EMC EMISSION - TEST REPORT

JQA APPLICATION No.	:	KL8080617
Model/Type No.	:	VRA671AT21
Name of Product	:	Video Cassette Recorder / Remote Locator (Intentional Radiator)
FCC ID	:	ADTVRA671
Applicant	:	FUNAI ELECTRIC CO., LTD.
Address	:	7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan
Manufacturer	:	FUNAI ELECTRIC CO., LTD.
Address	:	7-1, 7-chome, Nakagaito, Daito-shi, Osaka, Japan
Final Judgement	:	**Passed**

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

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

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

NVLAP®

LAB CODE: 200191-0

DIRECTORY

TEST REGULATION

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

○ - Class A Digital Device
○ - Class B Digital Device
● - Intentional Radiator

Test procedure:

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

GENERAL INFORMATION

Test facility:

1) Test Facility located at Kita-Kansai : 1st and 2nd Open Sites (3 m Site)
Test Facility located at Kameoka Open Site (3, 10 and 30 m, on common plane)
FCC filing No. : 31040/SIT 1300F2

2) KITA-KANSAI TESTING CENTER is recognized under the National Voluntary Lavoratory Accreditation Program for satisfactory compliance established in Title 15, Part 285 Code of Federal Regurations.
NAVLAP Lab Code: 200191-0

Description of the Equipment Under Test (EUT):

1) Name : Video Cassette Recorder / Remote Locator
2) Model/Type No. : VRA671AT21
3) Product Type : Pre-Production (S/N : 00003)
4) Category : Intentional Radiator
5) EUT Authorization : ○ - Verification ● - Certification ○ - D.o.C
6) Highest frequency used/generated : 390 MHz
7) Power Rating : AC 120V 60Hz

Definitions for symbols used in this test report:

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

TEST CONDITIONS

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

Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan
● - Shielded room
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
○ - Shielded room
○ - On metal plane of open site

Used test instruments and sites:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
○ - ESH 3	A - 1		
● - ESH 2	A - 2	December, 1998	1 Year
○ - ESH 2	A - 3		
● - KNW-407	D - 6	February, 1998	1 Year
○ - KNW-408	D - 11		
○ - KNW-242	D - 7		
○ - ESH3-Z5	D - 12		
○ - KNW-341C	D - 13		
○ - KNW-408	D - 14		
○ - KNW-244C	D - 77		
○ - KNW-408	D - 78		
○ - ESH2-Z5	D - 10		
○ - ESH2-Z3	D - 17		
○ - 8568B	A - 10		
○ - 8566B	A - 13		
○ - 8593A	A - 15		
● - Cable	H - 8	February, 1998	1 Year

Environmental conditions:

Temperature: 19 °C Humidity: 27 %

The measurement of the Radiated Emission (Magnetic Field)
was performed in the frequency range of 9 kHz - 30 MHz, in the following test site.

Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan
● - 1st site (3 meters)
○ - 2nd site (3 meters)
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
○ - 3 meters
○ - 10 meters
○ - 30 meters

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
○ - ESH 3	A - 1		
● - ESH 2	A - 2	December, 1998	1 Year
○ - ESH 2	A - 3		
● - HFH2-Z2	C - 2	September, 1998	1 Year
○ - HFH2-Z2	C - 3		

Environmental conditions:

Temperature: 18 °C Humidity: 38 %

The measurement of the Radiated Emission (Electric Field)

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

Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan
● - 1st site (3 meters)
○ - 2nd site (3 meters)
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
○ - 3 meters
○ - 10 meters

Validation of Site Attenuation:

1) Last Confirmed Date: November 27, 1998
2) Interval : 1 Year

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - ESV/ESV-Z3	A - 7 / A - 17	December, 1998	1 Year
○ - ESV/ESV-Z3	A - 6 / A - 18		
○ - ESV/ESV-Z3	A - 5 / A - 16		
○ - ESV/ESV-Z3	A - 4 / A - 20		
○ - ESV/ESV-Z3	A - 8 / A - 19		
● - KBA-511A	C - 12	November, 1998	1 Year
● - KBA-611	C - 22	November, 1998	1 Year
○ - KBA-511A	C - 13		
○ - KBA-611	C - 19		
○ - KBA-511A	C - 11		
○ - KBA-611	C - 21		
● - Cable	H - 5	November, 1998	1 Year

Environmental conditions:

Temperature: 18 °C Humidity: 38 %

The measurement of the Radiated Emission (Electric Field)
was performed in horizontal and vertical polarization, in the frequency range of 1 GHz - 4 GHz, in the following test site.

Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan
● - 1st site (3 meters)
○ - 2nd site (3 meters)
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
○ - 3 meters
○ - 10 meters

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - 8566B	A - 13	October, 1998	1 Year
○ - 8593A	A - 15		
○ - ESV	A - 5		
● - 4T-10	D - 73	May, 1998	1 Year
● - 4T-10	D - 74	May, 1998	1 Year
● - WJ-6611-513	A - 23	May, 1998	1 Year
● - WJ-6882-824	A - 21	May, 1998	1 Year
○ - DBL-0618N515	A - 33		
● - 91888-2	C - 41 - 1	May, 1998	1 Year
● - 91889-2	C - 41 - 2	May, 1998	1 Year
● - 94613-1	C - 41 - 3	May, 1998	1 Year
○ - 91891-2	C - 41 - 4		
○ - 94614-1	C - 41 - 5		
○ - 3160-09	C - 48		
○ - TRA-603D	D - 24		
○ - 8494H/8595H	D - 76		
○ - MZ5010C	D - 81		
● - Cable	C - 40 - 11	May, 1998	1 Year
● - Cable	C - 40 - 12	May, 1998	1 Year

Setting of the spectrum analyzer:

RES B.W : 1 MHz Video B.W : 1 MHz
SCALE : LINEAR Sweep Time: 20 msec.

