FCC Part 15 Subpart B
EMI TEST REPORT

of

E.U.T. : Thin-Client PC
MODEL : TP100
FCC ID. : NYYTP100

for

APPLICANT : MOVITA TECHNOLOGIES INC.

ADDRESS : No. 26, Wu-Chuan 7th Rd., Wu-Ku Industrial Park, Taipei County, Taiwan, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 8 LANE 29, WENMIMG ROAD,
LOSHAN TSUN, KWEISHAN HSIANG,
TAOYUAN, TAIWAN, R.O.C.

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Report Number : ET89R-11-043-01

TEST REPORT VERIFICATION

Applicant	: MOVITA TECHNOLOGIES INC. No. 26, Wu-Chuan 7th Rd., Wu-Ku Industrial Park, Taipei County, Taiwan, R.O.C.
Manufacturer	: MOVITA TECHNOLOGIES INC. No. 26, Wu-Chuan 7th Rd., Wu-Ku Industrial Park, Taipei County, Taiwan, R.O.C.
Description of EUT	:
a) Type of EUT	: Thin-Client PC
b) Trade Name	: Movita
c) Model No.	: TP100
e) Power Supply	: Adaptor : LAD6019AB5; I/P : 100-240VAC, 50/60Hz; O/P : DC 12V, 5A
Regulation Applied	: FCC Rules and Regulations Part 15 Subpart B (1999)

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

Issued Date : Dec. 12, 2000

Test Engineer : Jeff Chuang
(Jeff Chuang)

Approve & Authorized Signer : Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS TESTING CENTER, TAIWAN

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Thin-Client PC

b) Trade Name : Movita

c) Model No. : TP100

d) Power Supply : Adaptor : LAD6019AB5
I/P : 100-240VAC, 50/60Hz; O/P : DC 12V, 5A

1.2 Characteristics of Device

1. A standard PS/2 Keyboard.
2. A PS/2, USB, or serial Mouse.
3. Standard Internal Hard Disk Drive.
4. DIMM SDRAM Memory SIMM(S).

1.3 Test Methodology

For Thin-Client PC, both conducted, radiated, conducted RF output signal and spurious level and transfer switch isolation testing were performed according to the procedures in section 12.2 of ANSI C63.4 (1992).

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, Lin 5, Ding Fu Tsun, Linkou Hsiang, Taipei Hsien, Taiwan, R.O.C.
This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10, 2000.

2 LIMITATIONS AND LABELING REQUIREMENT

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

2.2 Limitation

(1) Conducted Emission Limits :

Class B Line Conducted Emission Limits :

Frequency MHz	Emissions μ V	Emissions dB μ V
0.45 - 30.0	250	48.0

(2) Radiated Emission Limits :

According to 15.109 ,Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Class B Radiated Emission Limits :

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
above 960	3	54.0	500

2.3 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.4 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion, as a customer would normally use it.

For radiated emission measuring, the EUT was rotated to obtain the maximum level of radiated emissions . The antenna was varied in height from 1 to 4 meters above ground to obtain the maximum signal strength. Measurement was performed under the condition that a computer program was exercised to simulate data communication of EUT. Three highest emissions were verified with varying placement of the connected cable to maximize the emission from EUT.

3.2 Device for Tested System

Device	Manufacture	Model	Description
Thin-Client PC*	MOVITA TECHNOLOGIES INC.	TP100	2.0m Unshielded Adaptor Power Cord 1.2m Unshielded Video Signal Cable 2.0m Unshielded RJ-11 Cable 5.0m Unshielded RJ-45 Cable
Monitor	NEC	JC-1743UMA	1.5m Unshielded Power Cord
Keyboard	Microsoft	E03786USRETI	1.8m Unshielded Cable with 1 Ferrite Core
Modem	Smar TEAM Co.	1200AT	1.8m Shielded Cable 2.0m Unshielded AC Adaptor Power Cord
Mouse	HP	M-S34	1.2m Unshielded Cable
USB Mosue×4	Logitech	M-UB48	1.2m Unshielded Cable
Printer	HP	2225C+	1.2m Shielded Cable 2.0m Unshielded AC Adaptor Power Cable
Earphone×2	----	----	1.5m Unshileded Cable
Microphone	TM-321	----	2.0m Unshielded Cable
Game Pad	Microsoft	MGP1	1.2m Unshielded Cable
Adaptor	LINEARITY	LAD6019AB5	2.0m Unshielded AC Adaptor Power Cord
CD-ROM	HITACHI	CDR-5300	----
RAM (64MHz)×2	----	PC-100	----
Hard Disk Drive	Seagate	U10SI320423A	----
CPU	Intel	Pentium Ⅲ 850 MHz	----

Remark "*" means equipment under test.

