# APPLICATION FOR CERTIFICATION
On Behalf of
Matsushita Electric Industrial Co., Ltd.
21" Color CRT Display Monitor

Model : (1)TX-D1F64NM (2)TX-D1F64
(3)TX-D1F64ML (4)TX-D1F64*****

FCC ID : ACJ93312140

TESTED WITH D-SUB & BNC CABLE @ 640 x 480 AND 1600 x 1200

Prepared for : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisawa,
Kanagawa 251 Japan

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

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Fax : (02) 2609-9303

| | | |
|---|---|---|
| File Number | : | ATM-G98671 |
| Report Number | : | TTEMC-F98183 |
| Date of Test | : | Nov. 19 / 26, 1998 |
| Date of Report | : | Dec. 11, 1998 |

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# TEST REPORT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | Matsushita Electric Industrial Co., Ltd. |
| Manufacturer | : | Matsushita Electric Industrial Co., Ltd. |
| FCC ID | : | ACJ93312140 |
| EUT Description | : | 21" Color CRT Display Monitor |
| | | (A) MODEL NO. : (1)TX-D1F64NM (2)TX-D1F64 |
| | | (3)TX-D1F64ML (4)TX-D1F64***** |
| | | (B) SERIAL NO. : FX8540009 |
| | | (C) POWER SUPPLY : AC 120V/60Hz |

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1997 AND FCC / ANSI C63.4-1992

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15B Class B limits both radiated and conducted emissions.
The measurement results were contained in this test report and TAIWAN TOKIN EMC ENG. CORP. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report showed that the EUT to be technically compliance with the FCC official limits.
This report applied to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : Nov. 19 / 26, 1998

Prepared by : _____ 12.15.98
(SHELENE HOU)

Test Engineer : Allen Wang 12.16.1998
(ALLEN WANG)

Approve & Authorized Signer : _____ 12/17/98
(JACKIE DENG)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

Description : 21" Color CRT Display Monitor

Model Number : (1)TX-D1F64NM (2)TX-D1F64
(3)TX-D1F64ML (4)TX-D1F64*****

TX-D1F64NM was selected in this test report.

Comparison Information for above models

| | Model Name | TX-D1F64NM | TX-D1F64 | TX-D1F64ML | TX-D1F64***** |
|---|---|---|---|---|---|
| 1 | Brand Name | No-Brand | Panasonic | Panasonic | Future OEM Brand |
| 2 | Cabinet Cosmetic | | Minor change | Minor change | Minor change |
| 3 | BNC Type Connector (Rear Panel) | Yes | Yes | None | Yes |

*****: is one thru five suffix in any combination of the alphanumeric character, symbols or blank.

Serial Number : FX8540009

Applicant : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisai,
Kanagai, 251, Japan

Manufacturer : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisawa,
Kanagawa 251 Japan

CRT : Panasonic, M/N M51LRF280X

Data Cable # 1 (D-Sub) : Shielded, Detachable, 1.5m
Bonded two ferrite cores

Data Cable # 2 (D-Sub) : Shielded, Detachable, 1.8m
Bonded two ferrite cores

Data Cable # 3 (D-Sub) : Shielded, Detachable, 3m
Bonded two ferrite cores

Data Cable # 4 (BNC) : Shielded, Detachable, 1.8m

| | | |
|---|---|---|
| Power Cord | : | Non-Shielded, Detachable, 1.8m |
| Date of Receipt of Sample | : | Nov. 11, 1998 |
| Date of Test | : | Nov. 19 / 26 , 1998 |

## 1.2. Tested Supporting System Details

### 1.2.1. PERSONAL COMPUTER

| | | |
|---|---|---|
| Model Number | : | D4594B |
| Serial Number | : | SG74350121 |
| FCC ID | : | By DoC |
| Manufacturer | : | Hewlett Packard |
| VGA Card | : | Matrox Graphics,<br>M/N 79075010153 (MGA-MIL/2/DIP)<br>S/N CAJ92909<br>FCC ID ID7057600 |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 1.2.2. KEYBOARD

| | | |
|---|---|---|
| Model Number | : | RT6656TWJP |
| Serial Number | : | 31470782 |
| FCC ID | : | AQ6-MTN4C15 |
| Manufacturer | : | Hewlett Packard |
| Data Cable | : | Shielded, Undetachable, 1.9m |

### 1.2.3. PRINTER

| | | |
|---|---|---|
| Model Number | : | 2225C |
| Serial Number | : | 2526S40437 |
| FCC ID | : | BS46XU2225C |
| Manufacturer | : | Hewlett Packard |
| Power Cord | : | Non-Shielded, Undetachable, 1.8m |
| Data Cable | : | Shielded, Detachable, 1.2m |

### 1.2.4. MODEM # 1

| | | |
|---|---|---|
| Model Number | : | DM-1414 |
| Serial Number | : | 980034398 |
| FCC ID | : | IFAXDM1414 |
| Manufacturer | : | Aceex |
| Data Cable | : | Shielded, Detachable, 1.2m |
| Power Adapter | : | Amigo, Model AM-91000A<br>Non-Shielded, Undetachable, 1.8m |

1.2.5. MODEM # 2

| | | |
|---|---|---|
| Model Number | : | DM-1414 |
| Serial Number | : | 980034397 |
| FCC ID | : | IFAXDM1414 |
| Manufacturer | : | Aceex |
| Data Cable | : | Shielded, Detachable, 1.2m |
| Power Adapter | : | Amigo, Model AM-91000A<br>Non-Shielded, Undetachable, 1.8m |

1.2.6. PS2 MOUSE

| | | |
|---|---|---|
| Model Number | : | M-S34 |
| Serial Number | : | LZ64952349 |
| FCC ID | : | DZL211029 |
| Manufacturer | : | Hewlett Packard |
| Data Cable | : | Shielded, Undetachable, 2.0m |

1.2.7. USB MOUSE # 1

| | | |
|---|---|---|
| Model Number | : | M-UB48 |
| Serial Number | : | LZB81900216 |
| FCC ID | : | DZL211137 |
| Manufacturer | : | Logitech |
| Data Cable | : | Shielded, Undetachable, 1.8m |

1.2.8. USB MOUSE # 2

| | | |
|---|---|---|
| Model Number | : | M-UB48 |
| Serial Number | : | LZB81900209 |
| FCC ID | : | DZL211137 |
| Manufacturer | : | Logitech |
| Data Cable | : | Shielded, Undetachable, 1.8m |

1.2.9. JOYSTICK

| | | |
|---|---|---|
| Model Number | : | 1FD05015 |
| Serial Number | : | N/A |
| Manufacturer | : | Rambo |
| Data Cable | : | Non-Shielded, Undetachable, 1.6m |

1.2.10. SPEAKER

| | | |
|---|---|---|
| Model Number | : | J-008 |
| Serial Number | : | 97-C-009780-T |
| Manufacturer | : | (J-S) JAZZ HIPSTER |
| Data Cable | : | Non-Shielded, Undetachable, 1m |

1.2.11. WALKMAN

| | | |
|---|---|---|
| Model Number | : | RQ-P35LT-K |
| Serial Number | : | HA08489 |
| Manufacturer | : | Panasonic |
| Data Cable | : | Non-Shielded, Detachable, 1.8m |

1.2.12. EARPHONE # 1

| | | |
|---|---|---|
| Model Number | : | N/A |
| Serial Number | : | N/A |
| Manufacturer | : | Cathay Pacific |
| Data Cable | : | Non-Shielded, Undetachable, 1.3m |

1.2.13. EARPHONE # 2

| | | |
|---|---|---|
| Model Number | : | N/A |
| Serial Number | : | N/A |
| Manufacturer | : | Aiwa |
| Data Cable | : | Non-Shielded, Detachable, 1m |

1.2.14. EARPHONE w/MIC.

| | | |
|---|---|---|
| Model Number | : | MI-2 |
| Serial Number | : | N/A |
| Manufacturer | : | N/A |
| Data Cable | : | Non-Shielded, Undetachable, 1.7m |

## 1.3. Description of Test Facility

| | | |
|---|---|---|
| Site Description (No. 2 Open Site) | : | Jul. 15, 1996 Re-file on<br>Federal Communication Commission<br>FCC Engineering Laboratory<br>7435 Oakland Mills Road<br>Columbia, MD 21046, U.S.A. |
| Name of Firm | : | Taiwan Tokin EMC Eng. Corp. |
| Site Location | : | No. 53-11, Tin-Fu Tsun, Lin-Kou,<br>Taipei Hsien, Taiwan, R.O.C. |
| NVLAP lab. Code | : | 200077-0 |

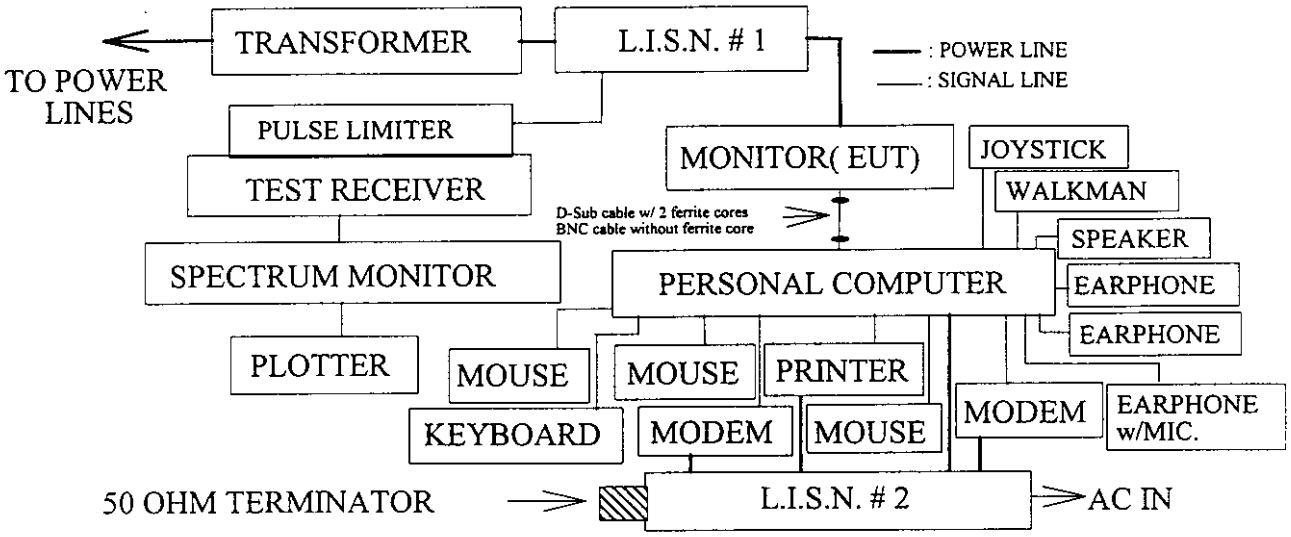
# 2. POWERLINE CONDUCTED TEST

## 2.1. Test Equipment

The following test equipments were used during the power line conducted tests :

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde & Schwarz | ESH3 | 880647/035 | Jun.24, 98' | 1 Year |
| 2. | L.I.S.N. # 1 | Kyoritsu | KNW-407 | 8-855-9 | Apr.14, 98' | 1 Year |
| 3. | L.I.S.N. # 2 | Kyoritsu | KNW-407 | 8-881-13 | Apr.14, 98' | 1 Year |

## 2.2. Block Diagram of Test Setup




## 2.3. Powerline Conducted Emission Limit (CLASS B)

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | uV | dBuV |
| 0.45MHz ~ 30Mhz | 250 | 48 |

REMARKS : RF LINE VOLTAGE (dBuV) = 20 log RF LINE VOLTAGE (uV)

## 2.4. EUT's Configuration during Compliance Measurement

The following equipments were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tend to maximize its emission characteristics in a normal application.

### 2.4.1. 21" Color CRT Display Monitor ( EUT)

| | | |
|---|---|---|
| Model Number | : | (1)TX-D1F64NM (2)TX-D1F64<br>(3)TX-D1F64ML (4)TX-D1F64***** |
| Serial Number | : | FX8540009 |
| Manufacturer | : | Matsushita Electric Industrial Co., Ltd. |
| CRT | : | Panasonic, M/N M51LRF280X |
| Data Cable # 1 (D-Sub) | : | Shielded, Detachable, 1.5m<br>Bonded two ferrite cores |
| Data Cable # 2 (D-Sub) | : | Shielded, Detachable, 1.8m<br>Bonded two ferrite cores |
| Data Cable # 3 (D-Sub) | : | Shielded, Detachable, 3m<br>Bonded two ferrite cores |
| Data Cable # 4 (BNC) | : | Shielded, Detachable, 1.8m |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 2.4.2. Supporting System : As in Section 1.2.

## 2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turn on the power of all equipments.

2.5.3. Personal Computer read data from disk.

2.5.4. Personal Computer sent "H" character to monitor (EUT) and the screen displayed and full with "H" pattern.

2.5.5. The other peripheral devices were driven and operated in turn during all testing.

## 2.6. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N.# 1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. # 2). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-1992 during conducted measurement.

The bandwidth of the R&S Test Receiver ESH3 was set at 10kHz.

The frequency range from 450KHz to 30MHz was checked.

Two kinds of horizontal working frequency with four kinds of data cables were investigated during pre-scanning and reported the two worst test modes (31.5kHz & 115kHz with 1.8m D-Sub Data Cable) in section 2.7., the others test data were attached within Appendix I. The detail of test modes are as follows :

Two kinds of display frequency :

| | 640 x 480 (Hf : 31.5kHz) | | 1600 x 1200 (Hf : 115.0kHz) | |
|---|---|---|---|---|
| (a) Dot Clock Frequency | 25.175 | MHz | 239.35 | MHz |
| (b) Vertical Frequency | 50 | Hz | 180 | Hz |
| (c) Horizontal Frequency | 30 | kHz | 115 | kHz |

Four kinds of data cable :

(1) 1.5m D-Sub data cable with two ferrite cores
(2) 1.8m D-Sub data cable with two ferrite cores
(3) 3.0m D-Sub data cable with two ferrite cores
(4) 1.8m BNC data cable

## 2.7. Line Conducted RF Voltage Measurement Results

The frequency range 450KHz to 30 MHz was investigated.
All emissions not reported below were too low against the prescribed limits.

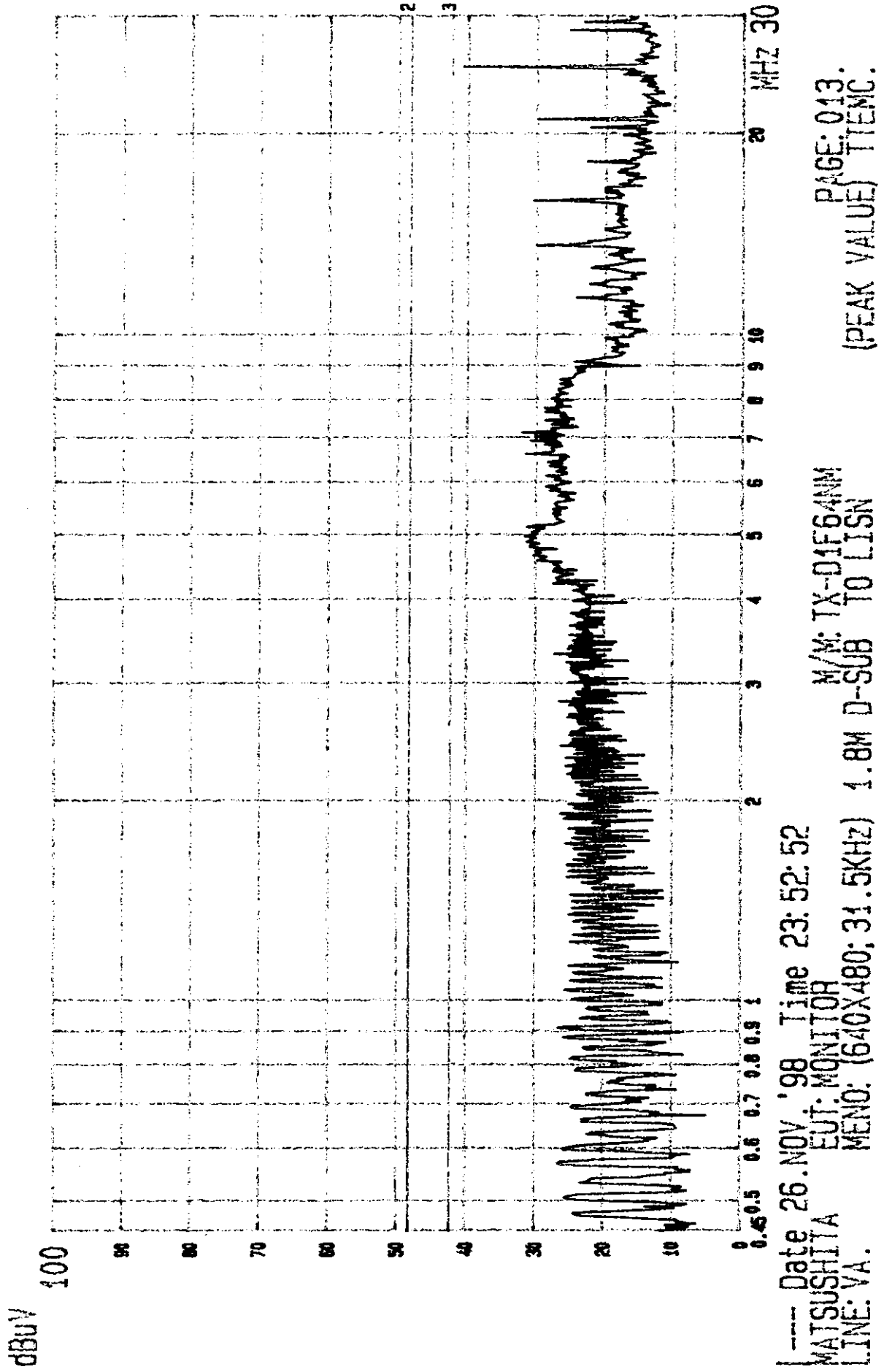
Date of Test : Nov. 26, 1998 Temperature : 22℃

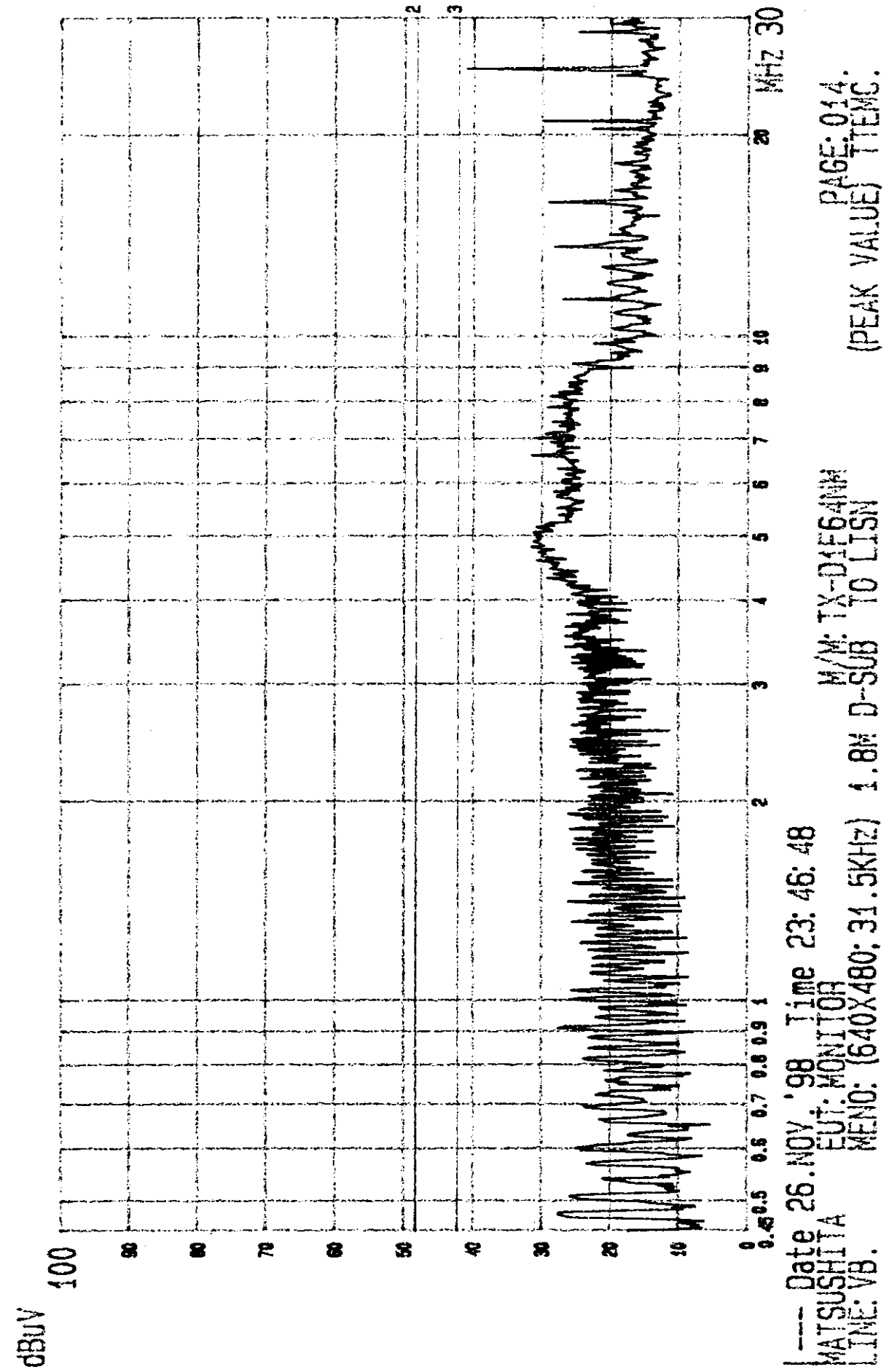
EUT : 21" Color CRT Display Monitor Humidity : 50%

Test Mode : 31.5kHz/640*480 with 1.8m D-Sub Data Cable

| Frequency | Factor | Measurement (dBuV) | | Reading (dBuV) | | Limits (dBuV) | Margin (dBuV) | |
|---|---|---|---|---|---|---|---|---|
| (MHz) | dB | VA | VB | VA | VB | | VA | VB |
| 0.5013 | 0.5 | 27.3 | * | 27.8 | * | 48.0 | 20.2 | * |
| 0.6892 | 0.5 | * | 24.1 | * | 24.6 | 48.0 | * | 23.4 |
| 1.8671 | 0.5 | 21.9 | * | 22.4 | * | 48.0 | 25.6 | * |
| 1.9112 | 0.5 | * | 25.2 | * | 25.7 | 48.0 | * | 22.3 |
| 5.0165 | 0.8 | 27.9 | 29.1 | 28.7 | 29.9 | 48.0 | 19.3 | 18.1 |
| 7.1482 | 0.8 | * | 26.9 | * | 27.7 | 48.0 | * | 20.3 |
| 15.9031 | 1.0 | 21.6 | 31.4 | 22.6 | 32.4 | 48.0 | 25.4 | 15.6 |
| 21.0285 | 1.1 | 22.1 | * | 23.2 | * | 48.0 | 24.8 | * |
| **25.3395** | **1.2** | **41.0** | 40.3 | **42.2** | 41.5 | **48.0** | **5.8** | 6.5 |

Remark :
1. All reading were Quasi-Peak values.
2. Factor = Insertion Loss + Cable Loss
3. The worst emission was detected at 25.3395MHz with corrected signal level of 42.2dBuV (limit was 48dBuV) when the VA side of the EUT was connected to L.I.S.N.


dBuV
100
90
80
70
60
50
40
30
20
10
0.45 0.5 0.6 0.7 0.8 0.9 1 2 3 4 5 6 7 8 9 10 20 30 MHz
2
3
|--- Date 26.NOV.'98 Time 23:52:52
MATSUSHITA EUT:MONITOR M/M:TX-D1E64NM
LINE:VA. MEMO:(640X480,31.5KHz) 1.8M D-SUB TO LISN
PAGE:013.
(PEAK VALUE) TIENC.


dBuV
100
90
80
70
60
50
40
30
20
10
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30
MHz
--- Date 26.NOV.'98 Time 23:46:48
MATSUSHITA EUT:MONITOR M/M:TX-D1F64NH
LINE:VB. MEMO:(640X480;31.5KHZ) 1.8M D-SUB TO LISN
PAGE:014.
(PEAK VALUE) TTEMC.

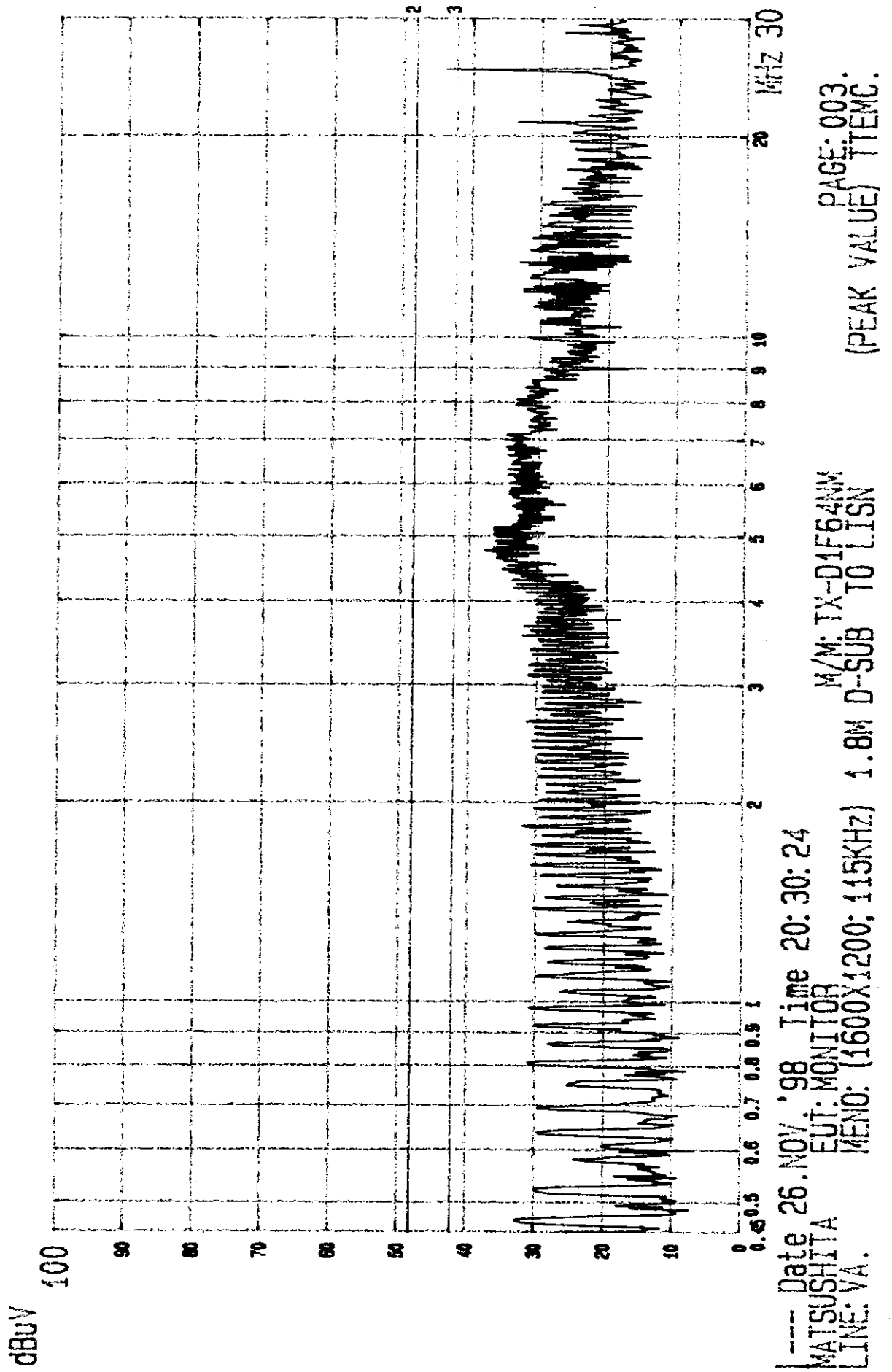
Date of Test : Nov. 26, 1998 Temperature : 22℃

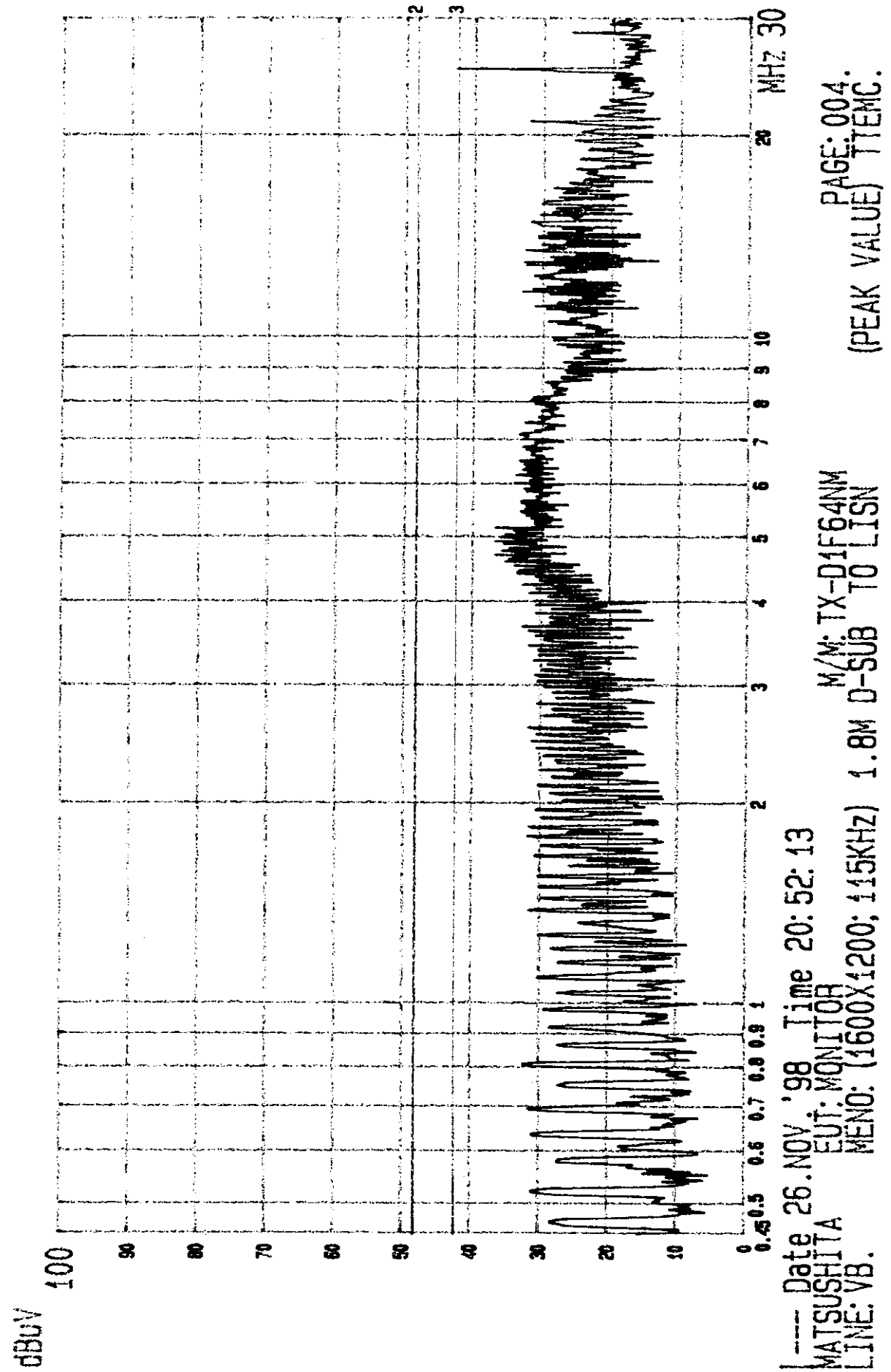
EUT : 21" Color CRT Display Monitor Humidity : 50%

Test Mode : 115kHz/1600*1200 with 1.8m D-Sub Data Cable

| Frequency (MHz) | Factor dB | Measurement (dBuV) VA | Measurement (dBuV) VB | Reading (dBuV) VA | Reading (dBuV) VB | Limits (dBuV) | Margin (dBuV) VA | Margin (dBuV) VB |
|---|---|---|---|---|---|---|---|---|
| 0.6866 | 0.5 | 27.8 | 30.9 | 28.3 | 31.4 | 48.0 | 19.7 | 16.6 |
| 1.8913 | 0.5 | 25.2 | 30.8 | 25.7 | 31.3 | 48.0 | 22.3 | 16.7 |
| 5.1142 | 0.8 | 34.9 | 28.3 | 35.7 | 29.1 | 48.0 | 12.3 | 18.9 |
| 7.1444 | 0.8 | 26.1 | 27.1 | 26.9 | 27.9 | 48.0 | 21.1 | 20.1 |
| 15.2814 | 1.0 | 29.4 | * | 30.4 | * | 48.0 | 17.6 | * |
| 15.9745 | 1.0 | * | 31.3 | * | 32.3 | 48.0 | * | 15.7 |
| **25.2908** | **1.2** | **37.9** | **37.9** | **39.1** | **39.1** | **48.0** | **8.9** | **8.9** |

Remark :
1. All reading were Quasi-Peak values.
2. Factor = Insertion Loss + Cable Loss
3. The worst emission was detected at 25.2908MHz with corrected signal level of 39.1dBuV (limit was 48dBuV) when the VA & VB side of the EUT was connected to L.I.S.N.


dBuV
100
90
80
70
60
50
40
30
20
10
0
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
30
MHz
2
3
Date 26.NOV.'98 Time 20:30:24
MATSUSHITA EUT:MONITOR M/M:TX-D1F64NW
LINE:VA. MEMO:(1600X1200;115KHz) 1.8M D-SUB TO LISN
(PEAK VALUE) TTEMC. PAGE:003.


dBuV
100
90
80
70
60
50
40
30
20
10
0
0.45 0.5 0.6 0.7 0.8 0.9 1 2 3 4 5 6 7 8 9 10 20 30 MHz
2
3
|--- Date 26.NOV.'98 Time 20:52:13
MATSUSHITA EUT:MONITOR M/N:TX-D1F64NM
LINE:VB. MENO.(1600X1200;115KHz) 1.8M D-SUB TO LISN
PAGE:004.
(PEAK VALUE) TTEMC.