Environmental conditions:

Temperature: 18 °C Humidity: 38 %

The measurement of the Ocupied Bandwidth
was performed in the following test site.

Test location:

KITA-KANSAI Testing Center
7-7, Ishimaru, 1-Chome, Minoh-Shi, Osaka, 562-0027, Japan
○ - 1st site
○ - 2nd site
● - Shielded room
KAMEOKA EMC Branch
9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan
○ - Open site
○ - Shielded room

Used test instruments:

Model No.	Device I.D No.	Last Cal. Date	Cal. Interval
● - 8568B	A - 10	May, 1998	1 Year
○ - 8566B	A - 13		
○ - 8593A	A - 15		
○ - 8673D	B - 2		
● - TR5212	B - 30	March, 1998	1 Year
● - KBA-511A	C - 16		
○ - KBA-611	C - 18	November, 1998	1 Year
○ - 2-10	D - 40		
○ - TRA-603D	D - 24		
○ - 8494H/8595H	D - 76		

Setting of the spectrum analyzer:

RES B.W.: 100 kHz Video B.W.: 3 MHz
SCALE : LOG 10dB/div Sweep Time: 1.5 sec.

Environmental conditions:

Temperature: 24 °C Humidity: 46 %

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of:

Description	Applicant (Manufacturer)	Model No. (Serial No.)	FCC ID
Video Cassette Recorder	FUNAI ELECTRIC CO., LTD. (FUNAI ELECTRIC CO., LTD.)	VRA671AT21 (00003)	ADTVRA671

The measurement was carried out with the following equipment connected:

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

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

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

Operation - mode of the EUT:

The equipment under test was operated during the measurement under the following specification:

The transmitter operation of the EUT is designed as the period within 4.9 seconds after power switching ON, therefore the EUT was modified to be continuously transmitted during the test.

The code of pulse operation, as command code "02", was set to obtain the maximum duty rate (Setting rate 55%).

Test system:

The EUT has ports shown as follows:

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

Special accessories:

None

The used (generated) frequencies in the EUT:

Center Frequency of transmitting : 390 MHz

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

EUT Modification

● - No modifications were conducted by JQA to achive compliance to applied levels.

○ - To achieve compliance to applied levels, the following change(s) were made by JQA during the compliance test.

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

Applicant : N/A Date : N/A

Typed Name : N/A Position : N/A

Responsible Party

Responsible Party of Test Item(Product)

Responsibe party :

Contact Person :

Signatory

TEST RESULTS

Conducted Emission 450 kHz - 30 MHz

The requirements are ● - KEPT ○ - NOT KEPT

Min. limit margin + 8.9 dB at 0.45 MHz

Max. limit exceeding _____ dB at _____ MHz

Uncertainty of measurement results + 2.1 dB(2σ) - 2.1 dB(2σ)

Remarks: _____

Radiated Emission (Electric Field) 9 kHz - 4 GHz

The requirements are ● - KEPT ○ - NOT KEPT

Min. limit margin + 6.9 dB at 780.0 MHz

Max. limit exceeding _____ dB at _____ MHz

Uncertainty of measurement results			
9 kHz - 30 MHz	+ 2.5 dB(2σ)	- 2.5 dB(2σ)
30 MHz - 1 GHz	+ 4.1 dB(2σ)	- 4.2 dB(2σ)
1 GHz - 10 GHz	+ 3.1 dB(2σ)	- 3.2 dB(2σ)

Remarks: _____

Ocupied Bandwidth

The requirements are ● - KEPT ○ - NOT KEPT

Results Refer to pages 25 - 26

Uncertainty of measurement results ±0.05 ppm(2σ)

Remarks: _____

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 15 Subpart A and C (April 17, 1997) under the test configuration, as shown in page 14.

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

FINAL JUDGEMENT :

The "as received" sample;

● - fulfill the test requirements of the regulation mentioned on page 3.

○ - fulfill the test requirements of the regulation mentioned on page 3, but with certain qualifications.

○ - doesn't fulfill the test regulation mentioned on page 3.

Begin of testing : January 5, 1999

End of testing : January 14, 1999

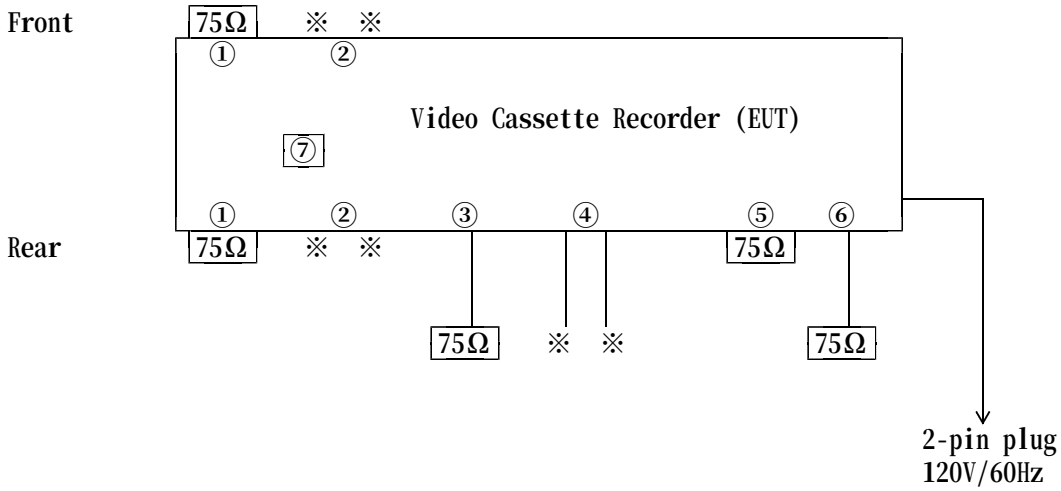
- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved Signatory :

