EMC TEST REPORT

Project No.: SE-01-0495

1. Applicant Name : SAMSUNG ELECTRONICS CO., LTD.
416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742

2. Identification of tested device

2.1 FCC ID : **A3LSCORHIFI**
2.2 Device Name : **VIDEO CASSETTE RECORDER**
2.3 Trade Name : **SONY**
2.4 Model Number : **SLV-N88**

3. Test Procedure and Items

3.1 Radiated Emissions Measurement : ANSI C63.4-1992
3.2 Output Signal Level Measurement : ANSI C63.4-1992
3.3 Output Terminal Conducted Spurious Emission Measurement : ANSI C63.4-1992
3.4 Antenna Transfer Switch Measurement : ANSI C63.4-1992

Date of test : September 20. 2001 ~ October 13. 2001

Issued Date : October 17. 2001

Tested by: C. K. Park
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1. GENERAL INFORMATION

1.1 Description for Equipment Authorization

1.1.1 Rules Part(s) under which Equipment Authorization

FCC Rule Part 15, Subpart B : Unintentional Radiators
TV Interface Devices.
This Product is a Video Cassette Recorder containing RF modulator.

1.1.2 Kind of Equipment Authorization : **CERTIFICATION**

1.1.3 FCC ID Number : **A3LSCORHIFI**

1.1.4 Applied TM-BLOCK(RF Units) : **TMDH2-A32** made by Alps
115VD025AP made by Sanyo
TMZH2-002A made by Alps

1.1.5 RF Modulator Frequency : CH.3 Visual Carrier 61.25MHz,
Aural Carrier 65.75MHz
CH.4 Visual Carrier 67.25MHz,
Aural Carrier 71.75MHz

1.1.6 Rate Power Supply : AC 120V, 60Hz

1.1.7 Type of RF Output Connector : Type "F" Connector 75ohm(Unbalanced)

1.1.8 Measurement Facility : Semi-anechoic chamber #1
(FCC Registration Number : 98856)

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2. TEST MODE

The EUT was tested in the following operating modes(at both channel 3 and 4) for the tests mention in this report:

1) Playback mode [VHS Play]
in this test mode, a video tape recorded with VITS signal was played on the EUT.

2) Record mode [1V VITS Signal Input]
A 1V peak-to-peak VITS signal was supplied through the video input connector for recording.

3) Record mode [5V VITS Signal Input]
A 5V peak-to-peak VITS signal was supplied through the video input connector for recording.

4) Record mode [NTSC Signal Input]
A NTSC signal(Color bar with grea lines) was supplied at ch. 5(77.25MHz) through the Ant. input connector for recording.

Note: The NTSC TV signal input record mode is not applicable to the antenna transfer switch test.

The explanation of measuring instrument setup when respective function is used in any frequency band is as following:

Frequency Band [MHz]	Instrument	Detector fuction	Resolution Bandwidth	Video Bandwidth
30 to 1000	Spectrum analyzer	Peak	1MHz	1MHz
	EMI Test receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Test receiver	Average	1MHz	-

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3. AC POWERLINE CONDUCTED EMISSION MEASUREMENT

3.1 Reference Rule and Specification
FCC Rule Part 15, Section 15.107(a)

3.2 Test Procedure

3.2.1 Configurate the EUT System in accordance with ANSI C63.4-1992 section 7 and 12.2. Connect the EUT's AC line cord to the EUT port of LISN.

3.2.2 All input terminals are terminated in the proper impedance.
The output ports are connected to the cable provided with the device and the ending port are terminated in the proper impedance.

3.2.3 Using a calibrated coaxial cable, the TEST RECEIVER is connected to the measuring port of the LISN for EUT. To the find out an EUT condition procedures the maximum emission, the position of cables, EUT operations mode are the position of cables, EUT operations mode are checked under normal usage of EUT.
Then, the emission are scanned from 0.45MHz to 30MHz relative to the limit are recorded.

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3.3 Test Results

* TM-BLOCK(RF UNIT) : TMDH2-A32

1) EUT Mode : Playback mode [VHS Play]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.624	26.8	25.7	0.2	27.0	**48.0**	21.0
2.034	25.3	30.1	0.3	30.4	**48.0**	17.7
7.086	23.3	21.6	0.1	23.4	**48.0**	24.6
19.368	25.4	24.8	1.2	26.6	**48.0**	21.4
25.170	31.4	32.8	1.7	34.5	**48.0**	13.5
28.632	36.2	27.6	1.7	37.9	**48.0**	10.1

2) EUT Mode : Record mode [1V & 5V VITS Signal Input]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.726	25.6	25.8	0.2	26.0	**48.0**	22.0
2.040	25.1	21.7	0.3	25.4	**48.0**	22.6
9.924	25.2	24.5	0.2	25.4	**48.0**	22.6
17.430	24.9	29.5	1.1	30.6	**48.0**	17.4
24.708	30.1	34.1	1.9	36.0	**48.0**	12.0
28.638	38.2	32.7	1.7	39.9	**48.0**	8.1

3) EUT Mode : Record mode [NTSC Signal Input]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.450	27.1	26.5	0.2	27.3	**48.0**	20.7
0.906	25.3	26.8	0.1	26.9	**48.0**	21.2
2.124	23.6	24.3	0.3	24.6	**48.0**	23.4
7.050	22.5	20.4	0.1	22.6	**48.0**	25.5
17.496	20.8	27.1	1.1	28.2	**48.0**	19.8
28.494	25.5	22.4	1.7	27.2	**48.0**	20.8

* Margin = Limits - Results

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* TM-BLOCK(RF UNIT) : 115VD025AP

1) EUT Mode : Playback mode [VHS Play]

Frequency	Meter reading(a)		Total	Results	Limits	Margin
	LISN Port		Loss(b)	(a) + (b)		
[MHz]	L1	L2	[dB]	[dBuV]	[dBuV]	[dB]
0.534	20.4	24.7	0.1	24.8	**48.0**	23.2
0.594	12.7	24.9	0.1	25.0	**48.0**	23.0
0.888	18.8	25.5	0.1	25.6	**48.0**	22.4
1.968	20.9	26.2	0.1	26.3	**48.0**	21.7
11.214	28.1	29.4	0.4	29.8	**48.0**	18.2
25.842	32.3	31.8	1.6	33.9	**48.0**	14.1

2) EUT Mode : Record mode [1V & 5V VITS Signal Input]

Frequency	Meter reading(a)		Total	Results	Limits	Margin
	LISN Port		Loss(b)	(a) + (b)		
[MHz]	L1	L2	[dB]	[dBuV]	[dBuV]	[dB]
0.468	24.4	23.5	0.1	24.5	**48.0**	23.5
0.582	21.5	26.0	0.1	26.1	**48.0**	21.9
1.891	22.6	23.8	0.1	23.9	**48.0**	24.1
6.432	21.0	19.2	0.1	21.1	**48.0**	26.9
11.286	28.0	28.0	0.4	28.4	**48.0**	19.6
25.056	37.4	37.5	1.7	39.2	**48.0**	8.8

3) EUT Mode : Record mode [NTSC Signal Input]

Frequency	Meter reading(a)		Total	Results	Limits	Margin
	LISN Port		Loss(b)	(a) + (b)		
[MHz]	L1	L2	[dB]	[dBuV]	[dBuV]	[dB]
0.516	21.1	23.8	0.1	23.9	**48.0**	24.1
1.794	22.3	23.6	0.2	23.8	**48.0**	24.2
2.874	22.8	17.6	0.1	22.9	**48.0**	25.1
6.108	20.1	18.8	0.1	20.2	**48.0**	27.8
11.142	27.8	20.8	0.4	28.2	**48.0**	19.8
25.794	32.0	23.1	1.6	33.6	**48.0**	14.4

* Margin = Limits - Results

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* TM-BLOCK(RF UNIT) : TMZH2-002A

1) EUT Mode : Playback mode [VHS Play]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.678	32.4	24.6	0.1	32.5	**48.0**	15.5
1.044	32.9	28.8	0.1	33.0	**48.0**	15.0
1.698	30.5	29.3	0.1	30.6	**48.0**	17.4
3.420	25.4	25.1	0.1	25.5	**48.0**	22.5
17.814	25.1	25.1	1.0	26.1	**48.0**	21.9
28.638	32.4	27.8	1.5	33.9	**48.0**	14.1

2) EUT Mode : Record mode(LINE 1) [1V & 5V VITS Signal Input]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.636	22.6	25.8	0.1	25.9	**48.0**	22.1
1.140	20.3	23.9	0.1	24.0	**48.0**	24.0
3.894	22.2	22.4	0.1	22.5	**48.0**	25.5
9.174	30.9	31.6	0.2	31.8	**48.0**	16.2
18.834	32.9	34.2	1.1	35.3	**48.0**	12.7
29.976	33.8	33.4	1.4	35.2	**48.0**	12.8

3) EUT Mode : Record mode(LINE 2) [1V & 5V VITS Signal Input]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.606	23.5	25.0	0.1	25.1	**48.0**	22.9
0.828	21.5	25.6	0.1	25.7	**48.0**	22.3
2.028	23.1	18.9	0.1	23.2	**48.0**	24.8
7.158	30.1	27.1	0.1	30.2	**48.0**	17.8
18.348	34.4	33.3	1.1	35.5	**48.0**	12.5
28.566	33.8	35.8	1.5	37.3	**48.0**	10.7

4) EUT Mode : Record mode [NTSC Signal Input]

Frequency [MHz]	Meter reading(a) LISN Port L1	L2	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.528	24.5	25.5	0.1	25.6	**48.0**	22.4
1.164	27.6	31.9	0.1	32.0	**48.0**	16.0
3.510	25.6	23.6	0.1	25.7	**48.0**	22.3
6.402	23.6	20.9	0.1	23.7	**48.0**	24.3
17.082	28.8	28.7	1.0	29.8	**48.0**	18.2
28.452	34.7	35.8	1.5	37.3	**48.0**	10.7

* Margin = Limits - Results

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4. RADIATED EMISSION MEASUREMENT

4.1 Reference Rule and Specification
FCC Rule Part 15, Section 15.109(a) and 15.107(a)

4.2 Test Procedure

4.2.1 Configurate the EUT System in accordance with ANSI C63.4-1992section 8 and 12.2.

4.2.2 Power cords for the EUT System are connected the receptacle on the ground plane. The output ports are connected to the cable provided with the device and the ending port of the cable are terminated in the proper impedance.

4.2.3 Activates the EUT system.

4.2.4 To find out the maximum emission, change the position of the cable, and the EUT operation mode under normal usage of the EUT.