# 3. RADIATED EMISSION TEST

## 3.1. Test Equipment

The following test equipments are used during the radiated emission tests :

### 3.1.1. For Anechoic Chamber :

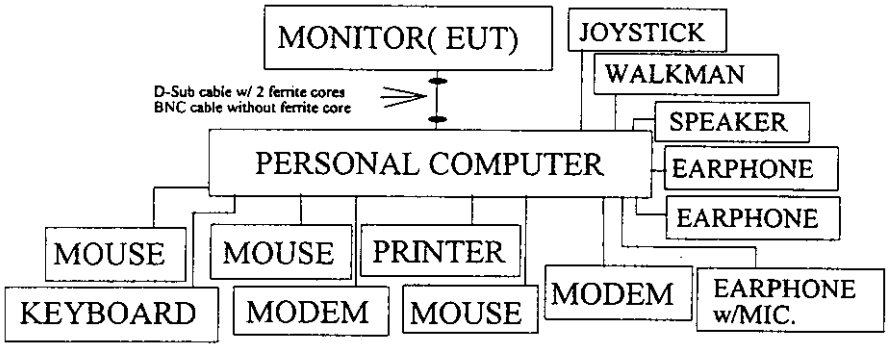
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8593A | 3212A01727 | Jul.25, 98' | 1 Year |
| 2. | Pre-Amplifier | HP | 8447D | 2944A06305 | May.13, 98' | 1 Year |
| 3. | Broadband Antenna | Schwarzbeck | BBA 9106 | A3L | Dec.24, 97' | 1 Year |
| 4. | Broadband Antenna | Schwarzbeck | UHALP 9107 | A3H | Dec.24, 97' | 1 Year |

### 3.1.2. For No. 2 Open Site :

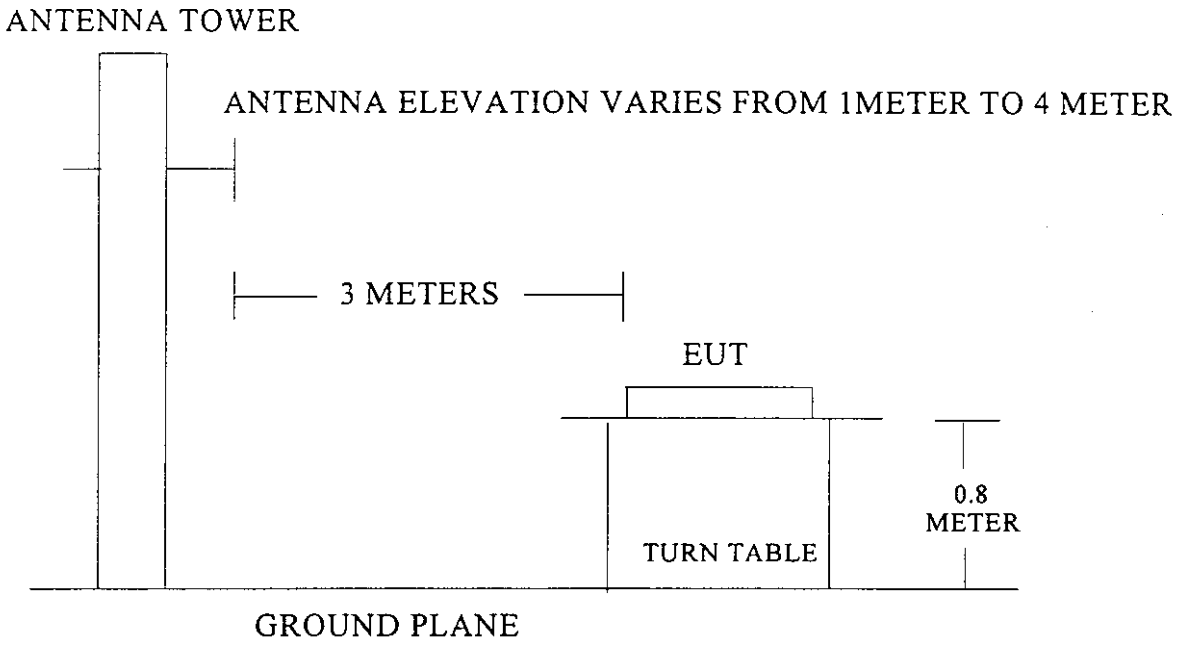
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde&Schwarz | ESVP | 893202/001 | Jul.24, 98' | 1 Year |
| 2. | Broadband Antenna | Chase | VBA6106A | 1240 | Jul.15, 98' | 1 Year |
| 3. | Broadband Antenna | Chase | UPA6109 | 1048 | Jul.15, 98' | 1 Year |

## 3.2. Block Diagram of Test Setup

### 3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram




## 3.3. Radiation Limit (CLASS B)

| FREQUENCY | DISTANCE | FIELD STRENGTHS LIMITS | |
|---|---|---|---|
| MHz | Meters | uV/M | dBuV/M |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |

Remark : (1) Emission level (dBuV/M) = 20 log Emission level (uV/M)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

## 3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators were same as those used in conducted measurement. Please refer to 2.4.

## 3.5. Operating Condition of EUT

Same as conducted measurement which was listed in 2.5.

## 3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotate 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which were mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 during radiated measurement.

The bandwidth of the R&S Test Receiver ESVP was set at 120KHz.

The frequency range from 30MHz to 1000MHz was checked.

Two kinds of horizontal working frequency with four kinds of data cable were investigated separately within Anechoic Chamber and all the scanning waveform were attached in Appendix II.

Finally, re-measured the worst operating situation (115kHz with 1.8m D-Sub data cable) at No. 2 Open Field Test site and all the test results are listed in section 3.7.

Two kinds of display frequency :

| | 640 x 480 (Hf : 31.5kHz) | | 1600 x 1200 (Hf : 115.0kHz) | |
|---|---|---|---|---|
| (a) Dot Clock Frequency | 25.175 | MHz | 239.35 | MHz |
| (b) Vertical Frequency | 50 | Hz | 180 | Hz |
| (c) Horizontal Frequency | 30 | kHz | 115 | kHz |

Four kinds of data cable :

(1) 1.5m D-Sub data cable with two ferrite cores
(2) 1.8m D-Sub data cable with two ferrite cores
(3) 3.0m D-Sub data cable with two ferrite cores
(4) 1.8m BNC data cable

## 3.7. Radiated Emission Noise Measurement Results

The frequency spectrum from 30 MHz to 1000MHz was investigated. All the emissions not reported below were too low against the FCC CLASS B limit.

Date of Test : Nov. 23, 1998 Temperature : 24℃

EUT : 21" Color CRT Display Monitor Humidity : 89%

Test Mode : 115kHz/1600*1200 with 1.8m D-Sub Data Cable

| | Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBuV | Emission Level Horizontal dBuV/m | Limits dBuV/m | Margin dBuV/m |
|---|---|---|---|---|---|---|---|
| | 70.227 | 11.60 | 2.85 | 1.50 | 15.95 | 40.00 | 24.05 |
| | 123.717 | 19.57 | 3.91 | -2.80 | 20.68 | 43.50 | 22.82 |
| | 134.415 | 20.29 | 4.05 | 1.20 | 25.54 | 43.50 | 17.96 |
| | 145.123 | 20.68 | 4.25 | 0.00 | 24.93 | 43.50 | 18.57 |
| | 182.556 | 21.20 | 4.78 | -7.90 | 18.08 | 43.50 | 25.42 |
| * | 193.251 | 21.40 | 4.94 | 0.30 | 26.64 | 43.50 | 16.86 |
| | 209.309 | 21.74 | 5.20 | -8.40 | 18.54 | 43.50 | 24.96 |
| | 220.006 | 21.89 | 5.29 | -5.80 | 21.38 | 46.00 | 24.62 |
| | 257.441 | 23.31 | 5.77 | -8.90 | 20.18 | 46.00 | 25.82 |
| | 284.190 | 24.33 | 6.12 | -8.50 | 21.95 | 46.00 | 24.05 |
| | 316.513 | 14.09 | 6.59 | -7.50 | 13.18 | 46.00 | 32.82 |
| | 327.234 | 14.46 | 6.68 | -1.00 | 20.14 | 46.00 | 25.86 |
| | 343.264 | 15.33 | 6.85 | -6.50 | 15.68 | 46.00 | 30.32 |
| | 364.581 | 14.93 | 7.10 | -7.90 | 14.13 | 46.00 | 31.87 |
| | 369.993 | 15.16 | 7.18 | -6.00 | 16.34 | 46.00 | 29.66 |
| | 391.357 | 16.67 | 7.42 | -0.60 | 23.49 | 46.00 | 22.51 |
| | 450.198 | 17.35 | 8.05 | -5.20 | 20.20 | 46.00 | 25.80 |
| | 466.205 | 16.98 | 8.26 | -4.00 | 21.24 | 46.00 | 24.76 |
| | 498.345 | 17.59 | 8.60 | -4.20 | 21.99 | 46.00 | 24.01 |

Remark :
1. All reading were Quasi-Peak values.
2. The worst emission was detected at 193.251MHz with corrected signal level of 26.64dBuV/m (limit was 43.5dBuV/m) when the antenna was at horizontal polarization and was at 1m high and the turn table was at 150° .
3. 0° is the table front facing the antenna. Degree was calculated from 0° clockwise facing the antenna.

Date of Test : Nov. 23, 1998 Temperature : 24℃

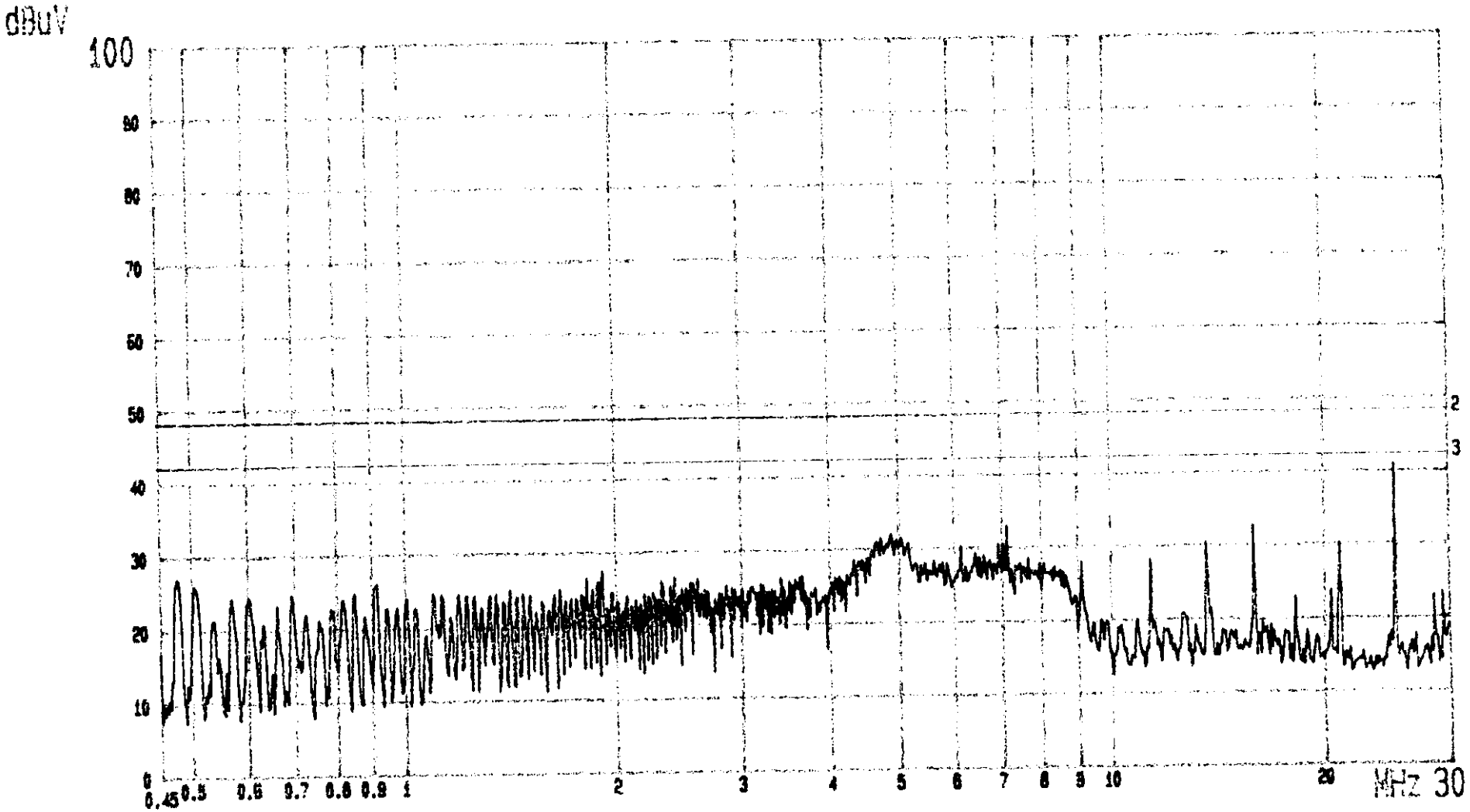
EUT : 21" Color CRT Display Monitor Humidity : 89%

Test Mode : 115kHz/1600*1200 with 1.8m D-Sub Data Cable

| | Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBuV | Emission Level Vertical dBuV/m | Limits dBuV/m | Margin dBuV/m |
|---|---|---|---|---|---|---|---|
| * | 64.880 | 12.46 | 2.72 | 5.00 | 20.18 | 40.00 | 19.82 |
| | 118.369 | 18.22 | 3.80 | -3.90 | 18.12 | 43.50 | 25.38 |
| | 129.069 | 18.43 | 3.97 | -4.60 | 17.80 | 43.50 | 25.70 |
| | 145.118 | 19.29 | 4.25 | -7.30 | 16.24 | 43.50 | 27.26 |
| | 182.558 | 19.46 | 4.78 | -7.60 | 16.64 | 43.50 | 26.86 |
| | 193.252 | 21.08 | 4.94 | -2.40 | 23.62 | 43.50 | 19.88 |
| | 209.319 | 23.92 | 5.20 | -6.50 | 22.62 | 43.50 | 20.88 |
| | 220.001 | 23.64 | 5.29 | -3.70 | 25.23 | 46.00 | 20.77 |
| | 252.095 | 22.30 | 5.74 | -8.00 | 20.04 | 46.00 | 25.96 |
| | 284.190 | 23.44 | 6.12 | -8.20 | 21.36 | 46.00 | 24.64 |
| | 316.507 | 14.69 | 6.59 | -6.20 | 15.08 | 46.00 | 30.92 |
| | 327.206 | 15.52 | 6.68 | -4.60 | 17.60 | 46.00 | 28.40 |
| | 343.257 | 15.42 | 6.85 | -7.20 | 15.07 | 46.00 | 30.93 |
| | 364.682 | 14.01 | 7.10 | -3.20 | 17.91 | 46.00 | 28.09 |
| | 369.999 | 14.32 | 7.18 | -4.90 | 16.60 | 46.00 | 29.40 |
| | 407.373 | 16.08 | 7.63 | -3.40 | 20.31 | 46.00 | 25.69 |
| | 450.197 | 17.40 | 8.05 | -5.40 | 20.05 | 46.00 | 25.95 |
| | 466.208 | 17.79 | 8.26 | 0.00 | 26.05 | 46.00 | 19.95 |
| | 498.339 | 18.50 | 8.60 | -1.50 | 25.60 | 46.00 | 20.40 |

Remark :
1. All reading were Quasi-Peak values.
2. The worst emission was detected at 64.880MHz with corrected signal level of 20.18dBuV/m (limit was 40dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 280° .
3. 0° is the table front facing the antenna. Degree was calculated from 0° clockwise facing the antenna.

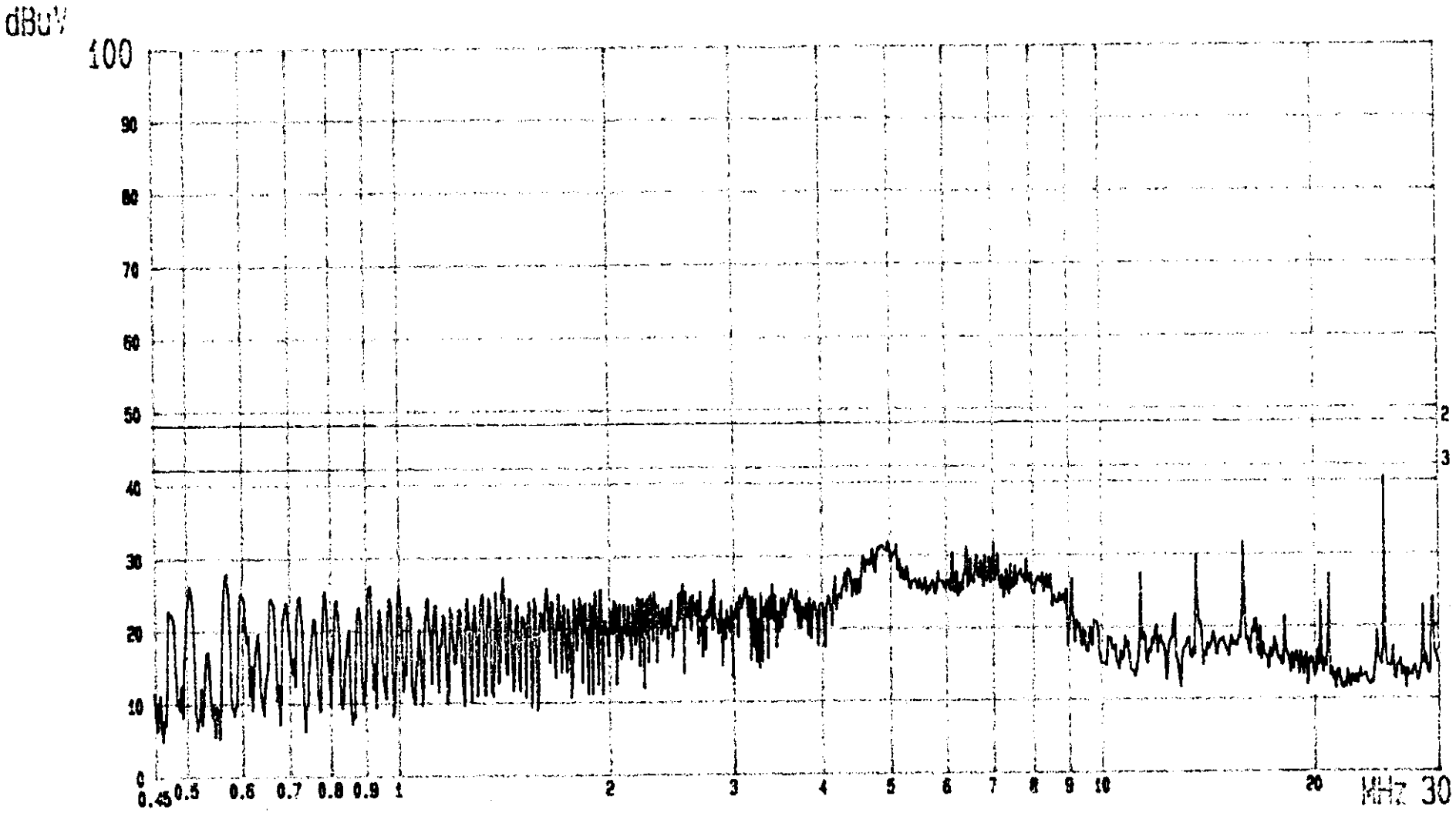
# APPENDIX I




--- Date 26.NOV.'98 Time 00:23:05

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 016.

LINE: VA. MENO: (640X480; 31.5KHz) 1.5M D-SUB TO LISN (PEAK VALUE) TTEMC.




--- Date 26.NOV.'98 Time 00:15:39

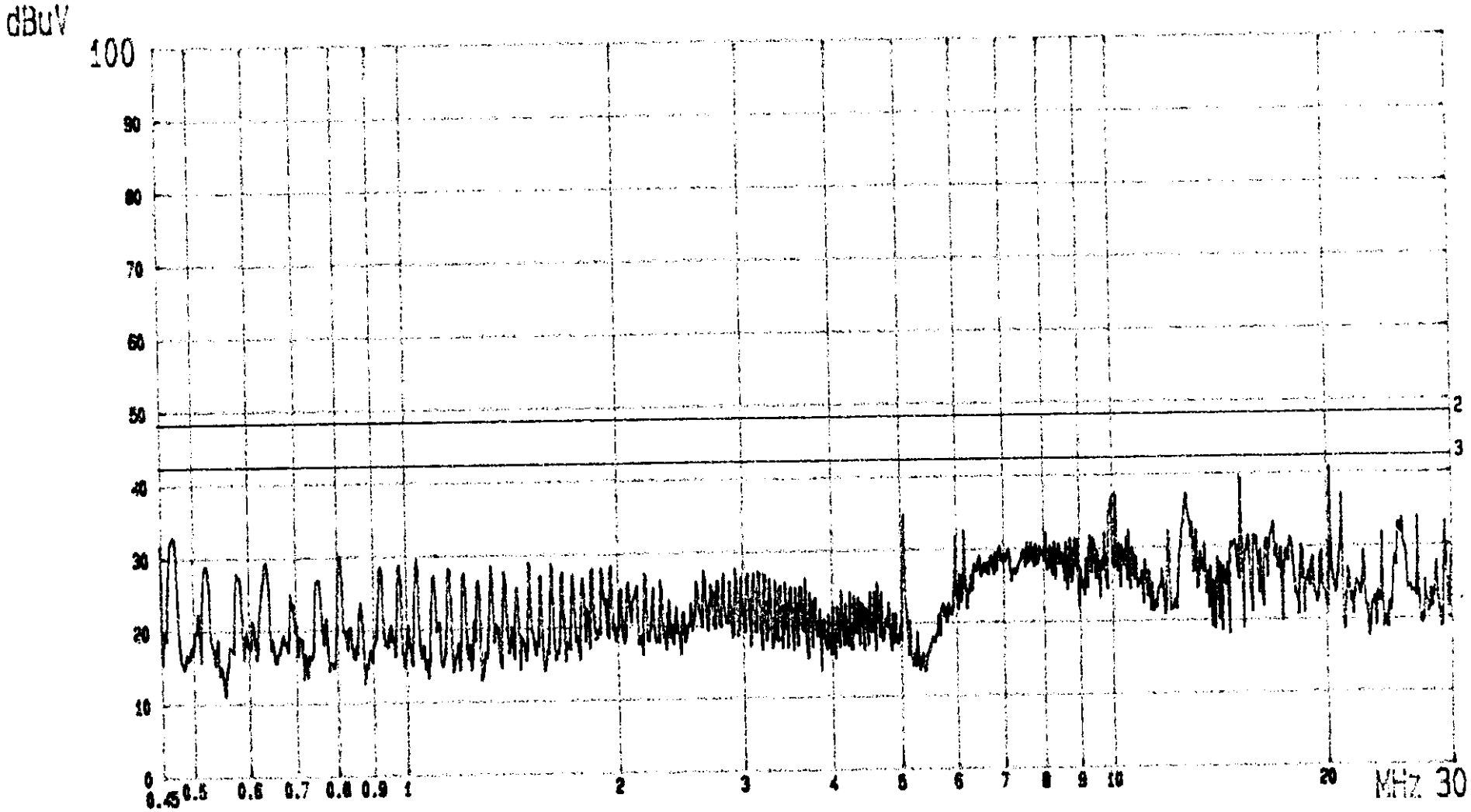
MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 015.

LINE: VB. MEMO: (640X480; 31.5KHz) 1.5M D-SUB TO LISN (PEAK VALUE) TTEMC.

# 4. DEVIATIONS TO TEST SPECIFICATIONS

[ NONE ]

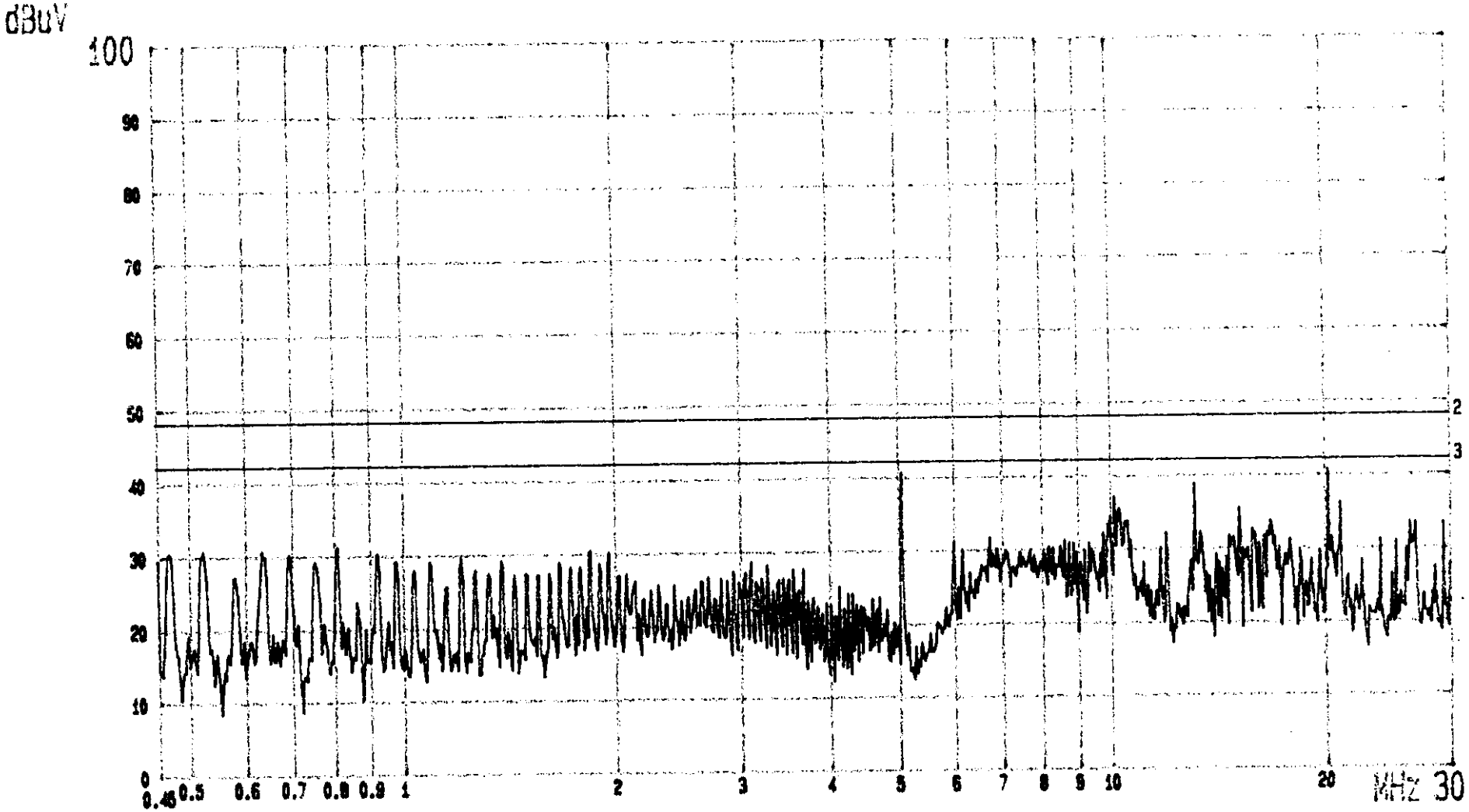
# APPENDIX I




--- Date 09.DEC.'98 Time 02:52:23

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 002.

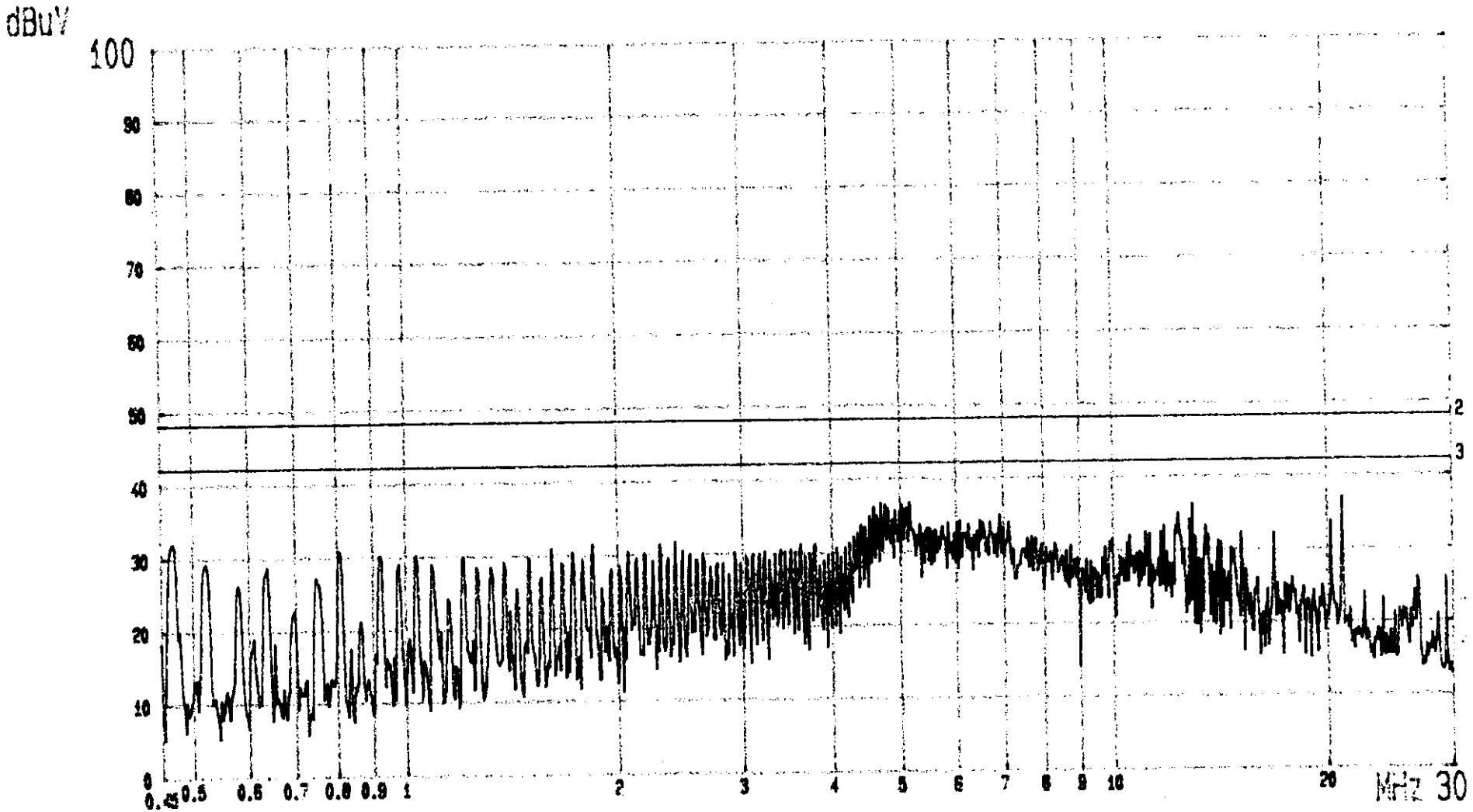
LINE: VA. MENO: (1800X1440; 105KHz) 1.5M D-SUB (PEAK VALUE) TTEMC.




--- Date 09.DEC.'98 Time 02:48:56

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 001.

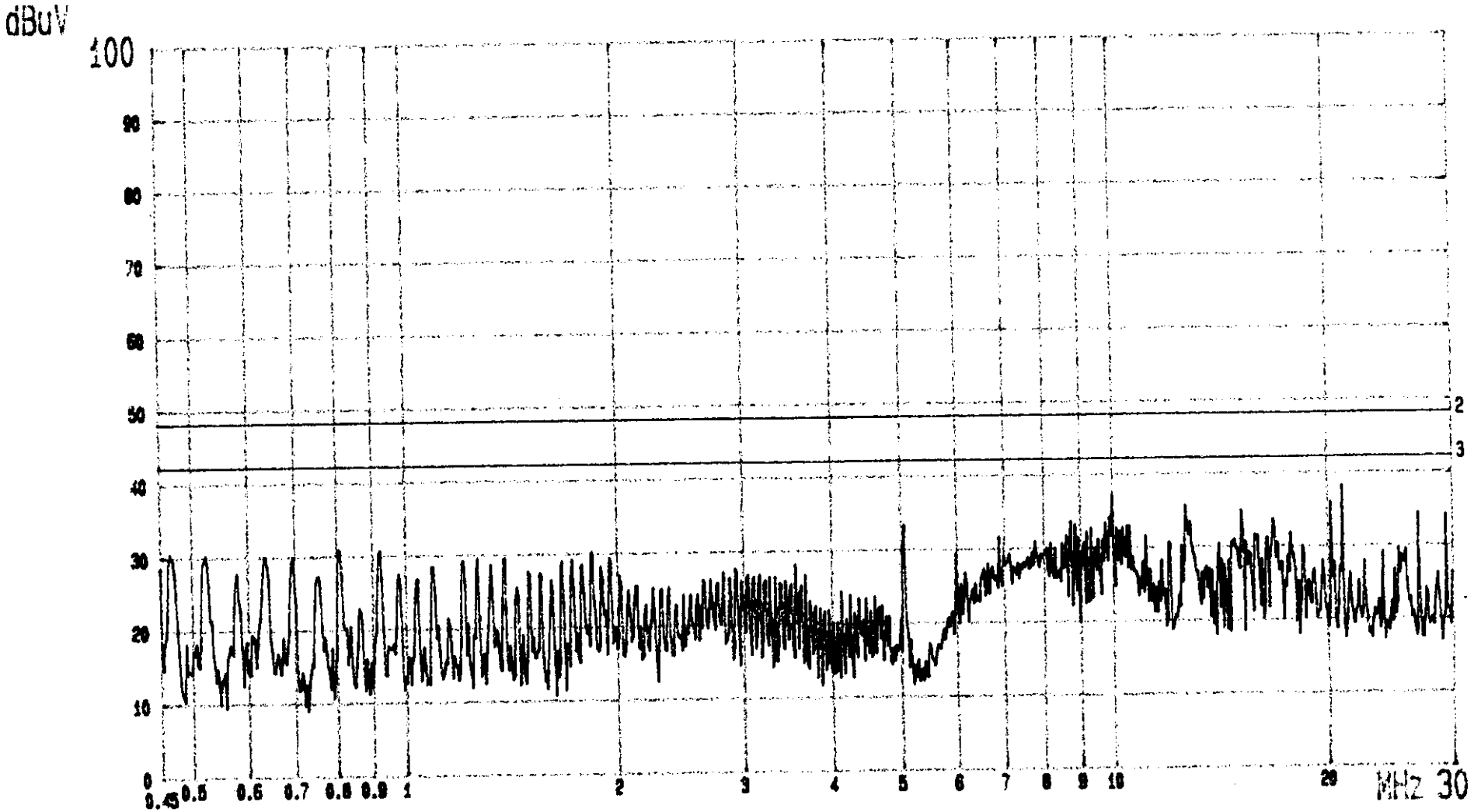
LINE: VB. MENO: (1800X1440; 105KHz) 1.5M D-SUB (PEAK VALUE) TTEMC.




--- Date 09.DEC.'98 Time 02:37:40

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 001.