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

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

Test System-Arrangement (Drawings)

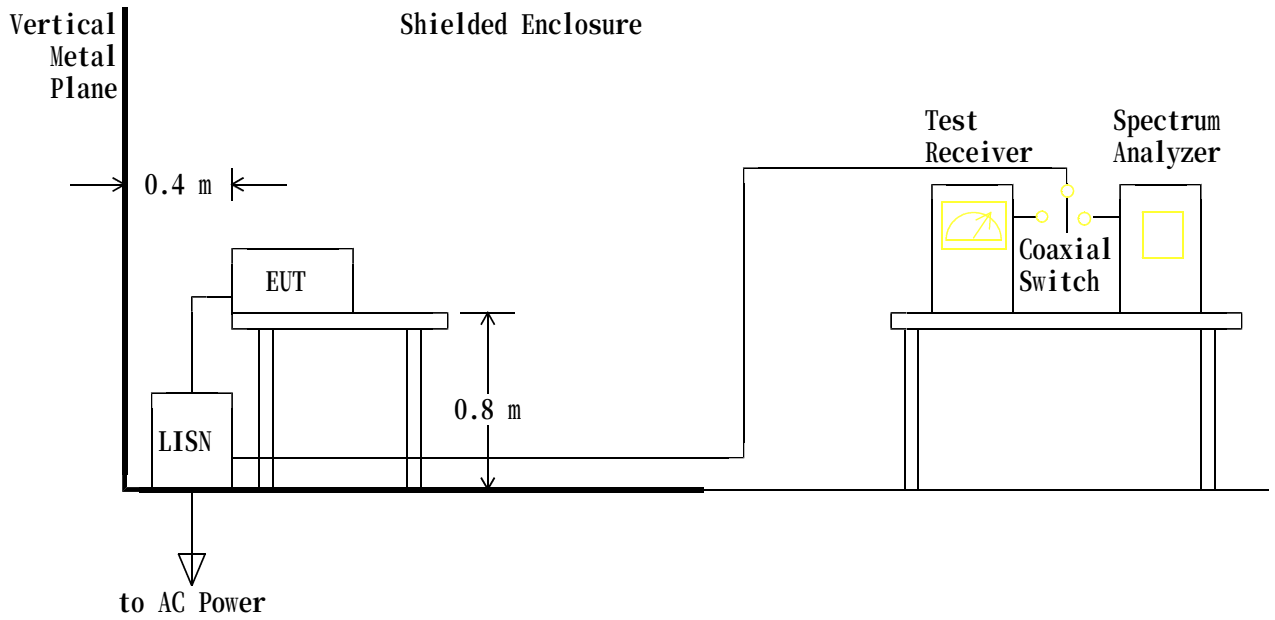


Note)
※ - No termination
① - VIDEO INPUT
② - AUDIO INPUT L/R
③ - VIDEO OUTPUT
④ - AUDIO OUTPUT L/R
⑤ - ANTENNA INPUT
⑥ - RF OUTPUT
⑦ - Channel Selector Switch (3ch and 4ch)

Preliminary Test and Test-setup(Drawings)

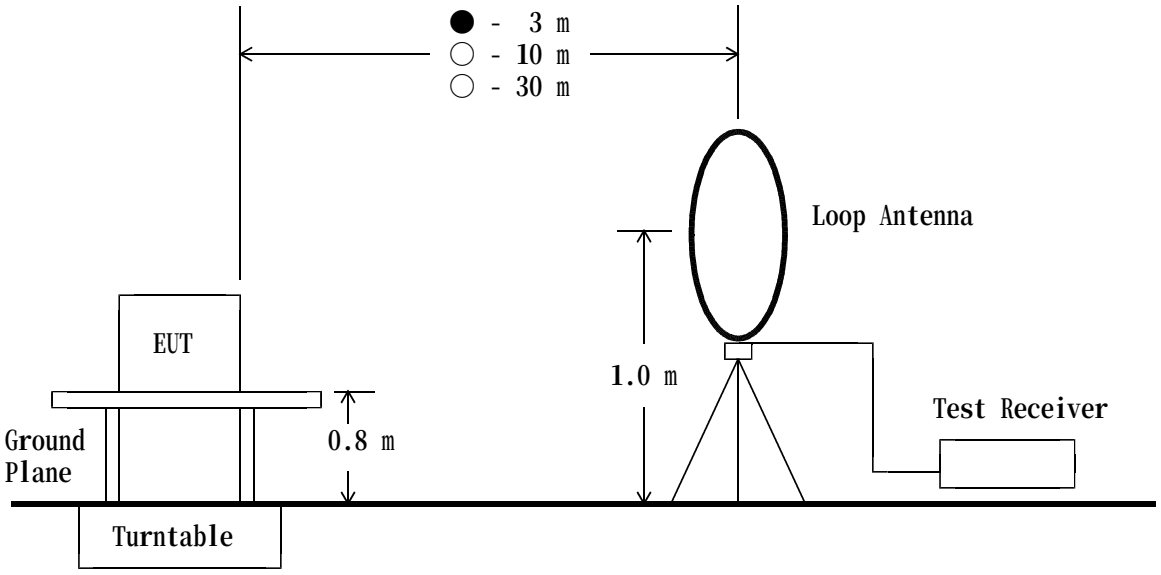
Conducted Emission 450 kHz - 30 MHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.7.2.3 (Preliminary AC Powerline Conducted Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests). The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.
Step 1: One operation mode of the test system was setting.
Step 2: Using both of a spectrum analyzer and a test receiver, the emission's circumstance from the system was monitored in one of ten divided frequency bands of the specified frequency range (450 kHz - 30 MHz). The maximum emission in the band was found by changing the typical cable positions or cable manipulation under a typical system configuration and by selecting of current-carrying conductor. The level and the frequency at the one point which are regarded as relative high emission in the band was measured and recorded. This step was repeated until the ending frequency band.
Step 3: Return to step 1, if the other operation mode was possible to be setting.
Step 4: Based on the collected results, the operation mode produced the maximum emission was selected. The final test on the selected operation mode was performed. But if it was difficult to select the operation mode, the final tests on all operation modes were performed.
Step 5: Based on the same data, as result if the final measurement, at the worst point that has the highest amplitude relative to the limit the repeatability of the worst was reconfirmed. The photographs of the test system setup on the worst point were taken and recorded.