4 RADIATED EMISSION MEASUREMENT

4.1 Description for Radiated Emission Measured

According to § 15.33 (b)(3), except for a CB receiver, a receiver employing super-heterodyne techniques shall be investigated from 30 MHz up to at least the second harmonic of the highest local oscillator frequency generated in the device.

The field strength measurements of the receiver under test which was placed on an wooden turntable 0.8 meter in height. The receiving antenna polarized horizontally was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the equipment under test. These measurements were repeated with the receiving antenna polarized vertically.

The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections),the corrected reading, the limit , and margin. Explanation of the Correction Factor is given in paragraph 4.3.

4.2 Radiated Emission Data

Operation Mode : Working
Test Date : Nov. 15, 2000 Temperature : 23 ℃ Humidity: 50 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
42.256	V	49.6	-12.3	37.3	40.0	-2.7	270	1.10
66.240	V	49.1	-16.4	32.7	40.0	-7.3	180	1.60
299.064	V	44.1	-0.9	43.2	46.0	-2.8	275	1.00
489.451	V	45.7	-4.4	41.3	46.0	-4.7	180	1.10
598.151	V	47.9	-4.6	43.3	46.0	-2.7	90	1.20
697.830	V	41.2	-1.0	40.2	46.0	-5.8	360	1.00
797.830	V	43.1	0.6	43.7	46.0	-2.3	245	1.10
897.167	V	41.5	2.1	43.6	46.0	-2.4	270	1.30
1096.650	H	56.4	-9.3	47.1	54.0	-6.9	270	1.50
1695.000	V	55.6	-6.4	49.2	54.0	-4.8	270	1.00
2492.500	H	50.7	-2.7	48.0	54.0	-6.0	90	1.50

4.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + CORR. FACTOR

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

4.4 Equipment for Radiation Measurement

The following test equipment are used during the radiated test .

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	01/05/2001
Quasi Peak Adapter	Hewlett-Packard	85650A	01/10/2001
Pre-selector	Hewlett-Packard	85685A	01/10/2001
Pre-Amplifier	Hewlett-Packard	8447D	01/18/2001
Log Periodic Antenna	EMCO	3146	11/03/2001
Biconical Antenna	EMCO	3110B	11/03/2001
Micro Wave EMI Test System	Hewlett-Packard	84125C	01/25/2001

4.5 Measuring Instrument Setup

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

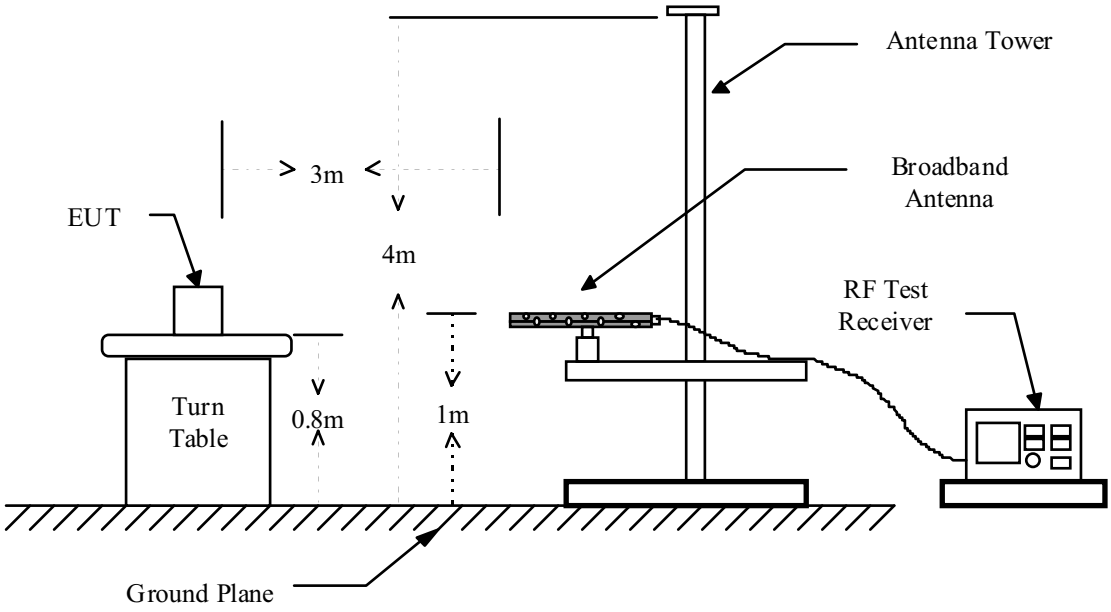
Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	300Hz

4.6 Photos of Radiation Measuring Setup

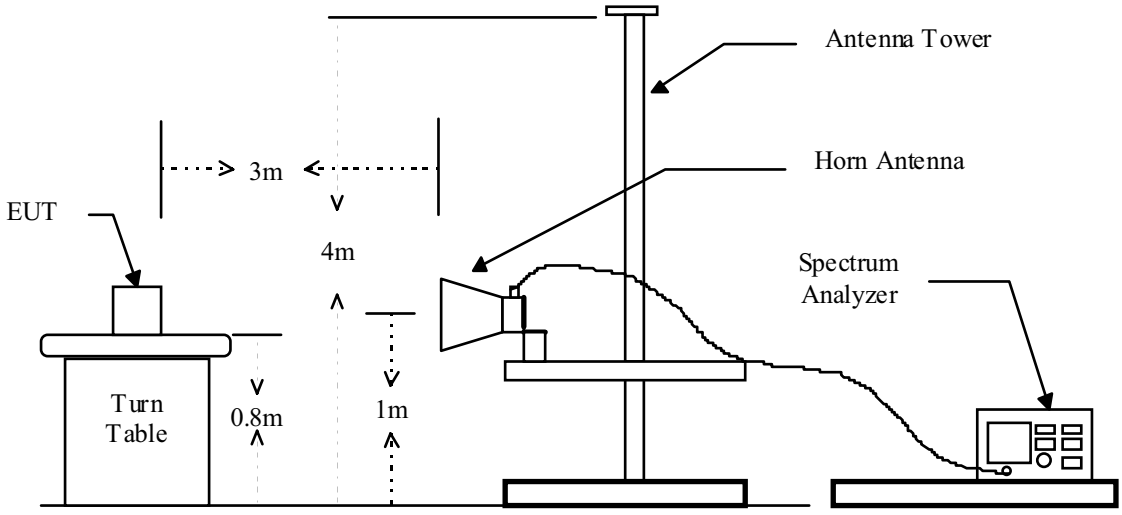
Please see setup photos in Exhibit F.

4.7 Open Field Test Site Setup Diagram

Radiated Emission's Frequency Below 1 GHz



Radiated Emission's Frequency Above 1 GHz



5 CONDUCTED EMISSION MEASUREMENT

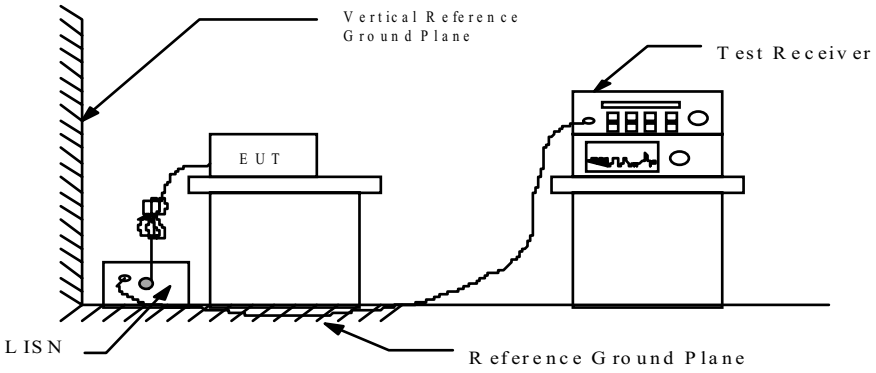
5.1 Standard Applicable

For intentional device, Line Conducted Emission Limits are in accordance to § 15.207(a), any emissions level shall not exceed 48 dBuV.

5.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



5.3 Conducted Emission Data

Operation Mode : Working
Test Date : Nov. 15, 2000 Temperature : 23 ℃ Humidity: 50 %

Frequency	Reading (dBuV)		Factor	Result (dBuV)		Limit	Margin
(MHz)	VA	VB	(dB)	VA	VB	(dBuV)	(dB)
0.4606	40.0	40.4	0.2	40.2	40.6	48.0	-7.4
0.5128	42.2	37.3	0.2	42.4	37.5	48.0	-5.6
0.5709	41.8	38.6	0.2	42.0	38.8	48.0	-6.0
3.3312	42.0	42.4	0.3	42.3	42.7	48.0	-5.3
3.6742	42.8	43.4	0.3	43.1	43.7	48.0	-4.3
6.3132	44.8	45.0	0.4	45.2	45.4	48.0	-2.6

Note : Please see appendix 1 for Plotted Data

5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

Assume a receiver reading of 22.5 dBμV is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dBμV.

RESULT = 22.5 + 0.1 = 22.6 dBμV
Level in μV = Common Antilogarithm[(22.6 dBμV)/20]
= 13.48 μV

5.5 Conducted Measurement Equipment

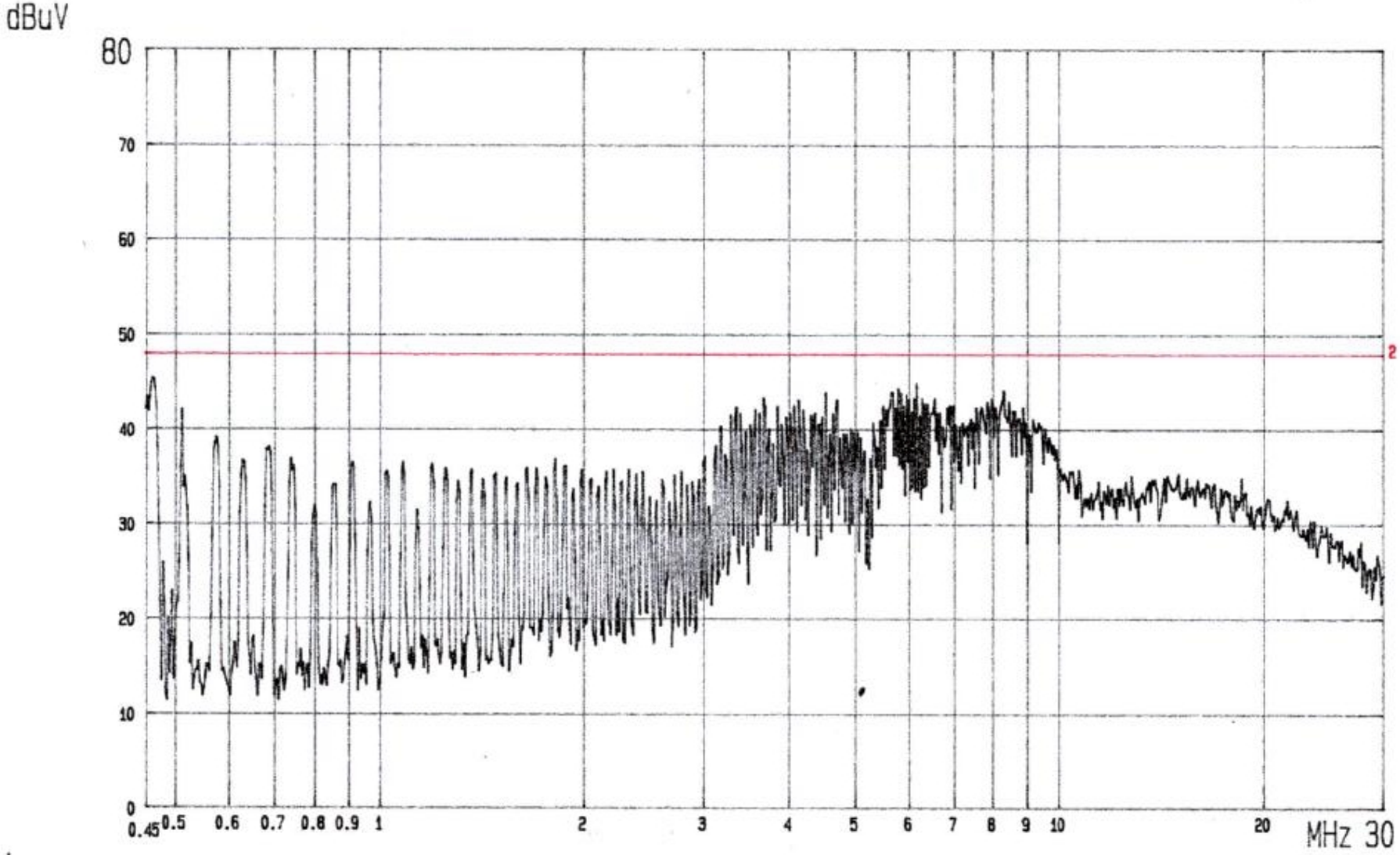
The following test equipment are used during the conducted test .

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	Rohde and Schwarz	ESH3	01/10/2001
Spectrum Monitor	Rohde and Schwarz	EZM	N.C.R.
Line Impedance Stabilization network	Kyoritsu	KNW-407	12/01/2001
Plotter	Hewlett-Packard	7440A	N/A
Shielded Room	Riken	N/A	N.C.R.

5.6 Photos of Conduction Measuring Setup

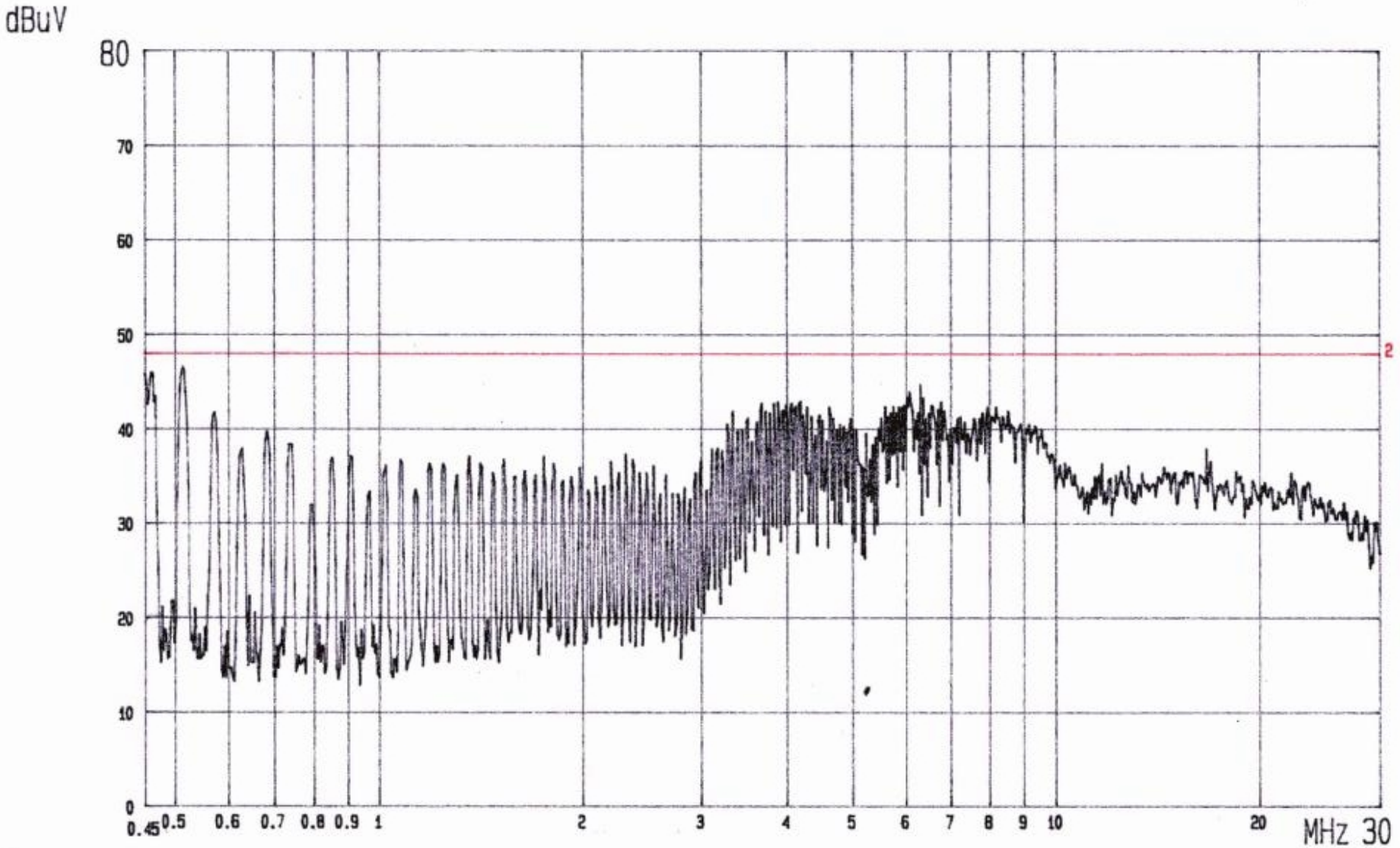
Please see setup photos in Exhibit F.

APPENDIX 1 : PLOTTED DATA FOR CONDUCTED EMISSION



FCC CONDUCTED TEST
MODEL: TP100

LISN: VA 2: QP CLASS B LIMIT
POWER: AC120V/60HZ ETC EMI LAB.



FCC CONDUCTED TEST
MODEL: TP100

LISN: VB 2: QP CLASS B LIMIT
POWER: AC120V/60HZ ETC EMI LAB.