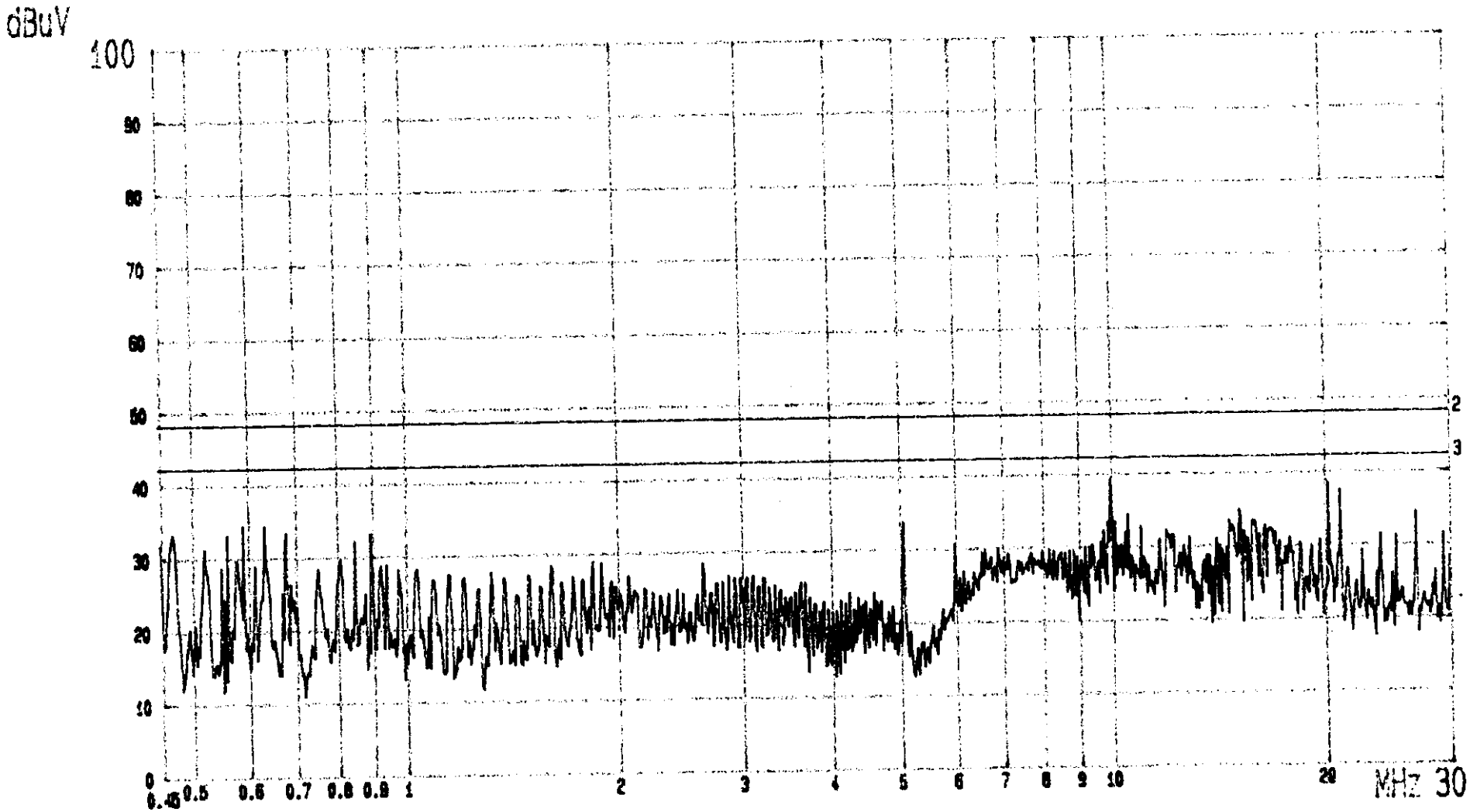
LINE: VA. MEMO: (1800X1440; 105KHz) 3.0M D-SUB (PEAK VALUE) TTEMC.




|--- Date 09.DEC.'98 Time 02:40:25

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 002.

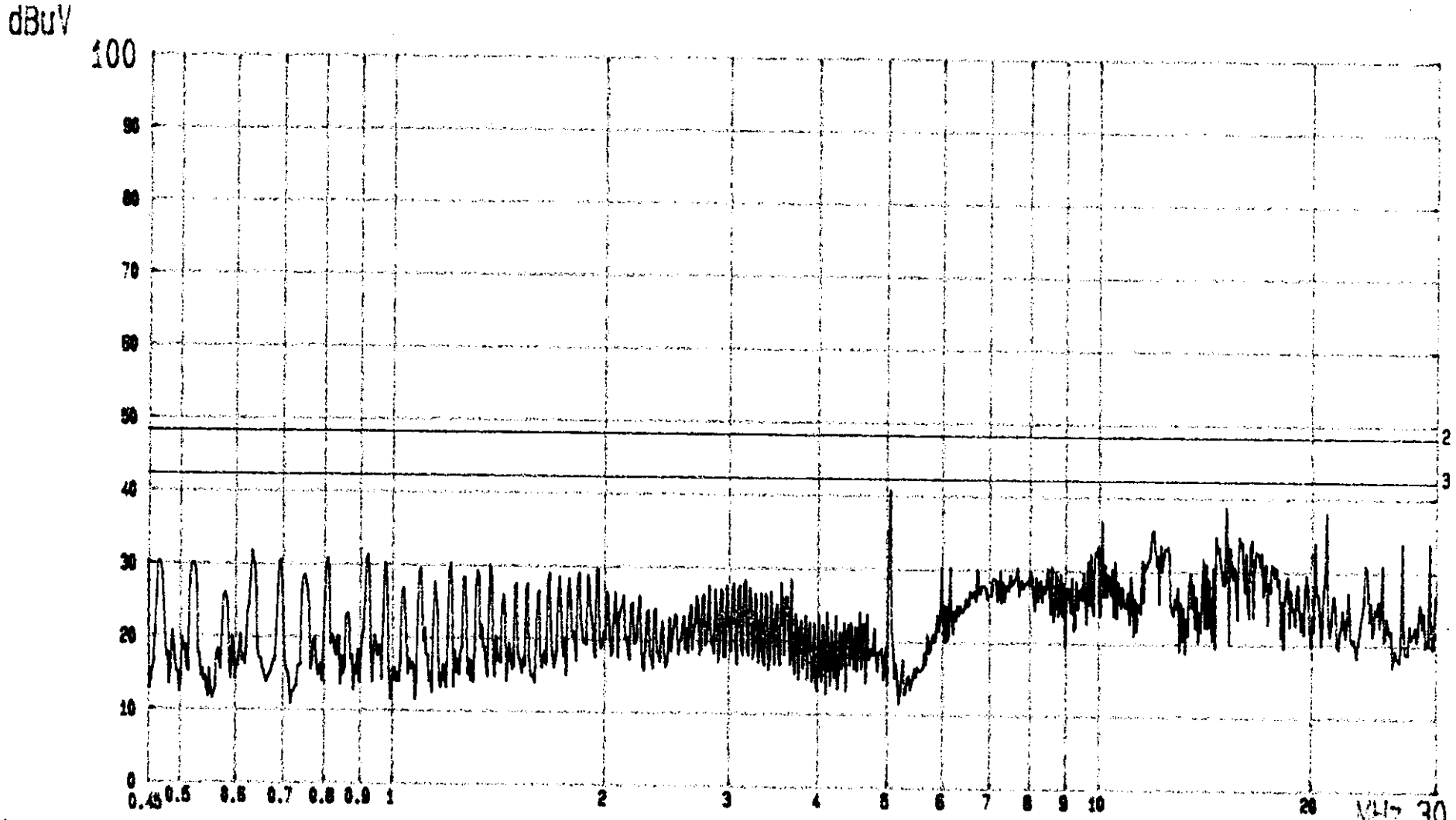
LINE: VB. MEMO: (1800X1440; 105KHz) 3.0M D-SUB (PEAK VALUE) TTEMC.




--- Date 09.DEC.'98 Time 02:43:50

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 002.

LINE: VA. MEMO: (1800X1440; 105KHz) 1.8M BNC (PEAK VALUE) TTEMC.



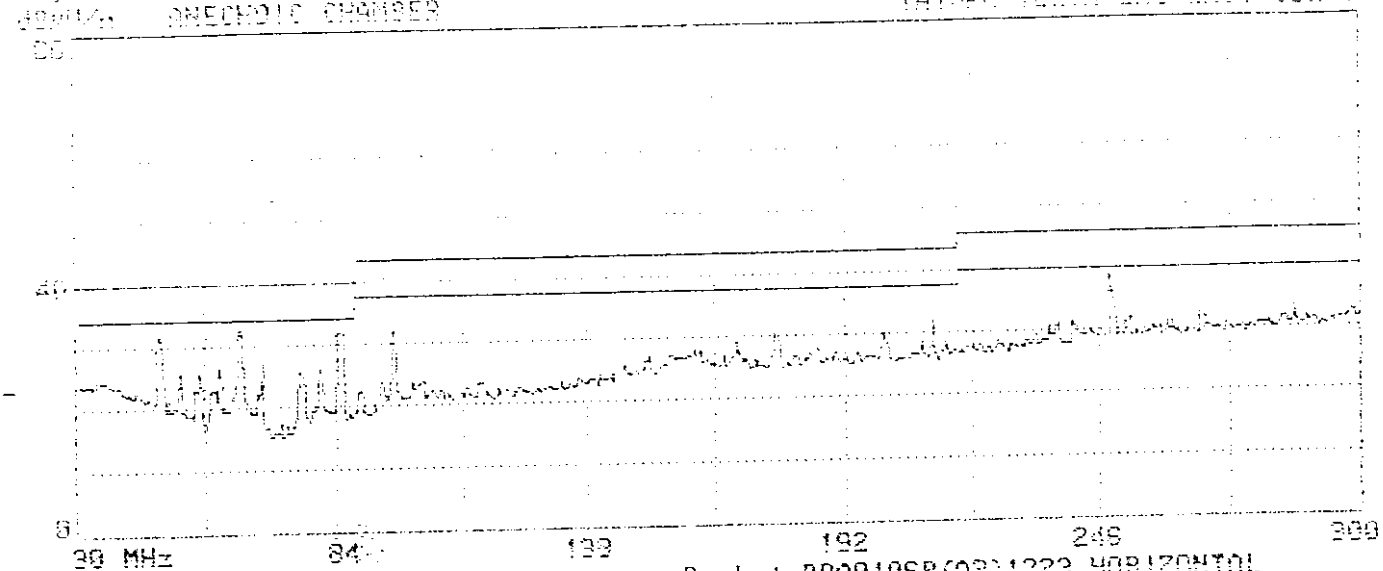

---- Date 09.DEC.'98 Time 02:41:51

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 001.

LINE: VB. MEMO: (1800X1440; 105KHz) 1.8M BNC (PEAK VALUE) TTEMC.

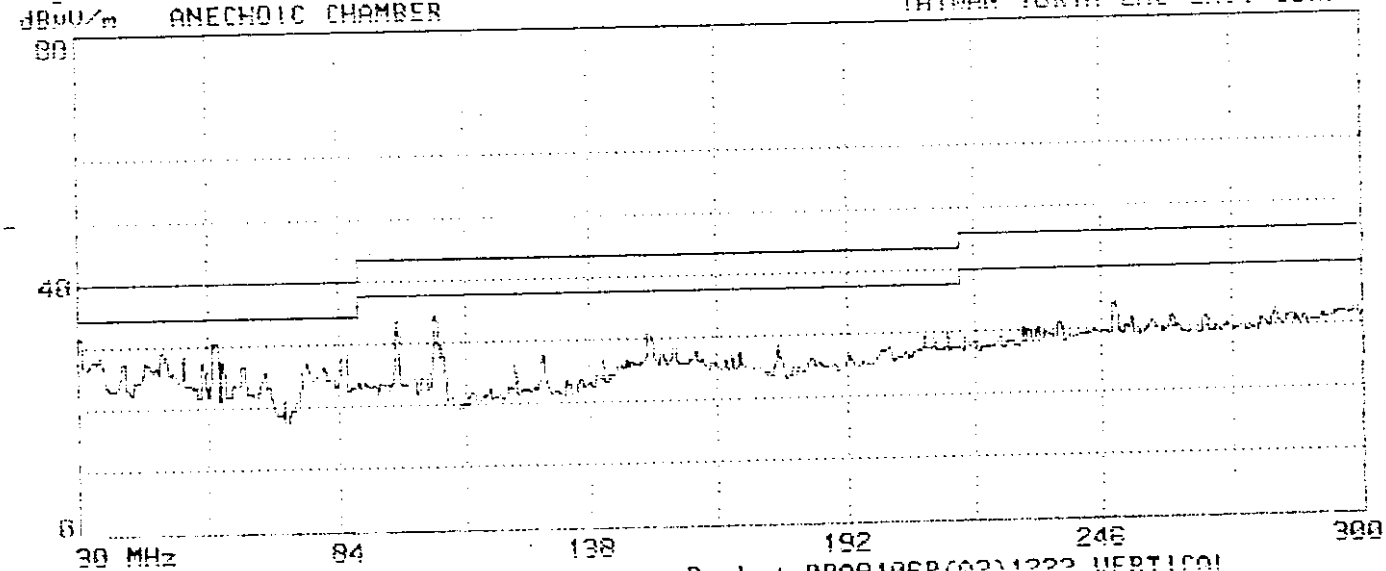
# APPENDIX II

Page#: 1433 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:39:01
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



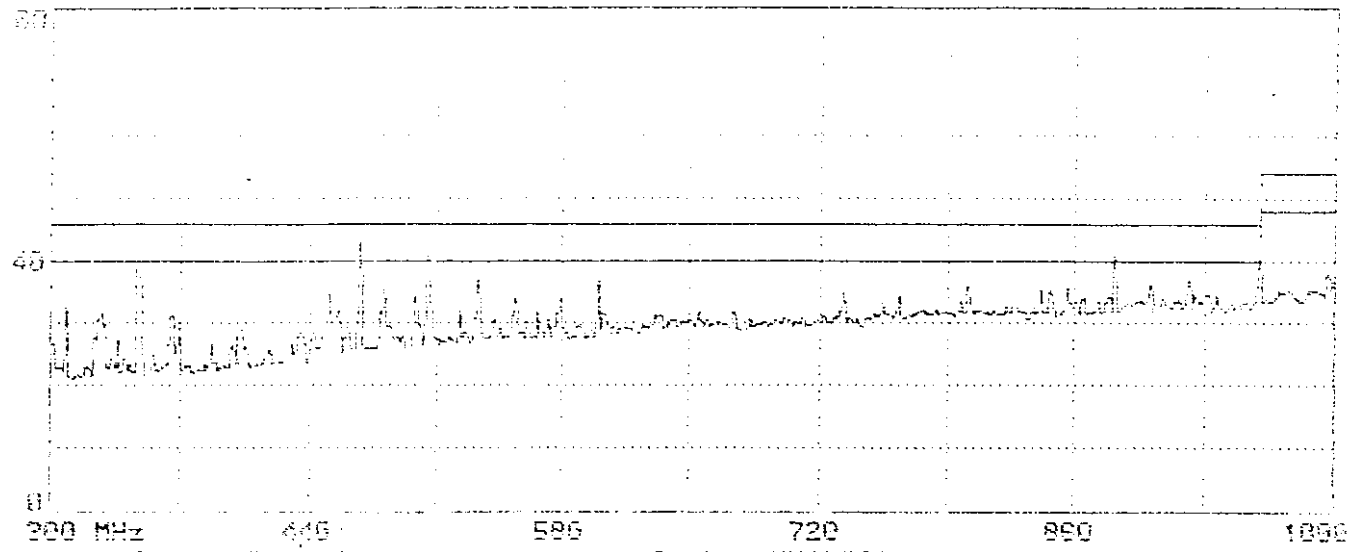

Limit : FCC CLASS-B 3m Probe: BBN9108B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-81F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1433, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.5m D-SUB

Page#: 1434 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:41:14
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



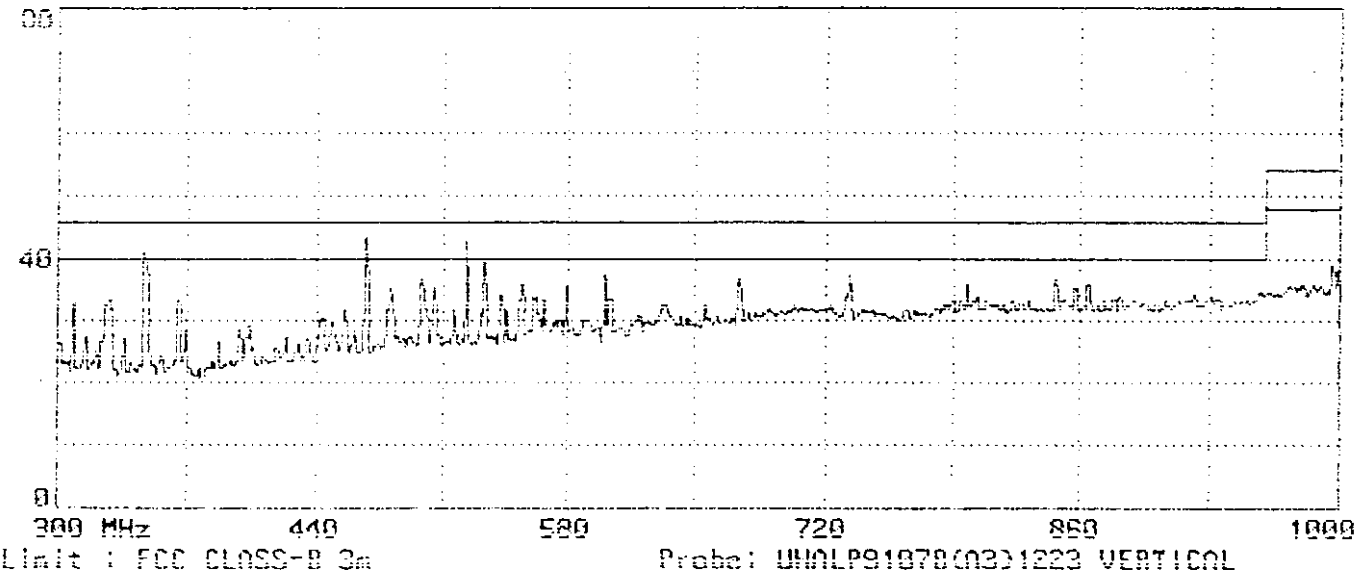

Limit : FCC CLASS-B 3m Probe: BBN9108B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-81F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1434, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.5m D-SUB

Page#: 1435 SP File#: MATSUSHI.21 Date: 12-11-1998 Time: 10:45:27
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

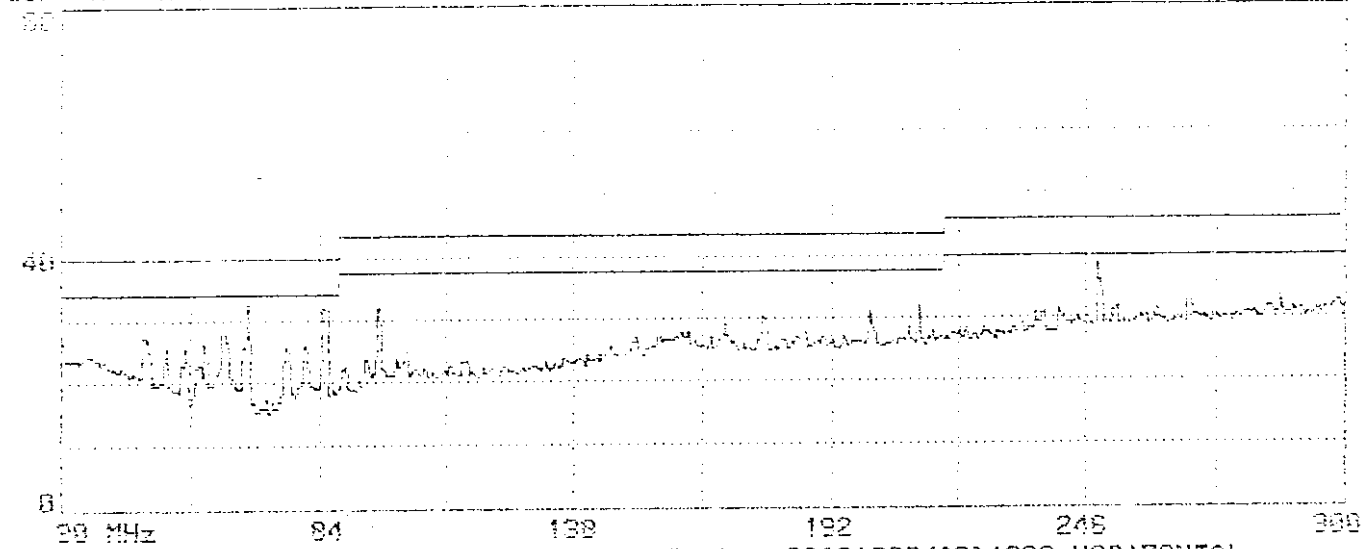



Limit : FCC CLASS-B 3m Probe: UHALP9107D(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-01F84HM Power: 120VAC/60HZ
Margin: 6dB Standard: 0 Trace: 1435, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.5m 0-SUB

Page#: 1436 SP File#: MATSUSHI.51 Date: 12-11-1998 Time: 10:46:55
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



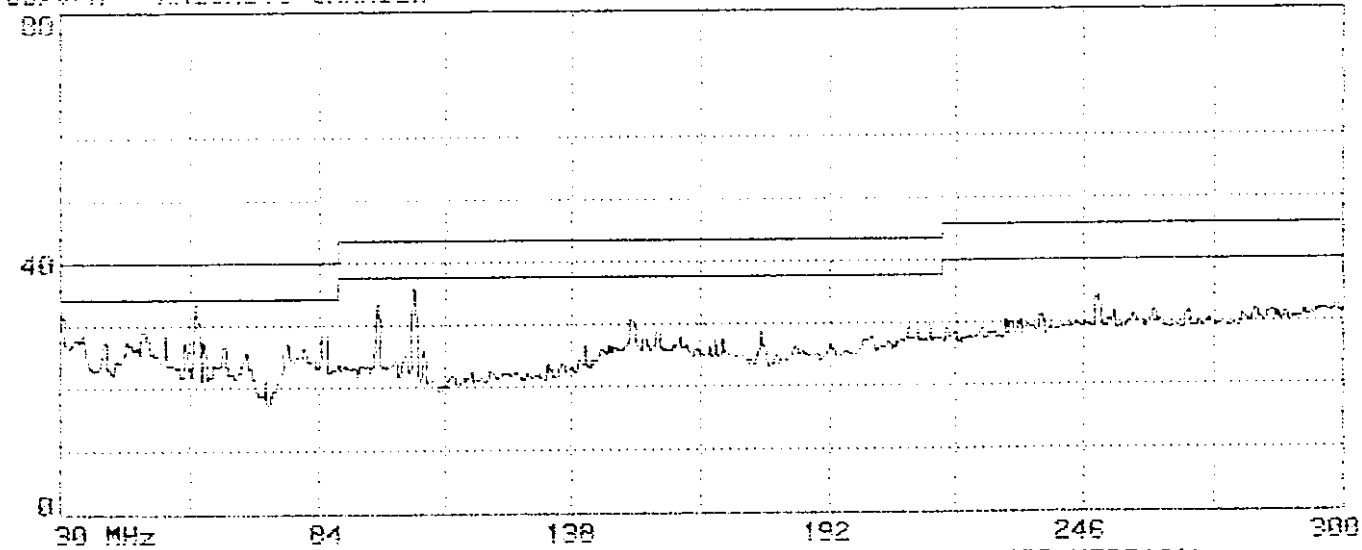

Limit : FCC CLASS-B 3m Probe: UHALP9107D(03)1223 VERTICAL
EUT : MONITOR M/N:TX-01F84HM Power: 120VAC/60HZ
Margin: 6dB Standard: 0 Trace: 1436, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.5m 0-SUB




Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-01F84NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m D-SUB

Probe: BBN9108B(03)1223 HORIZONTAL
Power : 120VAC/60Hz
Trace: 1428, 0, 0, 0, 0

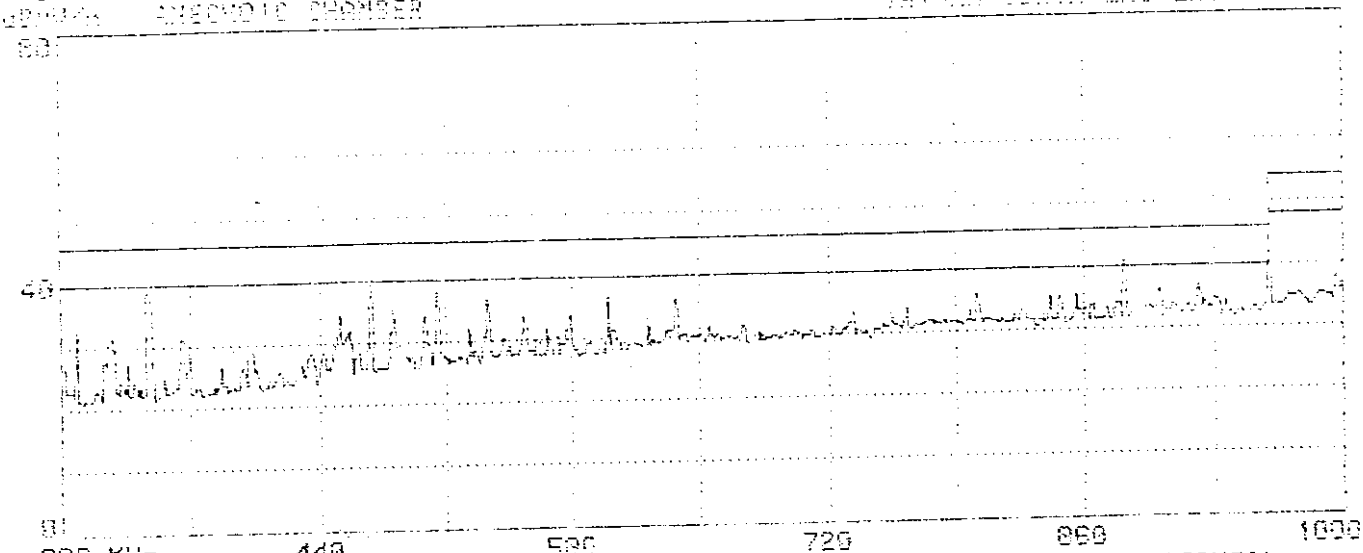
Page#: 1430 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:41:14
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.




Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-01F84NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m D-SUB

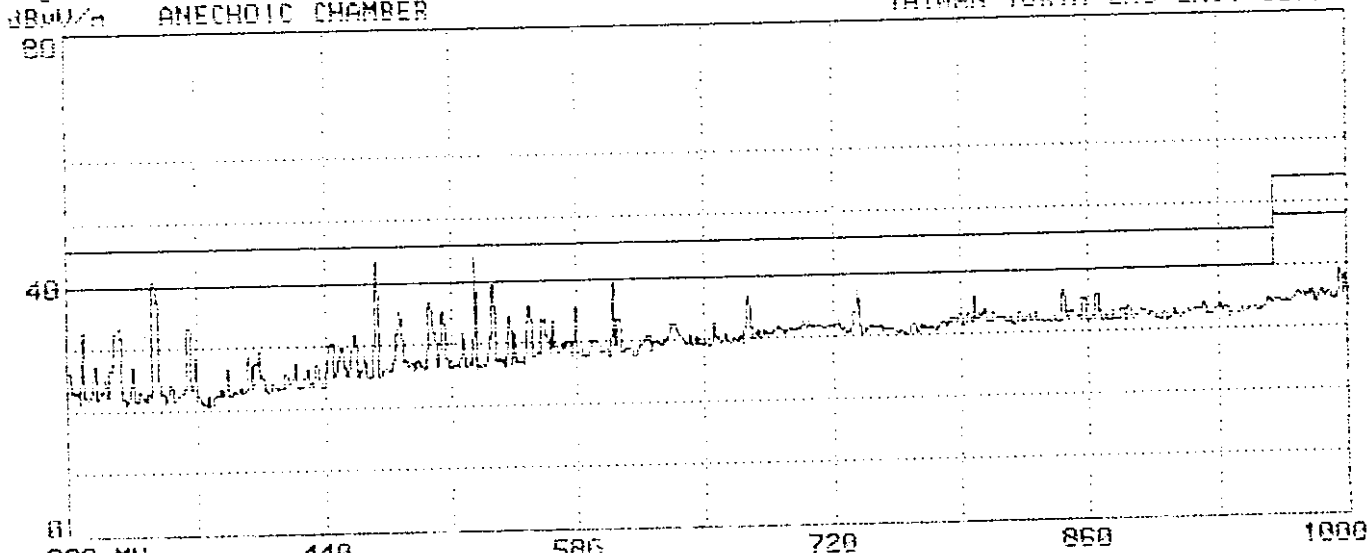
Probe: BBN9108B(03)1223 VERTICAL
Power : 120VAC/60Hz
Trace: 1430, 0, 0, 0, 0

Page#: 1431 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:46:12
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

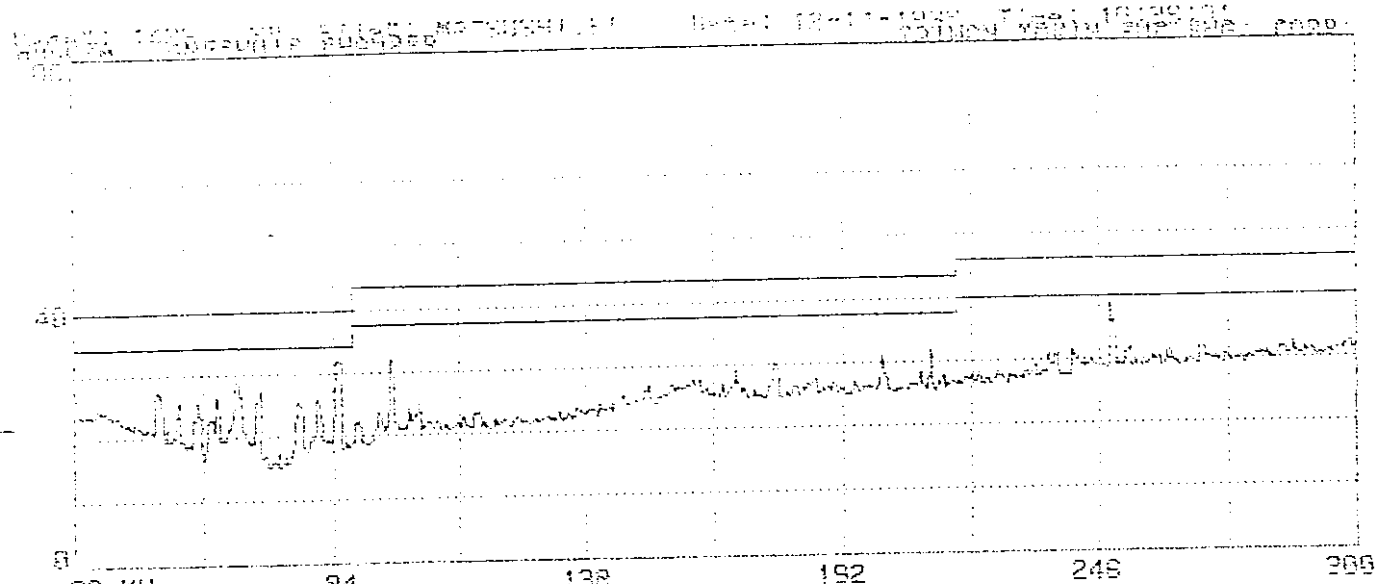



Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F84NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m D-SUB
Probe: WHNLP91078(03)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1431, 0, 0, 0, 0

Page#: 1432 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:46:55
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



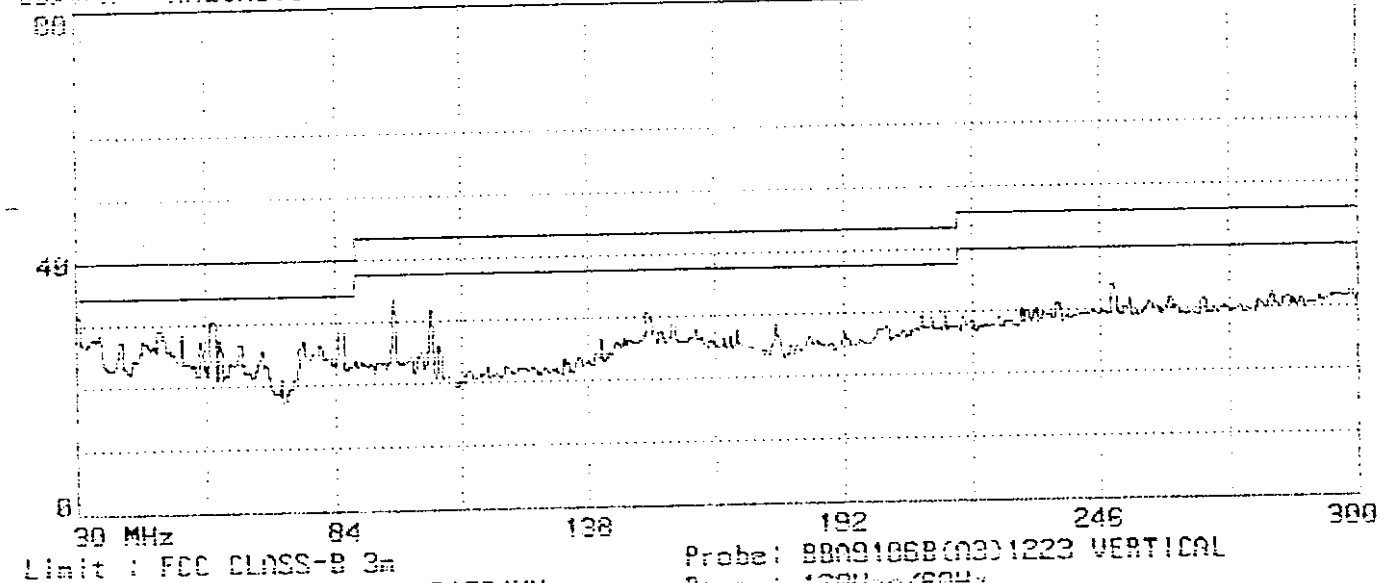

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F84NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m D-SUB
Probe: WHNLP91078(03)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1432, 0, 0, 0, 0




Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-B1F64NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 3.0m 0-SUB

Probe: BBN9108B(03)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1425, 0, 0, 0, 0

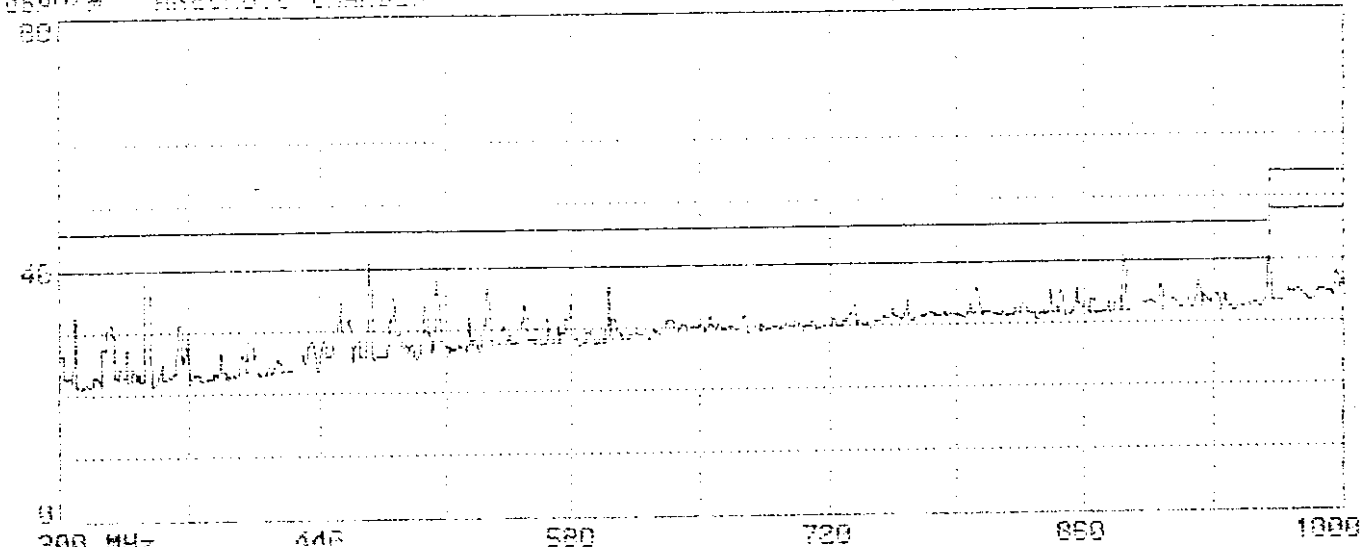
Page#: 1426 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 18:41:14
dBuV/m ONECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.




Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-B1F64NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 3.0m 0-SUB

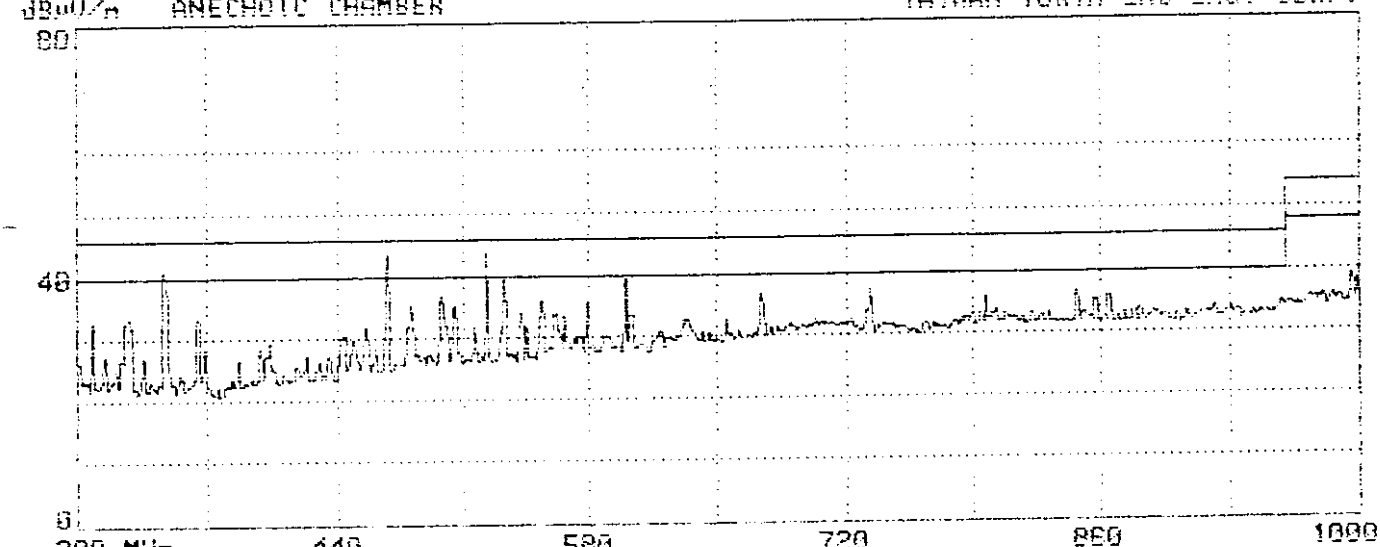
Probe: BBN9108B(03)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1426, 0, 0, 0, 0

Page#: 1427 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:45:27
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



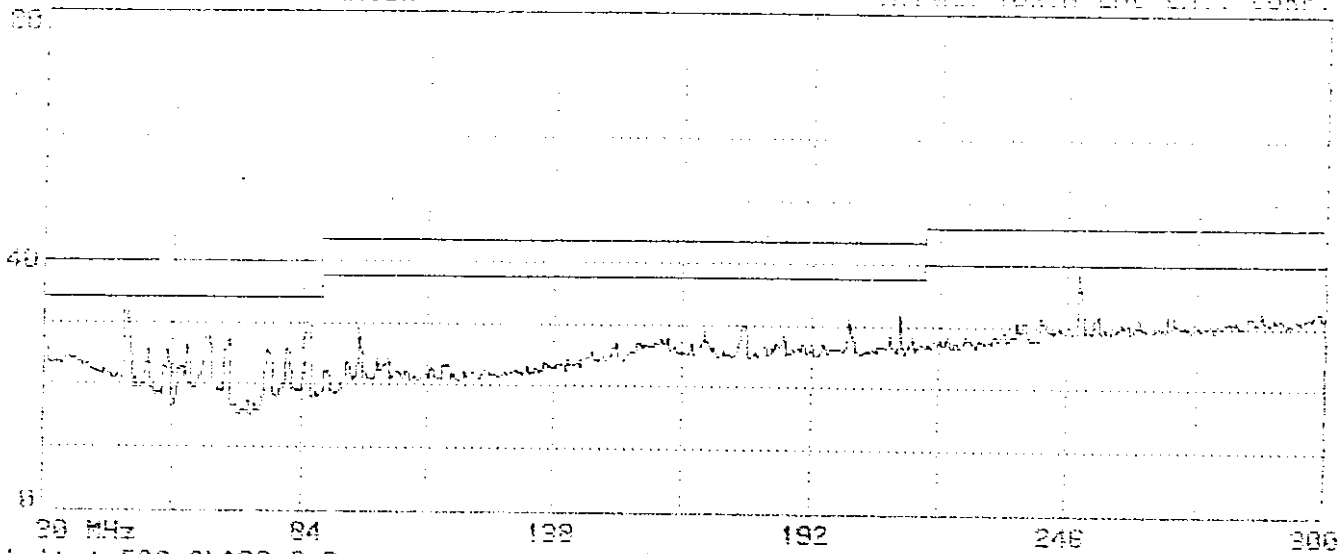

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1754HM Power: 120VAC/60Hz
Margin: 6dB Standard: 0 Trace: 1427, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 3.0m 0-SUB

Page#: 1428 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:46:55
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



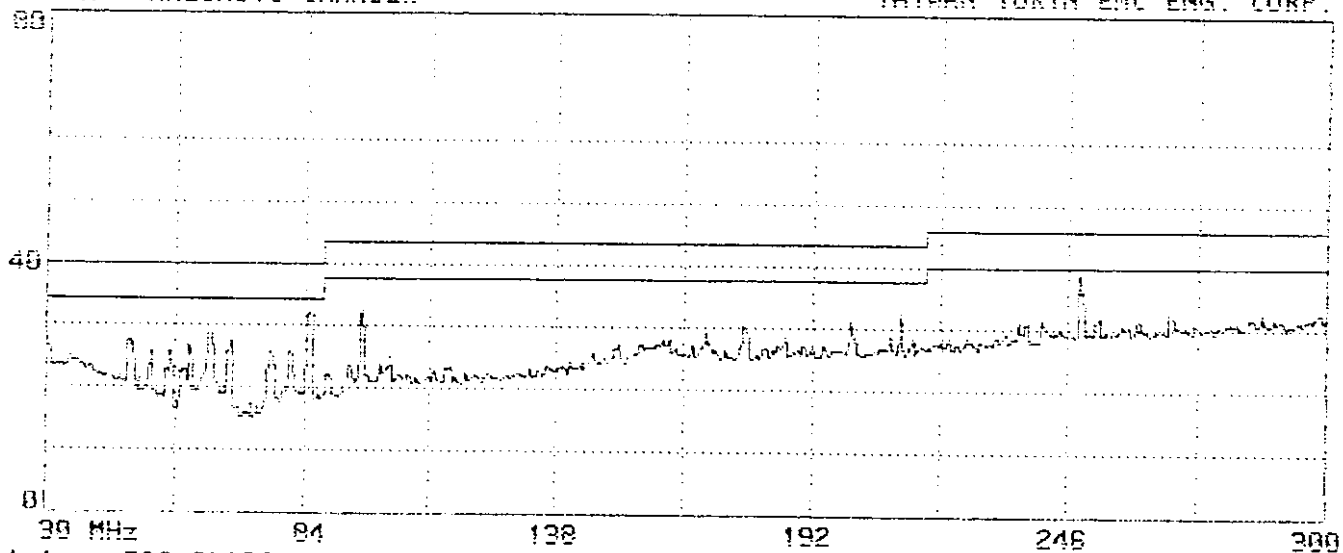

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-D1754HM Power: 120VAC/60Hz
Margin: 6dB Standard: 0 Trace: 1428, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 3.0m 0-SUB

Page#: 1437 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 18:38:01
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

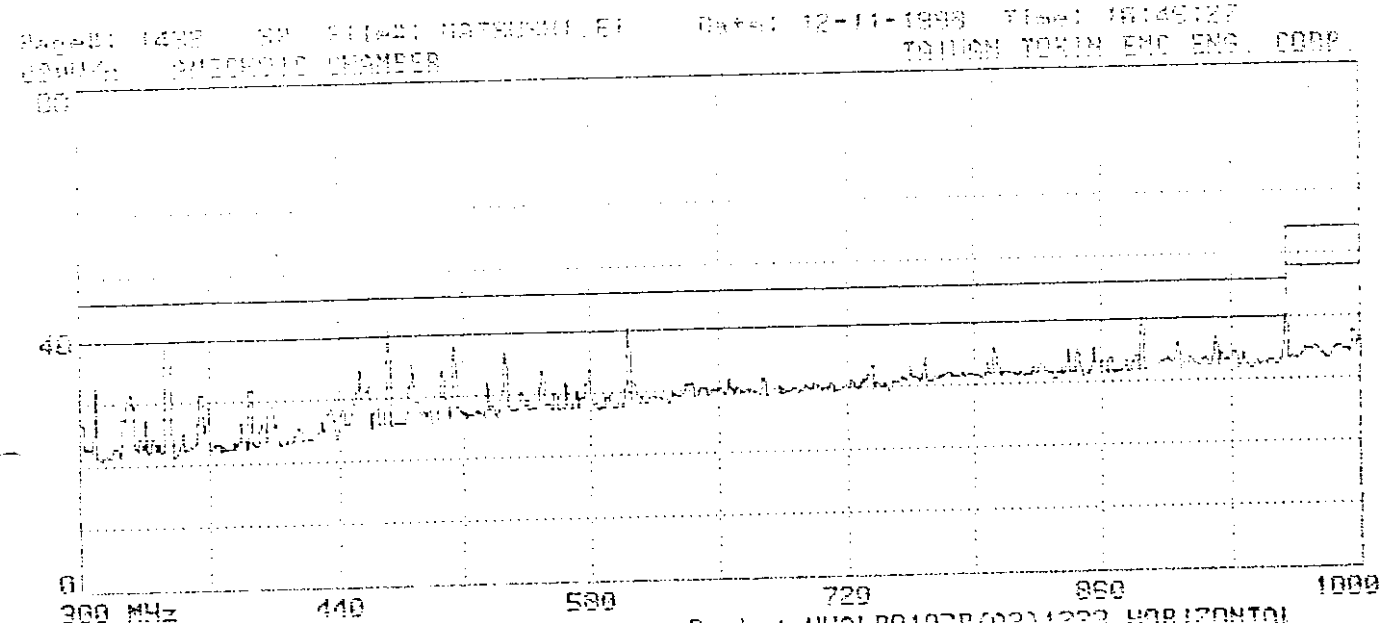



Limit : FCC CLASS-B 3m Probe: BBA9108B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-01F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1437, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m BNC

Page#: 1438 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 18:39:01
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



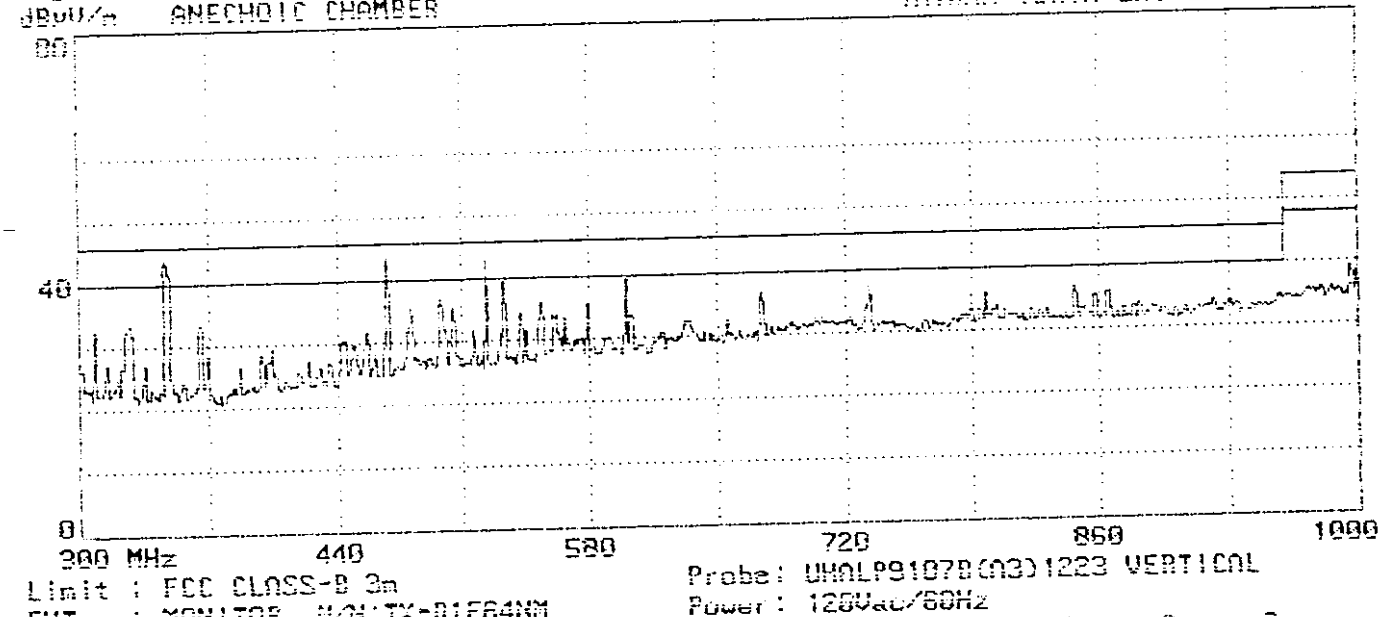

Limit : FCC CLASS-B 3m Probe: BBA9108B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-01F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1438, 0, 0, 0, 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m BNC




Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-81F64NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m BNC

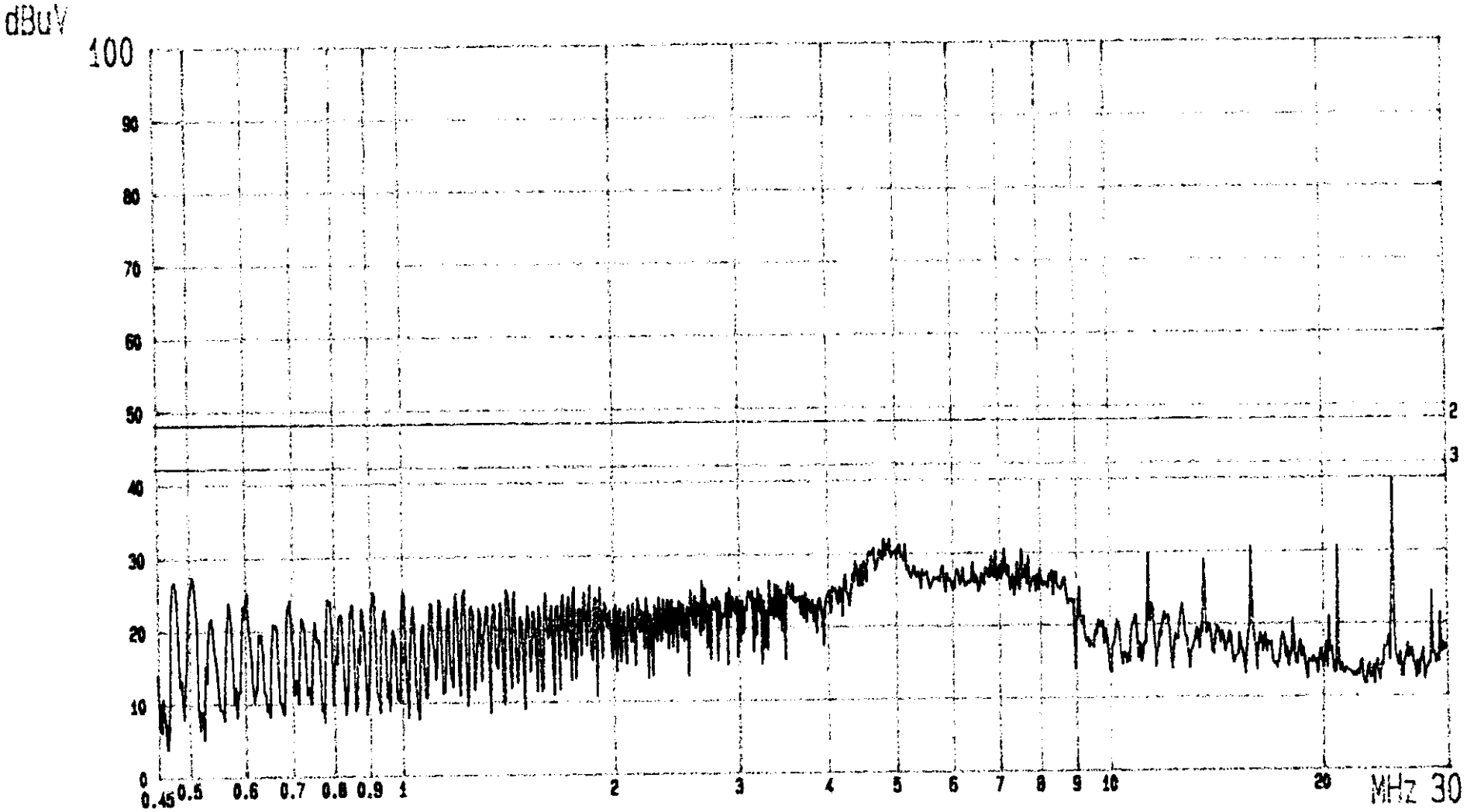
Probe: UHALP9107B(03)1222 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1439, 0, 0, 0, 0

Page#: 1440 SP File#: MATSUSHI.EI Date: 12-11-1998 Time: 10:46:55
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

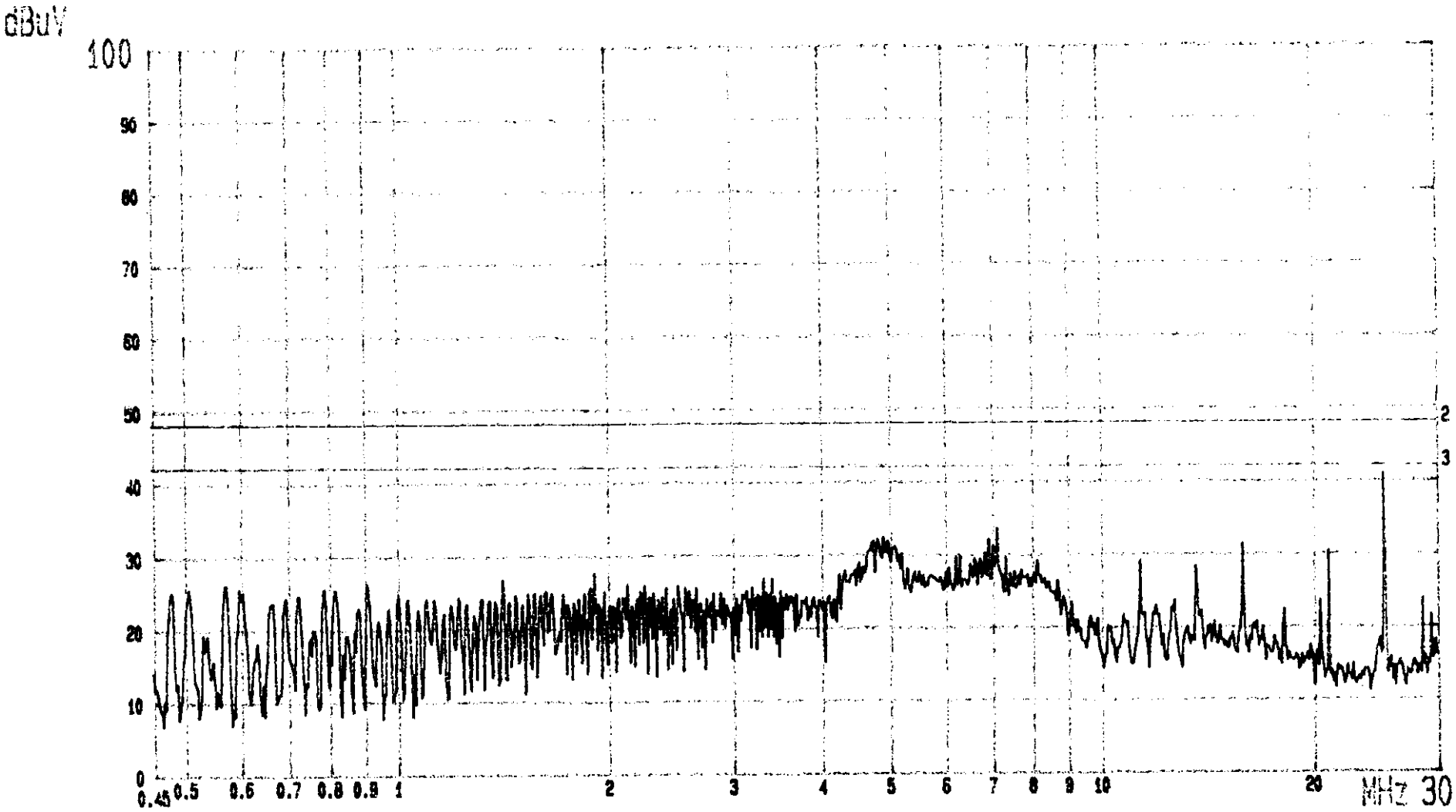



Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-81F64NM
Margin: 6dB Standard: 0
Memo : 105KHZ(1800*1400 70Hz) CABLE 1.8m BNC

Probe: UHALP9107B(03)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1440, 0, 0, 0, 0



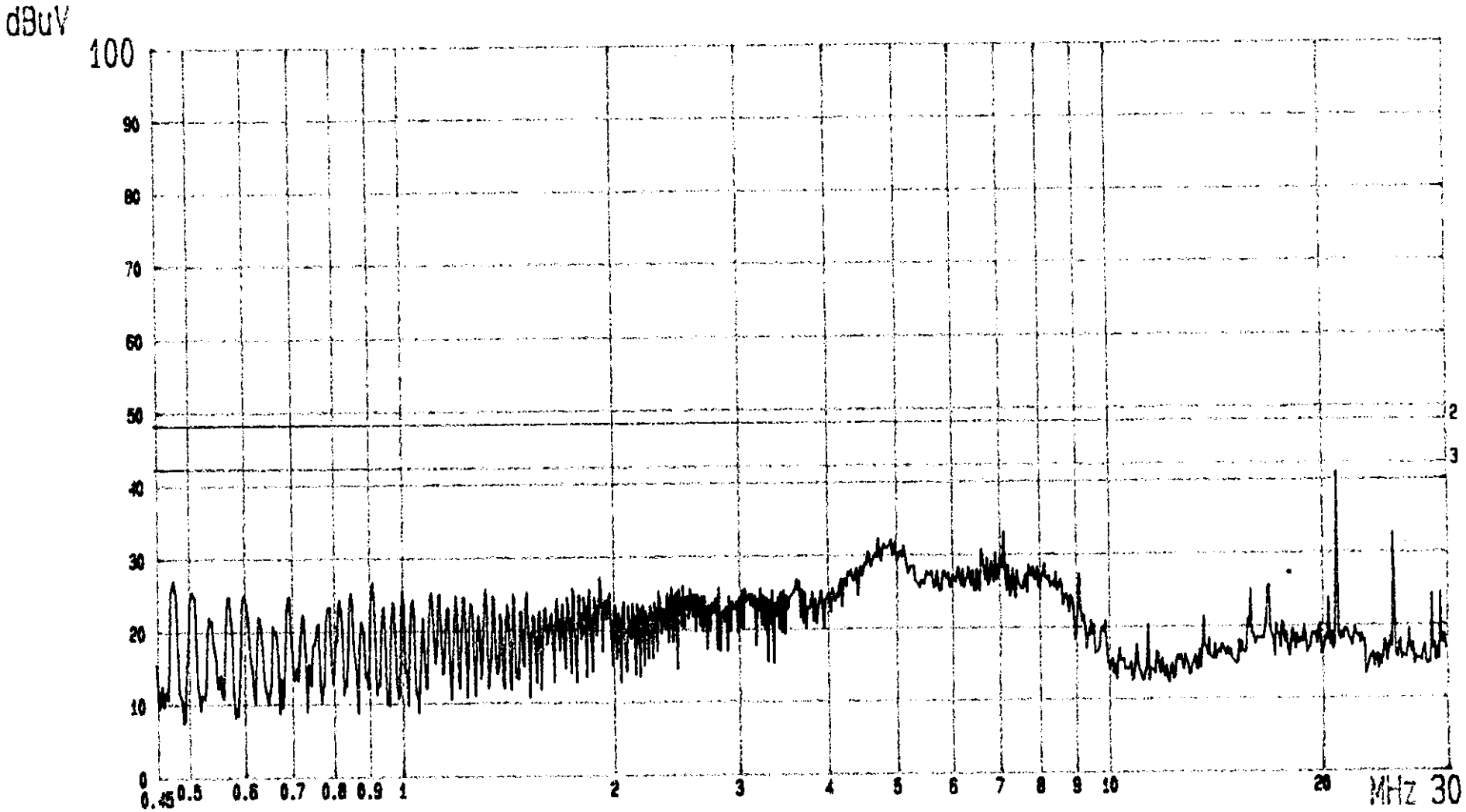

|--- Date 26.NOV.'98 Time 23:59:46
MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 011.
LINE: VA. MENO: (640X480; 31.5KHz) 3.0M D-SUB TO LISN (PEAK VALUE) TTEMC.




|--- Date 26.NOV.'98 Time 00:05:02

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 012.

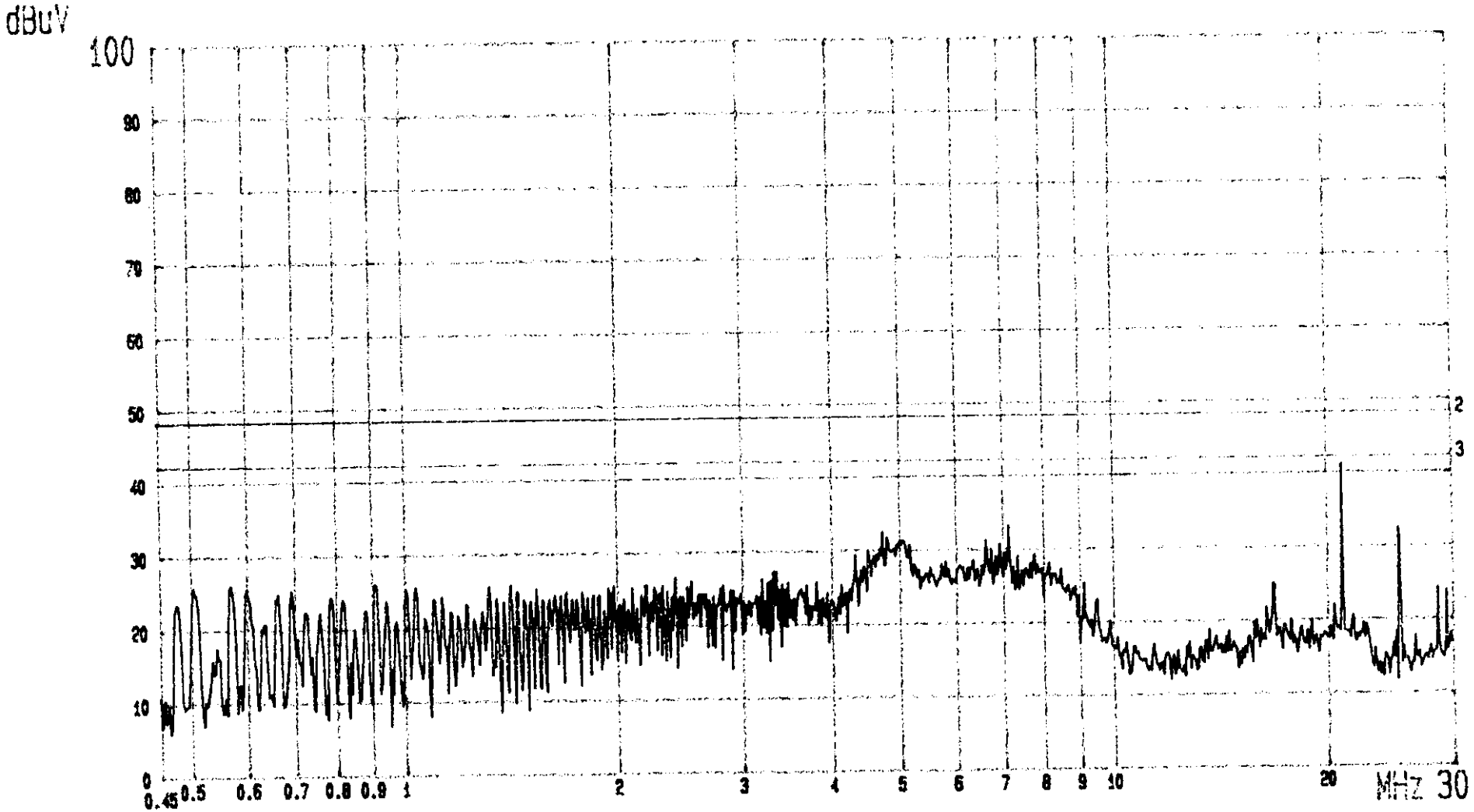
LINE: VB. MEMO: (640X480; 31.5KHz) 3.0M D-SUB TO LISN (PEAK VALUE) TTEMC.




--- Date 26.NOV.'98 Time 22:26:22

MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 010.

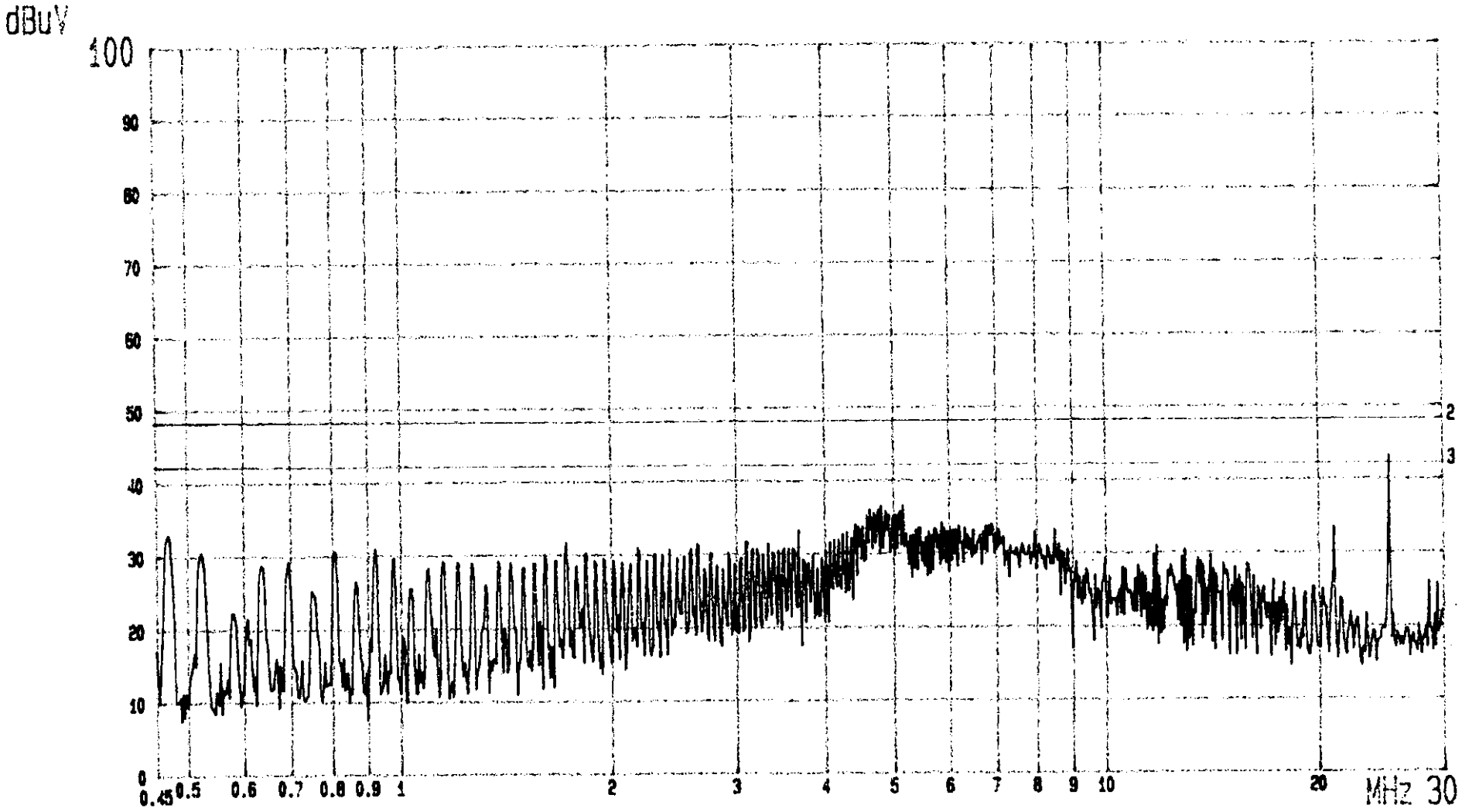
LINE: VA. MENO: (640X480; 31.5KHz) 1.8M BNC TO LISN (PEAK VALUE) TTEMC.




--- Date 26.NOV.'98 Time 22:19:04

MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 009.