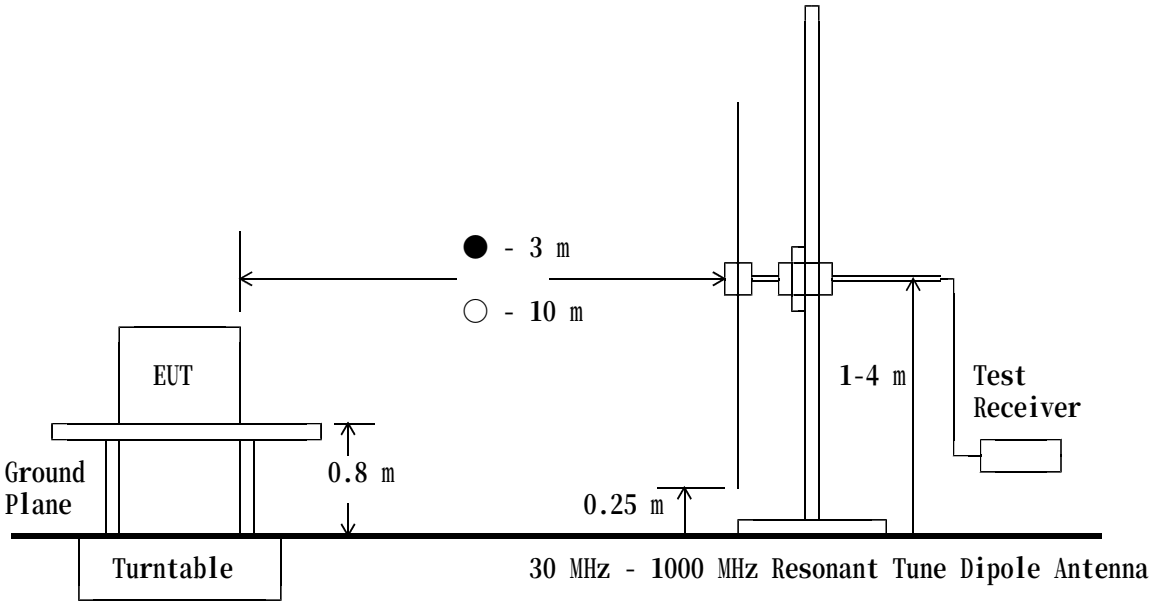
Radiated Emission (Magnetic Field) 9 kHz - 30 MHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.8.3.1.1 (Preliminary Radiated Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests).
The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.
Step 1: One operation mode of the test system was setting.
Step 2: In order to investigate the frequencies of maximum emissions, the loop antenna position was approached to the EUT and the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded in the specified frequency band (9 kHz - 30 MHz).
Step 3: Using a test receiver and a loop antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-1992 Sec.8.3.1.2 (Final Radiated Emissions Tests) at each frequency which was found the higher emission referred to level vs. frequency on the list and which was measured by the loop antenna. The maximum emission was found by rotating three orthogonal axes under a typical system configuration.
Step 4: Return to step 1, if the other operation mode was possible to be setting.
Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.
At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the worst point were taken and recorded.



