, through the carrier limiter inside IC1, to the Video modulator, where the modulator also is incorporated to IC1.

The modulated signal comes out from the pin No.15 with C15 in series, and is suppied to "VHF OUT" through the attenuator (R13), the band pass filter (L7, C17 and C18) and the switching trnasistor (Q3).

Audio signal comes from the "AUDIO IN" terminal, followed by R5, C9, C10, and R7 which has 75 μsec pre-emphasis time constant, and is supplied to the pin No.6 on IC1.

The pin No.6 on IC1 is an audio input terminal; the audio signal having 75 μsec pre-emphasis time constant is supplied to 4.5 MHz oscillator after being amplified in the audio amp.
The oscillator of 4.5 MHz consists of T1 and a transistor integrated in IC1.

The 4.5 MHz signal, having been modulated, forms an audio carrier by going through the frequency converter and comes out from the pin No.15 on IC1, and is mixed with the video modulated signal through the attenator (R13).

The power supply is regulated by the IC1. Channel selection is done by the slide switch (S101) in Main PWB, that selects the Video carrier by either impressing a voltage on the pin No. 7 or shorting the same, since there is a switching circuit inside the IC1.

(g) Complete Schematic diagram : Attached

(h) Operation manual : Attached

(i) Tune up procedure over the power range or at specific operating power level : Not Adjustable

(j) A description of all circuit and devices provided for determing and stabilizing frequency :

In order to perform a good reguration of the video carrier, the oscillator employs a SAW Resonator (X1). An inter-carrier is formed by a LC oscillator, since the capacitor in T1 has the temperature constant RH (N220 ±60 PPM / deg C), drift due to temperature change is small. To protect effects from the outside power source, the internal circuits are supplied their power through a regulator.

(k) A description of any circuit or devices employed for suppression of sprious radiation, for limiting modulation, and limiting the operation power :

Suppression of sprious radiation

The oscillator circuit are designed to get oscillator power as small as possible.
And on the "VHF OUT", there is a band pass filter (C17, C18, L7 and C16), to suppress sprious.
Also on the input circuit of "VIDEO", and on the input circuit of "AUDIO", there are buffer amplifier, which is incorporated to IC1.
These buffer amplifier are used for suppressing sprious radiation.

Limiting modulation

The modulation is set with resistors (R10, R11 and R12).

Limiting the operation power

The output power is set with resistors R13.

(9) Identification photo or label : Attached

Enclosure rear

4. Explanation on Machanism and Tuning Method of VHF and UHF Tuner for Model XA-702 with Supplemental photos.

(1). Mechanism of channel selection :

This model is employed Phase Locked Loop (PLL) type frequency synthesizer circuit systems.
The local oscillation frequency of selected channel is detected by this circuit and compared with the correct local oscillation frequency which is generated by the standard crystal oscillation circuit.
The different frequency from correct one is detected by the phase detector circuit and feed back to the local oscillation circuit of tuner for correcting frequency.

The tuning accuracy by this PLL circuit system is within ±10 kHz to the correct local oscillation frequency allocated by FCC.

Therefore, this accurate frequency control system eliminates the need of fine tuning.

This model is equipped with both random access selection system and up/down system for channel selection, and possible to receive midband, superband and hyperband channels (CATV).

Photo 4.
a. channel ▲/▼ button
b. channel number display

Photo 5. Remote control unit

a. MENU button
b. ▲/▼ button (To select "CHANNEL PRESET" mode)
c. SET button
d. ◀/▶ button
e. randam acces channel selector buttons (0-9・100)

Photo 6. Control part

a. MENU button
b. SET button
c. FF/REW switch

Photo 7. Remote control unit

a. Channel ▲/▼ button

(2) Setting the channels

When setting using the "NENU" button on the Remote control unit.

① Press the "POWER" button

② Press the 'MENU" button

After above setting, operate according to the procedure displayed on the TV screen.
Concerning the details of setting, please refer "SETTING THE CHANNELS" in the Operation manual.

When setting using the "NEMU" button on the main unit.

① Press the "POWER" button

② Press the 'MENU" button

After above setting, operate according to the procedure displayed on the TV screen.
Concerning the datails of setting, please refer "SETTING THE CHANNELS" in the Operation manual.

(3) Channel read out :

This model is employed Digital Sign System which selected channel number is indicated on display (Photo 4-b) and TV screen.

TV Node		Covered channel
"TV" display	:	VHF ; 2 - 13 CH
		UHF ; 14 - 69 CH
"CATV-STD" display	:	CATV ; 2 - 125 CH (STANDARD)
"CATV-HRC" display	:	CATV ; 1 - 125 CH (HRC/IRC)

Channel selection up/down system can be performed by pushing channel up/down buttons (Please 4-a and 7-a).

This directional channel selection is capable selecting from low CH to high CH (up " ▲" button) and from high CH to low CH (down " ▼" button).