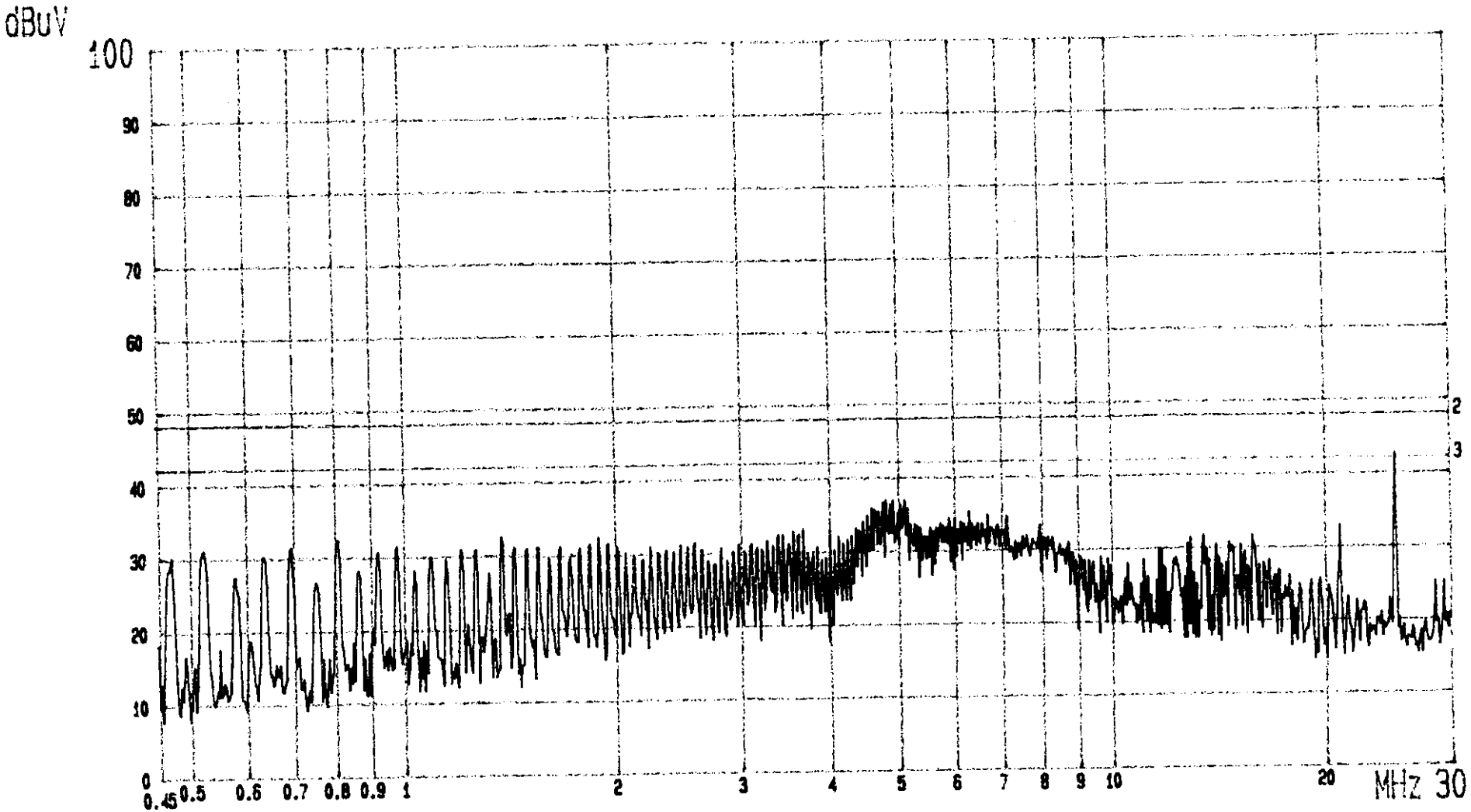
LINE: VB. MENO: (640X480; 31.5KHz) 1.8M BNC TO LISN (PEAK VALUE) TTEMC.




--- Date 26.NOV.'98 Time 20:19:24

MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 002.

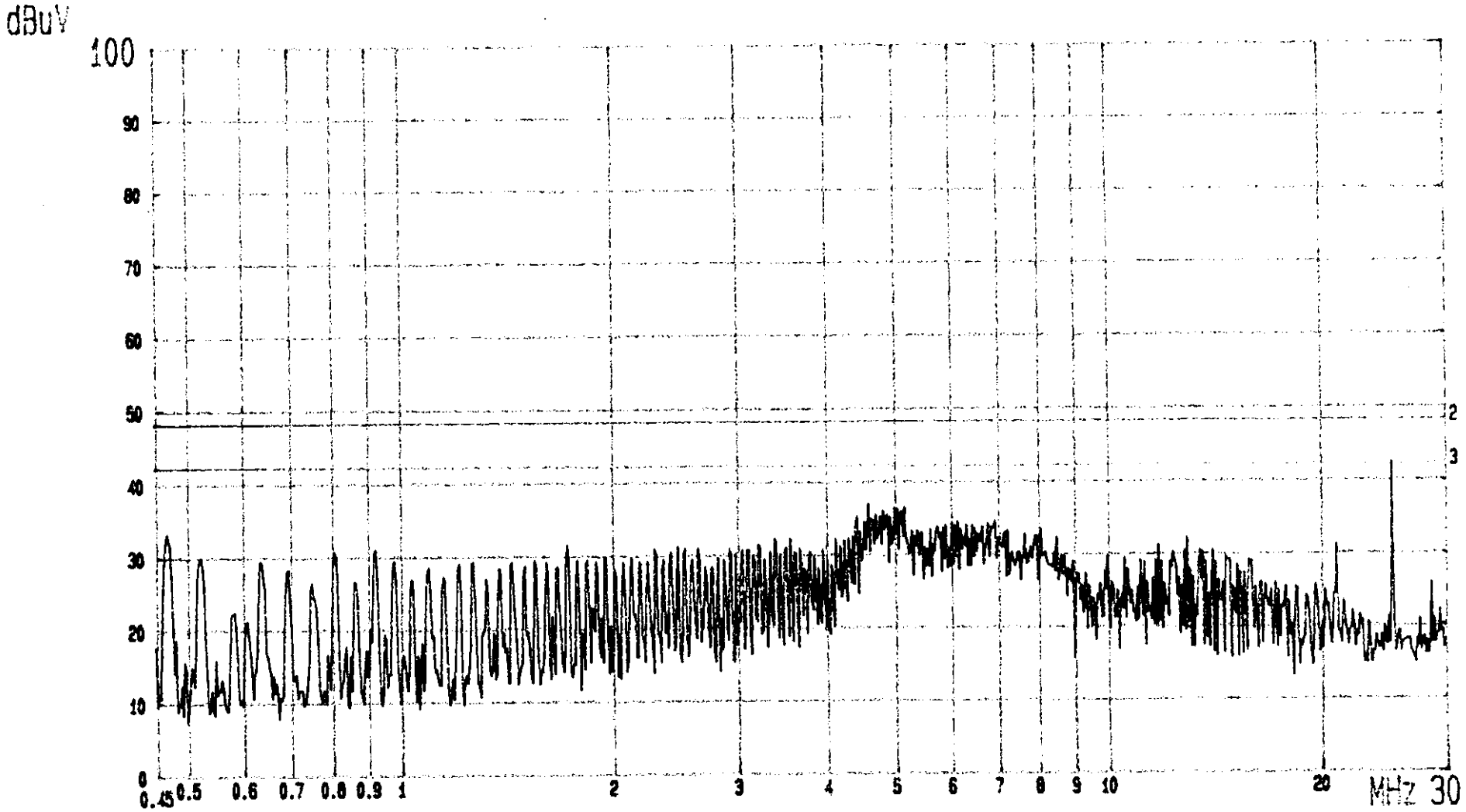
LINE: VA. MEMO: (1600X1200; 115KHz) 1.5M D-SUB TO LISN (PEAK VALUE) TTEMC.



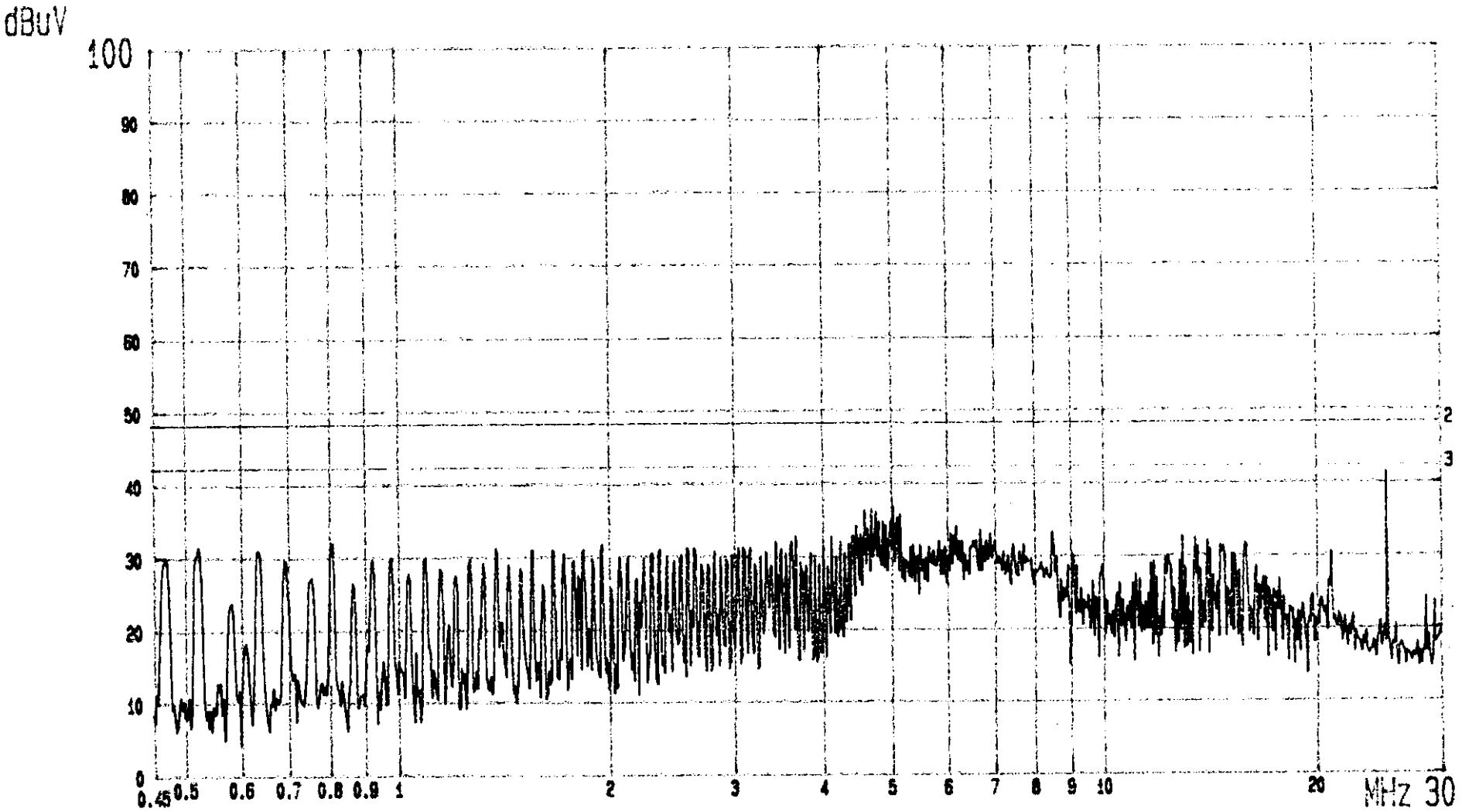

--- Date 26.NOV.'98 Time 20:11:35

MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 001.

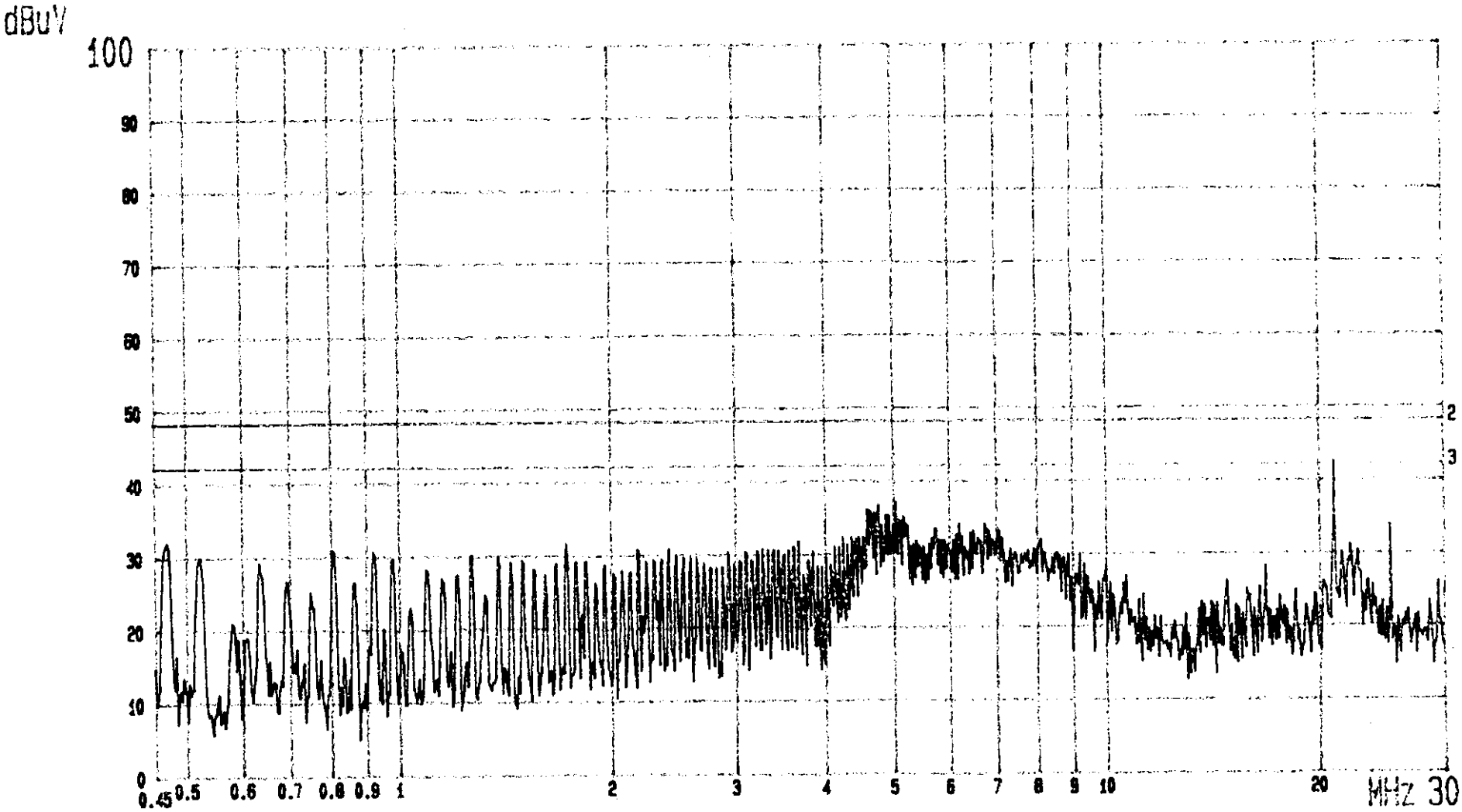
LINE: VB. MENO: (1600X1200; 115KHz) 1.5M D-SUB TO LISN (PEAK VALUE) TTEMC.




|--- Date 26.NOV.'98 Time 21:11:44
MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 006.
LINE: VA. MEMO: (1600X1200; 115KHz) 3.0M D-SUB TO LISN (PEAK VALUE) TTEMC.



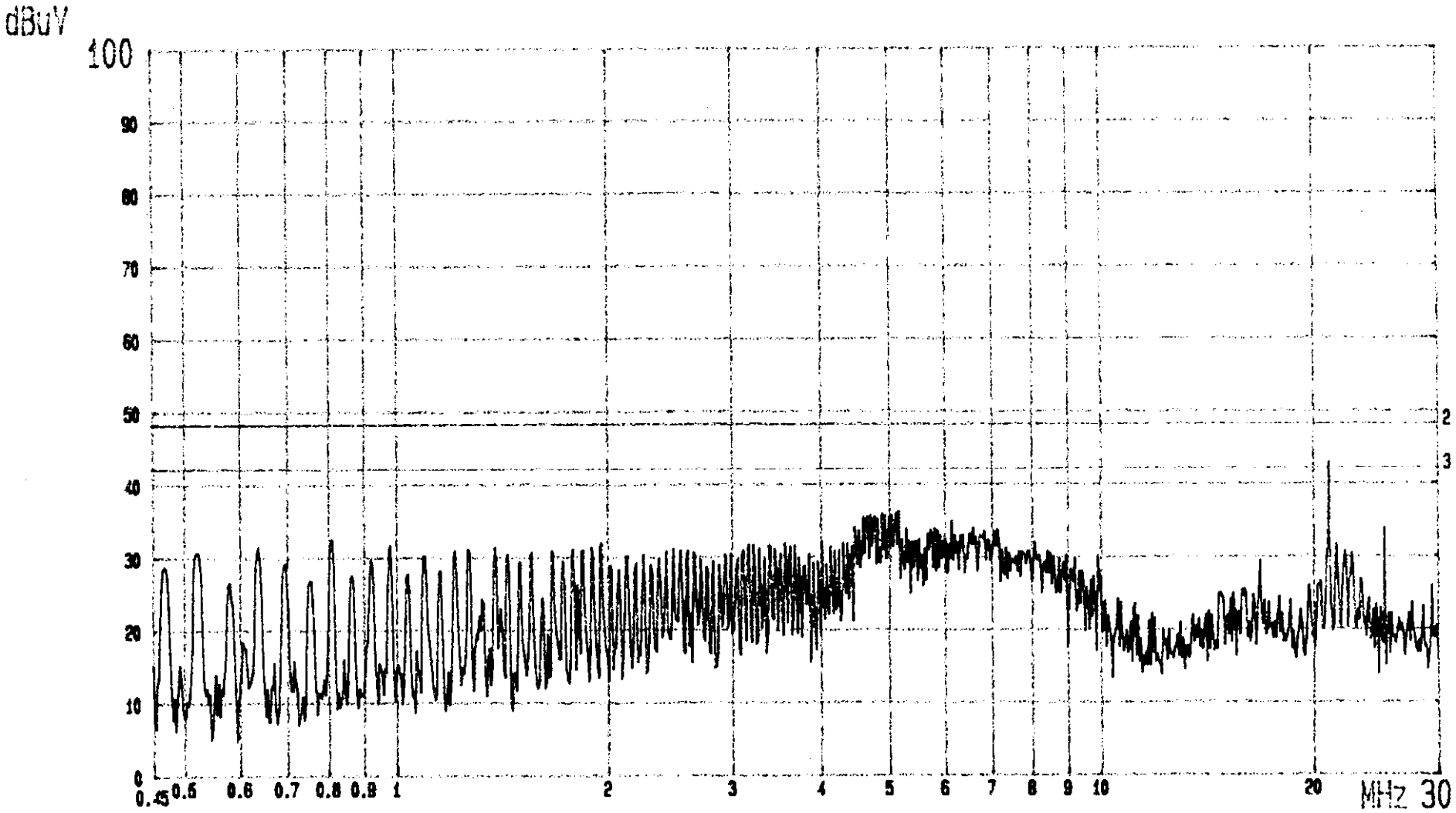

|--- Date 26.NOV.'98 Time 21:04:01
MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 005.
LINE: VB. MEMO: (1600X1200; 115KHz) 3.0M D-SUB TO LISN (PEAK VALUE) TTEMC.




(--- Date 26.NOV.'98 Time 21:56:25

MATSUSHITA EUT: MONITOR M/M: TX-D1F64NM PAGE: 007.

LINE: VA. MEMO: (1600X1200; 115KHz) 1.8M BNC TO LISN (PEAK VALUE) TTEMC.



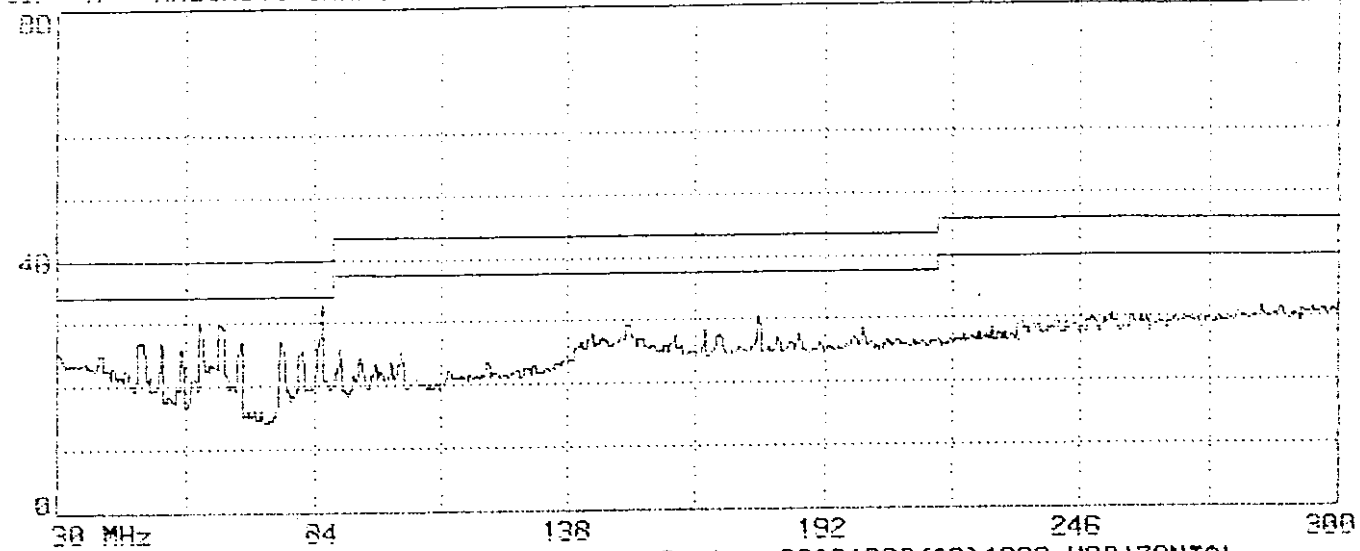

--- Date 26.NOV.'98 Time 22:02:01

MATSUSHITA EUT: MONITOR M/N: TX-D1F64NM PAGE: 008.

LINE: VB. MENO: (1600X1200; 115KHz) 1.8M BNC TO LISN (PEAK VALUE) TTEMC.

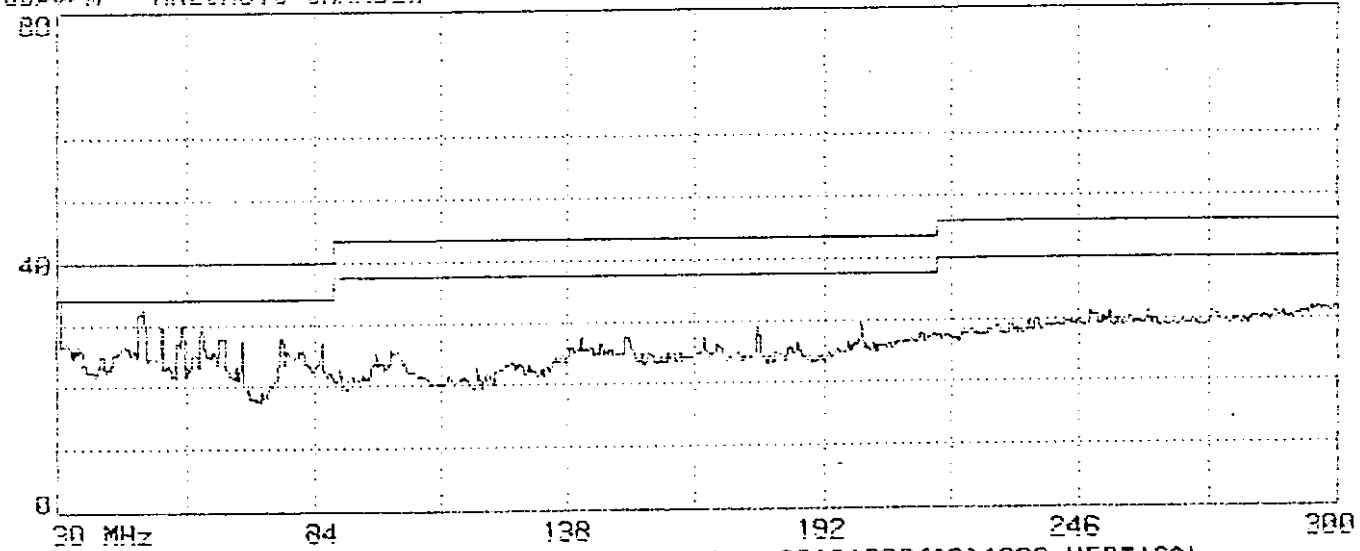
# APPENDIX II

Page#: 1395 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:10:04
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



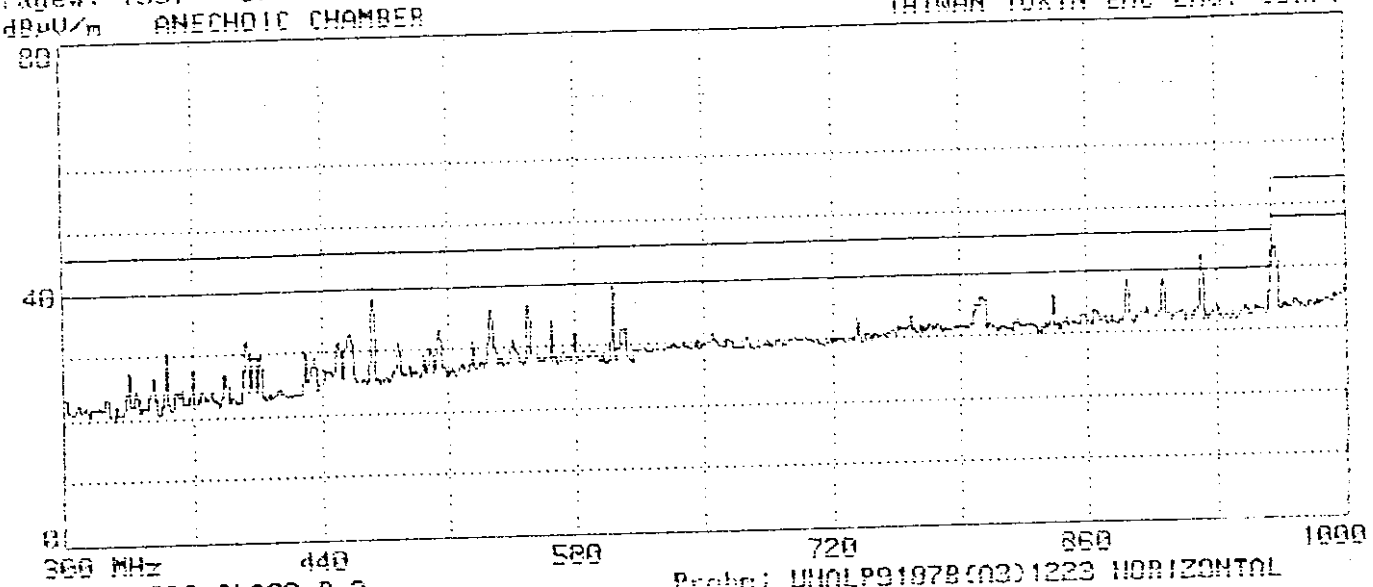

Limit : FCC CLASS-B 3m Probe: BBA9108B(A3)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F64NN Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1395, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.5m D-SUB

Page#: 1396 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:11:53
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



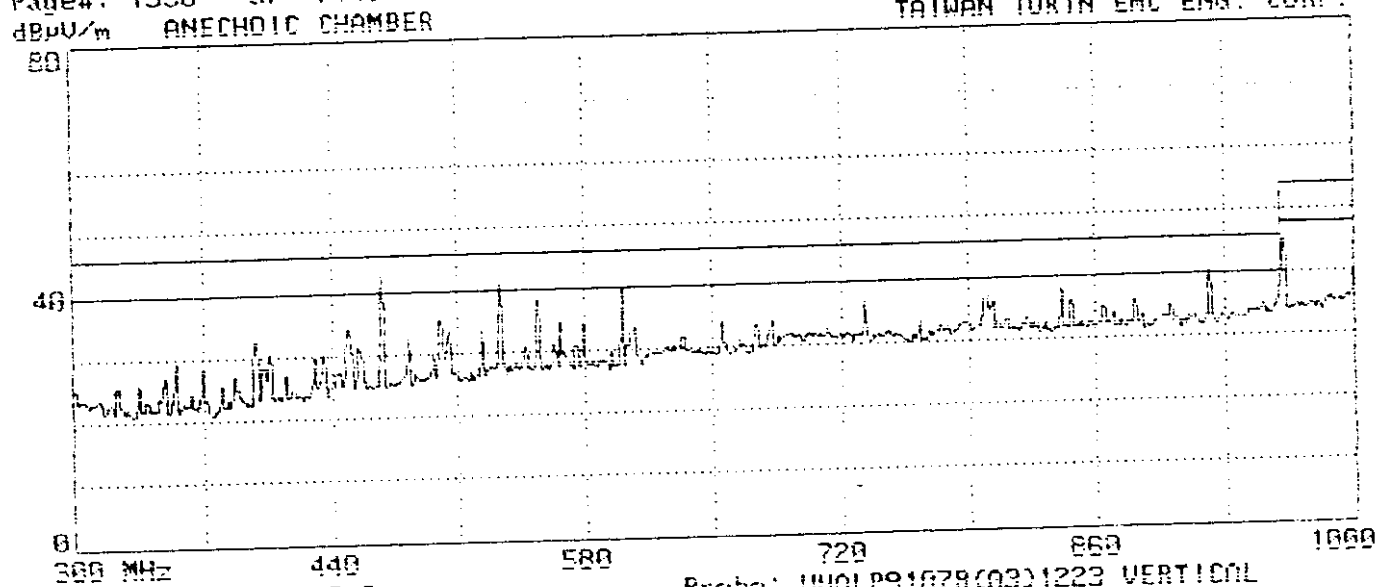

Limit : FCC CLASS-B 3m Probe: BBA9108B(A3)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F64NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1396, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.5m D-SUB

Page#: 1397 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 11:38:46
TAIWAN TOKIN EMC ENG. CORP.



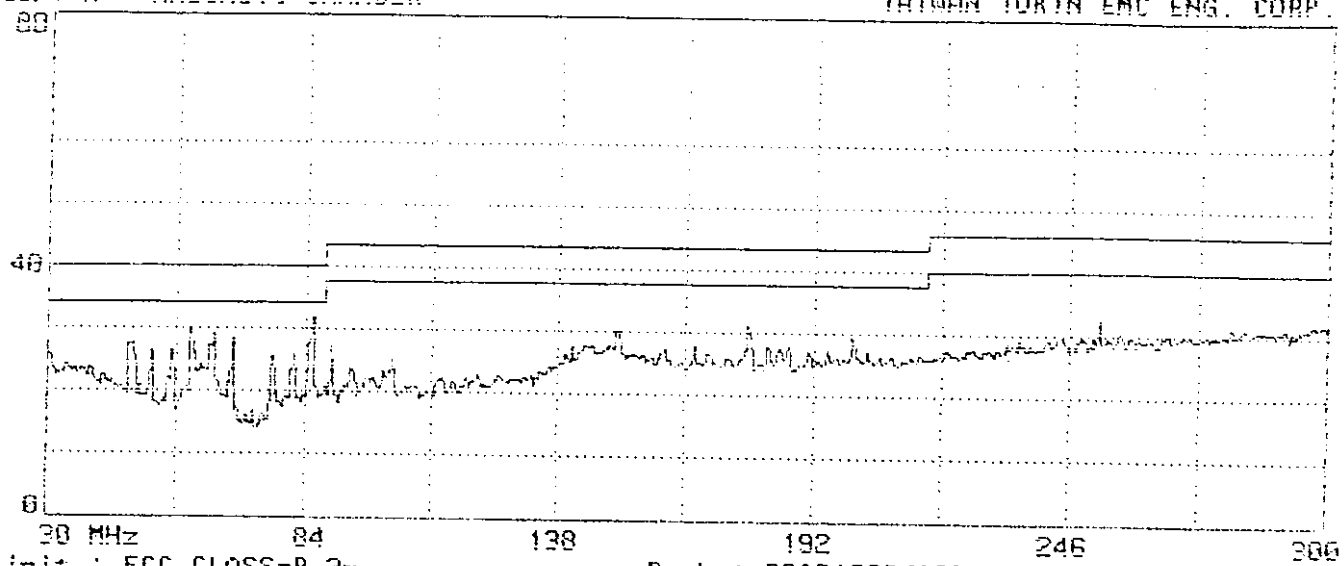

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.5m D-SUB
Probe: UHOLP91078(03)1223 HORIZONTOL
Power : 120Vac/60Hz
Trace: 1397, 0, 0, 0, 0

Page#: 1398 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 11:40:35
TAIWAN TOKIN EMC ENG. CORP.