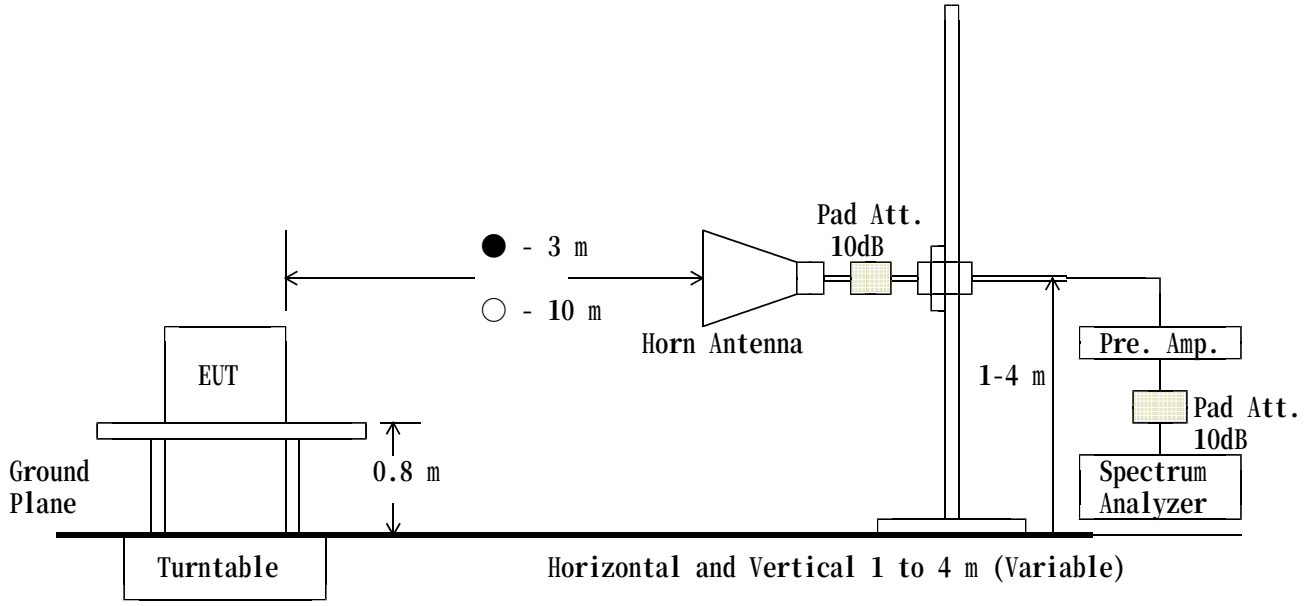
Radiated Emission (Electric Field) 30 MHz - 1000 MHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.8.3.1.1 (Preliminary Radiated Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests).
The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.
Step 1: One operation mode of the test system was setting.
Step 2: Using a test receiver and a test antenna probe, the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded every one of 22 divided bands in the specified frequency band (30 MHz - 1000 MHz).
Step 3: Using a test receiver and a resonant tuned dipole antenna, the emission's circumstance from the test system was measured in according with ANSI C63.4-1992 Sec.8.3.1.2 (Final Radiated Emissions Tests) at each frequency which was found the higher emission referred to level vs. frequency on the list and which was measured by the resonant tuned dipole antenna. The maximum emission was found by changing the cable positions or cable manipulation under a typical system configuration.
Step 4: Return to step 1, if the other operation mode was possible to be setting.
Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.
At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the worst point were taken and recorded.



Radiated Emission (Electric Field) 1 GHz - 4 GHz:

The preliminary test was performed according to the description of ANSI C63.4-1992 Sec.8.3.1.1 (Preliminary Radiated Emissions Tests) and Sec.6.2.1 (Tabletop Equipment Tests).
The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.
Step 1: One operation mode of the test system was setting.
Step 2: In order to investigate the frequencies of maximum emissions, the horn antenna position was approached to the EUT and the significant frequency of the emission's circumstance from the test system were investigated. These data were recorded in the specified frequency band (1 GHz - 4 GHz).
Step 3: The emission's circumstance from the test system was measured in accordance with ANSI C63.4-1992, Sec.8.3.1.2 (Final Radiated Emissions Tests) at each frequency which was found higher emission referred to level vs. frequency on the list and which was measured in the specified distance using the horn antenna.
Step 4: Return to step 1, if the other operation mode was possible to be setting.
Step 5: The worst result was reported arranging data of which was obtained and performed by one or plural operation modes as the final test.
At the worst point that has the highest amplitude relative to the limit the repeatability of the level was reconfirmed. The photographs of the tests system setup on the worst point were taken and recorded.

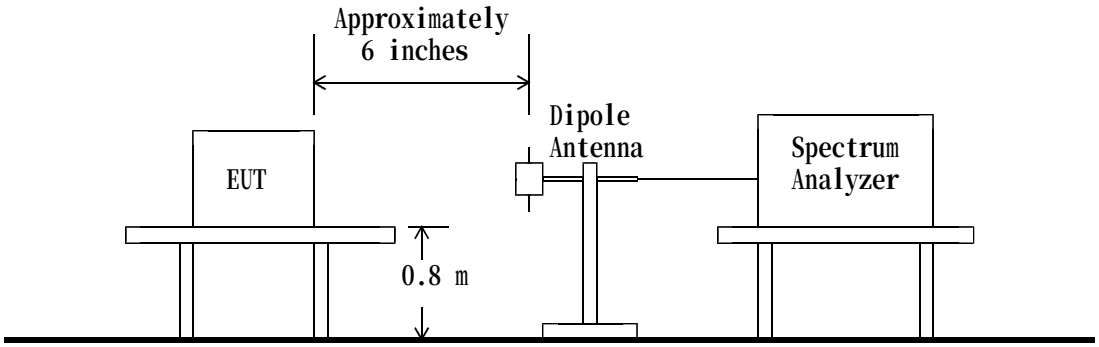


Spectrum Analyzer Setting:

Detector	Peak
RES BW	1 MHz
VIDEO BW	1 MHz
SPAN	0 Hz

Ocupied Bandwidth :

The test was performed according to the description of ANSI C63.4-1992 Sec.13.1.7 (Ocupied Bandwidth Measurements) and FCC rule §15.231(c).