" ▲" and " ▼" buttons employ both function (Channel up/down function and Auto Tracking function).

Channel up/down function operate only EE (stop) Mode and "REC + PAUSE" Mode.
Auto Trackong function operate only play-back Mode.

* * * * * * * * * *

With the above explanation, we believe that this model complies with requirement of FCC comparable tuning rules.

5. TV RECEIVER APPLICATION CHECK LIST for Model XA-720

(X)(1). A statement identifying the production run plan you will be using to show compliance in meeting a 14 dB UHF noise figure - reference "TV Receiver, UHF noise figure - Certification and Compliance Criteria" second issue, January 1981).

We will use the same "plan C" of the "TV Receiver UHF noise figure - Certification and Compliance Criteria" for production.

(X)(2). A statement that NF measurements were made pursuant to OST Measurement Procedure MP-2, Second Issue, January 1980. Departure from the procedures of OST Measurement Procedure MP-2 must be approved by the Chief Scientist or his designate. Details of any departures from OST Measurement Procedure MP-2 must accompany the certificate application.

Our measurement were made pursuant to OST Measurement Procedure MP-2 Second Issue, July 1982 for measuring the UHF noise figure.

(X)(3). The names of all manufacturing sources for the VHF and UHF tuners as well as the tuner Manufacture's Nos.

Parts Name : ENG56701G (VHF & UHF combined in one unit)
Manufacturer's Name : Matsushita Electronic components (M) Sdn. Bhd.

(X)(4). UHF and VHF tuner part numbers assigned by the receiver manufacturer.

Parts Name : VTUENG56701-1 (VHF & UHF combined in one unit)

(X)(5). Frequency bands tuned by the receiver (i.e., UHF, VHF, midband, superband, AM/FM, etc.).

VHF (L)	54 - 88 MHz	UHF including CATV(ULTRA)	470 - 806 MHz
(H)	174 - 216 MHz	CATV (LOW/MID)	72 - 174 MHz
		CATV (SUPER)	216 - 300 MHz
		CATV (HYPER)	300 - 474 MHz

(X)(6). Pursuant to Section 15.117 of the Rules, a statement specifying the receiver design noise figure, in dB.

Refer to Attachment 1.

- to be continued -

(X) 7. The length of the UHF lead, from antenna input terminals to the tuner.

None

(X) 8. Schematic diagram for the receiver.

Attached

(X) 9. The exact chassis number.

None

(X) 10. Picture tube size in inches.

None

(X) 11. Type of receiver - clow of black and white.

None

(X) 12. A description of the cabinet material.

Plastic

(X) 13. Copy of all the information submitted with the original certification for basic receiver (for application for FCC ID numbers other than those for initial application submittals with a report of measurements).

None

(X) 14. The IF noise figure contribution that was added to the measured value for each UHF channels noise figure in the report of measurements, or a statement that the contribution is not exceeded 0.25 dB for the channel.

We measured the UHF noise figure on the ten (10) production units of the test samples for this application and the IF noise figure contribution. As the result of this measurement, at least 97.5% of all production units have a noise figure not exceeding 14 dB and the IF noise figure contribution is not exceed 0.25 dB.
Please refer to the attached UHF noise figure measurement report.

With the above explanation, we believe that this model complies with the requirement of the FCC rules and regulations, section 15.117.

Measurement procedure : OST Measurement Procedure MP-2.
July 1982.

(Technical Conference on Noise Figure Measurements)

List of Measuring Equipment :

1. Automatic Noise Figure Indicator :
   Model No. ENF-2005 ELENA

2. Solid - State Noise Generator :
   Model No. MC1100 MICROWAVE SEMICONDUCTOR

3. UHF Balun :
   Model No. U2A MEASUREMENTS

Attached 1

UHF NOISE FIGURE MEASURENENT DATA

Manufactuer : SHARP CORPORATION
Trade Name (Brand Name) : SHARP
Noise Figure Measurement : _____

Model No. : XA-720
FCC ID where assigned : N/A
Tuner/RF Converter No. : VTUENG56701-1