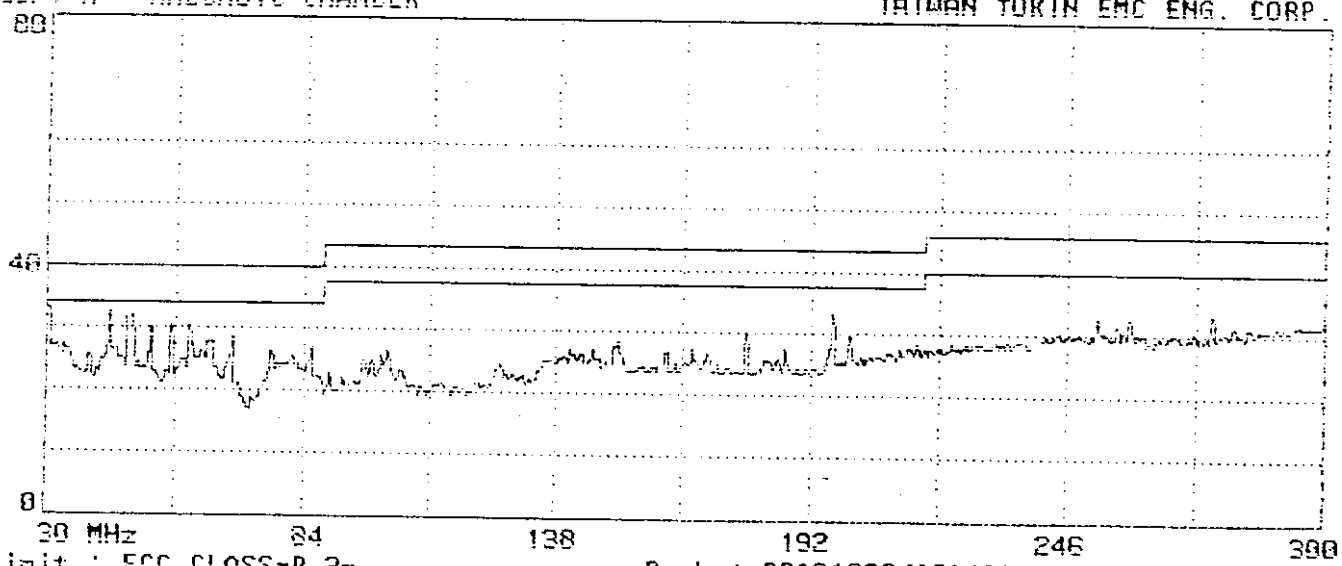

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.5m D-SUB
Probe: UHOLP91078(03)1223 VERTICOL
Power : 120Vac/60Hz
Trace: 1398, 0, 0, 0, 0

Page#: 1399 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:35:26
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



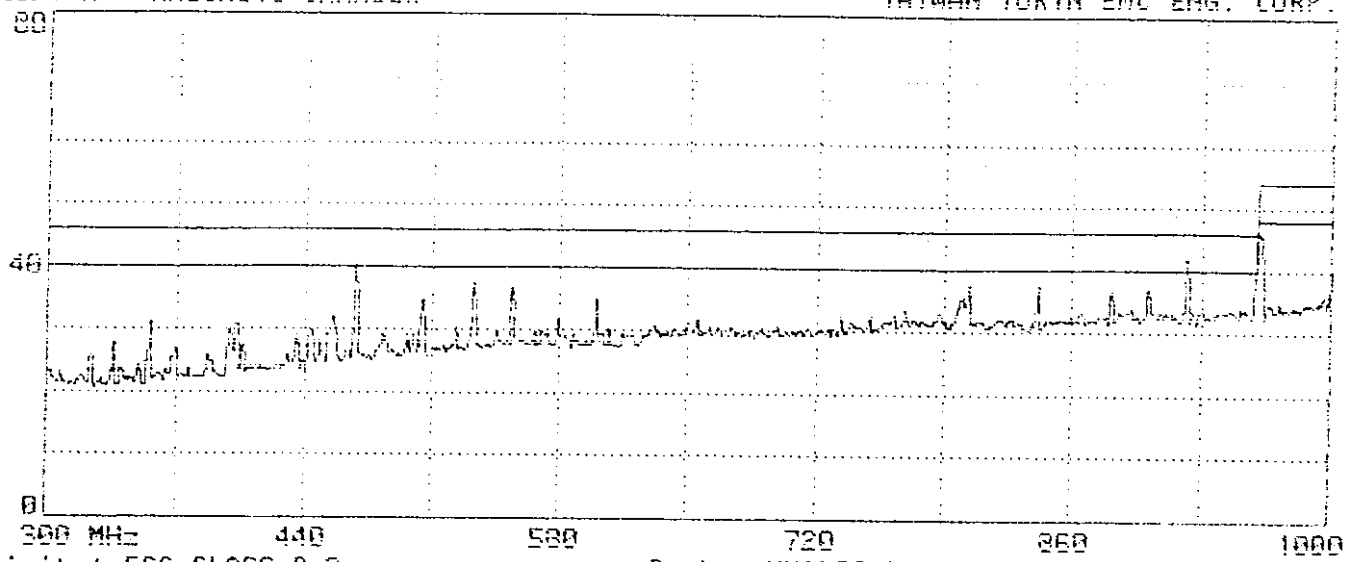

Limit : FCC CLASS-B 3m Probe: BBA9168B(A3)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1399, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m D-SUB

Page#: 1400 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:37:17
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



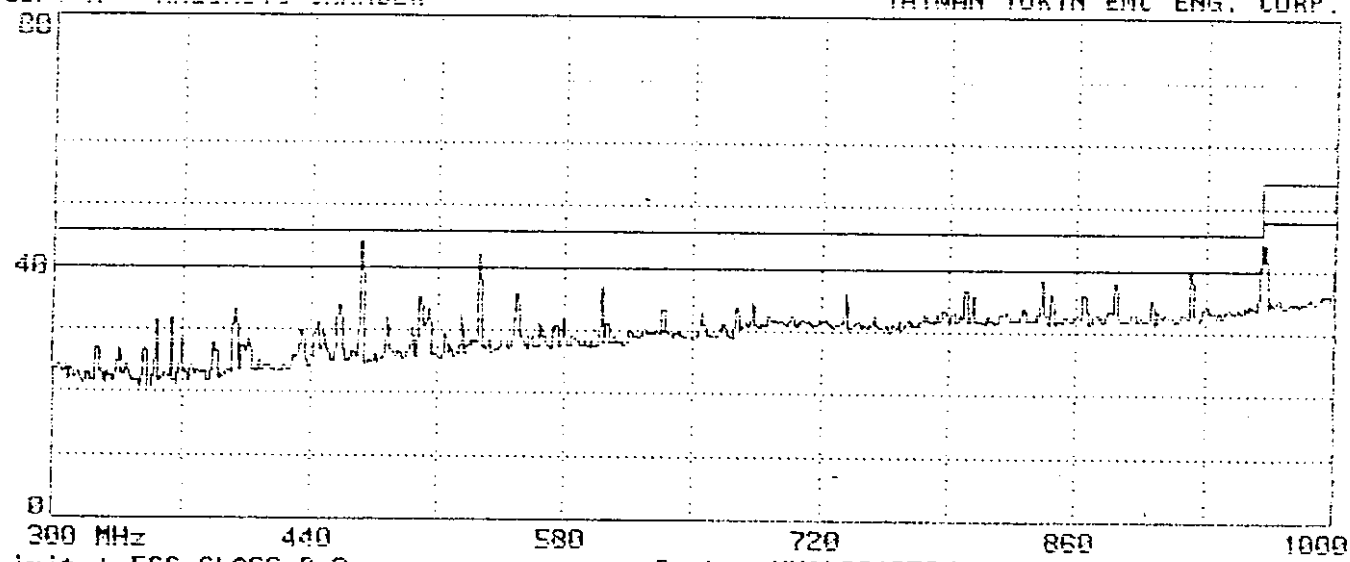

Limit : FCC CLASS-B 3m Probe: BBA9168B(A3)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1400, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m D-SUB

Page#: 1401 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:41:46
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



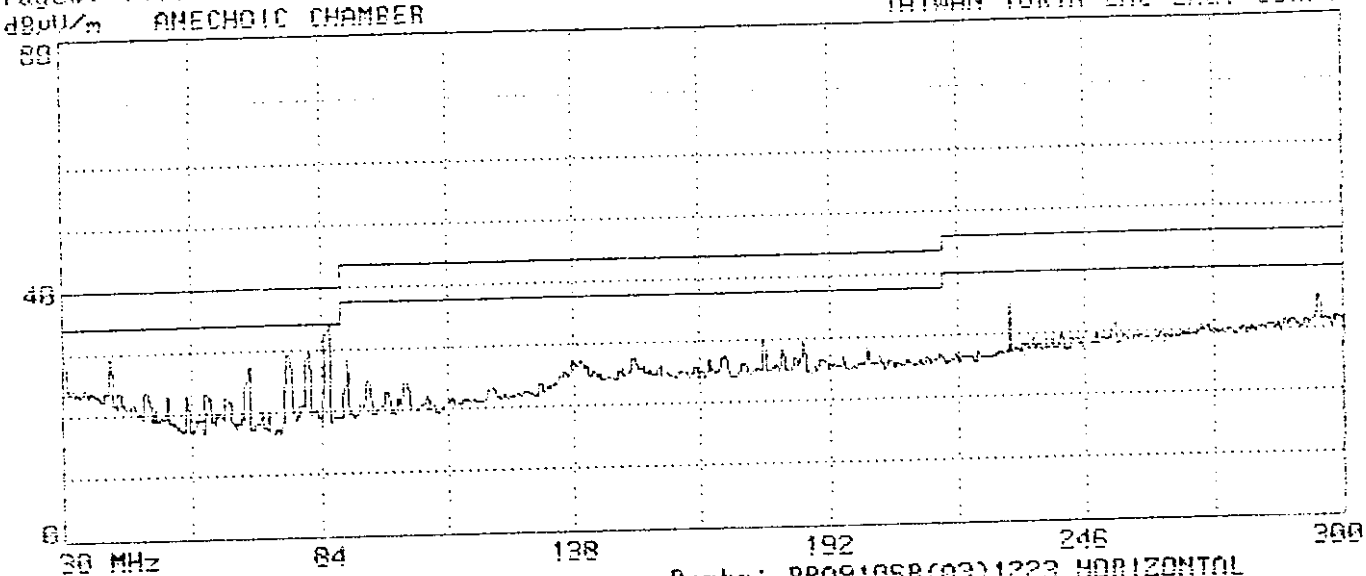

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1FB4HM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1401, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m D-SUB

Page#: 1402 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:43:50
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



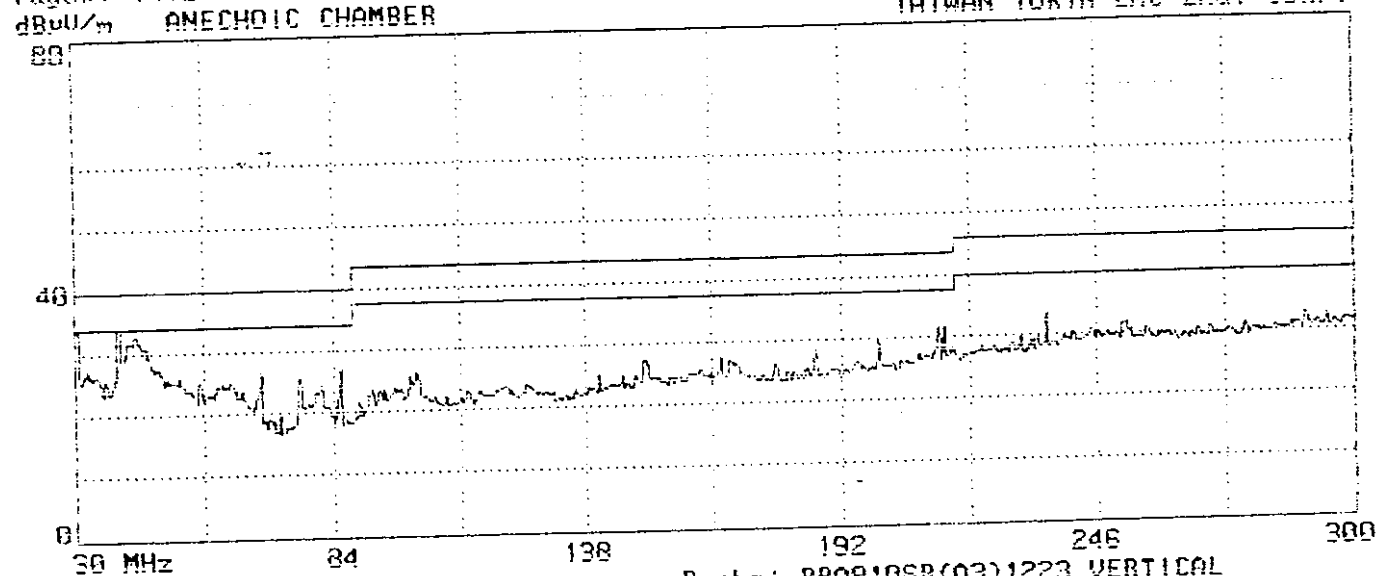

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-D1FB4HM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1402, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m D-SUB

Page#: 1411 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:20:05
TAIWAN TOKIN EMC ENG. CORP.
dBuV/m ANECHOIC CHAMBER



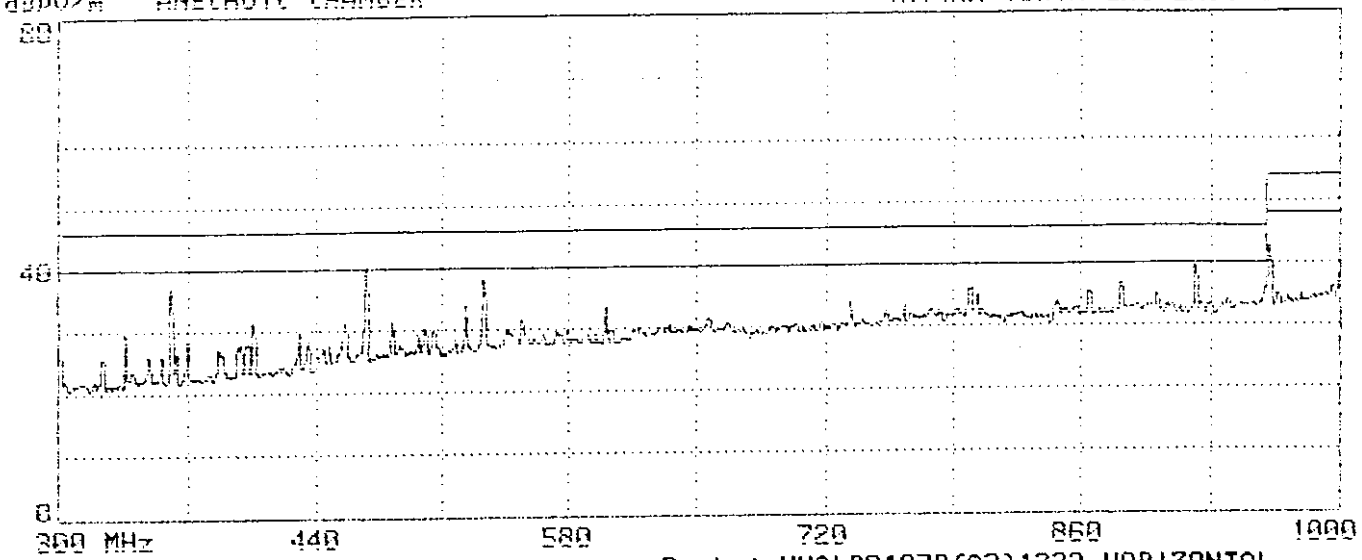

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: B
Memo : 31.5KHZ(640*480 60Hz) CABLE 3.0m D-SUB
Probe: BBA9108B(03)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1411, 0, 0, 0, 0

Page#: 1412 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:21:53
TAIWAN TOKIN EMC ENG. CORP.
dBuV/m ANECHOIC CHAMBER



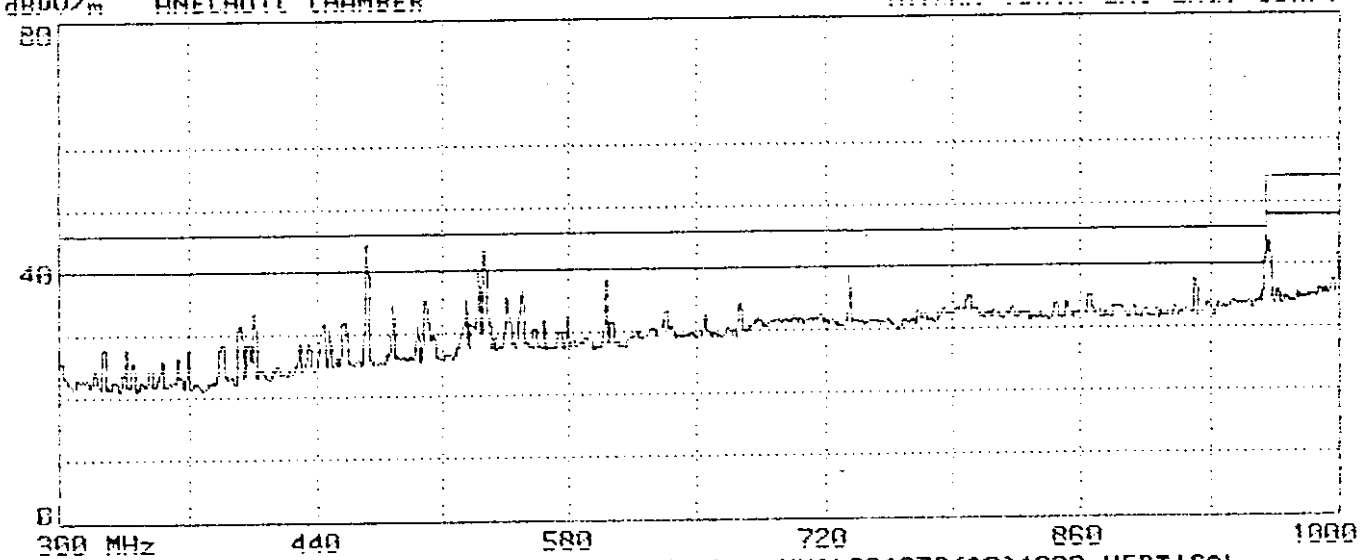

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: B
Memo : 31.5KHZ(640*480 60Hz) CABLE 3.0m D-SUB
Probe: BBA9108B(03)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1412, 0, 0, 0, 0

Page#: 1413 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:25:25
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



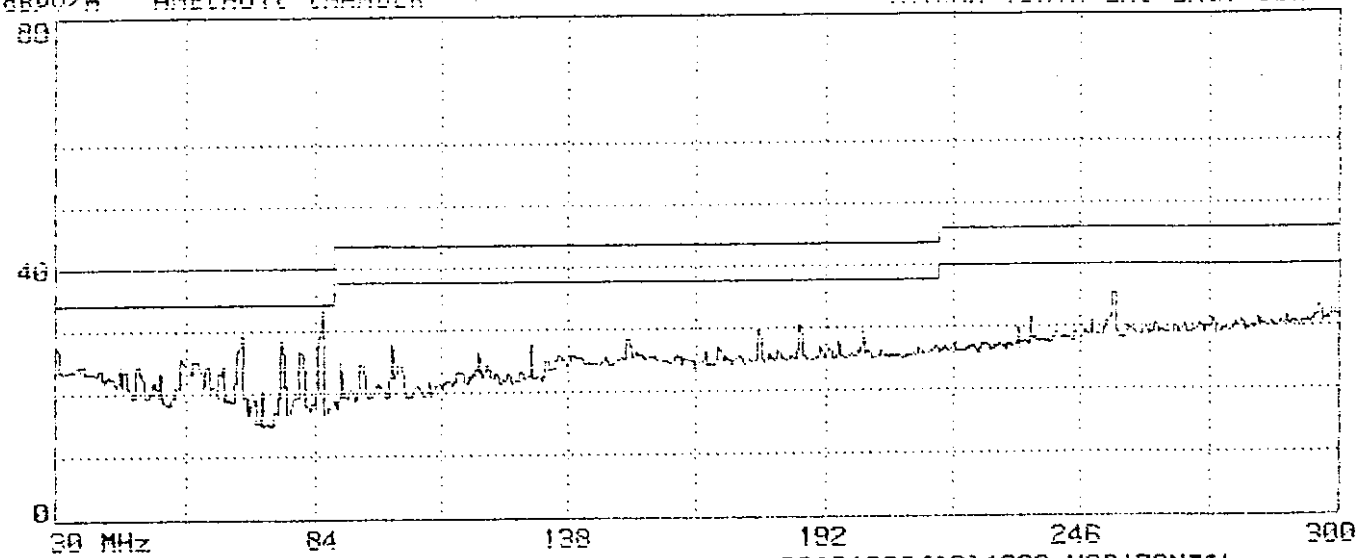

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1413, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 3.0m D-SUB

Page#: 1414 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:27:12
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



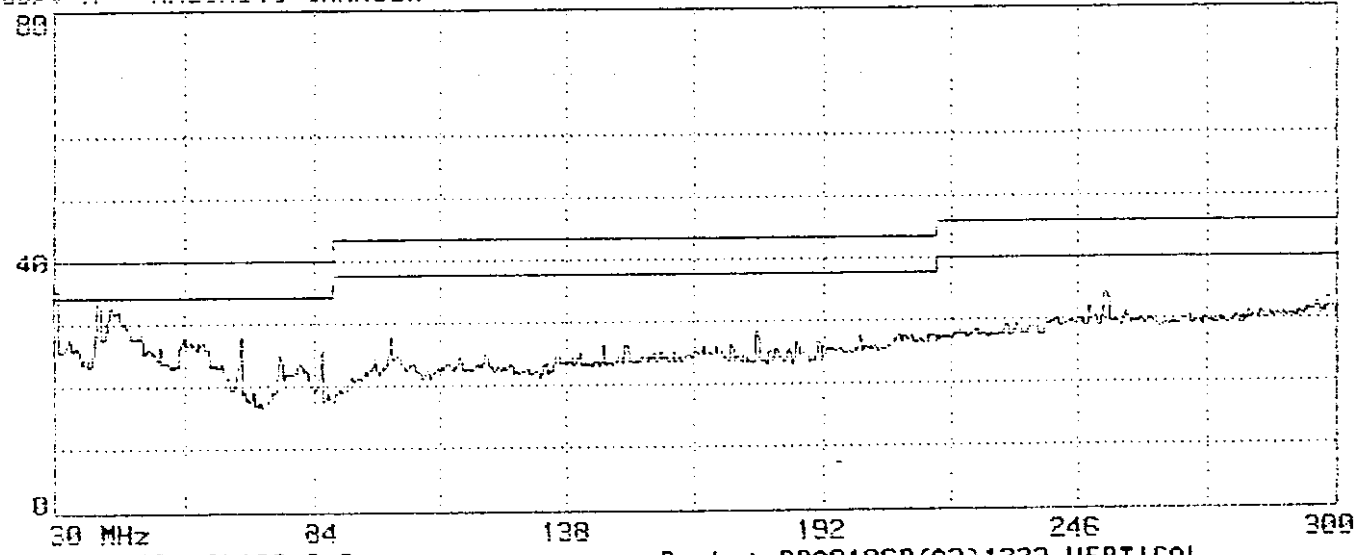

Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1414, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 3.0m D-SUB

Page#: 1417 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:46:46
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



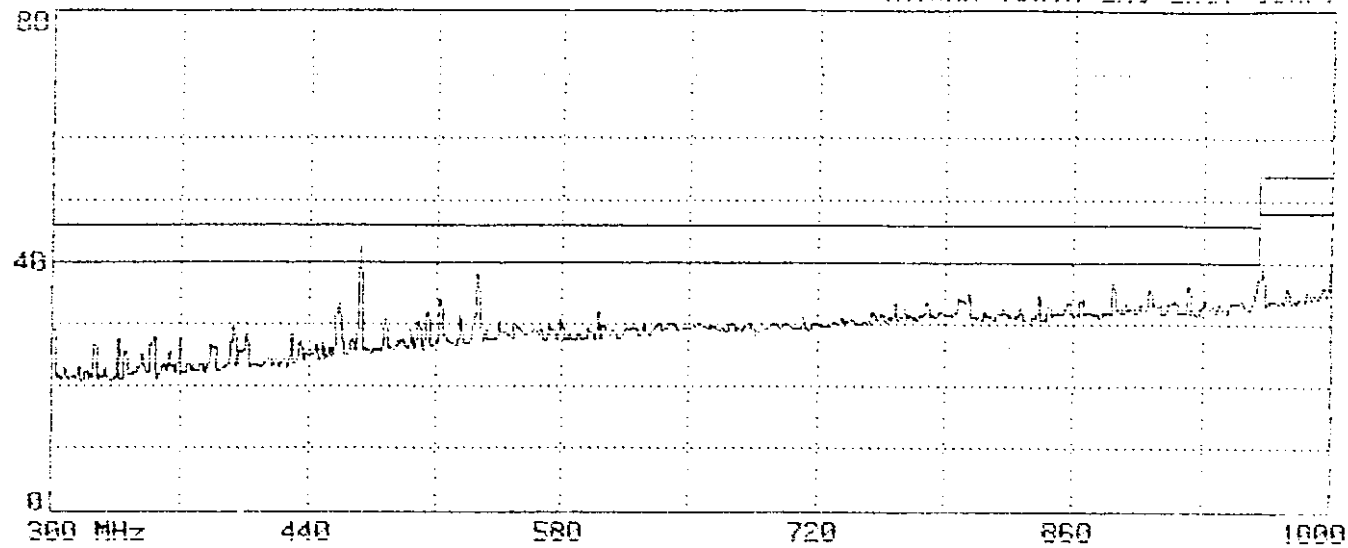

Limit : FCC CLASS-B 3m Probe: BBA9168B(A3)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F64NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1417, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m BNC

Page#: 1418 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:48:34
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



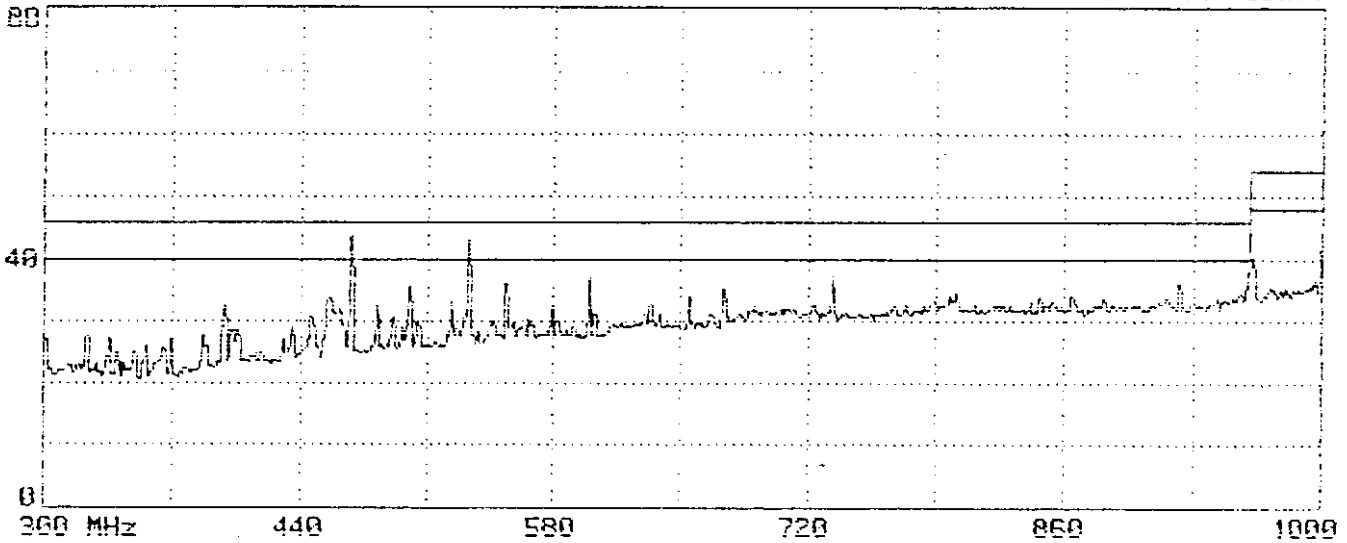

Limit : FCC CLASS-B 3m Probe: BBA9168B(A3)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F64NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1418, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m BNC

Page#: 1415 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:41:07
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



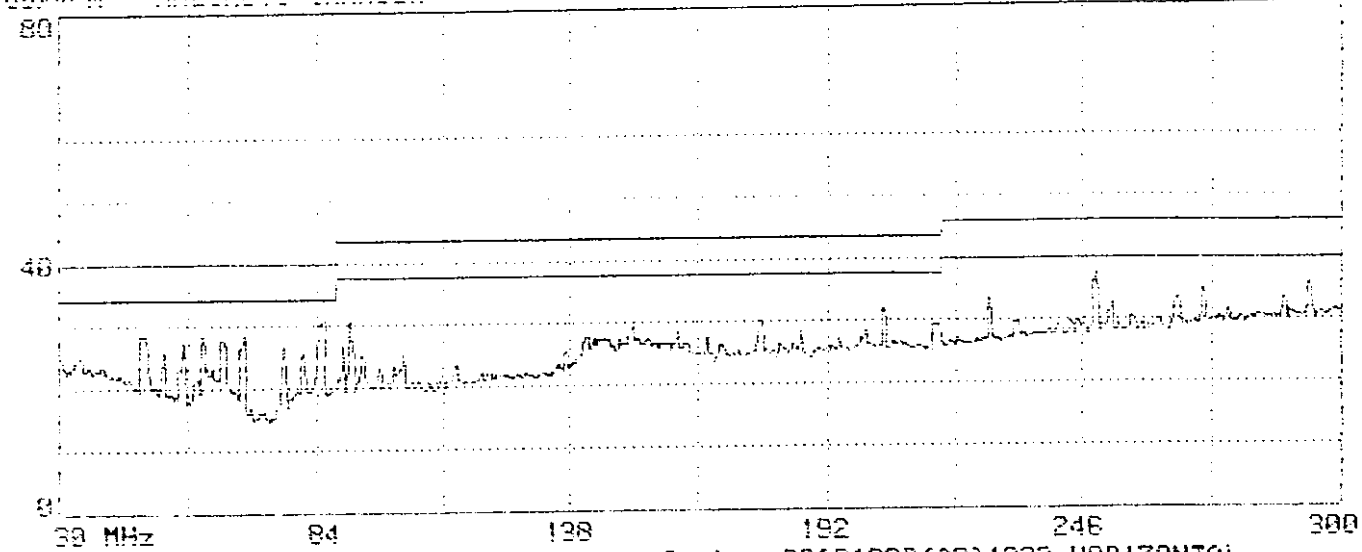

Limit : FCC CLASS-B 3m Probe: UHALP91078(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-B1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1415, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m BNC

Page#: 1416 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:42:56
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



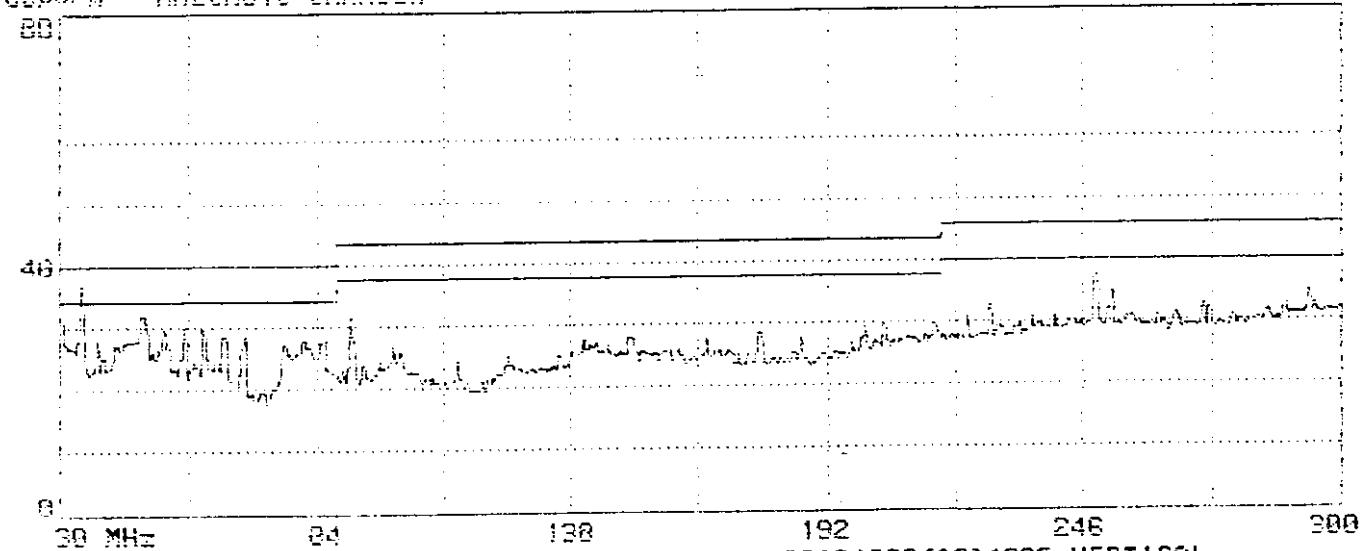

Limit : FCC CLASS-B 3m Probe: UHALP91078(03)1223 VERTICAL
EUT : MONITOR M/N:TX-B1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1416, 0, 0, 0, 0
Memo : 31.5KHZ(640*480 60Hz) CABLE 1.8m BNC

Page#: 1391 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 11:55:43
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



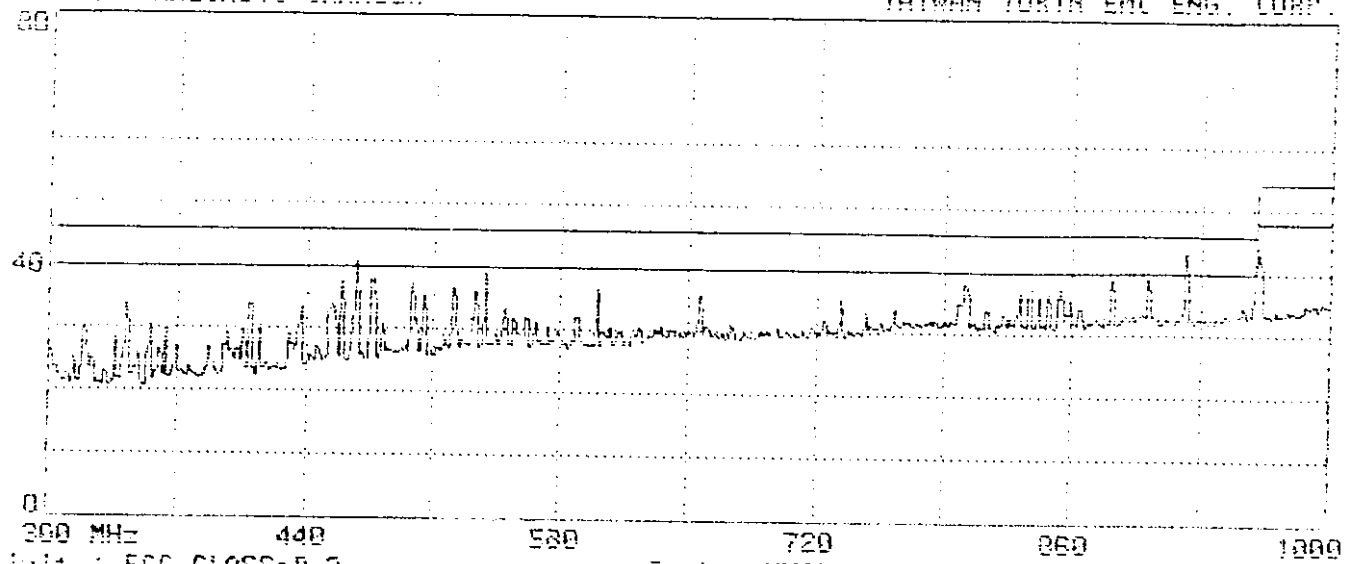

Limit : FCC CLASS-B 3m Probe: BBN9108B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-B1F84NM Power: 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1391, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.5m 0-SUB

Page#: 1392 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 11:57:32
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



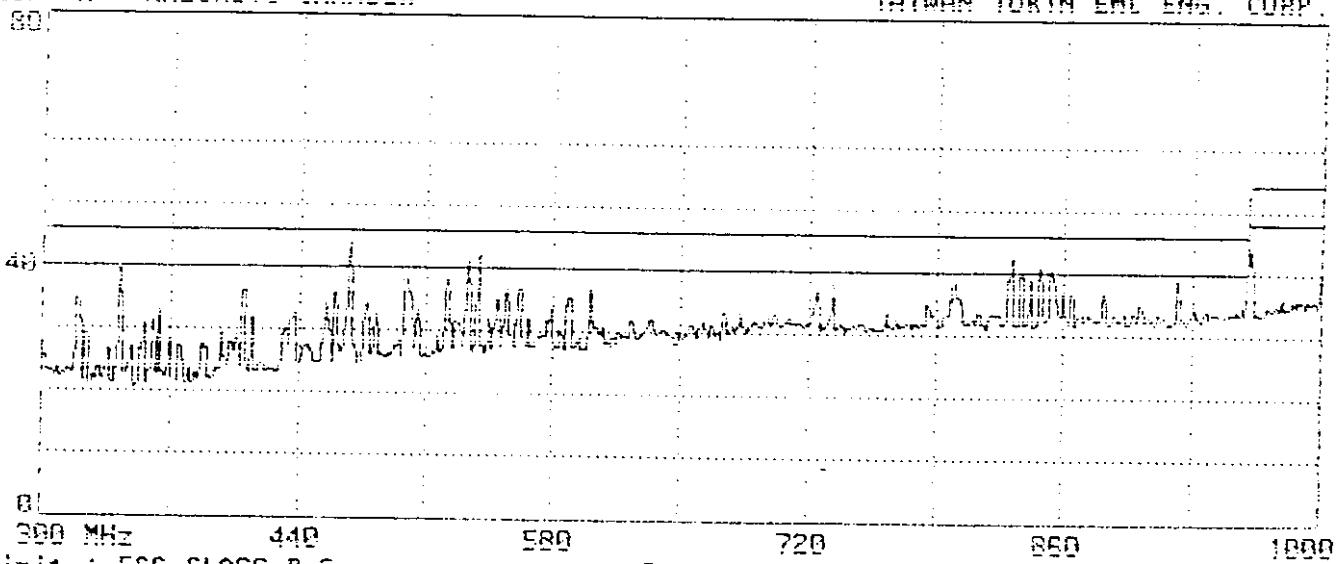

Limit : FCC CLASS-B 3m Probe: BBN9108B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-B1F84NM Power: 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1392, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.5m 0-SUB

Page#: 1393 SP File#: MATSUSHI.E1 Date: 11-19-1998 Time: 12:08:57
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