Test-Setup (Photographs) at worst case

Conducted Emission 450kHz - 30MHz:

Front View

Rear View

Side View

Radiated Emission 9kHz - 4GHz:

Front View

Rear View

Mains terminal Disturbance Measurement

Intentional Radiator

Based on the test result of every test mode,the mode of operation that produce the conducted emission that has the highest amplitude is shown as follows:

Test Date: January 14, 1999
Temp.: 19 °C ; Humi.: 27 %

Frequency [MHz]	Correction Factor [dB]	Meter Readings dB(μV) VA-QP	VA-AV	VB-QP	VB-AV	Limits dB(μV)	Results dB(μV) QP	AV	Margin [dB]	Remarks (Note 2)
0.45	0.1	39.0	-	39.0	-	48.0	39.1	-	+ 8.9	A
0.76	0.1	33.0	-	33.0	-	48.0	33.1	-	+14.9	A
0.88	0.1	33.0	-	32.0	-	48.0	33.1	-	+14.9	A
1.28	0.2	35.0	-	33.0	-	48.0	35.2	-	+12.8	A
2.28	0.2	25.0	-	25.0	-	48.0	25.2	-	+22.8	A
3.58	0.3	21.0	-	21.0	-	48.0	21.3	-	+26.7	A
14.32	0.6	33.0	-	31.0	-	48.0	33.6	-	+14.4	A
19.13	0.7	20.0	-	18.0	-	48.0	20.7	-	+27.3	A
25.06	0.9	28.0	-	25.0	-	48.0	28.9	-	+19.1	A
28.64	0.9	33.0	-	31.0	-	48.0	33.9	-	+14.1	A

Sample of calculated result at 0.45 MHz, as the Minimum Margin point:
Correction Factor = 0.1 dB
+)Meter Reading = 39.0 dB(μV)
Result = 39.1 dB(μV)
Minimum Margin : 48.0 - 39.1 = 8.9(dB)
The point shown on "___ " is the Minimum Margin Point.

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

Remarks:

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

Tester Signature : *A.Hosoda*

Type Name : Akio Hosoda

Electromagnetic Radiation Disturbance Measurement

Intentional Radiator

Based on the test result of every test mode, the mode of operation that produce the Radiated emission that has the highest amplitude is shown as follows:

Test Date: January 12, 1999
Temp.: 18 °C ; Humi.: 38 %

Compliance with the peak limits

Frequency [MHz]	Antenna Factor dB(1/m)	Corr. Factor [dB]	Meter Readings dB(μV) Hori.	Meter Readings dB(μV) Vert.	Limits (Peak) dB(μV/m)	Results (Peak) dB(μV/m) Hori.	Results (Peak) dB(μV/m) Vert.	Margin [dB]	Remarks (Note 2)
Fundamental									
390.0	20.9	4.1	49.0	40.0	99.2	74.0	65.0	+25.2	A
Harmonics									
780.0	27.5	6.1	24.0	22.0	79.2	57.6	55.6	+21.6	A
1170.0	21.2	-26.4	52.0	54.0	74.0	46.8	48.8	+25.2	B
1560.0	21.0	-26.2	45.0	47.0	74.0	39.8	41.8	+32.2	B
1950.0	21.6	-28.0	53.0	54.0	79.2	46.6	47.6	+31.6	B
2340.0	21.5	-21.8	44.0	< 35.0	74.0	43.7	< 34.7	+30.3	B
2730.0	21.5	-21.6	< 35.0	< 35.0	74.0	< 34.9	< 34.9	>+39.1	B
3120.0	22.0	-21.2	< 35.0	< 35.0	79.2	< 35.8	< 35.8	>+43.4	B
3510.0	22.3	-21.1	< 35.0	< 35.0	79.2	< 36.2	< 36.2	>+43.0	B
3900.0	34.5	-20.9	< 35.0	< 35.0	74.0	< 48.6	< 48.6	>+25.4	B

Compliance with the average limits

Frequency [MHz]	Antenna Factor dB(1/m)	Corr. Factor [dB]	Conv. Factor [dB]	Meter Readings dB(μV) Hori.	Meter Readings dB(μV) Vert.	Limits (Ave.) dB(μV/m)	Results (Ave.) dB(μV/m) Hori.	Results (Ave.) dB(μV/m) Vert.	Margin [dB]	Remarks (Note 2)
Fundamental										
390.0	20.9	4.1	-5.3	49.0	40.0	79.2	68.7	59.7	+10.5	A
Harmonics										
780.0	27.5	6.1	-5.3	24.0	22.0	59.2	52.3	50.3	+ 6.9	A
1170.0	21.2	-26.4	-5.3	52.0	54.0	54.0	41.5	43.5	+10.5	B
1560.0	21.0	-26.2	-5.3	45.0	47.0	54.0	34.5	36.5	+18.0	B
1950.0	21.6	-28.0	-5.3	53.0	54.0	59.2	41.3	42.3	+16.9	B
2340.0	21.5	-21.8	-5.3	44.0	< 35.0	54.0	38.4	< 29.4	+15.6	B
2730.0	21.5	-21.6	-5.3	< 35.0	< 35.0	54.0	< 29.6	< 29.6	>+24.4	B
3120.0	22.0	-21.2	-5.3	< 35.0	< 35.0	59.2	< 30.5	< 30.5	>+28.7	B
3510.0	22.3	-21.1	-5.3	< 35.0	< 35.0	59.2	< 30.9	< 30.9	>+28.3	B
3900.0	34.5	-20.9	-5.3	< 35.0	< 35.0	54.0	< 43.3	< 43.3	>+10.7	B

Sample of calculated result at 780.0 MHz (Average), as the Minimum Margin point:

Antenna Factor	=	27.5 dB(1/m)
Corr. Factor	=	6.1 dB
Conv. Factor	=	-5.3 dB
+)Meter Reading	=	24.0 dB(μV/m)
Result	=	52.3 dB(μV/m)

Minimum Margin : 59.2 - 52.3 = 6.9(dB)
The point shown on "___ " is the Minimum Margin Point.