List UHF Noise Figure (dB)	UHF Channel Number										Plan C				
	14	20	26	32	38	44	50	56	62	69	MAX	CH	x	Sn	x+K*Sn
1	6.7	7.0	7.4	7.7	7.8	7.2	7.3	7.6	7.6	7.1	7.8	38	7.34	0.35	8.39
2	6.3	6.8	6.8	6.4	5.6	4.8	5.2	5.9	6.0	5.6	6.8	20/26	5.94	0.66	7.92
3	5.3	5.8	6.1	6.1	5.8	4.8	5.0	5.6	5.6	5.2	6.1	26/32	5.53	0.44	6.87
4	6.0	6.3	6.7	7.0	7.1	6.5	6.6	6.9	6.9	6.4	7.1	38	6.64	0.35	7.69
5	6.6	7.1	7.1	6.7	5.9	5.1	5.5	6.2	6.3	5.9	7.1	20/26	6.24	0.66	8.22
6	6.3	6.8	7.1	7.1	6.8	5.8	6.0	6.6	6.6	6.2	7.1	26/32	6.53	0.44	7.87
7	5.7	6.0	6.4	6.7	6.8	6.2	6.3	6.6	6.6	6.1	6.8	38	6.34	0.35	7.39
8	5.0	5.5	5.8	5.8	5.5	4.5	4.7	5.3	5.3	4.9	5.8	26/32	5.23	0.44	6.57
9	7.0	7.5	7.5	7.1	7.3	5.5	5.9	6.6	6.7	6.3	7.5	20/26	6.74	0.68	8.78
10	5.5	6.0	6.3	6.3	6.0	5.0	5.2	5.8	5.8	5.4	6.3	26/32	5.73	0.44	7.07

* I substracted 4 dB from the measured NF, because a power splitter is equipped in set.
Sample Size 10 (K=3.0113)

x : Mean of ten distributed noise figures including the max. value.
Sn : Standard deviation for ten distributed noise figure including max. value.
Note : The above "MAX." value is indicated the worst noise figure in the total range of the 69 UHF channel.

Noise Figure Contribution of the N.F. Amplifier
(Measured Values)

Second Stage Noise Figure : _____ dB

Tuner Gain : N.A. dB

Noise Figure Contributin : less than 0.30 dB

8. Explanation on UHF-VHF antenna comparability of Model No. XA-720

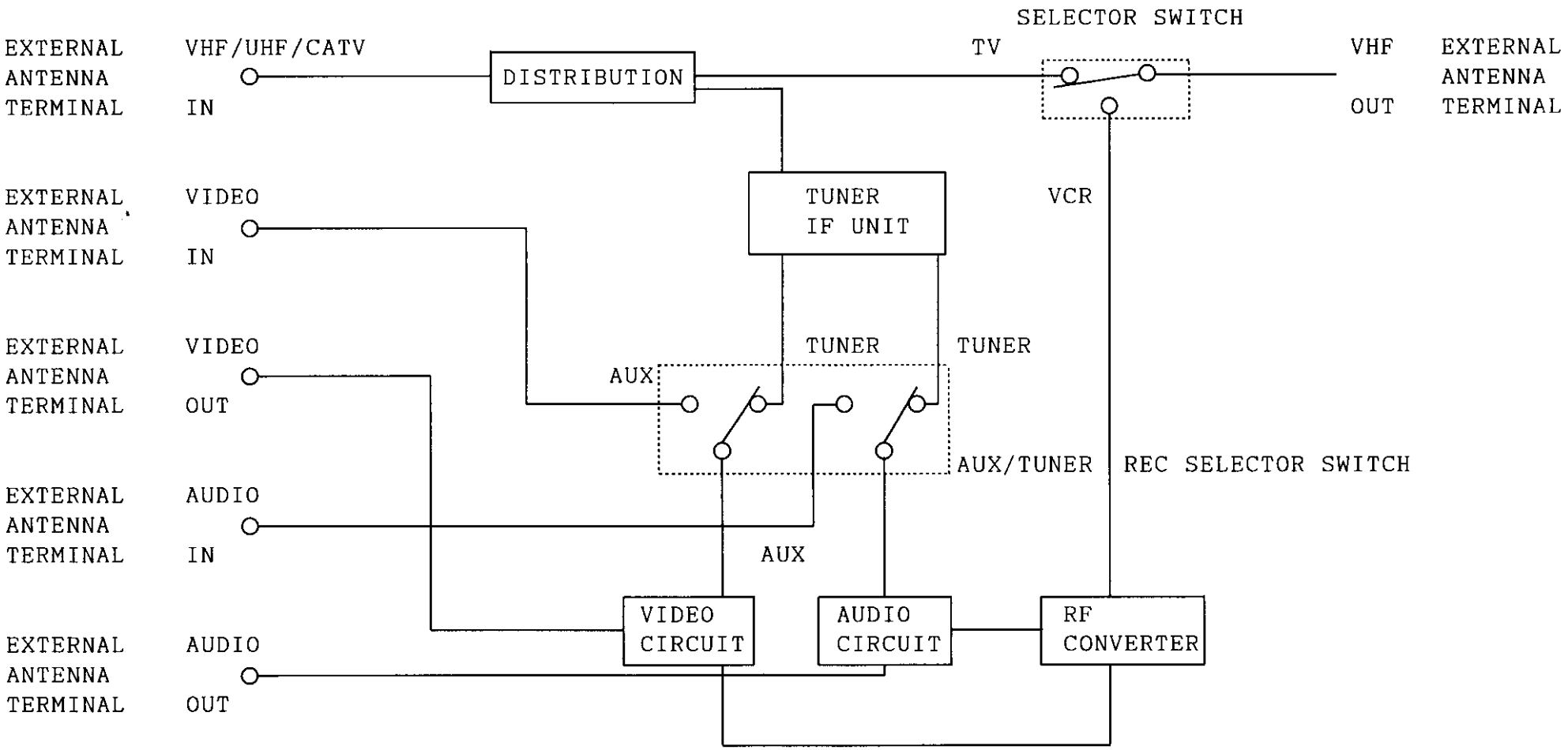
UHF Loop and VHF Dipole antenna are not mounted on VCR set.
They are not provided in carton.