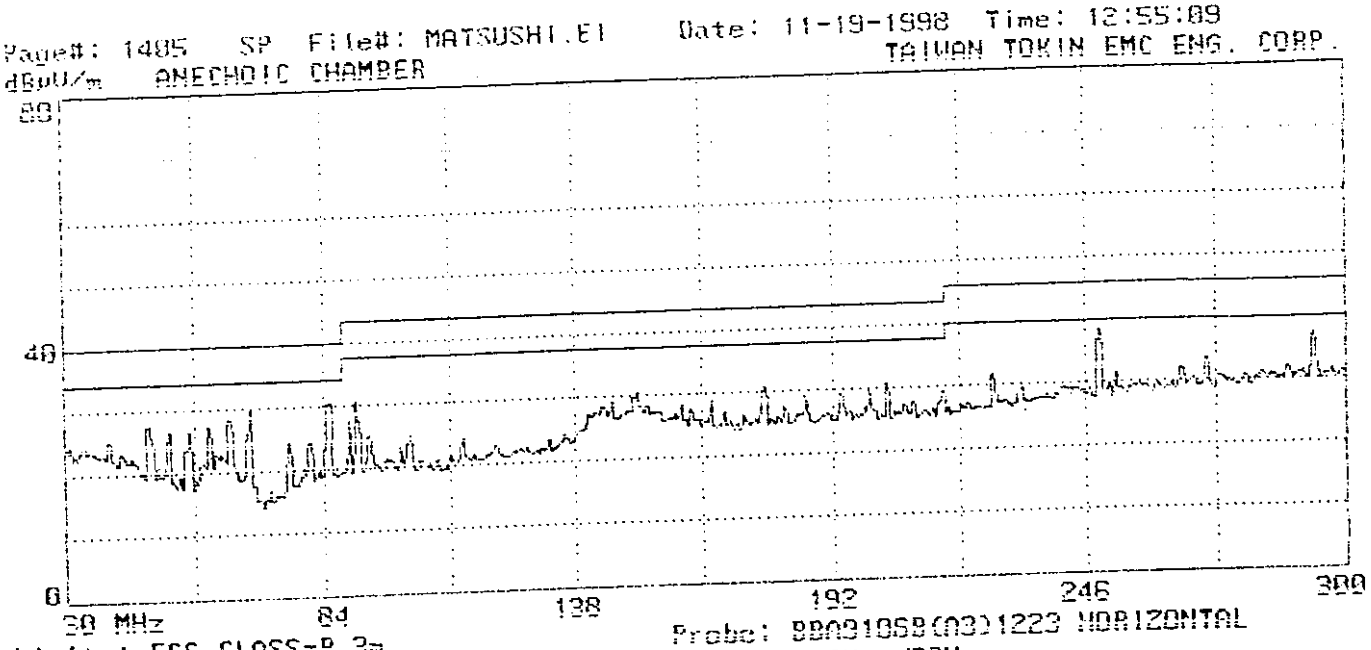


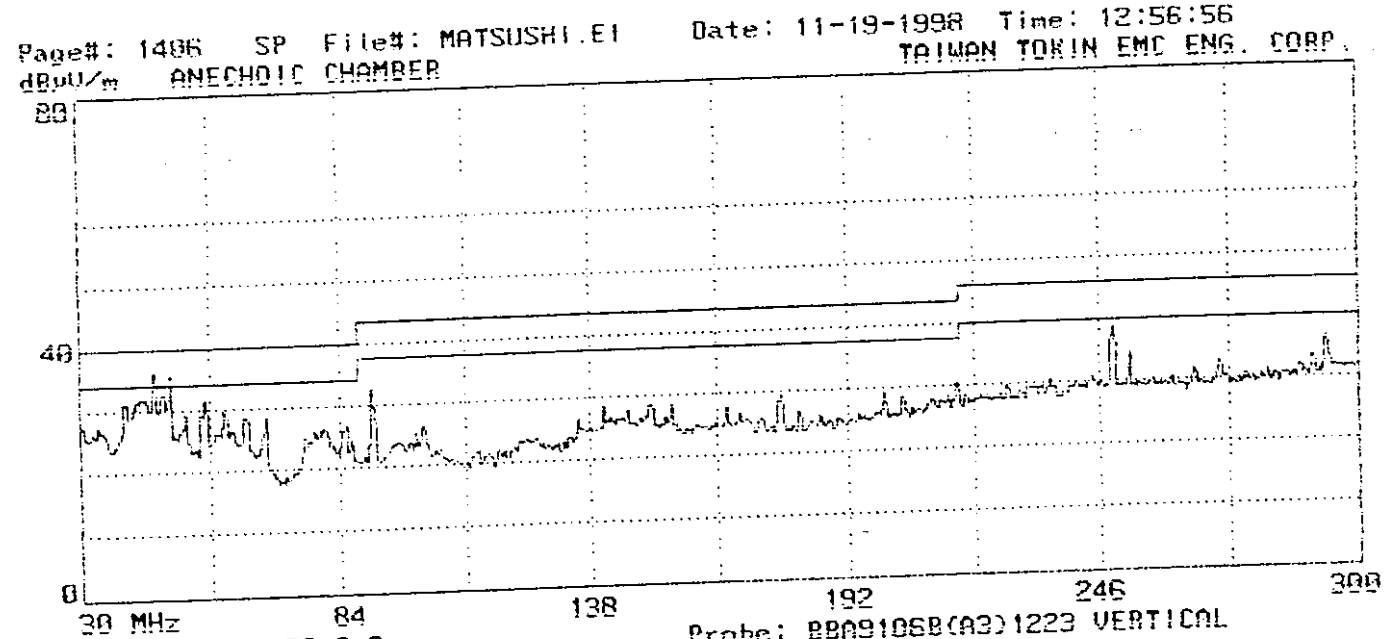

Limit : FCC CLASS-B 3m Probe: UHALP91078(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-B1FB4NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1393, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.5m D-SUB

Page#: 1394 SP File#: MATSUSHI.E1 Date: 11-19-1998 Time: 12:02:45
dBµV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

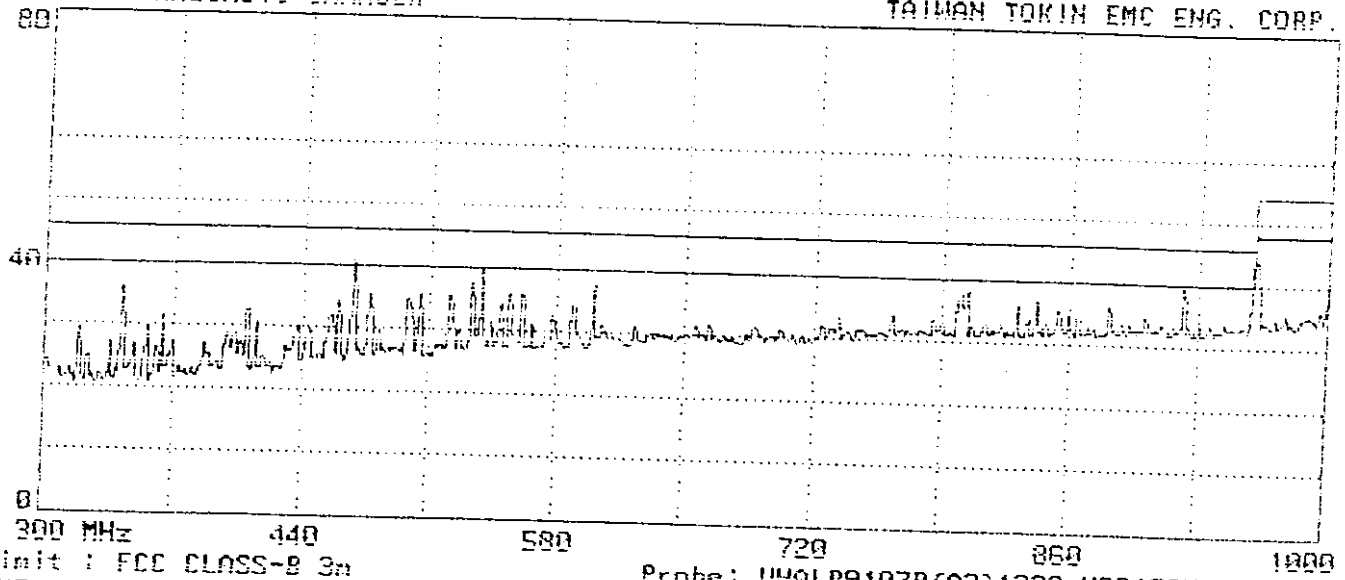



Limit : FCC CLASS-B 3m Probe: UHALP91078(03)1223 VERTICAL
EUT : MONITOR M/N:TX-B1FB4NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1394, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.5m D-SUB


Page#: 1485 SP File#: MATSUSHI.E1 Date: 11-19-1998 Time: 12:55:09
TAIWAN TOKIN EMC ENG. CORP.
dBuV/m ANECHOIC CHAMBER
80
40
0
30 MHz
84
138
192
246
300
Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m D-SUB
Probe: BBA9108B(A3)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1485, 0, 0, 0, 0

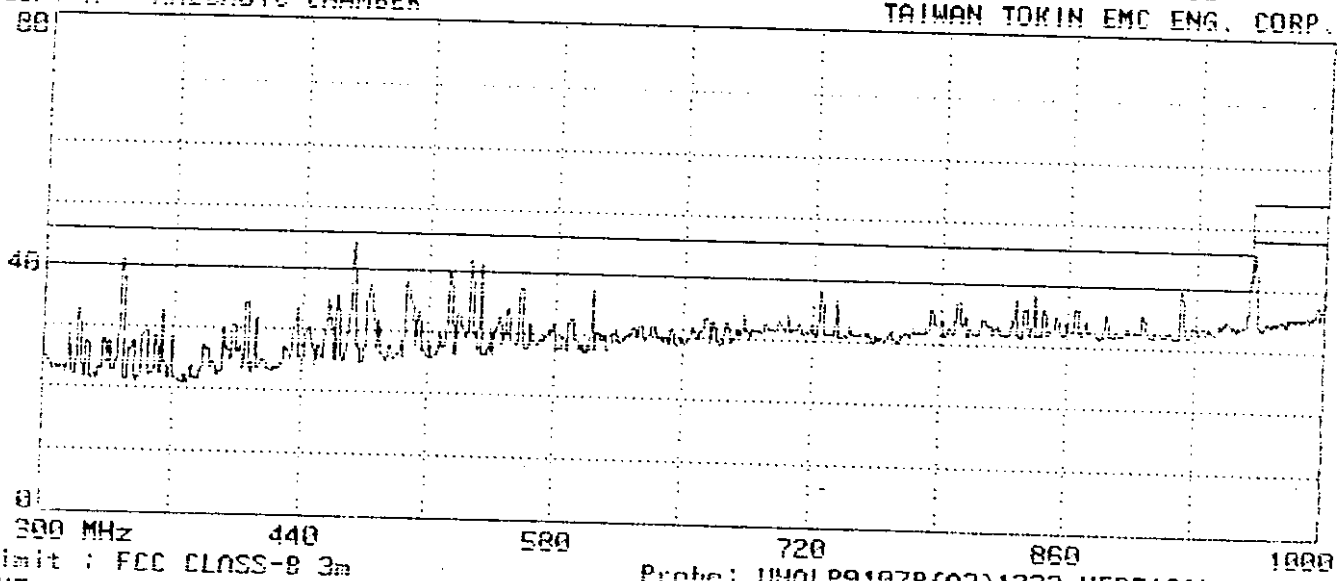

Page#: 1486 SP File#: MATSUSHI.E1 Date: 11-19-1998 Time: 12:56:56
TAIWAN TOKIN EMC ENG. CORP.
dBuV/m ANECHOIC CHAMBER
80
40
0
30 MHz
84
138
192
246
300
Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m D-SUB
Probe: BBA9108B(A3)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1486, 0, 0, 0, 0

Page#: 1403 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:49:45
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



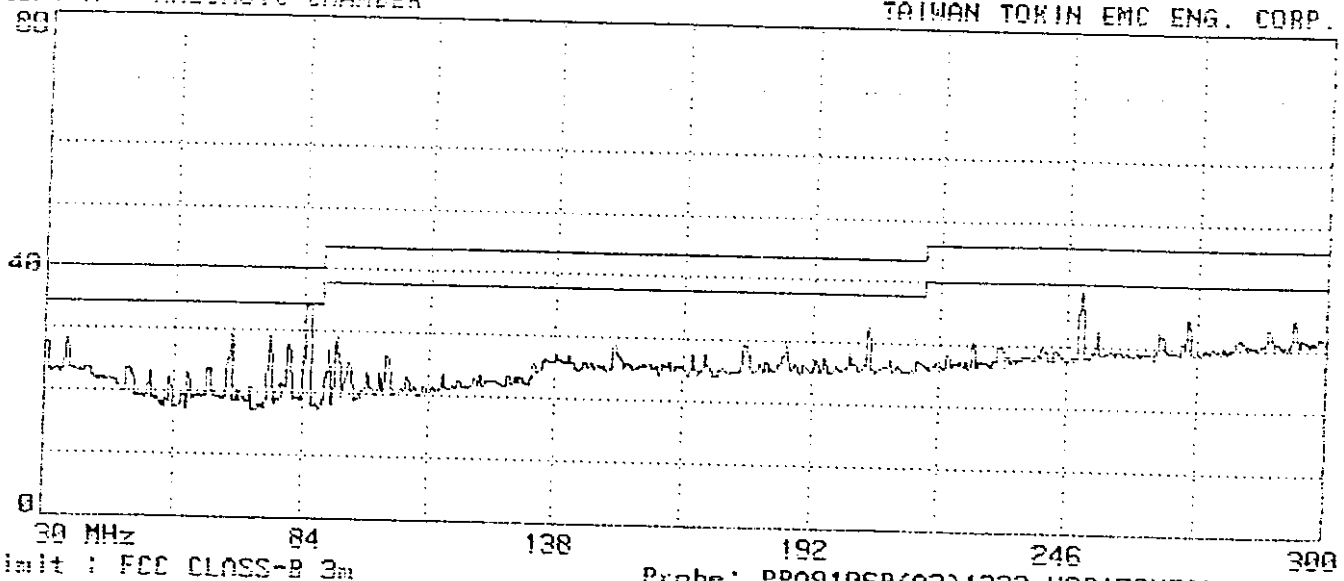

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F84NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m D-SUB
Probe: UHOLP9107B(A3)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1403, 0, 0, 0, 0

Page#: 1404 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 12:51:33
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



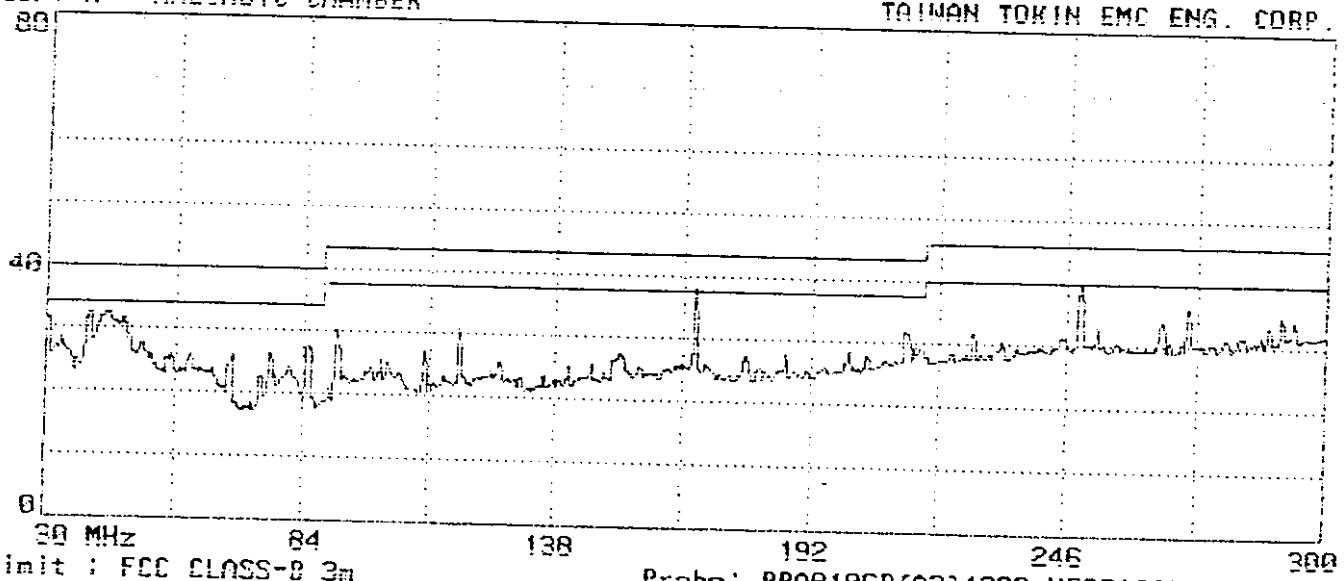

Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F84NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m D-SUB
Probe: UHOLP9107B(A3)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1404, 0, 0, 0, 0

Page#: 1409 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:11:31
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



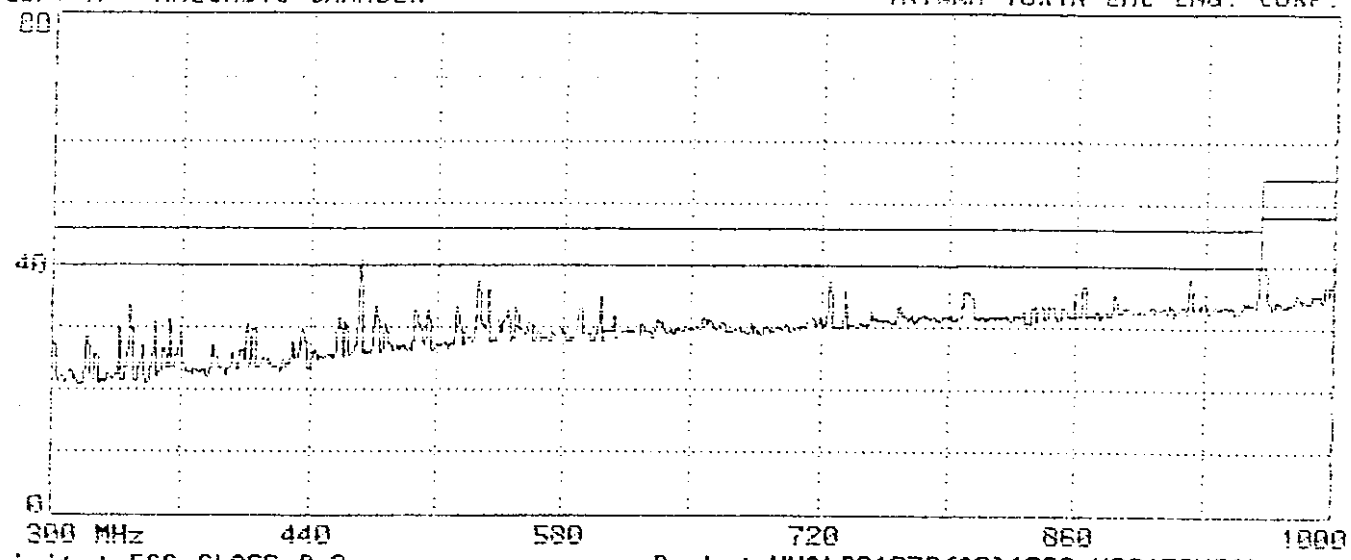

Limit : FCC CLASS-B 3m Probe: BBA9108B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F64NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1409, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 3.0m D-SUB

Page#: 1410 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:13:18
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.



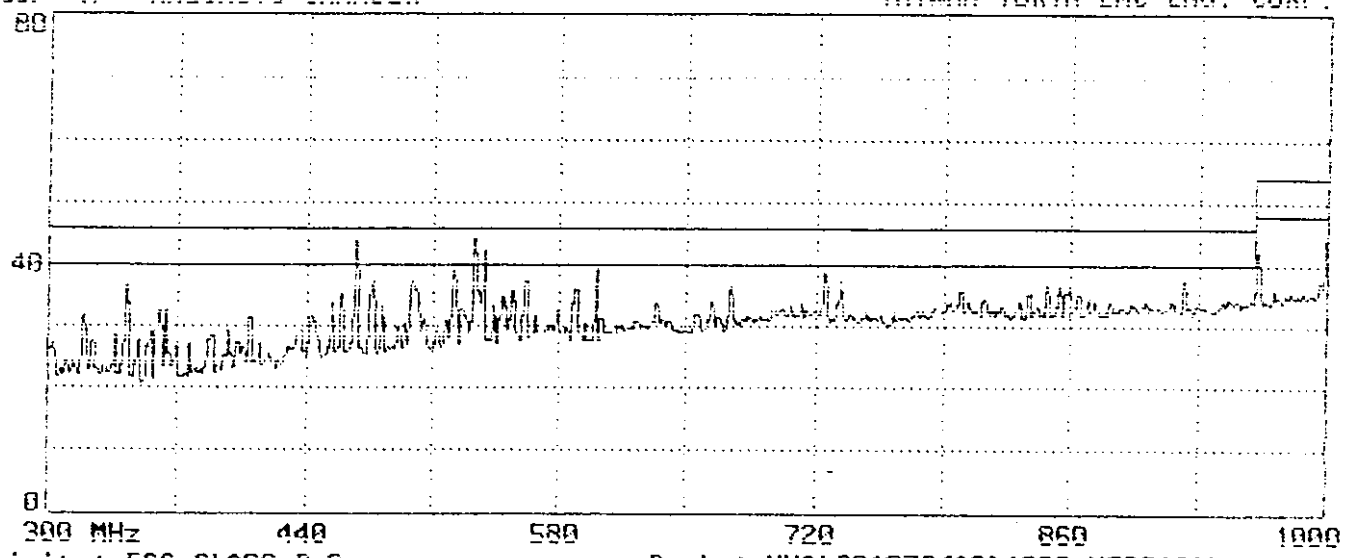

Limit : FCC CLASS-B 3m Probe: BBA9108B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F64NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1410, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 3.0m D-SUB

Page#: 1487 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 14:59:38
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

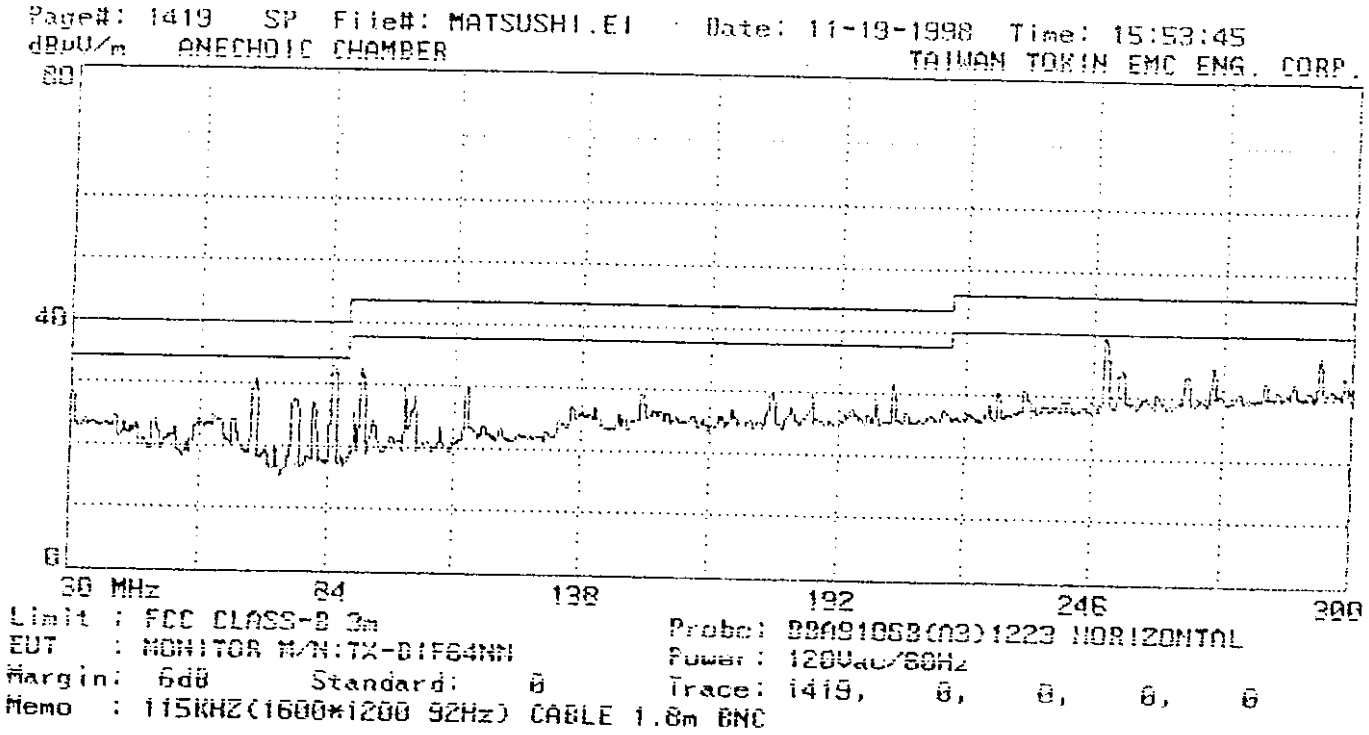


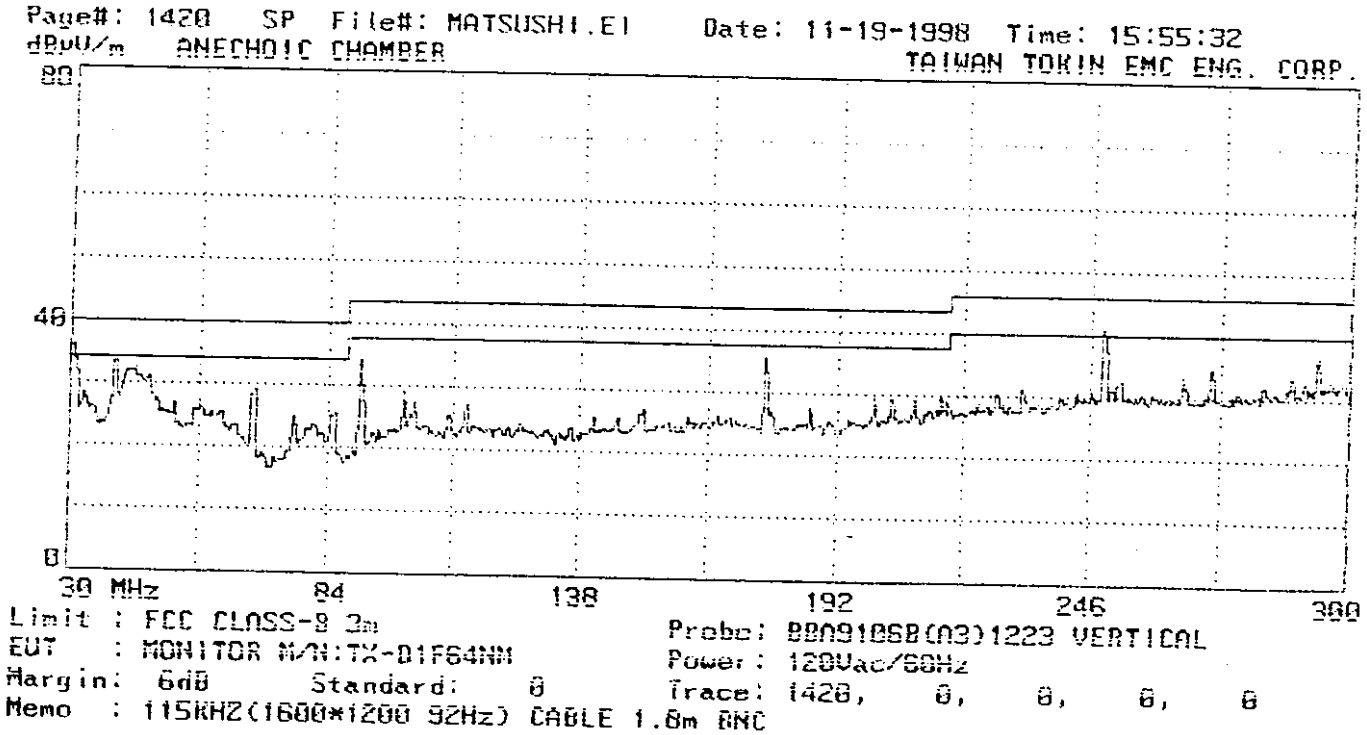

Limit : FCC CLASS-B 3m Probe: UHALP91878(A3)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1487, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 3.0m D-SUB

Page#: 1488 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:04:46
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.

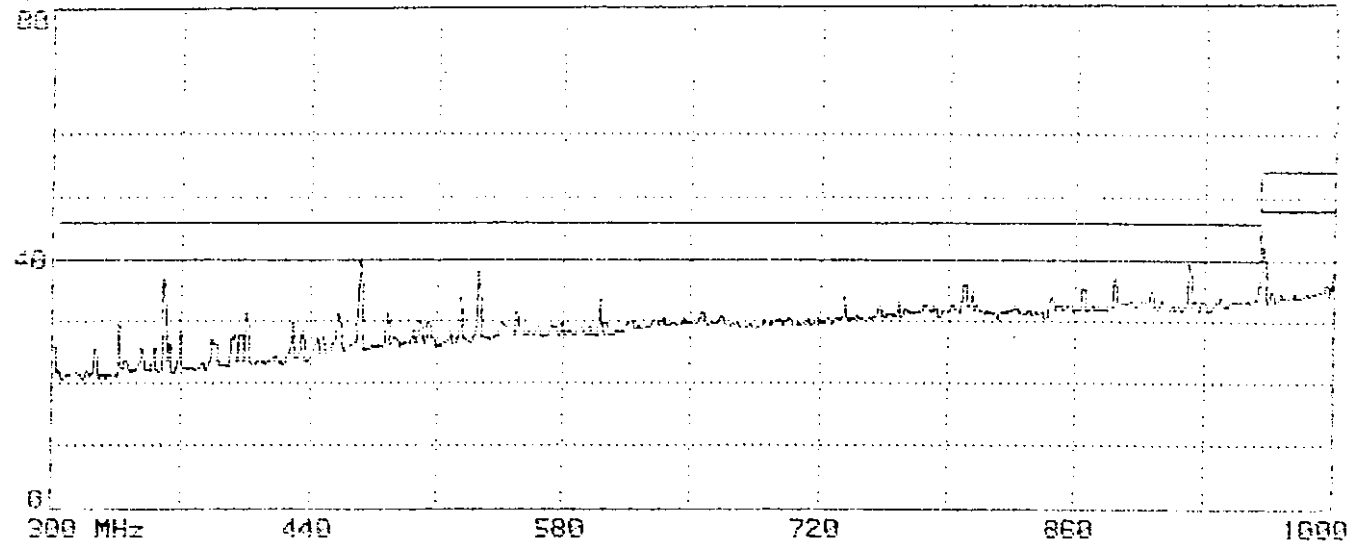



Limit : FCC CLASS-B 3m Probe: UHALP91878(A3)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F84NM Power : 120Vac/60Hz
Margin: 6dB Standard: 0 Trace: 1488, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 3.0m D-SUB


Page#: 1419 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:53:45
dBpU/m ANECHOIC CHAMBER
TAIWAN TOKIN EMC ENG. CORP.
80
40
0
30 MHz
84
138
192
246
300
Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m BNC
Probe: 88091068(03)1223 HORIZONTAL
Power : 120Vac/60Hz
Trace: 1419, 0, 0, 0, 0

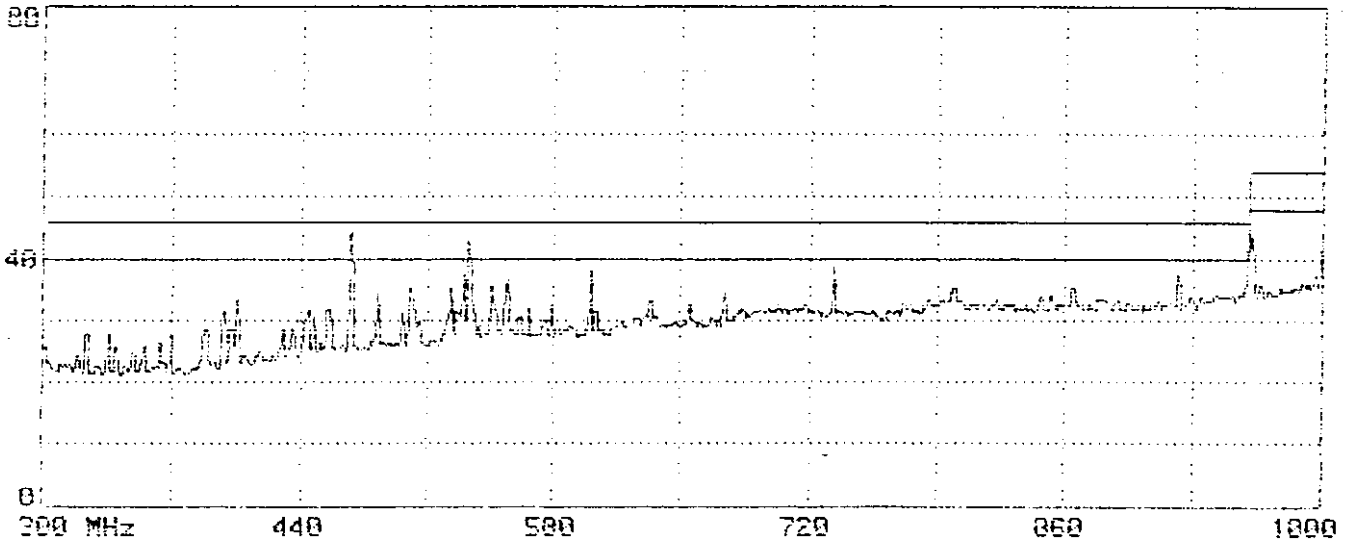

Page#: 1420 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:55:32
dBpU/m ANECHOIC CHAMBER
TAIWAN TOKIN EMC ENG. CORP.
80
40
0
30 MHz
84
138
192
246
300
Limit : FCC CLASS-B 3m
EUT : MONITOR M/N:TX-D1F64NM
Margin: 6dB Standard: 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m BNC
Probe: 88091068(03)1223 VERTICAL
Power : 120Vac/60Hz
Trace: 1420, 0, 0, 0, 0

Page#: 1425 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:25:25
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.




Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 HORIZONTAL
EUT : MONITOR M/N:TX-D1F84NM Power: 120Vac/60Hz
Margin: 6d0 Standard: 0 Trace: 1425, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m BNC

Page#: 1426 SP File#: MATSUSHI.EI Date: 11-19-1998 Time: 15:27:12
dBuV/m ANECHOIC CHAMBER TAIWAN TOKIN EMC ENG. CORP.