4.2.5 The spectrum analyzer are scanned from 30MHz to 1,300MHz in channel 3 and 4.

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4.3 Test Results

* TM-BLOCK(RF UNIT) : TMDH2-A32

1. EUT Mode :Playback mode [VHS Play] at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency : 54.4 [MHz]
Meter Reading : 20.4 [dBuV] <---------- Maximum Meter Reading
Antenna Factor : 12.2 [dB]

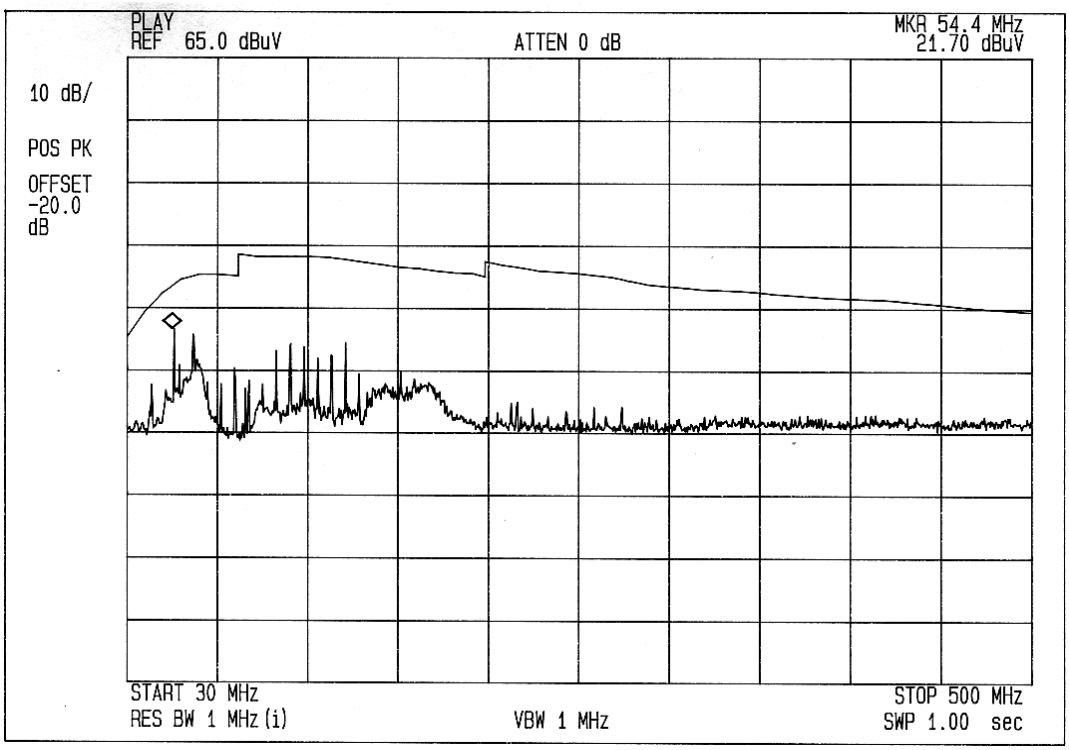
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

20.4 + 12.2 = 32.6 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 7.4 dB at 54.4 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	773.6	[MHz]
Meter Reading	:	10.1	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	26.22	[dB]

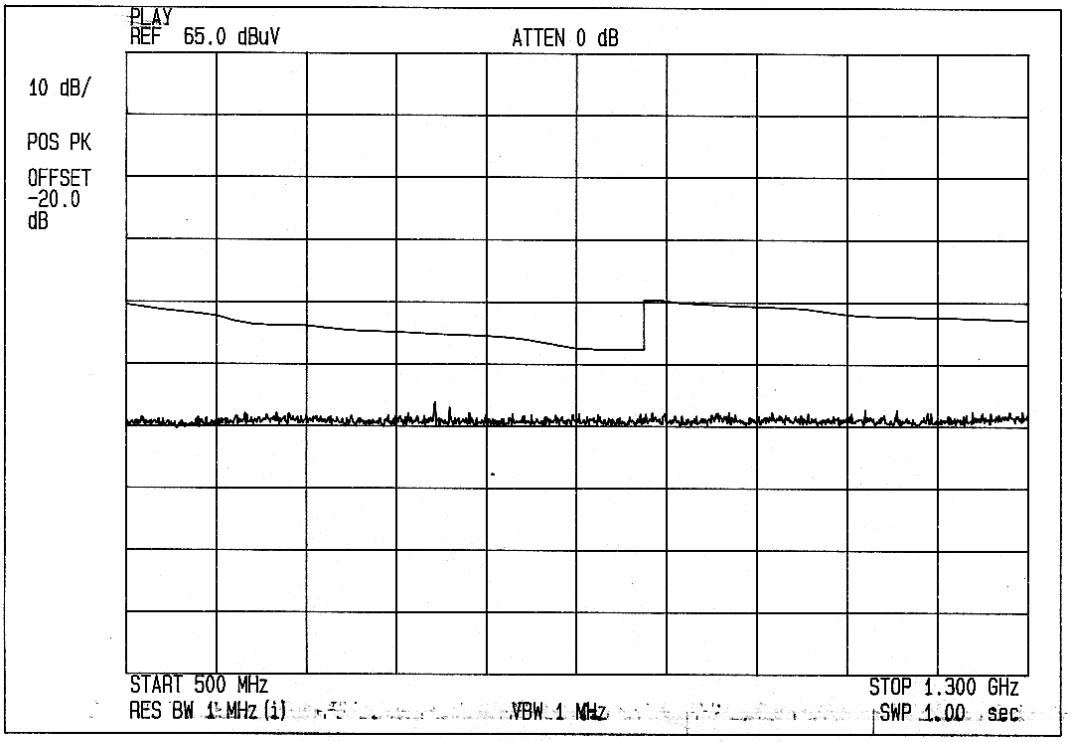
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

10.1 + 26.22 = 36.32 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 9.68 dB at 773.6 MHz.

3) Data graph



2. EUT Mode : Recording(VITS 1Vp-p & 5Vp-p) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	64.3	[MHz]
Meter Reading	:	21.2	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.02	[dB]

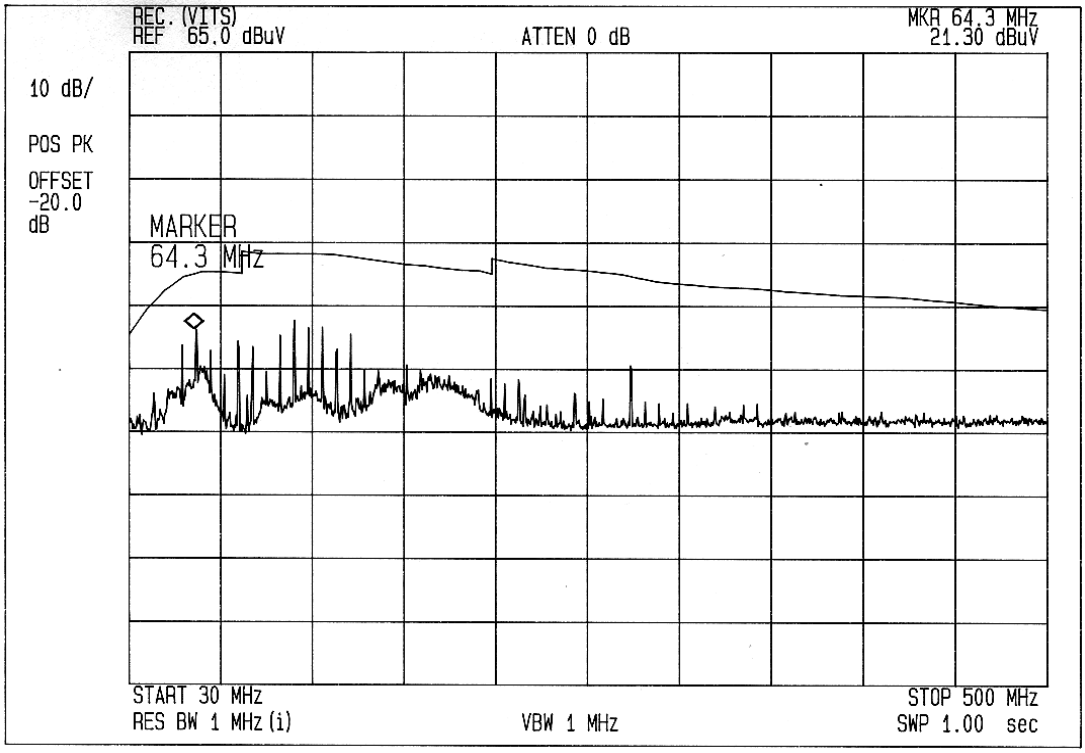
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

21.2 + 10.02 = 31.22 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 8.78 dB at 64.3 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency : 773.6 [MHz]
Meter Reading : 10.1 [dBuV] <---------- Maximum Meter Reading
Antenna Factor : 26.2 [dB]

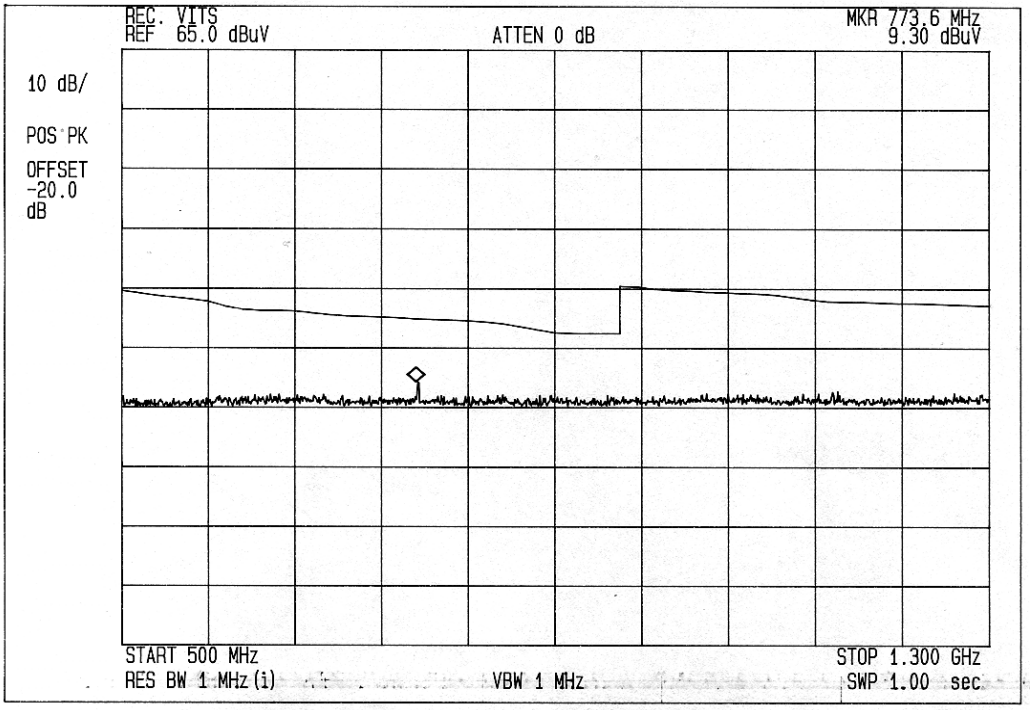
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

10.1 + 26.2 = 36.3 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 9.7 dB at 773.6 MHz.

3) Data graph



3. EUT Mode : Recording(NTSC Signal) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency : 115.1 [MHz]
Meter Reading : 23.1 [dBuV] <---------- Maximum Meter Reading
Antenna Factor : 10.33 [dB]

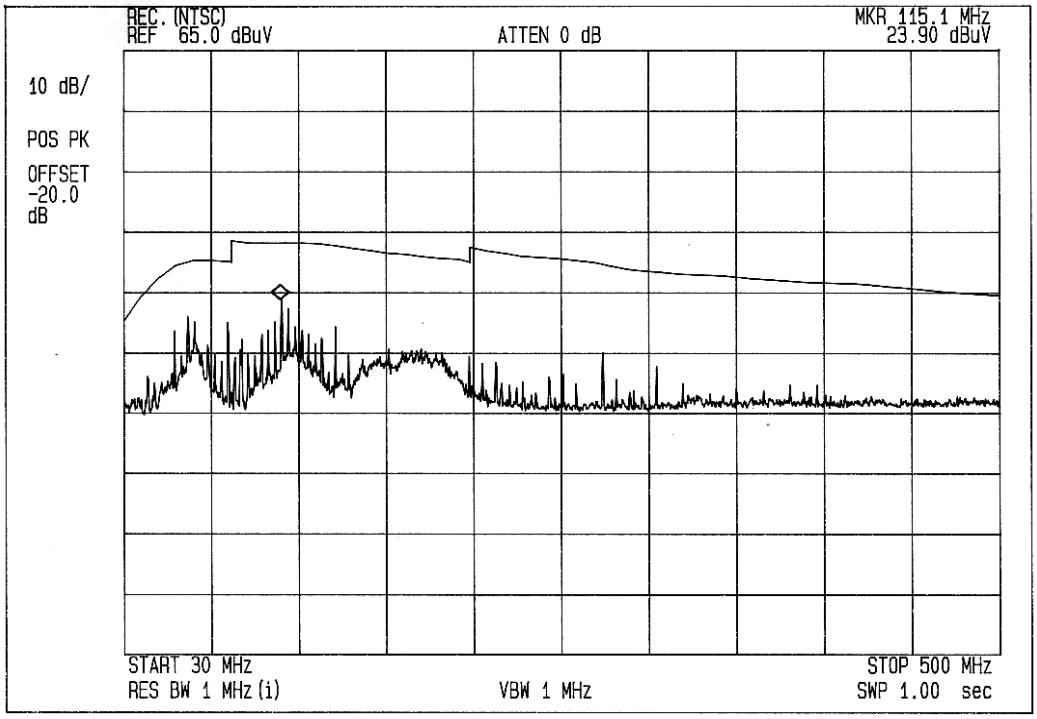
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

23.1 + 10.33 = 33.43 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 6.57 dB at 115.1 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	504.8	[MHz]
Meter Reading	:	12.7	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	21.65	[dB]

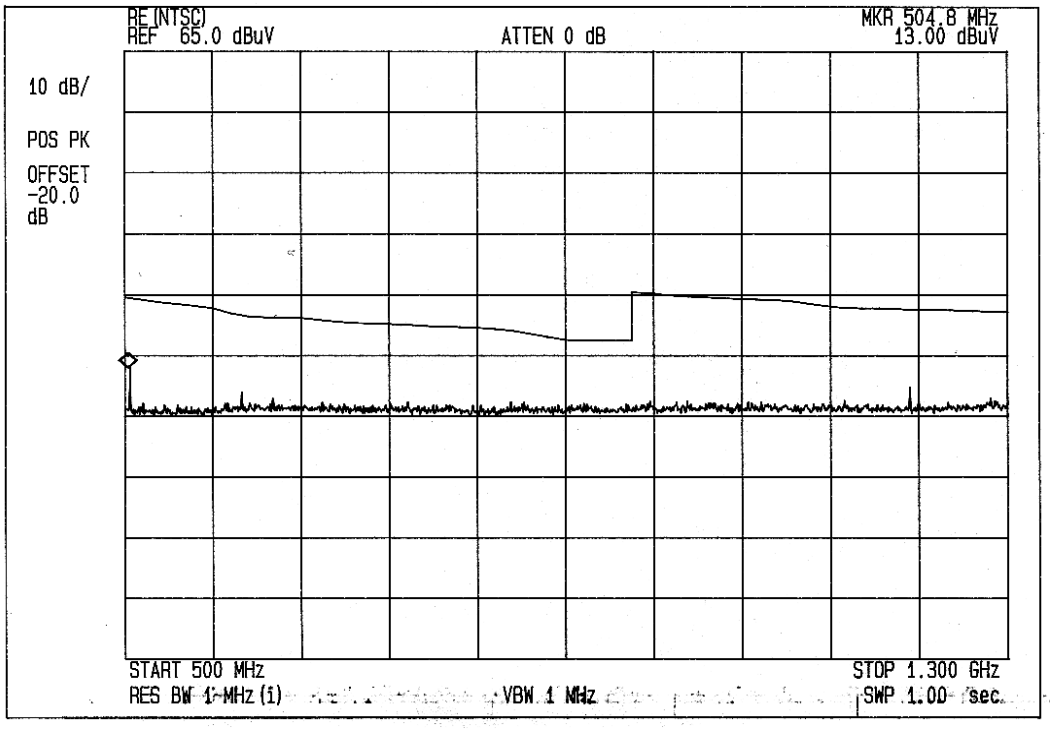
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

12.7 + 21.65 = 34.35 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 11.65 dB at 504.8 MHz.

3) Data graph



* TM-BLOCK(RF UNIT) : 115VD025AP

1. EUT Mode :Playback mode [VHS Play] at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency : 115.1 [MHz]
Meter Reading : 25.1 [dBuV] <---------- Maximum Meter Reading
Antenna Factor : 10.33 [dB]

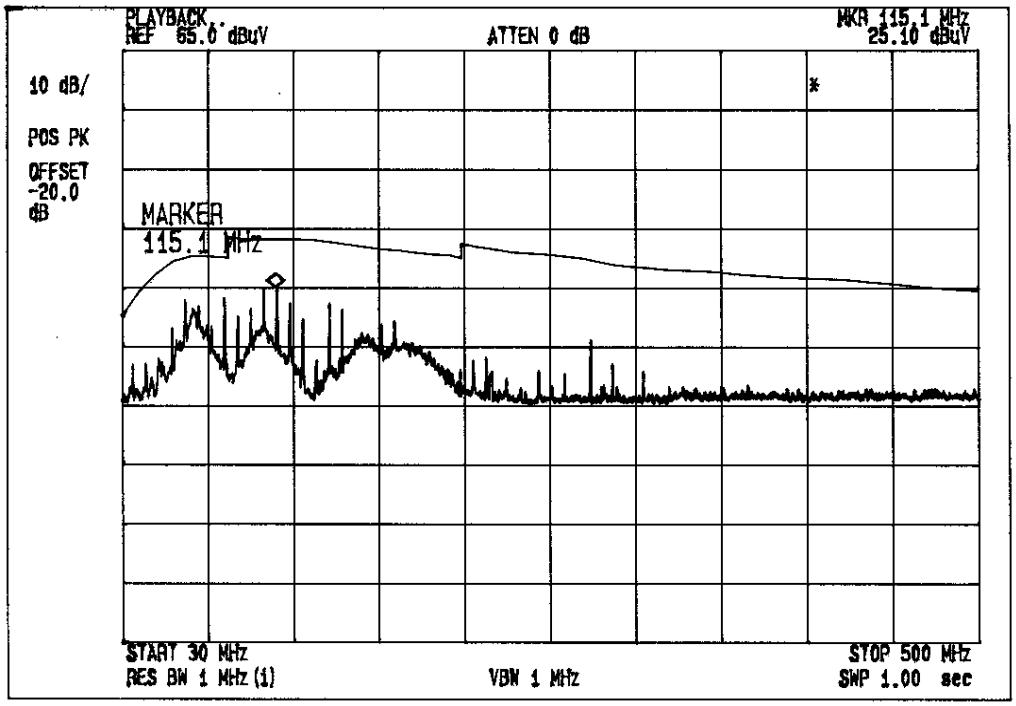
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

25.1 + 10.33 = 35.43 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 8.07 dB at 115.1 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	668	[MHz]
Meter Reading	:	7.3	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	24.87	[dB]

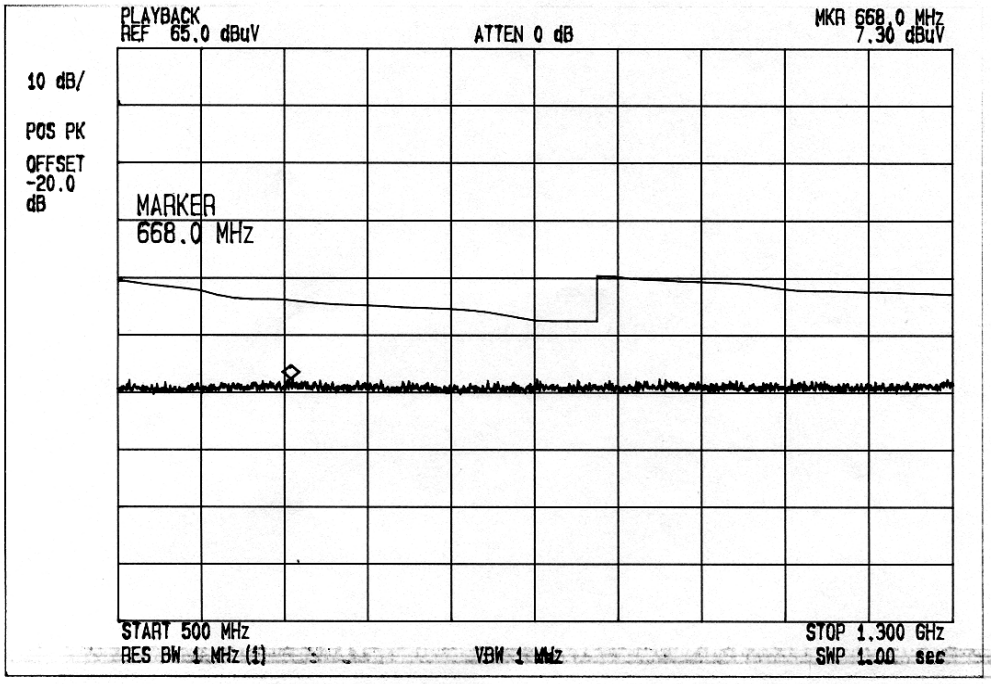
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

7.3 + 24.87 = 32.17 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 13.83 dB at 668 MHz.

3) Data graph



2. EUT Mode : Recording(VITS 1Vp-p & 5Vp-p) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	107.6	[MHz]
Meter Reading	:	27	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.27	[dB]

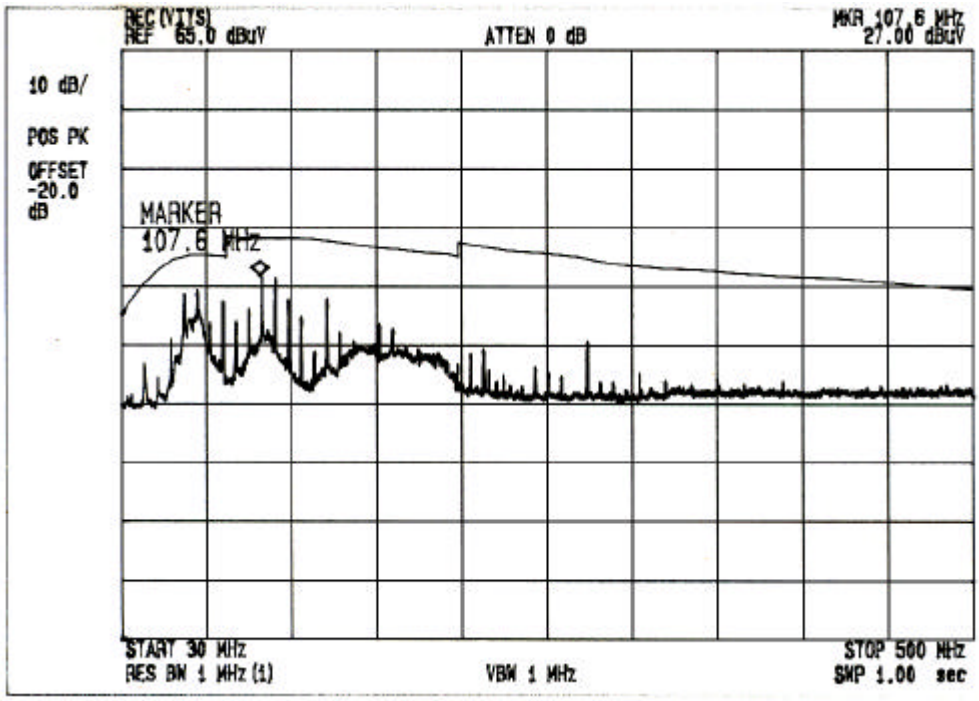
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

27 + 10.27 = 37.27 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 6.23 dB at 107.6 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	1270.4	[MHz]
Meter Reading	:	7.9	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	31.64	[dB]

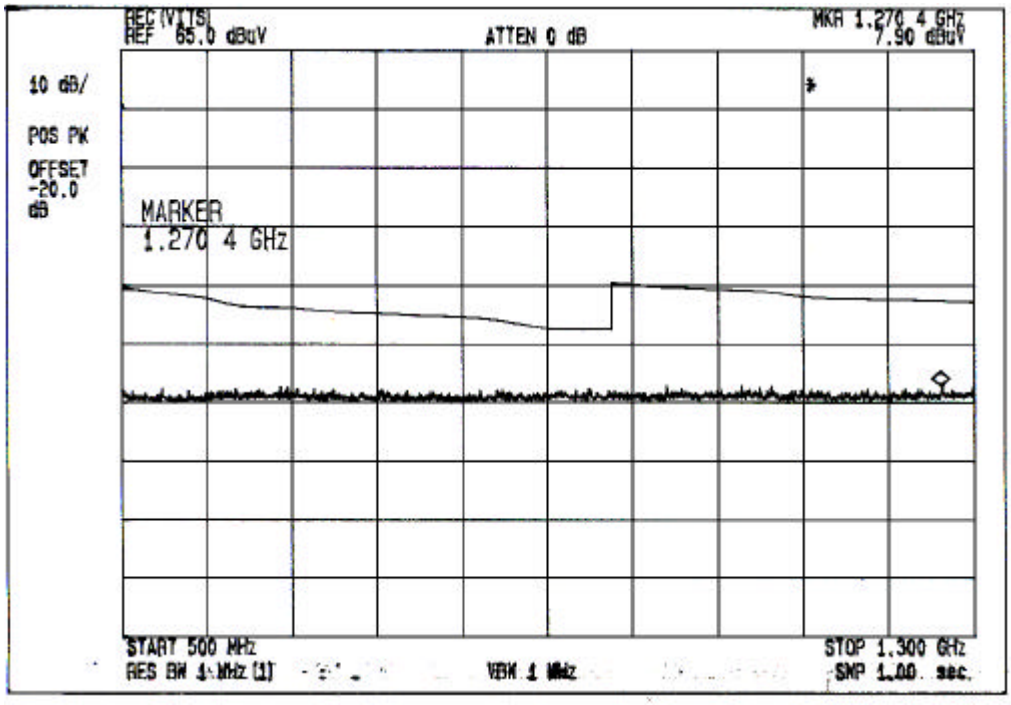
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

7.9 + 31.64 = 39.54 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 14.46 dB at 1270 MHz.

3) Data graph



3. EUT Mode : Recording(NTSC Signal) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	115.1	[MHz]
Meter Reading	:	26.2	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.33	[dB]

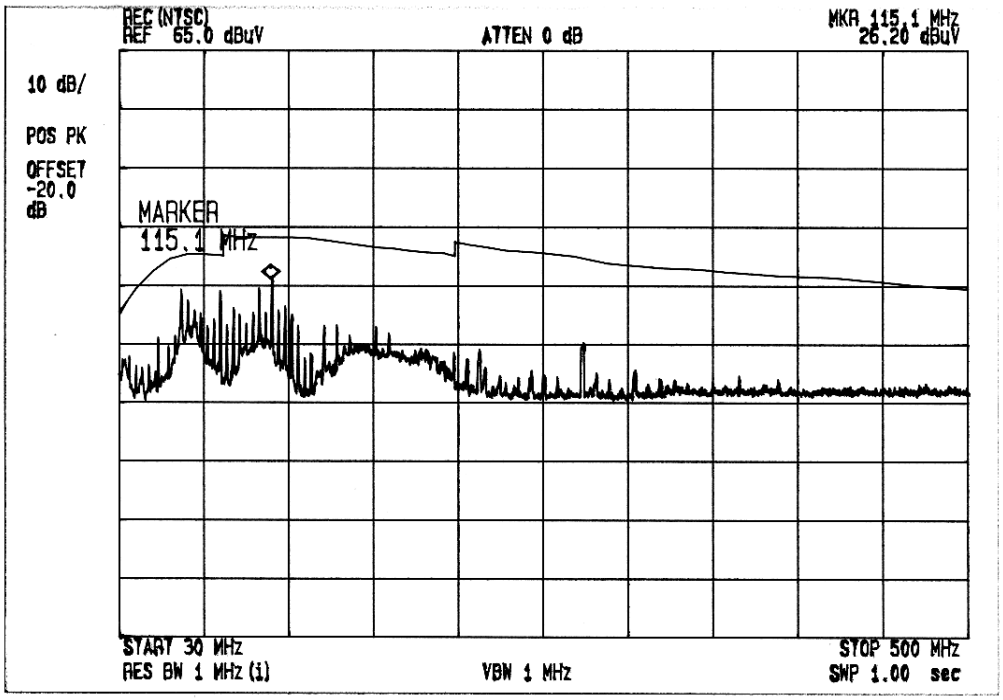
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

26.2 + 10.33 = 36.53 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 6.97 dB at 115.1 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	882.4	[MHz]
Meter Reading	:	7.9	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	27.9	[dB]

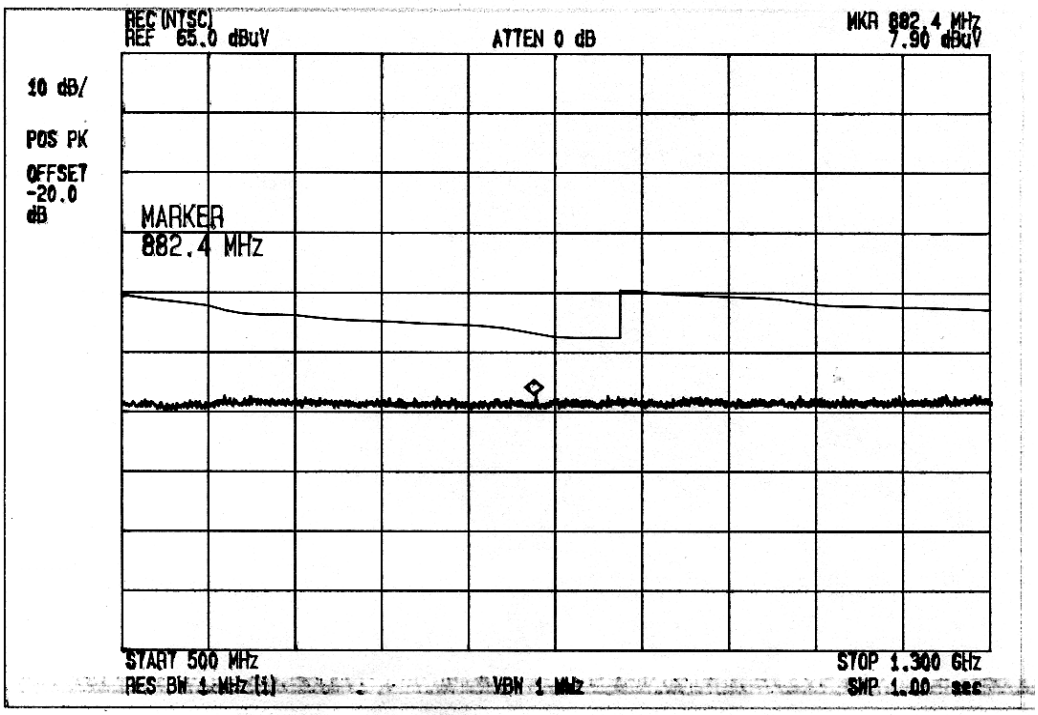
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

7.9 + 27.9 = 35.8 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 10.2 dB at 882.4 MHz.

3) Data graph



* TM-BLOCK(RF UNIT) : TMZH2-002A

1. EUT Mode :Playback mode [VHS Play] at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	114.55	[MHz]
Meter Reading	:	30.1	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.33	[dB]

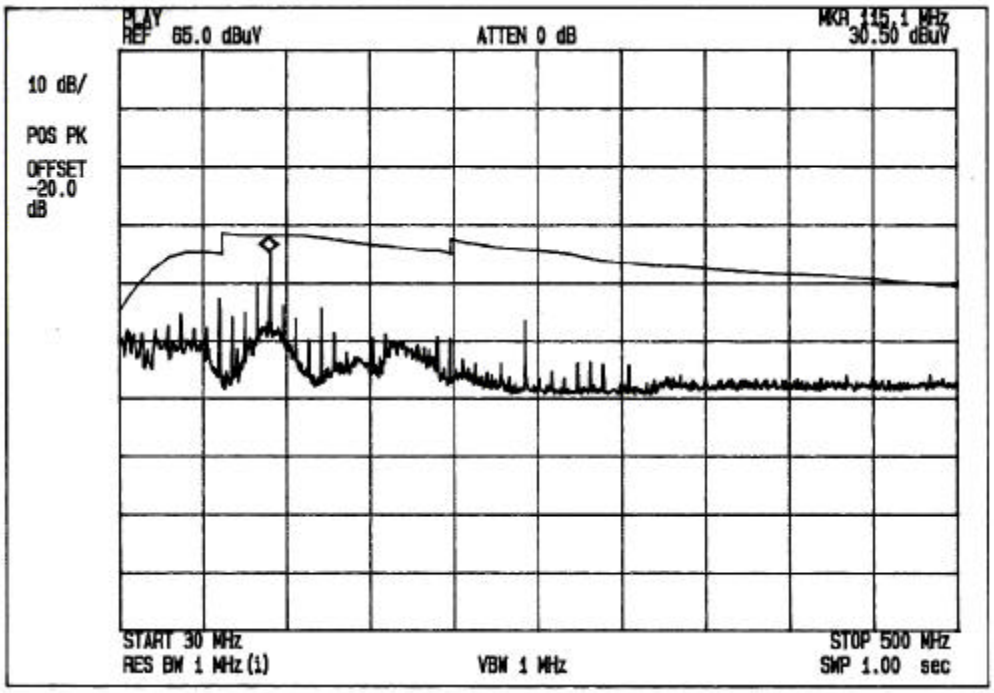
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

30.1 + 10.33 = 40.43 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 3.07 dB at 114.6 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	513.6	[MHz]
Meter Reading	:	8.4	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	21.86	[dB]

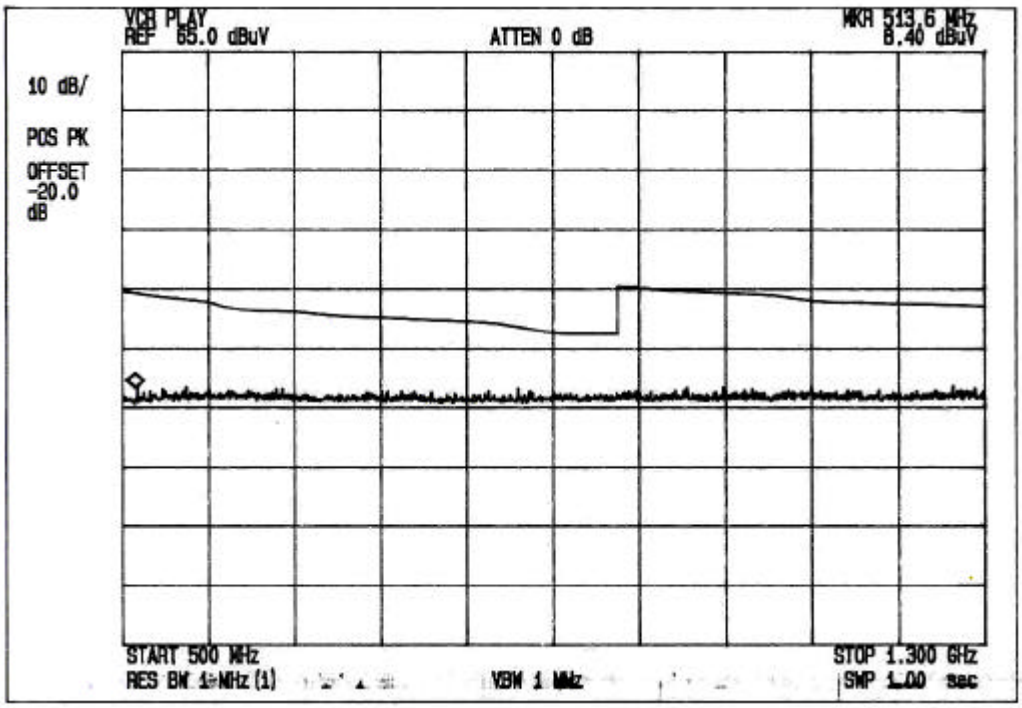
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

8.4 + 21.86 = 30.26 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 15.74 dB at 513.6 MHz.