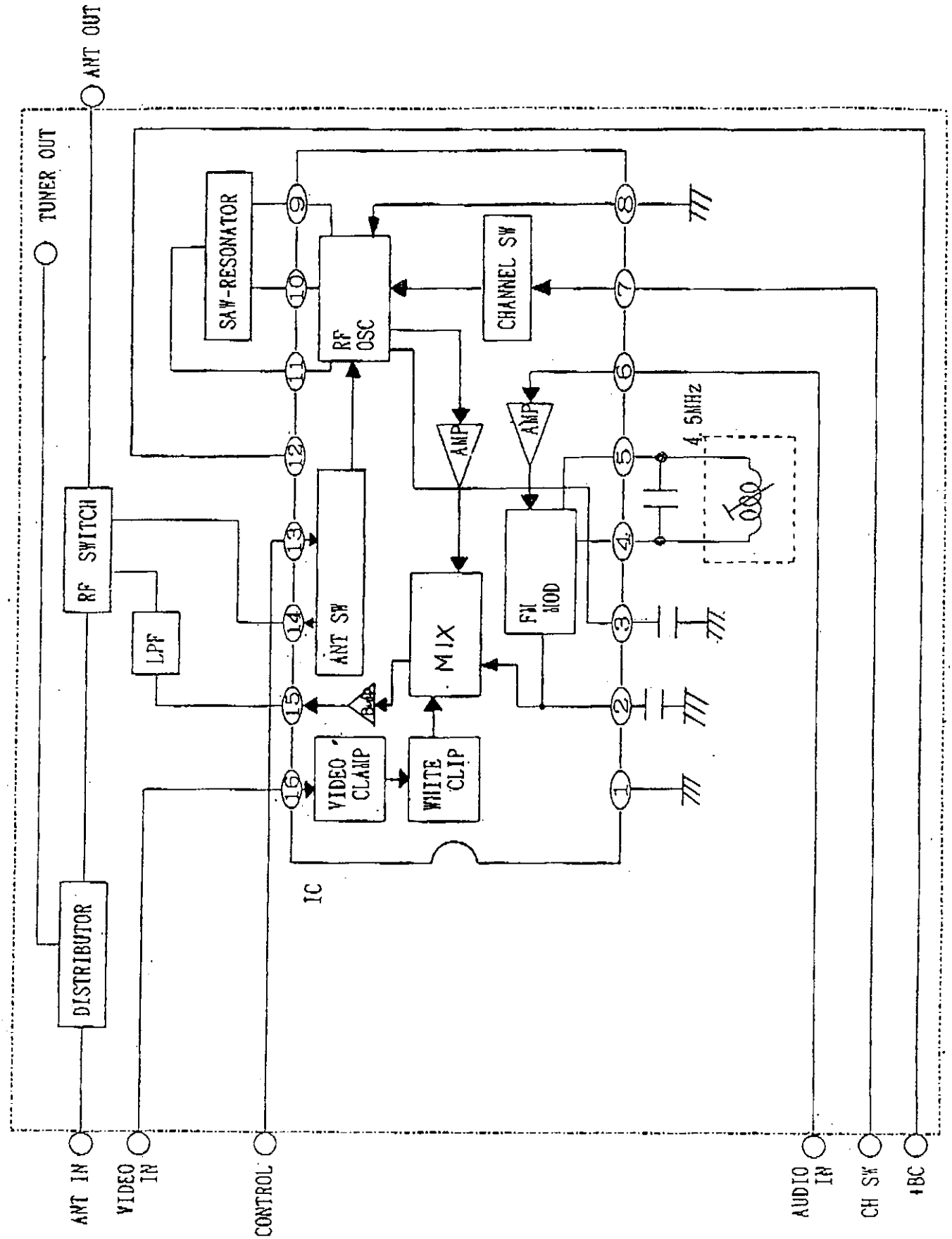
* * * * * * * * * *

With the above explanation, we are confident that this Video Cassette Recorder comply with the rule, section 15.117.

Attachment 1

ANTENNA CIRCUIT BLOCK DIAGRAM



Attachment 2

RF CONVERTER BLOCK DIAGRAM