Limit : FCC CLASS-B 3m Probe: UHALP9107B(03)1223 VERTICAL
EUT : MONITOR M/N:TX-D1F84NM Power: 120Vac/60Hz
Margin: 6d0 Standard: 0 Trace: 1426, 0, 0, 0, 0
Memo : 115KHZ(1600*1200 92Hz) CABLE 1.8m BNC

# APPLICATION FOR CERTIFICATION
On Behalf of
Matsushita Electric Industrial Co., Ltd.
21" Color CRT Display Monitor

Model : (1)TX-D1F64NM (2)TX-D1F64
(3)TX-D1F64ML (4)TX-D1F64*****

FCC ID : ACJ93312140

TESTED WITH D-SUB & BNC CABLE @ 1800 X 1440

Prepared for : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisawa,
Kanagawa 251 Japan

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

Tel : (02) 2609-9301, 2609-2311
Fax : (02) 2609-9303

| | | |
|---|---|---|
| File Number | : | ATM-G98671 |
| Report Number | : | TTEMC-F98188 |
| Date of Test | : | Dec. 09 / 11, 1998 |
| Date of Report | : | Dec. 11, 1998 |

# TABLE OF CONTENTS

# TEST REPORT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | Matsushita Electric Industrial Co., Ltd. |
| Manufacturer | : | Matsushita Electric Industrial Co., Ltd. |
| FCC ID | : | ACJ93312140 |
| EUT Description | : | 21" Color CRT Display Monitor |
| | | (A) MODEL NO. : (1)TX-D1F64NM (2)TX-D1F64 |
| | | (3)TX-D1F64ML (4)TX-D1F64***** |
| | | (B) SERIAL NO. : FX8540009 |
| | | (C) POWER SUPPLY : AC 120V/60Hz |

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1997 AND FCC / ANSI C63.4-1992

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15B Class B limits both radiated and conducted emissions.
The measurement results were contained in this test report and TAIWAN TOKIN EMC ENG. CORP. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report showed that the EUT to be technically compliance with the FCC official limits.
This report applied to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : Dec. 09 / 11, 1998

Prepared by : _____
(SHELENE HOU)

Test Engineer : _____ 12.18.1998
(ALLEN WANG)

Approve & Authorized Signer : _____ 12/18/98
(JACKIE DENG)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

Description : 21" Color CRT Display Monitor

Model Number : (1)TX-D1F64NM (2)TX-D1F64
(3)TX-D1F64ML (4)TX-D1F64*****

TX-D1F64NM was selected in this test report.

Comparison Information for above models

| | Model Name | TX-D1F64NM | TX-D1F64 | TX-D1F64ML | TX-D1F64***** |
|---|---|---|---|---|---|
| 1 | Brand Name | No-Brand | Panasonic | Panasonic | Future OEM Brand |
| 2 | Cabinet Cosmetic | | Minor change | Minor change | Minor change |
| 3 | BNC Type Connector (Rear Panel) | Yes | Yes | None | Yes |

*****: is one thru five suffix in any combination of the alphanumeric character, symbols or blank.

Serial Number : FX8540009

Applicant : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisai,
Kanagai, 251, Japan

Manufacturer : Matsushita Electric Industrial Co., Ltd.
6-4-1, Tsujidomotomachi, Fujisawa,
Kanagawa 251 Japan

CRT : Panasonic, M/N M51LRF280X

Data Cable # 1 (D-Sub) : Shielded, Detachable, 1.5m
Bonded two ferrite cores

Data Cable # 2 (D-Sub) : Shielded, Detachable, 1.8m
Bonded two ferrite cores

Data Cable # 3 (D-Sub) : Shielded, Detachable, 3m
Bonded two ferrite cores

Data Cable # 4 (BNC) : Shielded, Detachable, 1.8m

| | | |
|---|---|---|
| Power Cord | : | Non-Shielded, Detachable, 1.8m |
| Date of Receipt of Sample | : | Nov. 11, 1998 |
| Date of Test | : | Dec. 09 / 11 , 1998 |

## 1.2. Tested Supporting System Details

### 1.2.1. PERSONAL COMPUTER

| | | |
|---|---|---|
| Model Number | : | D4594B |
| Serial Number | : | SG74350121 |
| FCC ID | : | By DoC |
| Manufacturer | : | Hewlett Packard |
| VGA Card | : | Matrox Graphics,<br>M/N 79075010153 (MGA-MIL/2/DIP)<br>S/N CAJ92909<br>FCC ID ID7057600 |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 1.2.2. KEYBOARD

| | | |
|---|---|---|
| Model Number | : | RT6656TWJP |
| Serial Number | : | 31470782 |
| FCC ID | : | AQ6-MTN4C15 |
| Manufacturer | : | Hewlett Packard |
| Data Cable | : | Shielded, Undetachable, 1.9m |

### 1.2.3. PRINTER

| | | |
|---|---|---|
| Model Number | : | 2225C |
| Serial Number | : | 2526S40437 |
| FCC ID | : | BS46XU2225C |
| Manufacturer | : | Hewlett Packard |
| Power Cord | : | Non-Shielded, Undetachable, 1.8m |
| Data Cable | : | Shielded, Detachable, 1.2m |

### 1.2.4. MODEM # 1

| | | |
|---|---|---|
| Model Number | : | DM-1414 |
| Serial Number | : | 980034398 |
| FCC ID | : | IFAXDM1414 |
| Manufacturer | : | Aceex |
| Data Cable | : | Shielded, Detachable, 1.2m |
| Power Adapter | : | Amigo, Model AM-91000A<br>Non-Shielded, Undetachable, 1.8m |

1.2.5. MODEM # 2

| | | |
|---|---|---|
| Model Number | : | DM-1414 |
| Serial Number | : | 980034397 |
| FCC ID | : | IFAXDM1414 |
| Manufacturer | : | Aceex |
| Data Cable | : | Shielded, Detachable, 1.2m |
| Power Adapter | : | Amigo, Model AM-91000A<br>Non-Shielded, Undetachable, 1.8m |

1.2.6. PS2 MOUSE

| | | |
|---|---|---|
| Model Number | : | M-S34 |
| Serial Number | : | LZ64952349 |
| FCC ID | : | DZL211029 |
| Manufacturer | : | Hewlett Packard |
| Data Cable | : | Shielded, Undetachable, 2.0m |

1.2.7. USB MOUSE # 1

| | | |
|---|---|---|
| Model Number | : | M-UB48 |
| Serial Number | : | LZB81900216 |
| FCC ID | : | DZL211137 |
| Manufacturer | : | Logitech |
| Data Cable | : | Shielded, Undetachable, 1.8m |

1.2.8. USB MOUSE # 2

| | | |
|---|---|---|
| Model Number | : | M-UB48 |
| Serial Number | : | LZB81900209 |
| FCC ID | : | DZL211137 |
| Manufacturer | : | Logitech |
| Data Cable | : | Shielded, Undetachable, 1.8m |

1.2.9. JOYSTICK

| | | |
|---|---|---|
| Model Number | : | 1FD05015 |
| Serial Number | : | N/A |
| Manufacturer | : | Rambo |
| Data Cable | : | Non-Shielded, Undetachable, 1.6m |

1.2.10. SPEAKER

| | | |
|---|---|---|
| Model Number | : | J-008 |
| Serial Number | : | 97-C-009780-T |
| Manufacturer | : | (J-S) JAZZ HIPSTER |
| Data Cable | : | Non-Shielded, Undetachable, 1m |

1.2.11. WALKMAN

| | | |
|---|---|---|
| Model Number | : | RQ-P35LT-K |
| Serial Number | : | HA08489 |
| Manufacturer | : | Panasonic |
| Data Cable | : | Non-Shielded, Detachable, 1.8m |

1.2.12. EARPHONE # 1

| | | |
|---|---|---|
| Model Number | : | N/A |
| Serial Number | : | N/A |
| Manufacturer | : | Cathay Pacific |
| Data Cable | : | Non-Shielded, Undetachable, 1.3m |

1.2.13. EARPHONE # 2

| | | |
|---|---|---|
| Model Number | : | N/A |
| Serial Number | : | N/A |
| Manufacturer | : | Aiwa |
| Data Cable | : | Non-Shielded, Detachable, 1m |

1.2.14. EARPHONE w/MIC.

| | | |
|---|---|---|
| Model Number | : | MI-2 |
| Serial Number | : | N/A |
| Manufacturer | : | N/A |
| Data Cable | : | Non-Shielded, Undetachable, 1.7m |

## 1.3. Description of Test Facility

| | | |
|---|---|---|
| Site Description<br>(No. 2 Open Site) | : | Jul. 15, 1996 Re-file on<br>Federal Communication Commission<br>FCC Engineering Laboratory<br>7435 Oakland Mills Road<br>Columbia, MD 21046, U.S.A. |
| Name of Firm | : | Taiwan Tokin EMC Eng. Corp. |
| Site Location | : | No. 53-11, Tin-Fu Tsun, Lin-Kou,<br>Taipei Hsien, Taiwan, R.O.C. |
| NVLAP lab. Code | : | 200077-0 |

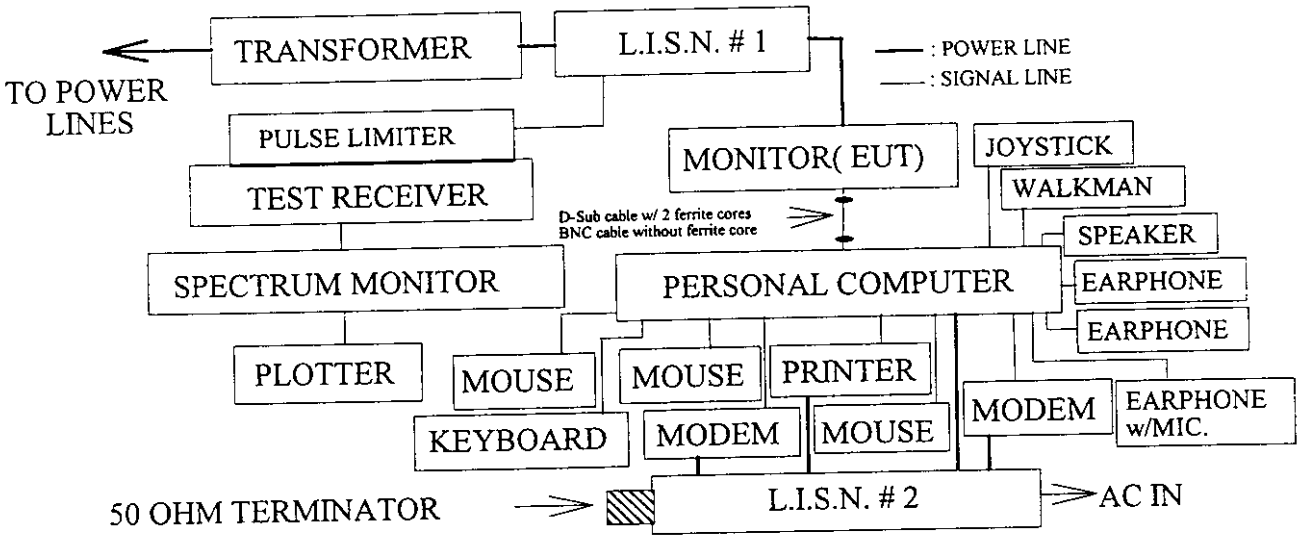
# 2. POWERLINE CONDUCTED TEST

## 2.1. Test Equipment

The following test equipments were used during the power line conducted tests :

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde & Schwarz | ESH3 | 880647/035 | Jun.24, 98' | 1 Year |
| 2. | L.I.S.N. # 1 | Kyoritsu | KNW-407 | 8-855-9 | Apr.14, 98' | 1 Year |
| 3. | L.I.S.N. # 2 | Kyoritsu | KNW-407 | 8-881-13 | Apr.14, 98' | 1 Year |

## 2.2. Block Diagram of Test Setup




## 2.3. Powerline Conducted Emission Limit (CLASS B)

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | uV | dBuV |
| 0.45MHz ~ 30Mhz | 250 | 48 |

REMARKS : RF LINE VOLTAGE (dBuV) = 20 log RF LINE VOLTAGE (uV)

## 2.4. EUT's Configuration during Compliance Measurement

The following equipments were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tend to maximize its emission characteristics in a normal application.

### 2.4.1. 21" Color CRT Display Monitor ( EUT)

| | | |
|---|---|---|
| Model Number | : | (1)TX-D1F64NM (2)TX-D1F64<br>(3)TX-D1F64ML (4)TX-D1F64***** |
| Serial Number | : | FX8540009 |
| Manufacturer | : | Matsushita Electric Industrial Co., Ltd. |
| CRT | : | Panasonic, M/N M51LRF280X |
| Data Cable # 1 (D-Sub) | : | Shielded, Detachable, 1.5m<br>Bonded two ferrite cores |
| Data Cable # 2 (D-Sub) | : | Shielded, Detachable, 1.8m<br>Bonded two ferrite cores |
| Data Cable # 3 (D-Sub) | : | Shielded, Detachable, 3m<br>Bonded two ferrite cores |
| Data Cable # 4 (BNC) | : | Shielded, Detachable, 1.8m |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 2.4.2. Supporting System : As in Section 1.2.

## 2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turn on the power of all equipments.

2.5.3. Personal Computer read data from disk.

2.5.4. Personal Computer sent "H" character to monitor (EUT) and the screen displayed and full with "H" pattern.

2.5.5. The other peripheral devices were driven and operated in turn during all testing.

## 2.6. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N.# 1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. # 2). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-1992 during conducted measurement.

The bandwidth of the R&S Test Receiver ESH3 was set at 10kHz.

The frequency range from 450KHz to 30MHz was checked.

The one horizontal working frequency with four kinds of data cables were investigated during pre-scanning and reported the worst test modes (with 1.8m D-Sub Data Cable) in section 2.7., the others test data were attached within Appendix I. The detail of test modes are as follows :

One display frequency :

| | 1800 x 1440 (Hf : 105kHz) |
|---|---|
| (a) Dot Clock Frequency | 250 MHz |
| (b) Vertical Frequency | 70 Hz |
| (c) Horizontal Frequency | 105 kHz |

Four kinds of data cable :

(1) 1.5m D-Sub data cable with two ferrite cores
(2) 1.8m D-Sub data cable with two ferrite cores
(3) 3.0m D-Sub data cable with two ferrite cores
(4) 1.8m BNC data cable

## 2.7. Line Conducted RF Voltage Measurement Results

The frequency range 450KHz to 30 MHz was investigated.
All emissions not reported below were too low against the prescribed limits.

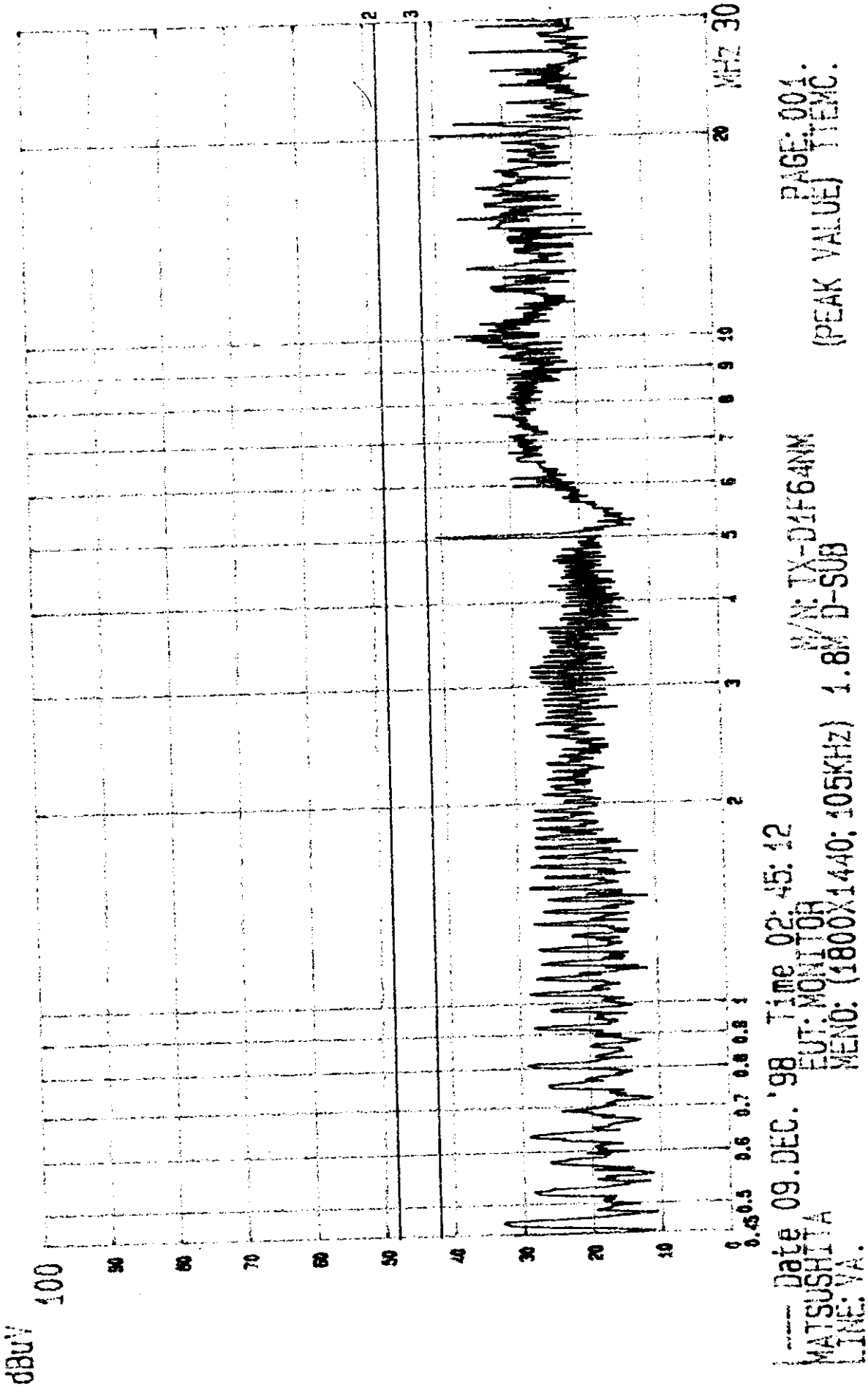
Date of Test : Dec. 09, 1998 Temperature : 24℃

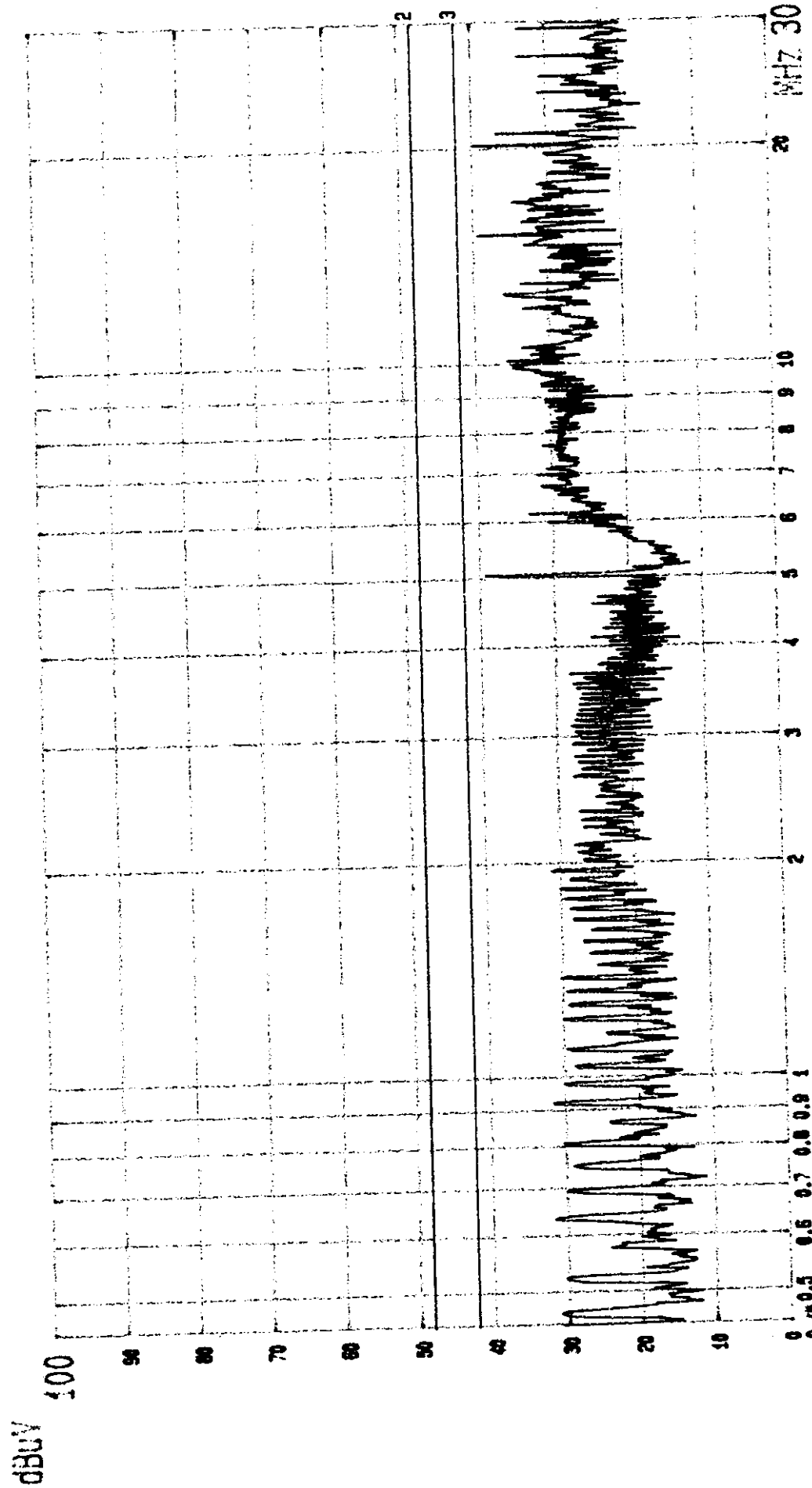
EUT : 21" Color CRT Display Monitor Humidity : 45%

Test Mode : 105kHz/1800*1440 with 1.8m D-Sub Data Cable

| Frequency | Factor | Measurement (dBuV) | | Reading (dBuV) | | Limits (dBuV) | Margin (dBuV) | |
|---|---|---|---|---|---|---|---|---|
| (MHz) | dB | VA | VB | VA | VB | | VA | VB |
| 0.4671 | 0.5 | 33.1 | * | 33.6 | * | 48.0 | 14.4 | * |
| 0.6326 | 0.5 | * | 30.5 | * | 31.0 | 48.0 | * | 17.0 |
| 1.0374 | 0.5 | 27.7 | * | 28.2 | * | 48.0 | 19.8 | * |
| 1.9478 | 0.5 | * | 29.4 | * | 29.9 | 48.0 | * | 18.1 |
| 3.0916 | 0.5 | 26.3 | 25.7 | 26.8 | 26.2 | 48.0 | 21.2 | 21.8 |
| 5.0462 | 0.8 | 30.9 | 30.7 | 31.7 | 31.5 | 48.0 | 16.3 | 16.5 |
| 9.9272 | 0.8 | * | 33.3 | * | 34.1 | 48.0 | * | 13.9 |
| **10.2568** | **1.0** | **34.2** | * | **35.2** | * | **48.0** | **12.8** | * |
| 20.2717 | 1.1 | * | 25.5 | * | 26.6 | 48.0 | * | 21.4 |
| 20.9448 | 1.1 | 28.7 | * | 29.8 | * | 48.0 | 18.2 | * |

Remark :
1. All reading were Quasi-Peak values.
2. Factor = Insertion Loss + Cable Loss
3. The worst emission was detected at 10.2568MHz with corrected signal level of 35.2dBuV (limit was 48dBuV) when the VA side of the EUT was connected to L.I.S.N.


dBuV
100
90
80
70
60
50
40
30
20
10
0.45 0.5 0.6 0.7 0.8 1 2 3 4 5 6 7 8 9 10 20 30
MHz
PAGE: 004
(PEAK VALUE) TTEMC.
P/N: TX-D1F64NW
1.8M D-SUB
MEMO: (1800X1440; 105KHz)
EUT: MONITOR
Time 02: 45: 12
Date 09. DEC. '98
MATSUSHITA
LINE: VA.


dBuV
100
90
80
70
60
50
40
30
20
10
0
0.45
0.5
0.6
0.7
0.8
0.9
1
2
3
4
5
6
7
8
9
10
20
MHz 30
1
2
3
--- Date 09.DEC.'98 Time 02:47:02
MATSUSHITA EUT:MONITOR M/N:TX-D1F64NW
LINE:VB. MEAS:(1800X1440;105KHz) 1.8M D-SUB
PAGE:002.
(PEAK VALUE) FCC.

# 3. RADIATED EMISSION TEST

## 3.1. Test Equipment

The following test equipments are used during the radiated emission tests :

### 3.1.1. For Anechoic Chamber :

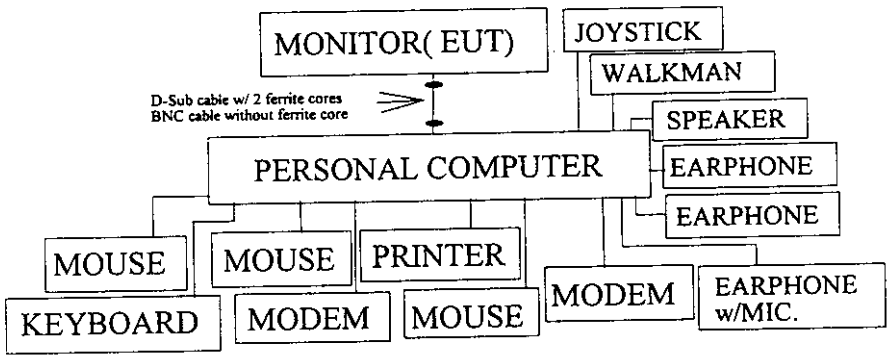
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8593A | 3212A01727 | Jul.25, 98' | 1 Year |
| 2. | Pre-Amplifier | HP | 8447D | 2944A06305 | May.13, 98' | 1 Year |
| 3. | Broadband Antenna | Schwarzbeck | BBA 9106 | A3L | Dec.24, 97' | 1 Year |
| 4. | Broadband Antenna | Schwarzbeck | UHALP 9107 | A3H | Dec.24, 97' | 1 Year |

### 3.1.2. For No. 2 Open Site :

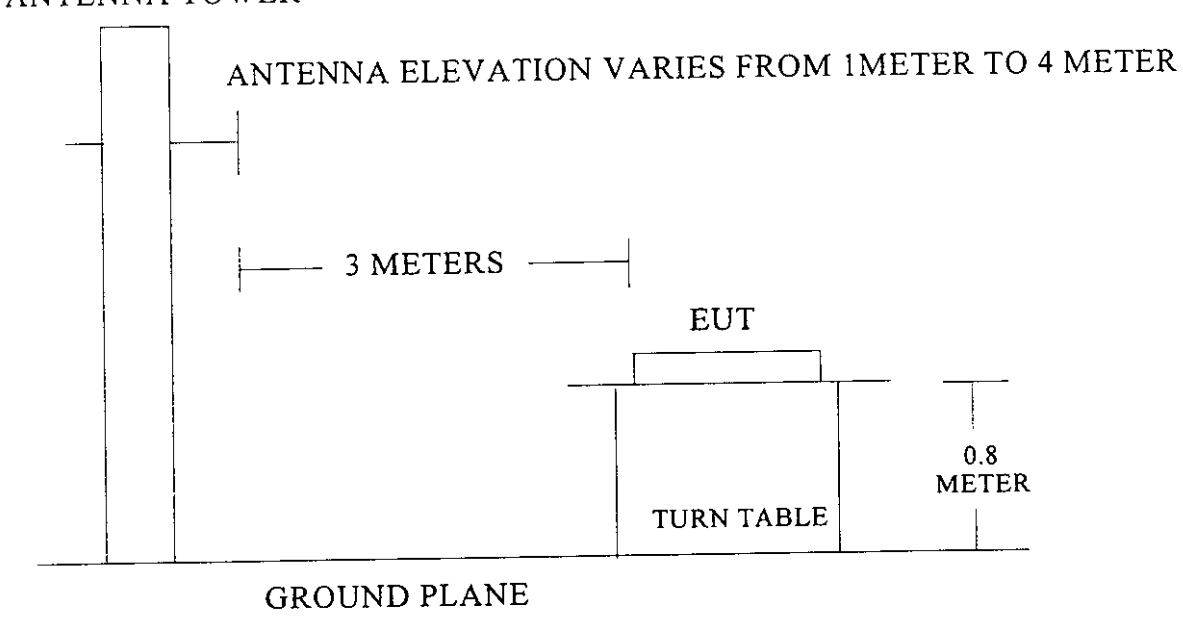
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | Rohde&Schwarz | ESVP | 893202/001 | Jul.24, 98' | 1 Year |
| 2. | Broadband Antenna | Chase | VBA6106A | 1240 | Jul.15, 98' | 1 Year |
| 3. | Broadband Antenna | Chase | UPA6109 | 1048 | Jul.15, 98' | 1 Year |

## 3.2. Block Diagram of Test Setup

### 3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram




## 3.3. Radiation Limit (CLASS B)

| FREQUENCY | DISTANCE | FIELD STRENGTHS LIMITS | |
|---|---|---|---|
| MHz | Meters | uV/M | dBuV/M |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |

Remark : (1) Emission level (dBuV/M) = 20 log Emission level (uV/M)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

## 3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators were same as those used in conducted measurement. Please refer to 2.4.

## 3.5. Operating Condition of EUT

Same as conducted measurement which was listed in 2.5.

## 3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotate 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which were mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 during radiated measurement.

The bandwidth of the R&S Test Receiver ESVP was set at 120KHz.

The frequency range from 30MHz to 1000MHz was checked.

The one horizontal working frequency with four kinds of data cable were investigated separately within Anechoic Chamber and all the scanning waveform were attached in Appendix II.

Finally, re-measured the worst operating situation (with 1.8m D-Sub data cable) at No. 2 Open Field Test site and all the test results are listed in section 3.7.

One display frequency :

| | 1800 x 1440 (Hf : 105kHz) | |
|---|---|---|
| (a) Dot Clock Frequency | 250 | MHz |
| (b) Vertical Frequency | 70 | Hz |
| (c) Horizontal Frequency | 105 | kHz |

Four kinds of data cable :

(1) 1.5m D-Sub data cable with two ferrite cores
(2) 1.8m D-Sub data cable with two ferrite cores
(3) 3.0m D-Sub data cable with two ferrite cores
(4) 1.8m BNC data cable

## 3.7. Radiated Emission Measurement Results

The frequency spectrum from 30 MHz to 1000MHz was investigated. All the emissions not reported below were too low against the FCC CLASS B limit.

Date of Test : Dec. 11, 1998 Temperature : 21℃

EUT : 21" Color CRT Display Monitor Humidity : 93%

Test Mode : 105kHz/1800*1440 with 1.8m D-Sub Data Cable

| | Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBuV | Emission Level Horizontal dBuV/m | Limits dBuV/m | Margin dBuV/m |
|---|---|---|---|---|---|---|---|
| | 53.489 | 14.41 | 2.44 | 5.10 | 21.95 | 40.00 | 18.05 |
| | 76.390 | 13.01 | 2.96 | 4.50 | 20.47 | 40.00 | 19.53 |
| | 114.554 | 18.66 | 3.74 | 1.80 | 24.20 | 43.50 | 19.30 |
| | 122.191 | 19.44 | 3.86 | -1.90 | 21.40 | 43.50 | 22.10 |
| | 152.726 | 20.93 | 4.35 | -1.50 | 23.78 | 43.50 | 19.72 |
| | 175.625 | 21.13 | 4.71 | -2.90 | 22.94 | 43.50 | 20.56 |
| | 190.899 | 21.26 | 4.91 | -1.90 | 24.27 | 43.50 | 19.23 |
| | 198.537 | 21.60 | 5.02 | -2.90 | 23.72 | 43.50 | 19.78 |
| | 229.089 | 22.38 | 5.44 | 1.70 | 29.52 | 46.00 | 16.48 |
| | 252.000 | 23.07 | 5.74 | -6.00 | 22.81 | 46.00 | 23.19 |
| | 267.306 | 23.40 | 5.91 | -0.60 | 28.71 | 46.00 | 17.29 |
| | 305.510 | 13.58 | 6.42 | 12.90 | 32.90 | 46.00 | 13.10 |
| | 343.690 | 15.35 | 6.90 | 14.60 | 36.85 | 46.00 | 9.15 |
| | 381.888 | 16.32 | 7.31 | 1.50 | 25.13 | 46.00 | 20.87 |
| | 420.040 | 16.37 | 7.80 | 4.70 | 28.87 | 46.00 | 17.13 |
| | 458.256 | 17.06 | 8.16 | 5.00 | 30.22 | 46.00 | 15.78 |
| * | 496.464 | 17.46 | 8.51 | 12.50 | 38.47 | 46.00 | 7.53 |
| | 534.628 | 19.09 | 8.96 | 3.50 | 31.55 | 46.00 | 14.45 |

Remark :
1. All reading were Quasi-Peak values.
2. The worst emission was detected at 496.464MHz with corrected signal level of 38.47dBuV/m (limit was 46dBuV/m) when the antenna was at horizontal polarization and was at 1m high and the turn table was at 185° .
3. 0° is the table front facing the antenna. Degree was calculated from 0° clockwise facing the antenna.

Date of Test : Dec. 11, 1998 Temperature : 21℃

EUT : 21" Color CRT Display Monitor Humidity : 93%

Test Mode : 105kHz/1800*1440 with 1.8m D-Sub Data Cable

| | Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBuV | Emission Level Vertical dBuV/m | Limits dBuV/m | Margin dBuV/m |
|---|---|---|---|---|---|---|---|
| | 53.500 | 14.71 | 2.44 | 8.10 | 25.25 | 40.00 | 14.75 |
| | 76.416 | 14.15 | 2.96 | 9.50 | 26.61 | 40.00 | 13.39 |
| | 114.557 | 17.59 | 3.74 | 5.00 | 26.33 | 43.50 | 17.17 |
| | 122.240 | 18.47 | 3.86 | -0.80 | 21.53 | 43.50 | 21.97 |
| | 145.141 | 19.29 | 4.25 | -0.30 | 23.24 | 43.50 | 20.26 |
| | 175.684 | 19.28 | 4.71 | -1.40 | 22.59 | 43.50 | 20.91 |
| | 191.002 | 20.36 | 4.91 | 1.00 | 26.27 | 43.50 | 17.23 |
| | 213.900 | 23.84 | 5.24 | -7.60 | 21.48 | 43.50 | 22.02 |
| | 252.029 | 22.30 | 5.74 | -6.00 | 22.04 | 46.00 | 23.96 |
| | 267.310 | 21.85 | 5.91 | 0.70 | 28.46 | 46.00 | 17.54 |
| | 305.490 | 13.85 | 6.42 | 12.30 | 32.57 | 46.00 | 13.43 |
| * | 343.672 | 15.45 | 6.90 | 18.30 | 40.65 | 46.00 | 5.35 |
| | 381.838 | 14.84 | 7.31 | 0.80 | 22.95 | 46.00 | 23.05 |
| | 420.051 | 16.20 | 7.80 | -2.10 | 21.90 | 46.00 | 24.10 |
| | 458.224 | 17.48 | 8.16 | 3.50 | 29.14 | 46.00 | 16.86 |
| | 496.464 | 18.52 | 8.51 | 11.40 | 38.43 | 46.00 | 7.57 |
| | 534.624 | 18.95 | 8.96 | -2.60 | 25.31 | 46.00 | 20.69 |

Remark :
1. All reading were Quasi-Peak values.
2. The worst emission was detected at 343.672MHz with corrected signal level of 40.65dBuV/m (limit was 46dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 145° .
3. 0° is the table front facing the antenna. Degree was calculated from 0° clockwise facing the antenna.