Note 1:
1)The highest frequency generated or used in the EUT: 390.0 MHz
2)The upper frequency of measurement range : 3900.0 MHz
3)The spectrum was scanned 9 kHz to 4 GHz and all emissions not reported were more than 20dB below the applied limits.
4)Corr. Factor (30 MHz - 1 GHz) : Cable Loss(dB)
Corr. Factor (1 GHz - 4 GHz) : Cable Loss(dB) + 20dB Pad Attenuator(dB) - Pre-Amplifier Gain(dB)
5)Conversion Factor was conducted as the duty rate 54.2 % : 20log(0.542) = -5.3 (dB)

Remarks:

Note 2	Detector Function	IF Bandwidth
A	Peak	120 KHz

Note 2	Detector Function	RES. B.W	V.B.W	Sweep T	Span
B	Peak (SP)	1 MHz	1 MHz	20 msec	0 Hz
C	Peak (SP)	100 kHz	100 kHz	20 msec	0 Hz

Tester Signature : *A.Hosoda*

Type Name : Akio Hosoda

Conversion Factor (Peak to Average) Calculation

Intentional Radiator

Test Date: January 14, 1999
Temp.: 24 °C ; Humi.: 46 %

The encoded waveform in the time domain is shown in page 25 - 26.
The coding in the waveform was set to obtain the maximum duty rate.

Description of the encoded waveform:

The period of the one pulse train observed at 20 msec. and 50 msec. The one pulse train in the waveform (A) is repeatedly transmitting during 4.9 sec. The duration of the 2 markers in the waveform (A) is the cycle of the one pulse train (16.90 msec.). In order to obtain the peak to average factor, calculation of the period of total on time was computed by personal computer.

Results was obtained by following:

Duty rate = (Maximum total on time) / (One pulse train) × 100
= 9.16 / 16.90 × 100
= 54.2 %