3) Data graph



2. EUT Mode : Recording(VITS 1Vp-p & 5Vp-p) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	114.54	[MHz]
Meter Reading	:	29.1	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.33	[dB]

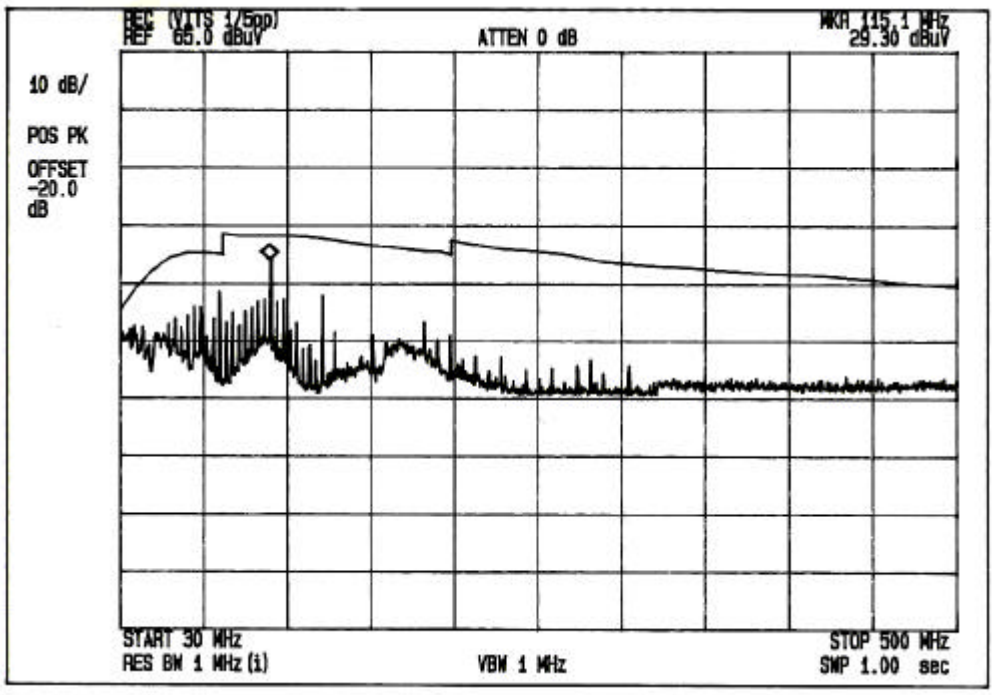
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

29.1 + 10.33 = 39.43 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 4.07 dB at 114.5 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	589.6	[MHz]
Meter Reading	:	8.3	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	23.8	[dB]

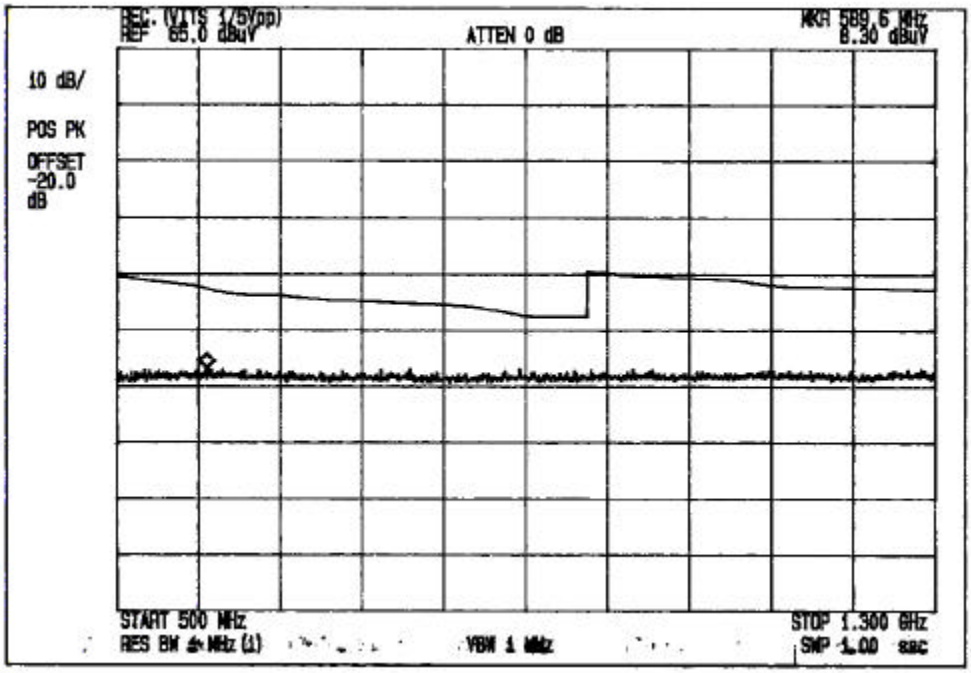
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

8.3 + 23.8 = 32.1 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 13.9 dB at 589.6 MHz.

3) Data graph



3. EUT Mode : Recording(NTSC Signal) at CH.3 and CH.4

[Test range : 30 - 500MHz]

1) Sample Calculation

Frequency	:	114.55	[MHz]
Meter Reading	:	30.1	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	10.33	[dB]

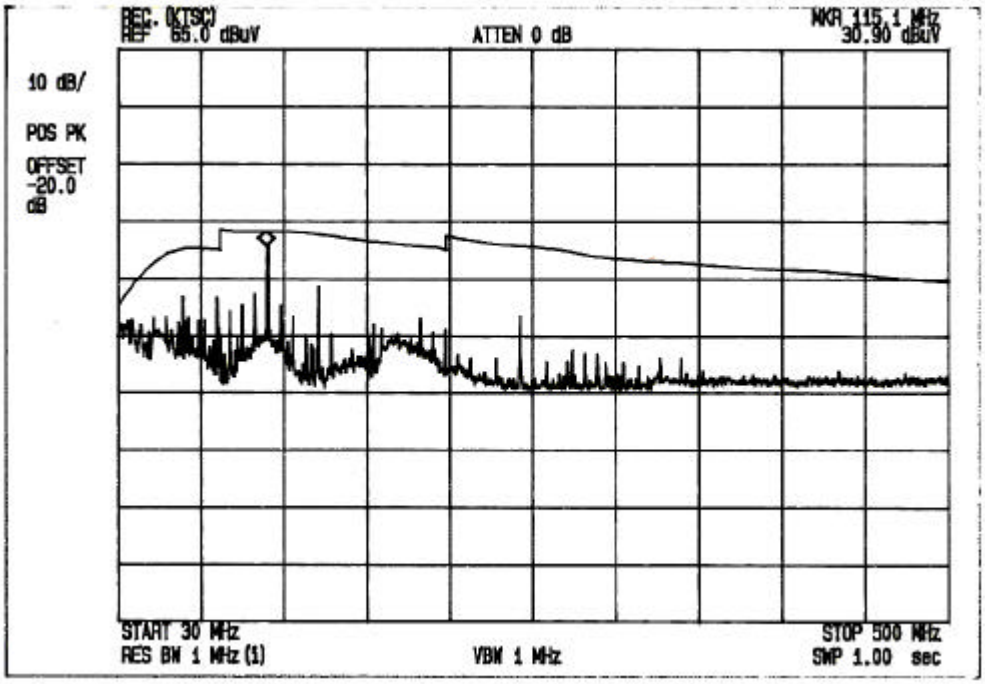
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

30.1 + 10.33 = 40.43 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 3.07 dB at 114.6 MHz.

3) Data graph



[Test range : 500 - 1300MHz]

1) Sample Calculation

Frequency	:	625.6	[MHz]
Meter Reading	:	8.3	[dBuV] <---------- Maximum Meter Reading
Antenna Factor	:	24.8	[dB]

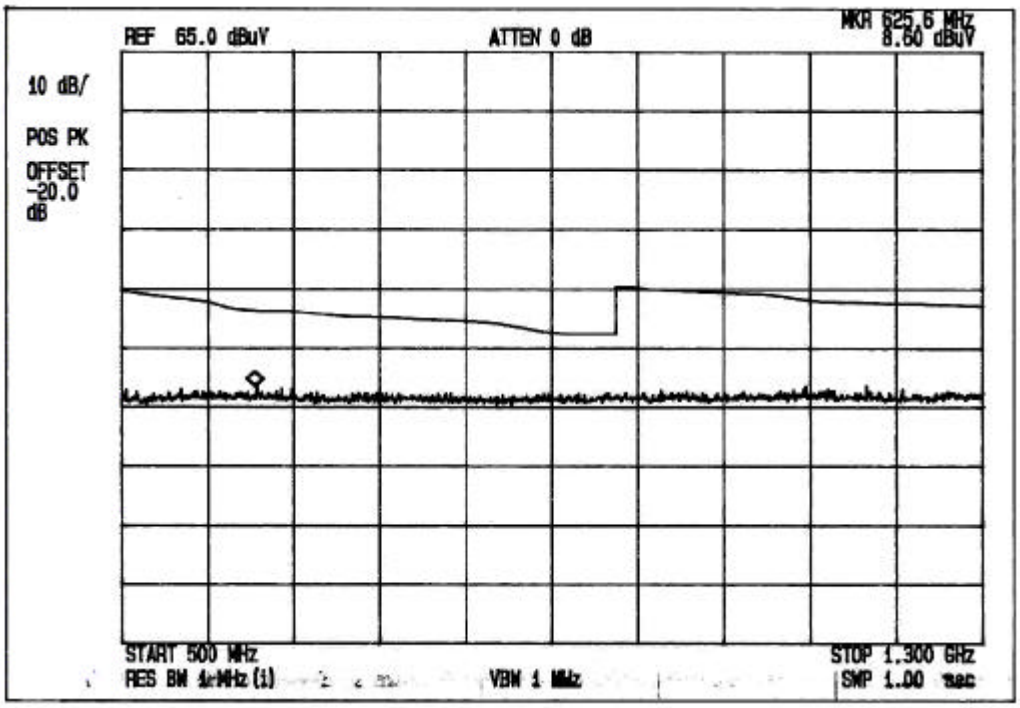
* The antenna factor includes the loss of coaxial cable used for the test.
Then, Result is calculated as follows.

8.3 + 24.8 = 33.1 [dBuV/m]

2) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 12.9 dB at 625.6 MHz.

3) Data graph



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

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

5.2.2 Activates the EUT system

5.2.4 The RF output terminal is connected is to the spectrum analyzer through the matching transformer with a calibrated 75 ohms coaxial cable.

5.2.5 Then, the RF output signal level is measured under the EUT condition produces the maximum signal level.

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5.3 Test results

* TM-BLOCK(RF UNIT) : TMDH2-A32

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.32	65.84	0.30	61.00	42.70	61.30	69.54	43.00	56.53
4	67.38	71.90	0.30	62.00	46.80	62.30	69.54	47.10	56.53

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.28	65.88	0.30	61.10	47.20	61.40	69.54	47.50	56.53
4	67.30	71.90	0.30	60.80	46.70	61.10	69.54	47.00	56.53

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.28	65.86	0.30	62.30	47.00	62.60	69.54	47.30	56.53
4	67.40	71.88	0.30	60.80	46.80	61.10	69.54	47.10	56.53

4) EUT Mode : Recording / NTSC TV Signal

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.34	65.88	0.30	61.90	47.40	62.20	69.54	47.70	56.53
4	67.32	71.90	0.30	60.80	46.80	61.10	69.54	47.10	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

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* TM-BLOCK(RF UNIT) : 115VD025AP

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.34	65.84	0.30	57.70	43.00	58.00	69.54	43.30	56.53
4	67.32	71.92	0.30	56.10	43.60	56.40	69.54	43.90	56.53

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.34	65.86	0.30	57.80	42.70	58.10	69.54	43.00	56.53
4	67.34	71.92	0.30	57.60	43.50	57.90	69.54	43.80	56.53

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.34	65.86	0.30	57.70	42.70	58.00	69.54	43.00	56.53
4	67.34	71.92	0.30	57.60	43.60	57.90	69.54	43.90	56.53

4) EUT Mode : Recording / NTSC TV Signal

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.30	65.80	0.30	57.60	42.70	57.90	69.54	43.00	56.53
4	67.32	71.86	0.30	56.40	43.50	56.70	69.54	43.80	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

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* TM-BLOCK(RF UNIT) : TMZH2-002A

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.28	65.86	0.30	64.30	49.30	64.60	69.54	49.60	56.53
4	67.32	71.92	0.30	63.80	48.90	64.10	69.54	49.20	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.30	65.88	0.30	63.40	49.50	63.70	69.54	49.80	56.53
4	67.38	71.94	0.30	63.80	49.10	64.10	69.54	49.40	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.20	65.80	0.30	64.30	49.80	64.60	69.54	50.10	56.53
4	67.30	71.90	0.30	64.00	49.60	64.30	69.54	49.90	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

4) EUT Mode : Recording / NTSC TV Signal

RF Output channel	Measured carrier frequency[MHz]		Matching Pad [dB]	Meter reding [dBuV/50ohm]		RF Output signal level [dBuV/75ohm]			
	Visual	Aural		Visual	Aural	Visual	Limit	Aural	Limit
3	61.34	65.90	0.30	64.30	49.30	64.60	69.54	49.60	56.53
4	67.32	71.90	0.30	63.80	48.80	64.10	69.54	49.10	56.53

* Matching Pad Loss + Meter reading = RF Output signal level

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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

6.2.1 The EUT system and measuring instrument are set up in the same maner of the output signal measurement.

6.2.2 The spectrum was scanned from 30MHz to more than 4.6MHz below the visual carrier frequency, and from more than 7.4MHz above the visual carrier frequency to 1000MHz.

6.2.3 Then, the significant spurious emissions are measured at the output terminal.

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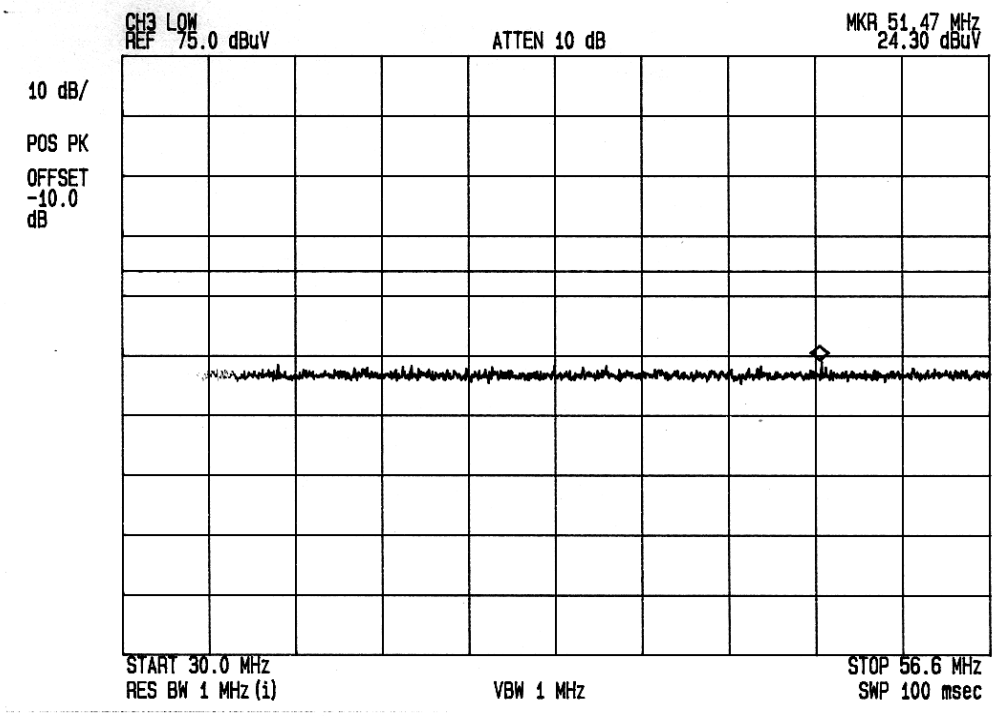
6.3 Test Results

* TM-BLOCK(RF UNIT) : TMDH2-A32

1. Test channel : 3
   1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
      (From 30MHz to more than 4.6MHz below the visual carrier frequency)
   2) Sample Calculation
      Frequency : 51.47 [MHz]
      Meter Reading : 24.3 [dBuV] <--- Maximum Meter Reading
      Correction Factor : 0.3 [dB]
      * The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

      Then, Result is calculated as follows.
      24.3 + 0.3 = 24.6 [dBuV]
   3) Summary of Test Result
      Below data shows that the test device complies with FCC rules.
      Minimum margin was 14.89 dB at 51.47 MHz.

   4) Data graph



2. Test channel : 3

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency : 356.4 [MHz]
Meter Reading : 23.1 [dBuV] <--- Maximum Meter Reading
Correction Factor : 0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

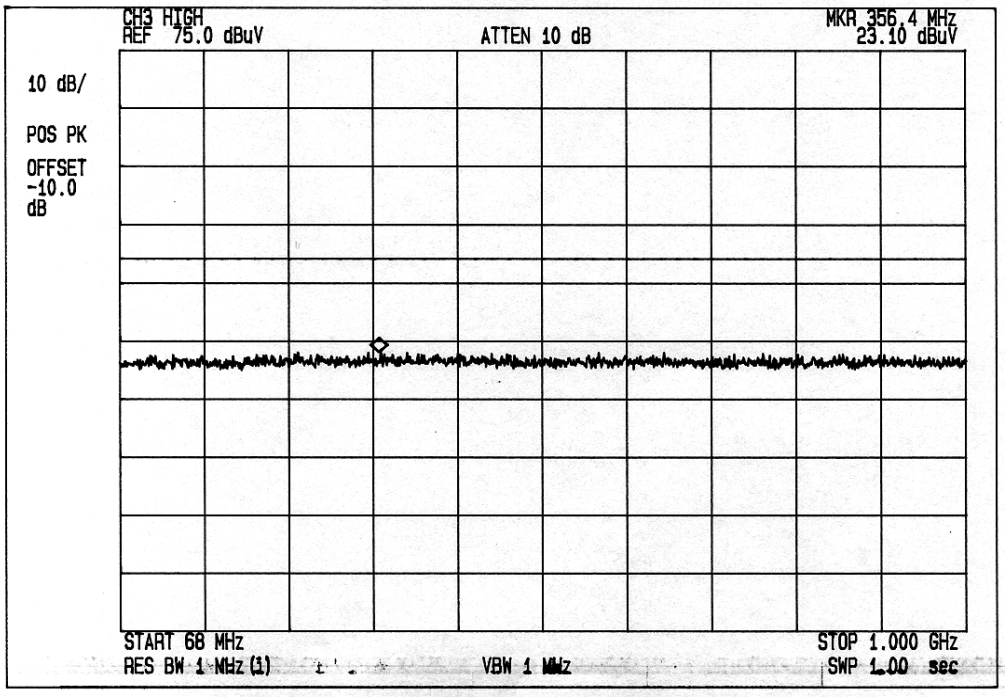
Then, Result is calculated as follows.

23.1 + 0.3 = 23.4 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 16.09 dB at 356.4 MHz.

4) Data graph



3. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From 30MHz to more than 4.6MHz below the visual carrier frequency)

2) Sample Calculation

Frequency : 46.01 [MHz]
Meter Reading : 23.3 [dBuV] <--- Maximum Meter Reading
Correction Factor : 0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

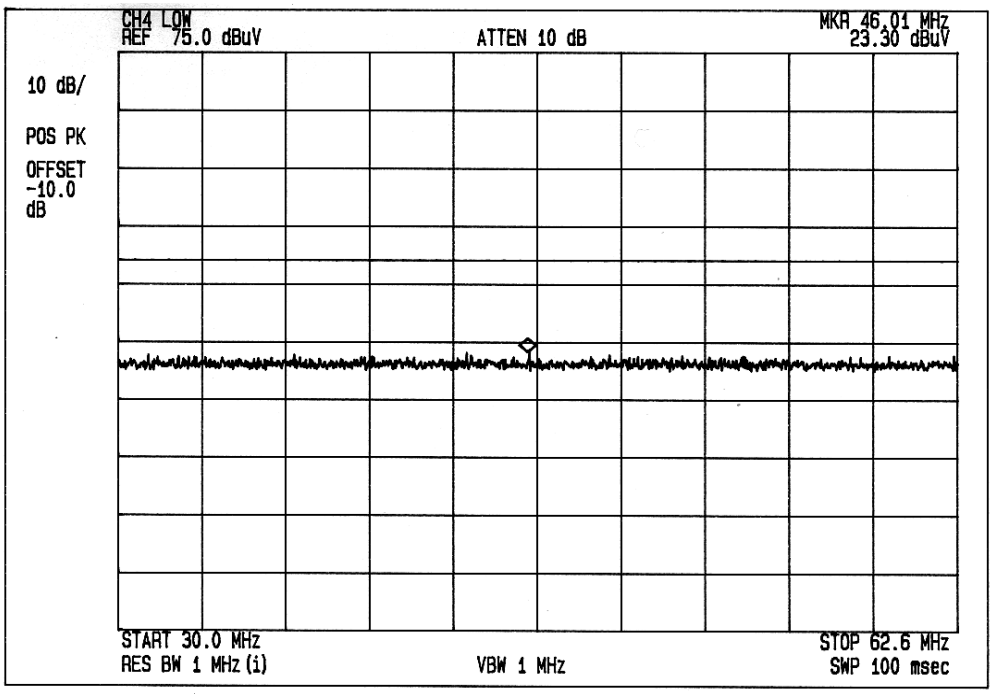
Then, Result is calculated as follows.

23.3 + 0.3 = 23.6 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 15.89 dB at 46.01 MHz.

4) Data graph



4. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency	:	471.3 [MHz]
Meter Reading	:	23.5 [dBuV] <--- Maximum Meter Reading
Correction Factor	:	0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

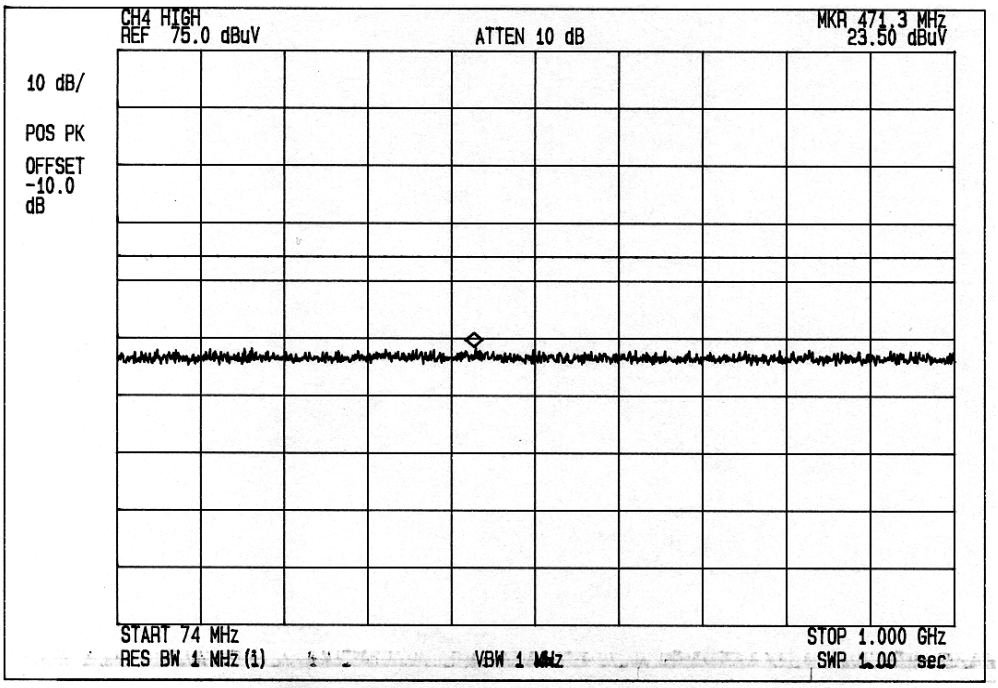
Then, Result is calculated as follows.

23.5 + 0.3 = 23.8 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 15.69 dB at 471.3 MHz.

4) Data graph



* TM-BLOCK(RF UNIT) : 115VD025AP

1. Test channel : 3
   1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
      (From 30MHz to more than 4.6MHz below the visual carrier frequency)
   2) Sample Calculation

      Frequency : 50.67 [MHz]
      Meter Reading : 33.8 [dBuV] <--- Maximum Meter Reading
      Correction Factor : 0.3 [dB]

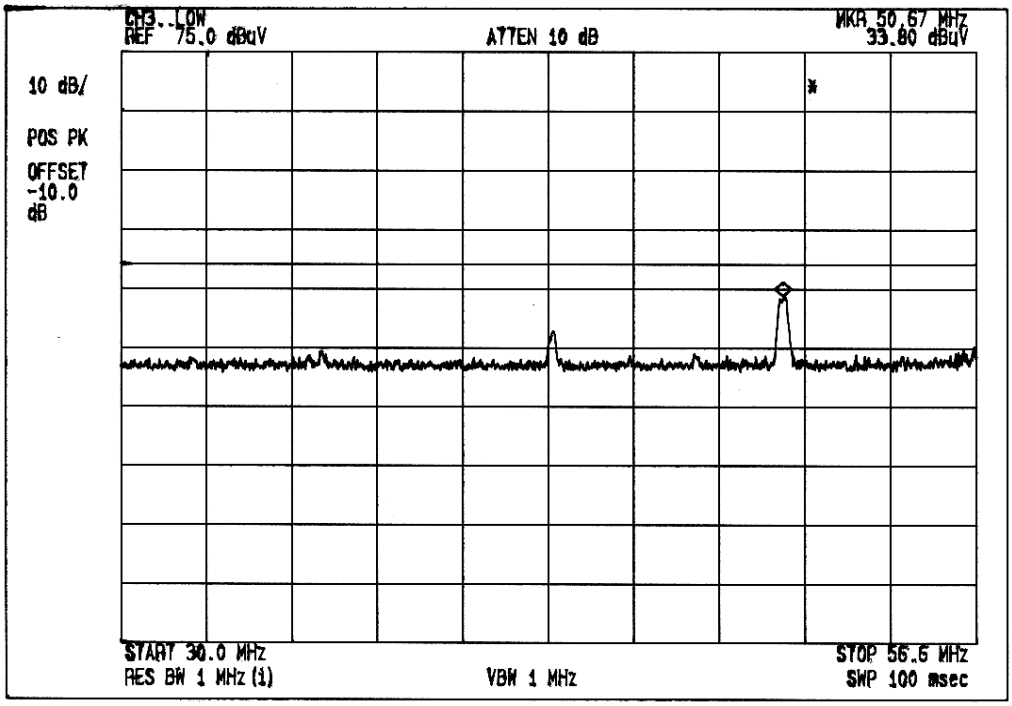
      * The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

      Then, Result is calculated as follows.

      33.8 + 0.3 = 34.1 [dBuV]

   3) Summary of Test Result
      Below data shows that the test device complies with FCC rules.
      Minimum margin was 5.39 dB at 50.67 MHz.

   4) Data graph



2. Test channel : 3

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency	:	71.4 [MHz]
Meter Reading	:	30.9 [dBuV] <--- Maximum Meter Reading
Correction Factor	:	0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

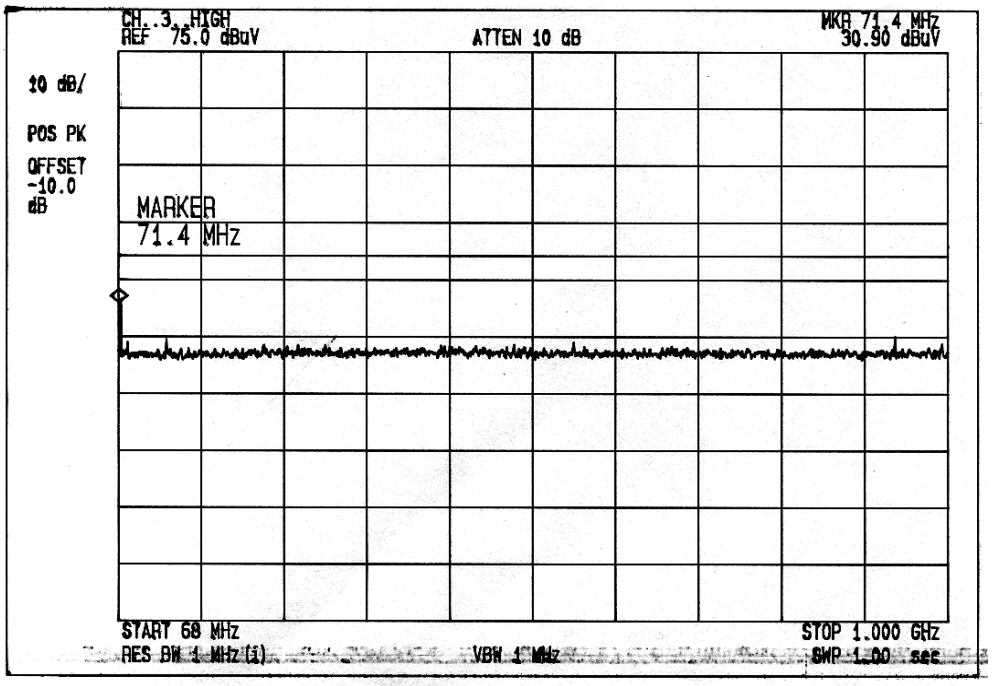
Then, Result is calculated as follows.

30.9 + 0.3 = 31.2 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 8.29 dB at 71.4 MHz.

4) Data graph



3. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From 30MHz to more than 4.6MHz below the visual carrier frequency)

2) Sample Calculation

Frequency	:	56.73 [MHz]
Meter Reading	:	33 [dBuV] <--- Maximum Meter Reading
Correction Factor	:	0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

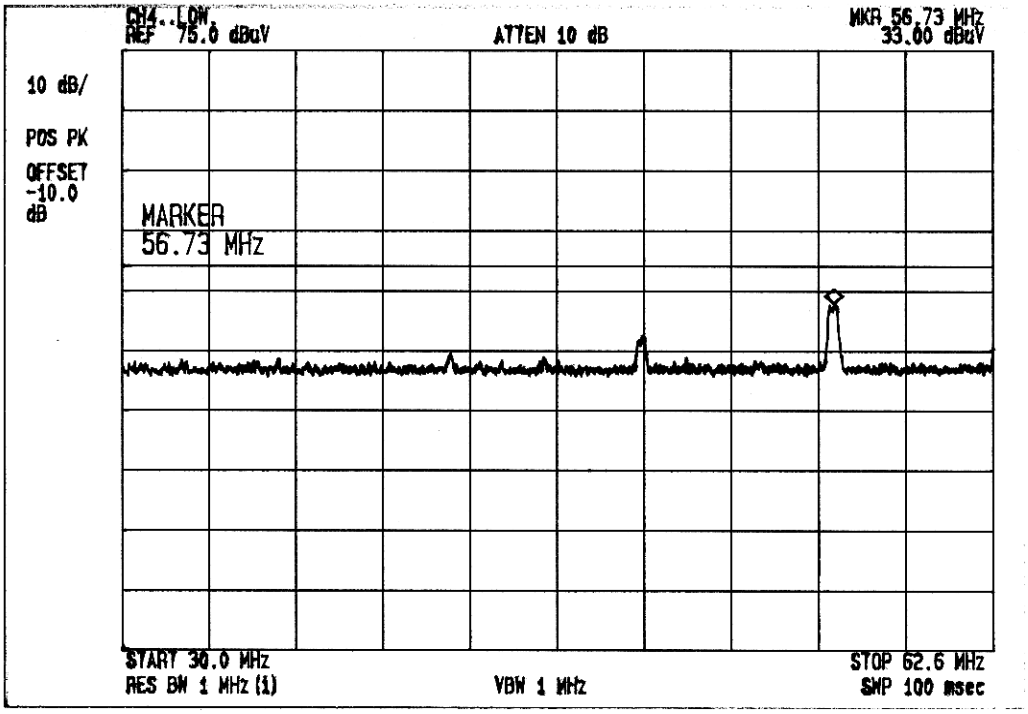
Then, Result is calculated as follows.

33 + 0.3 = 33.3 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 6.19 dB at 56.73 MHz.

4) Data graph



4. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency	:	77.7 [MHz]
Meter Reading	:	29.6 [dBuV] <--- Maximum Meter Reading
Correction Factor	:	0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

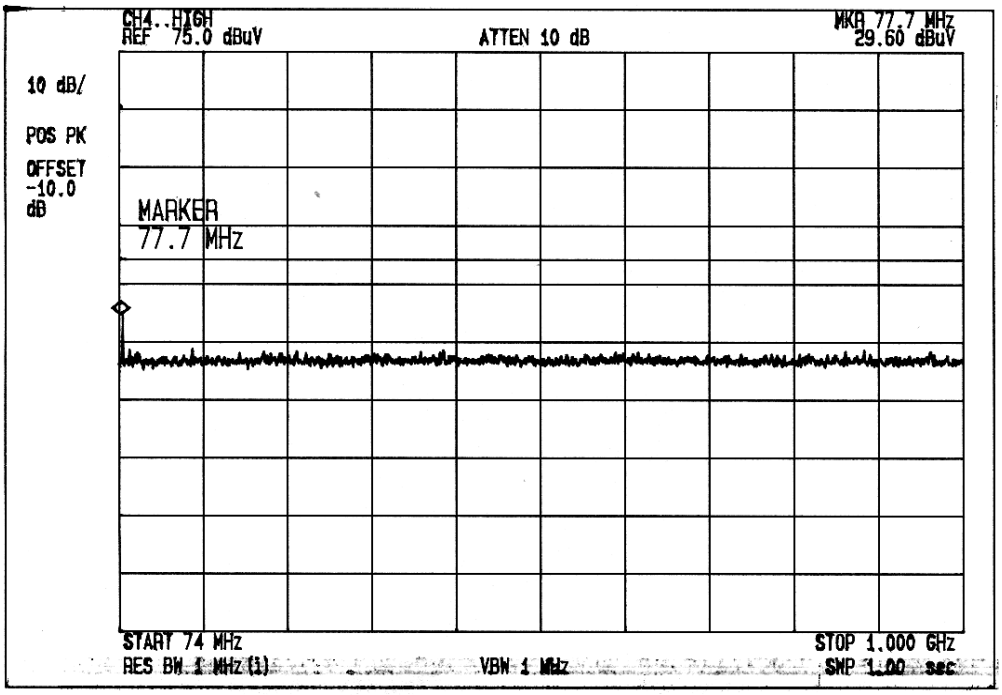
Then, Result is calculated as follows.

29.6 + 0.3 = 29.9 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 9.59 dB at 77.7 MHz.

4) Data graph



* TM-BLOCK(RF UNIT) : TMZH2-002A

1. Test channel : 3

   1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
   (From 30MHz to more than 4.6MHz below the visual carrier frequency)

   2) Sample Calculation

   Frequency : 54.29 [MHz]
   Meter Reading : 24.6 [dBuV] <--- Maximum Meter Reading
   Correction Factor : 0.3 [dB]

   * The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

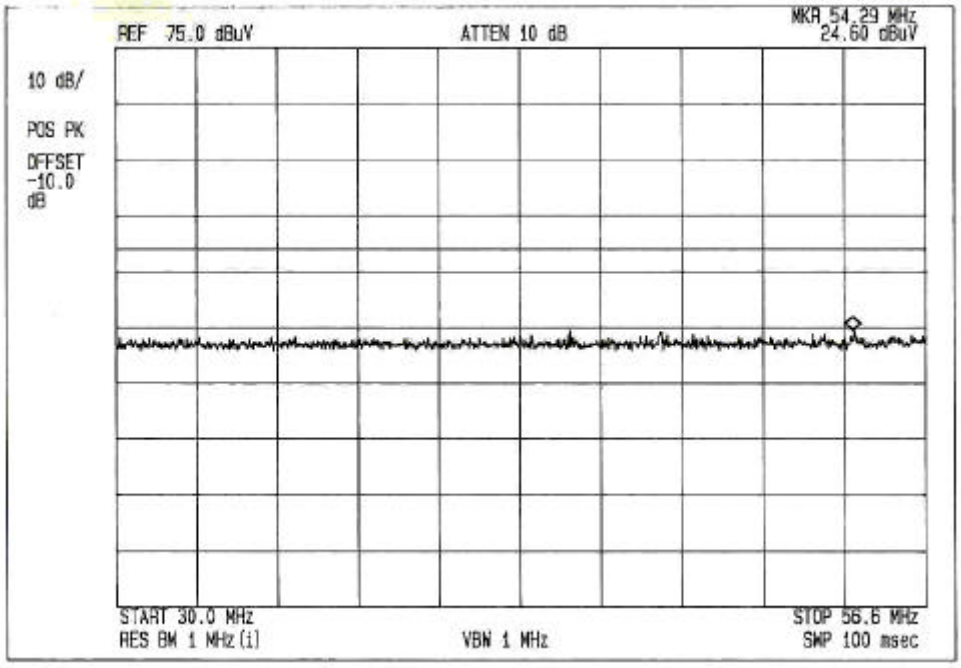
   Then, Result is calculated as follows.

   24.6 + 0.3 = 24.9 [dBuV]

   3) Summary of Test Result

   Below data shows that the test device complies with FCC rules.
   Minimum margin was 14.59 dB at 54.29 MHz.

   4) Data graph



2. Test channel : 3

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency : 122.6 [MHz]
Meter Reading : 24.6 [dBuV] <--- Maximum Meter Reading
Correction Factor : 0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

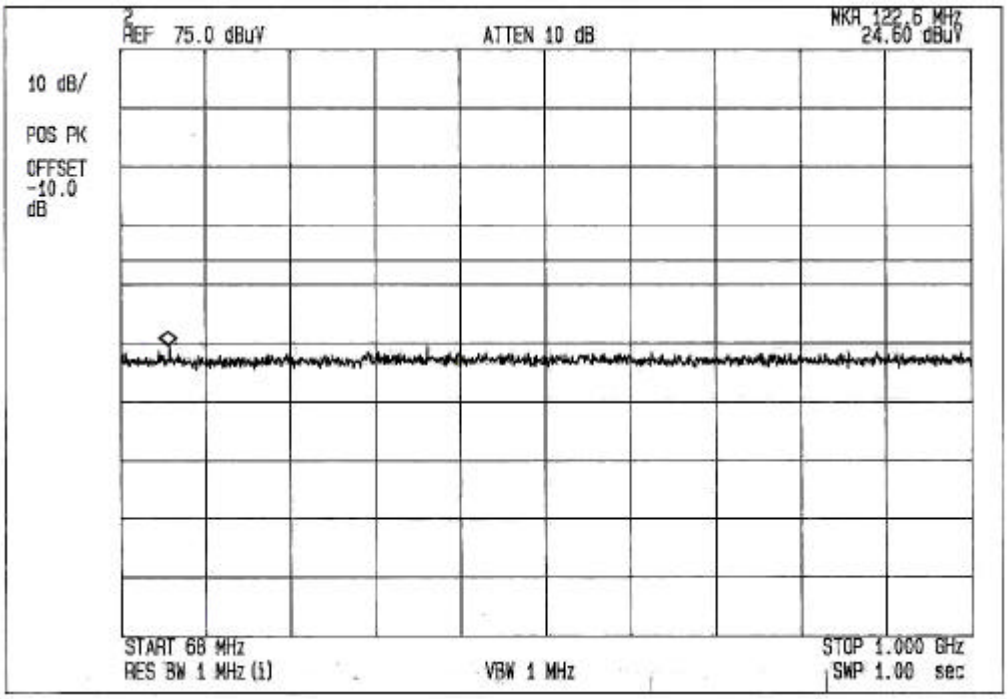
Then, Result is calculated as follows.

24.6 + 0.3 = 24.9 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 14.59 dB at 122.6 MHz.

4) Data graph



3. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From 30MHz to more than 4.6MHz below the visual carrier frequency)

2) Sample Calculation

Frequency : 45.97 [MHz]
Meter Reading : 25 [dBuV] <--- Maximum Meter Reading
Correction Factor : 0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

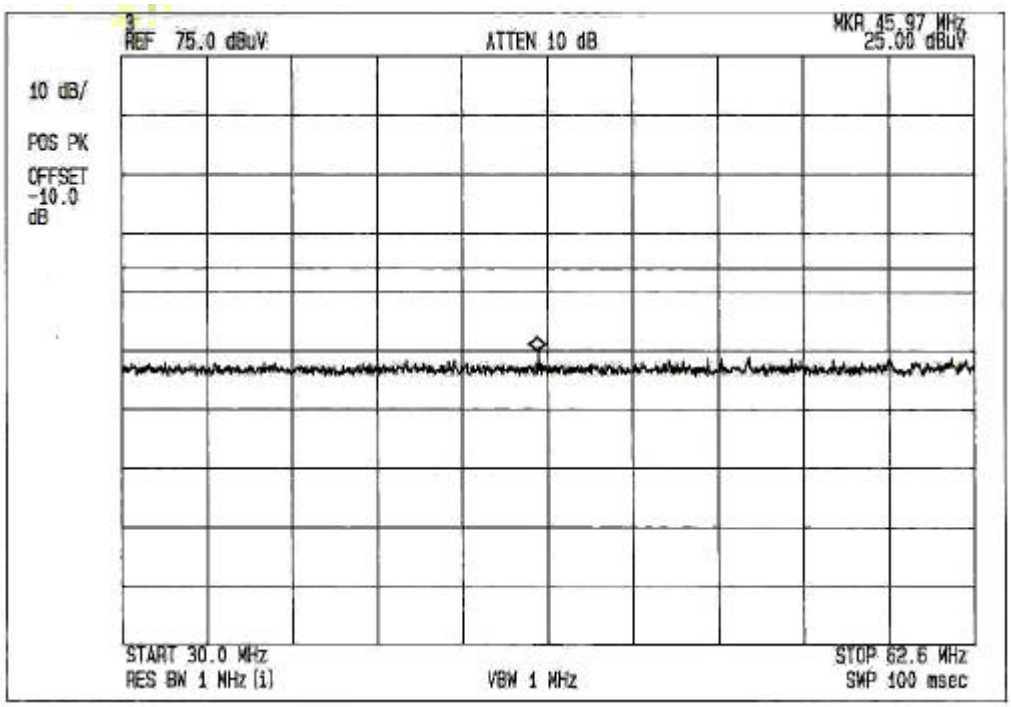
Then, Result is calculated as follows.

25 + 0.3 = 25.3 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 14.19 dB at 45.97 MHz.

4) Data graph



4. Test channel : 4

1) Test mode : Playback / VITS 1Vp-p / VITS 5Vp-p / NTSC TV Signal
(From more than 7.4MHz above the visual carrier frequency)

2) Sample Calculation

Frequency	:	134.2 [MHz]
Meter Reading	:	24.5 [dBuV] <--- Maximum Meter Reading
Correction Factor	:	0.3 [dB]

* The correction factor consist of the voltage loss of the impedance matching pad and the coaxial cable used for the test.

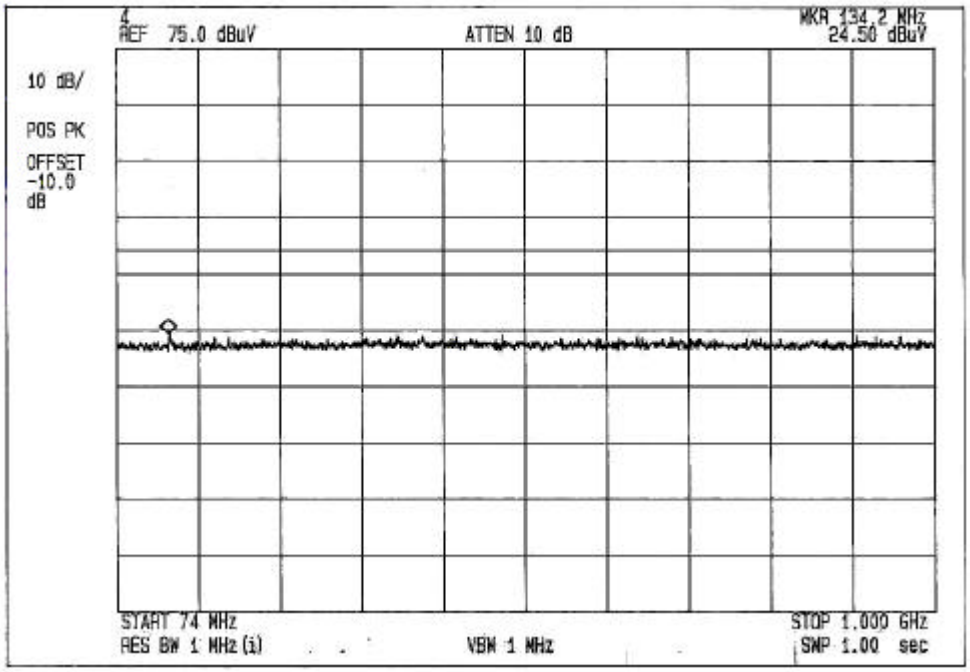
Then, Result is calculated as follows.

24.5 + 0.3 = 24.8 [dBuV]

3) Summary of Test Result

Below data shows that the test device complies with FCC rules.
Minimum margin was 14.69 dB at 134.2 MHz.

4) Data graph



7. ANTENNA TRANSFER SWITCH MEASUREMENT

7.1 Reference Rule and Specification
FCC Rule Part 15, Section 15.115(c)(1)(ii)

7.2 Test Procedure

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

7.2.2 Activates the EUT system

7.2.3 The RF output terminal is terminated in the proper impedance.

7.2.4 The ANT input terminal is connected is to the spectrum analyzer through the matching transformer with a calibrated 75 ohms coaxial cable.

7.2.5 Then, the RF output leakage level is measured under the EUT condition produces the maximum signal level.

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7.3 Test results

* TM-BLOCK(RF UNIT) : TMDH2-A32

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.24	4.2	0.3	4.5	9.54
4	67.31	3.2	0.3	3.5	9.54

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.35	4.0	0.3	4.3	9.54
4	67.30	3.1	0.3	3.4	9.54

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.28	3.3	0.3	3.6	9.54
4	67.30	3.0	0.3	3.3	9.54

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* TM-BLOCK(RF UNIT) : 115VD025AP

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.30	6.3	0.3	6.6	9.54
4	67.34	4.8	0.3	5.1	9.54

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.28	5.2	0.3	5.5	9.54
4	67.34	4.3	0.3	4.6	9.54

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.28	5.5	0.3	5.8	9.54
4	67.34	5.3	0.3	5.6	9.54

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* TM-BLOCK(RF UNIT) : TMZH2-002A

1) EUT Mode : Playback[VHS Play]

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.2	5.4	0.3	5.7	9.54
4	67.3	5.7	0.3	6.0	9.54

2) EUT Mode : Recording / VITS 1Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.32	6.0	0.3	6.3	9.54
4	67.30	6.5	0.3	6.8	9.54

3) EUT Mode : Recording / VITS 5Vp-p

RF Output channel	Measured frequency [MHz]	Meter reding [dBuV/50ohm]	Matching Pad [dB]	Results [dBuV/75ohm]	Limits [dBuV/75ohm]
3	61.22	5.6	0.3	5.9	9.54
4	67.35	6.6	0.3	6.9	9.54

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8. LIST OF TEST INSTRUMENTS

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Spectrum analyzer	8566B	3340A21744	H.P	01/ 3/20, 12Months
	Firmware versions : Rev.29.9.86			
Quasi-peak adapter	85650A	2521A00687	H.P	01/10/10, 12Months
RF Preselector	85685A	3506AD1500	H.P	01/10/10, 12Months
Field strength meter	ESCS30	839809/022	R & S	01/ 6/18, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI 26	832692/002	R & S	01/06/18, 12Months
	Firmware versions : BIOS 3.3, Analyzer 2.09.2			
L.I.S.N	3825-2	9208-1981	EMCO	01/03/23, 12Months
Biconilog Antenna	3142	1237	EMCO	01/ 01/02, 12Months

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