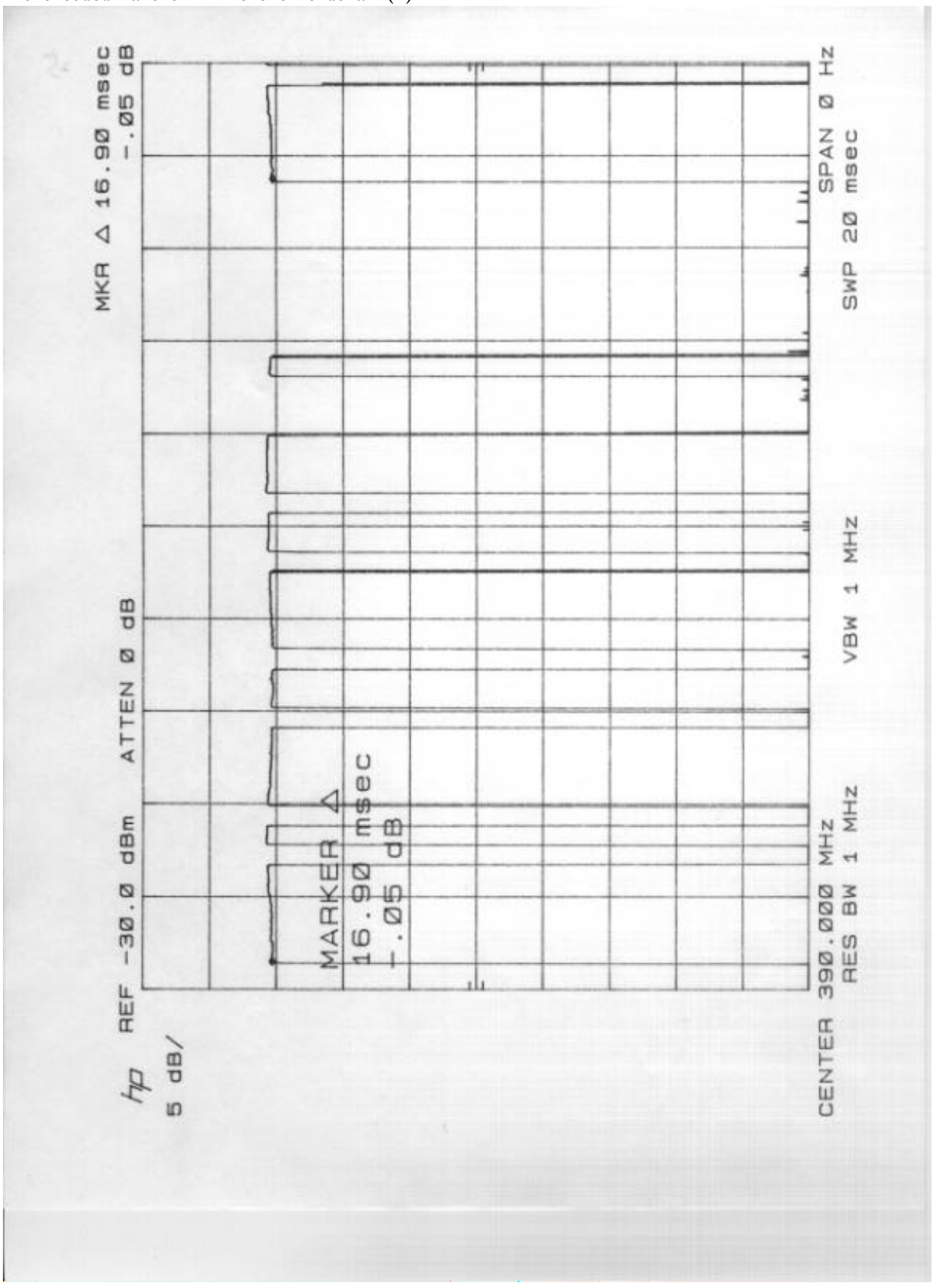
Therefore,

Conversion Factor = 20log(0.542)
= -5.3 dB

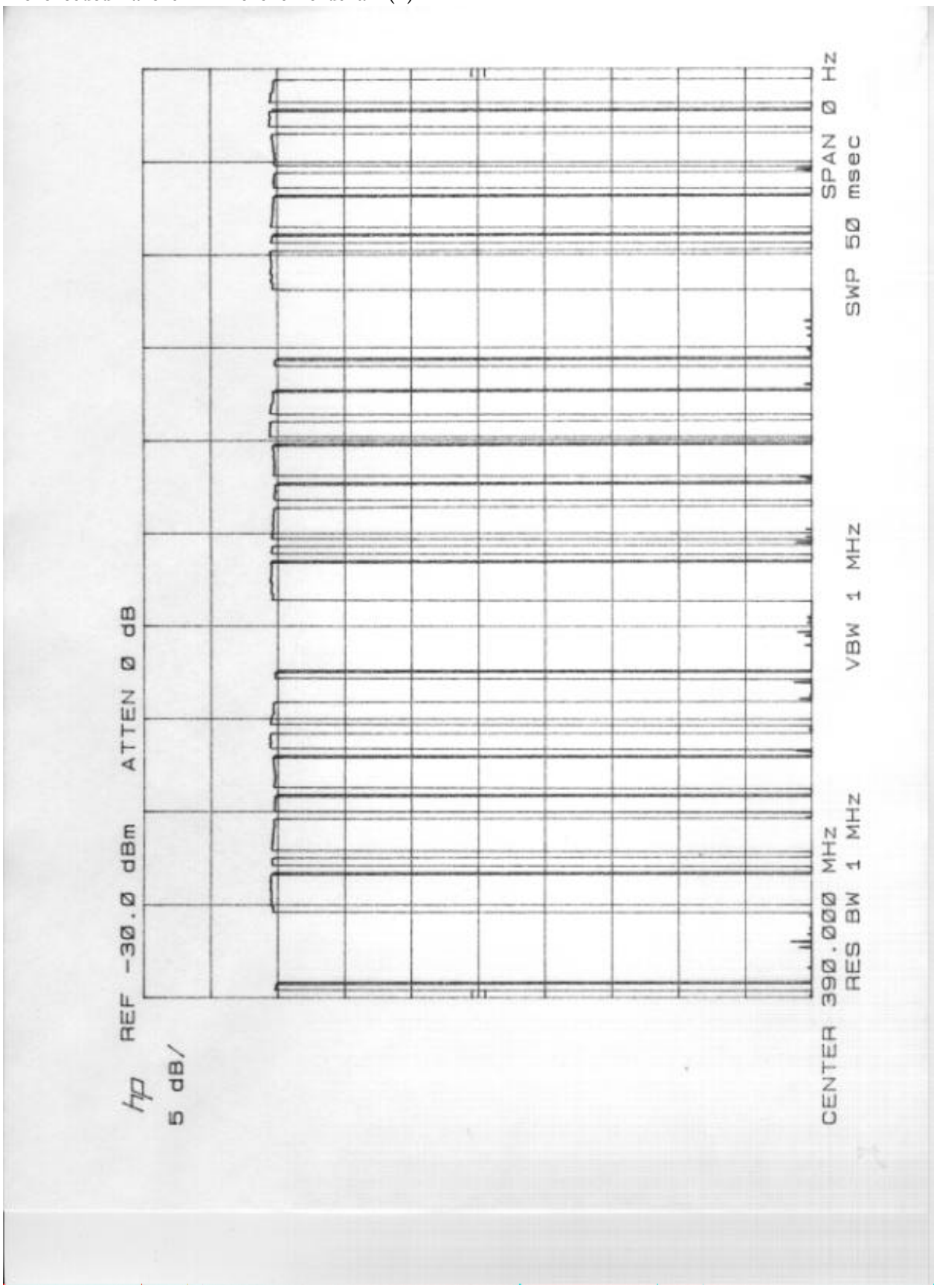
Tester Signature : *A.Hosoda*

Type Name : Akio Hosoda

The encoded waveform in the time domain(A)



The encoded waveform in the time domain(B)



Ocupied Bandwidth Measurement

Intentional Radiator

Test Date: January 14, 1999
Temp.: 24 °C ; Humi.: 46 %

The result is shown in page 28.
The bandwidth is determined at the points 20 dB down from the modulated carrier.

Measurement condition :

The measurement of emission falling within 0.975 MHz band (0.25% of the center frequency 390 MHz) were made by using a spectrum analyzer with a resonant tuned dipole antenna under the following modulation conditions of the EUT.

Modulation Signal (Internal) : The coding were set to be obtain the maximum duty rate.

Tester Signature : *A.Hosoda*

Type Name : Akio Hosoda

Occupied Bandiwidth: