



EMC

TEST REPORT

REPORT NO. : F87072108
MODEL NO. : ETNA-110
DATE OF TEST : July 22, 1998

PREPARED FOR: MOVITA TECHNOLOGIES INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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TAIPEI, TAIWAN, R.O.C.

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1.

CERTIFICATION

Issue Date: July 27, 1998

Product : NOTEBOOK COMPUTER
Trade Name : MOVITA
Model No. : ETNA-110
Applicant : MOVITA TECHNOLOGIES INC.
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on July 22, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY: Ken Liu , DATE: 7.27.98
(Ken Liu)

CHECKED BY: Sharon Hsiung , DATE: 7/27/98
(Sharon Hsiung)

APPROVED BY: Mike Su , DATE: 7/27/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	NOTEBOOK
Model No.	:	ETNA-110
Power Cord	:	AC Nonshielded (1.8m) DC Nonshielded (1.2m)
Data Cable	:	N/A

Note: The EUT was tested with an ILAN power adapter, model: F1700C which has a 2 pin nonshielded power cord.

Its rating	Input	:	100-240 Vac, 1.8A, 50-60 Hz
	Output	:	20Vdc, 2.8A

The EUT was tested with the following configuration:

HDD	:	IBM DTCA-23240
CD-ROM	:	TEAC CD-224E
FDD	:	TEAC FD-05HG
CPU	:	Intel Tillamook Pentium 266, Speed : 266 MHz, the frequency of clock generator is 66 MHz with
XGA LCD display: HITACHI 14.1" TFT model: TX36D62VC1CAB		

For more detailed features, please refer to manufacturer's specification or User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	FCC ID	I/O Cable
1	MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
3	PRINTER	HP	C2145A	B94C2145X	Shielded Signal (1.4m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m)
5	MICROPHONE	CAROL	MUD-329	N/A	Nonshielded Signal (3.8m)
6	EARPHONE	GAMMA	LH115	N/A	Shielded Signal (2.4m)
7	MOUSE	HP	M-S34	DZL211029	Shielded Signal (1.8m)
8	TELEVISION	SONY	PVM-1351Q	VERIFICATION	Shielded Signal (1.0m) Nonshielded Power (1.8m)

Note: 1. A 600 ohm resistor load was connected to the internal modem port of EUT via a telephone cable (2.4m)

2. A USB cable (1.2m) was connected to the USB port of EUT to form an open loop cable.

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992. Radiated testing was performed at a 3/10 meters open area test site. Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 29, 1999
HP Preamplifier	8447D	2944A08313	Sept. 18, 1998
HP Preamplifier	8347A	3307A01088	Sept. 4, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 5, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6111A	1647	July 3, 1999
EMCO Double Ridged Guide Antenna	3115	9312-4192	April 3, 1999
EMCO Turn Table	1016	1722	N/A
EMCO Tower	1051	1825	N/A
Open Field Test Site	Site 4	ADT-R04	June 19, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828765/002	July 31, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 28, 1998
EMCO-L.I.S.N.	3825/2	90031627	July 28, 1998
Shielded Room	Site 5	ADT-C05	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note: (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
- (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 2000 MHz (Radiated Emission)
Input Voltage : 120 Vac, 60 Hz
Temperature : 30 °C
Humidity : 45 %
Atmospheric Pressure : 1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -21.9 dB at 0.175 MHz
	Minimum passing margin of radiated emission: -2.0 dB at 193.33 MHz

Note : The EUT was pretested under the following mode :

Mode 1 : Notebook Display + CRT Display

Mode 2 : Notebook Display + TV Display

During the pretest, the worst emission levels were found when there was EUT and CRT Display and therefore the data of only this mode is recorded in this report.

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. EUT runs a test program to enable all functions.
3. EUT sends "H" messages to LCD display and external monitor. The LCD and external monitor display "H" patterns on their screen and simultaneously.
4. EUT sends "H" messages to printer and printer prints "H" messages on paper.
5. EUT sends "H" messages to modem.
6. EUT sends audio messages to earphone.
7. Repeat steps 3-7.



4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **NOTEBOOK COMPUTER**MODEL: **ETNA-110**MODE: **Notebook + CRT Display**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL:

KEN

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.175	42.20	-	42.80	-	64.72	54.72	-22.5	-	-21.9	-
0.462	17.90	-	31.70	-	56.66	46.66	-38.8	-	-25.0	-
1.221	18.20	-	26.50	-	56.00	46.00	-37.8	-	-29.5	-
4.490	27.40	-	30.90	-	56.00	46.00	-28.6	-	-25.1	-
22.570	34.40	-	35.60	-	60.00	50.00	-25.6	-	-24.4	-
27.143	34.80	-	33.50	-	60.00	50.00	-25.2	-	-26.5	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value

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Prepared by KEN

ADT CO. Shielded Room 5

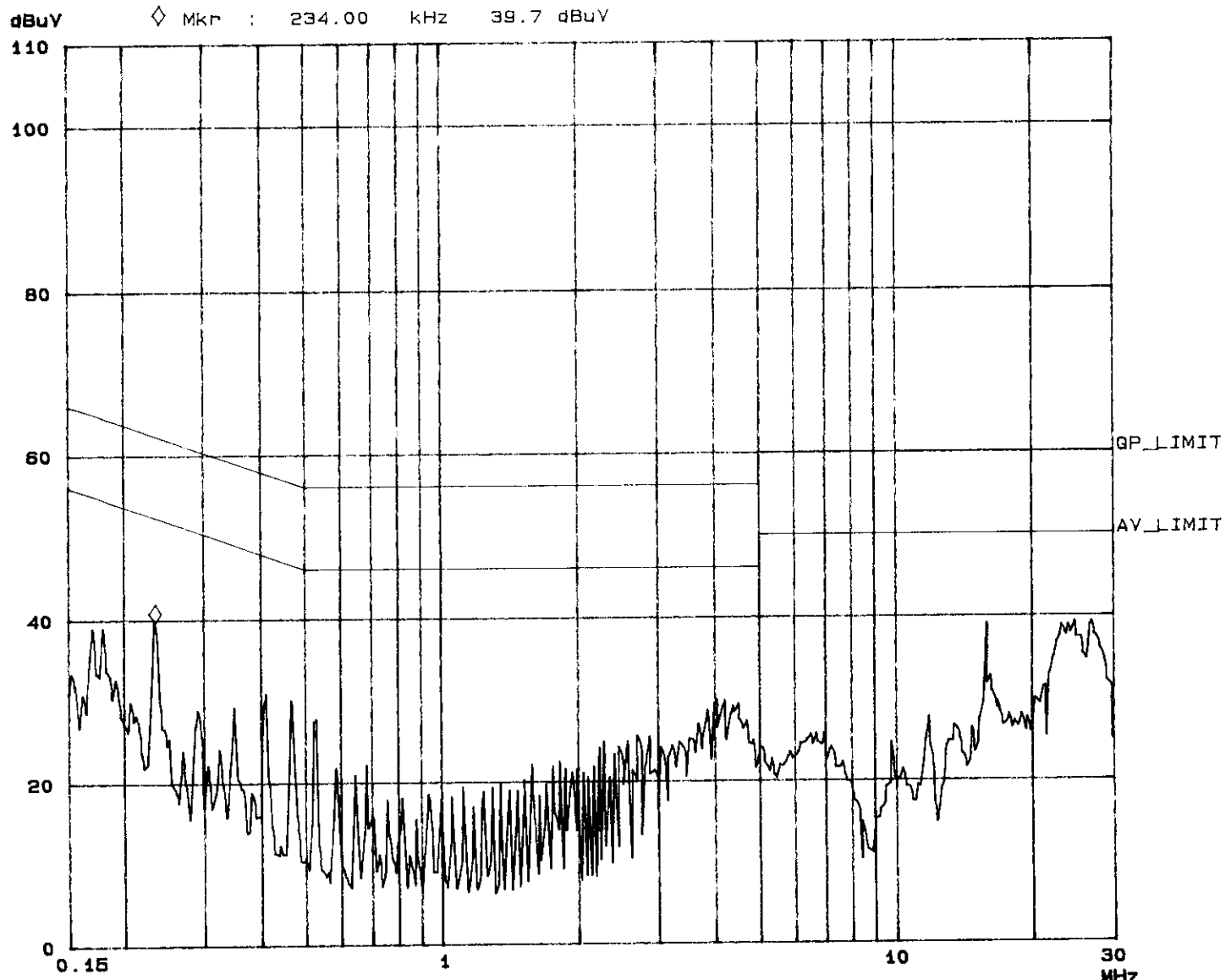
22. Jul 98 17:21

CISPR 22 CLASS B

EUT: ETNA-110
Test Spec: LISN : L
Comment: CPU 266MHZ HITACHI 14.1 FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB	
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB	
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB	



ADT CO. Shielded Room 5
CISPR 22 CLASS B

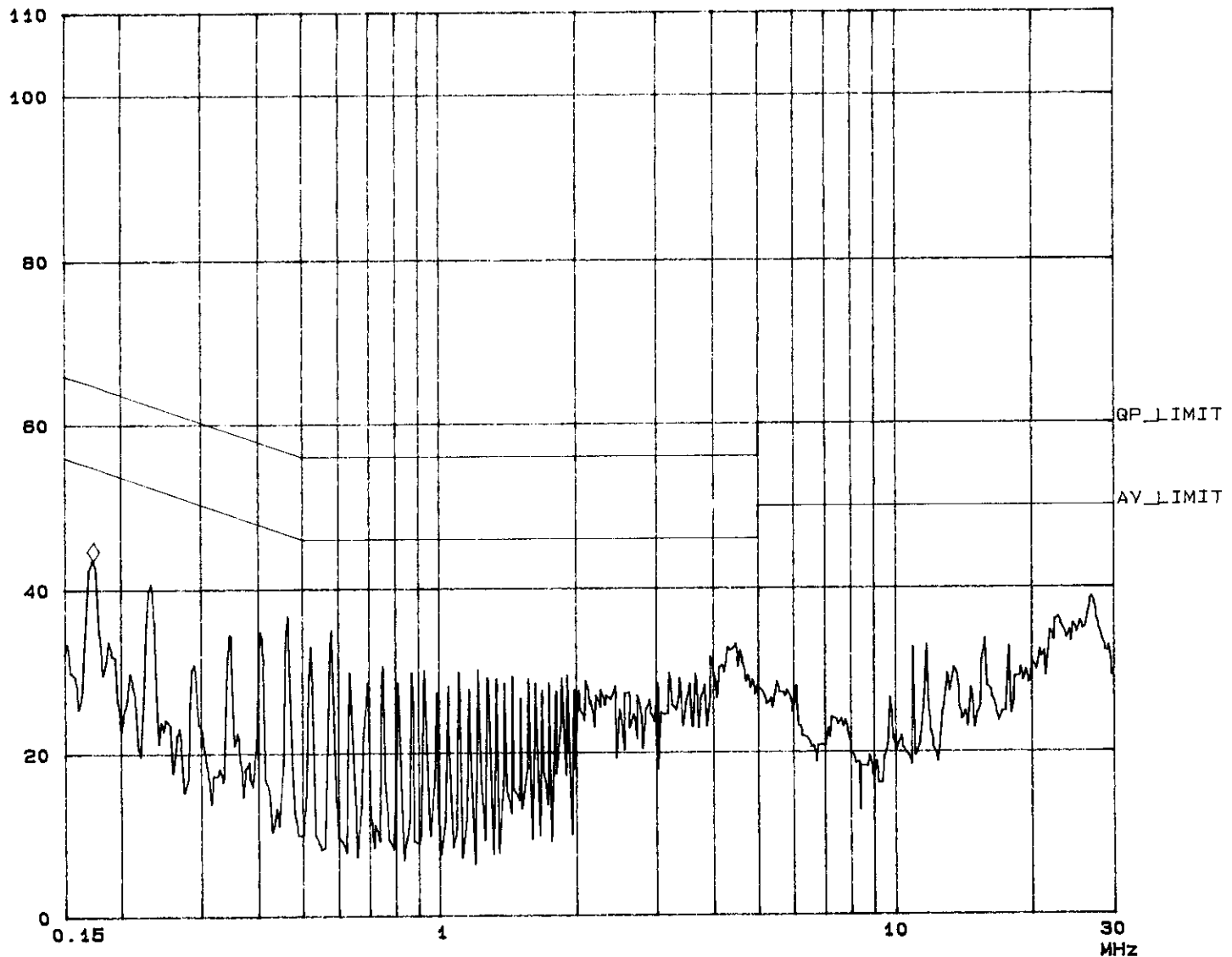
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EUT: ETNA-110
Test Spec: LISN : N
Comment: CPU 266MHZ HITACHI 14.1 FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	80dB	
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	80dB	
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	80dB	

dBuV ◇ Mkr : 174.00 kHz 43.5 dBuV





4.3 TEST DATA OF RADIATED EMISSION

EUT: NOTEBOOK COMPUTERMODEL: ETNA-110MODE: Notebook + CRT DisplayPOLARITY: HorizontalANTENNA: CHASE BILOG CBL 6111A/EMCO Horn 3115DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 MTEST PERSONNEL: KE✓

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
160.40	12.0	14.5	26.5	30.0	-3.5
180.45	11.6	13.3	24.9	30.0	-5.1
193.33	11.6	16.4	28.0	30.0	-2.0
212.65	12.4	13.9	26.3	30.0	-3.7
225.55	13.3	14.4	27.7	30.0	-2.3
322.19	17.2	15.9	33.1	37.0	-3.9

REMARKS :

1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: **NOTEBOOK COMPUTER**MODEL: **ETNA-110**MODE: **Notebook + CRT Display**POLARITY: Vertical

ANTENNA: CHASE BILOG CBL 6111A/EMCO Horn 3115

 DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

TEST PERSONNEL:

KEN

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
115.99	12.6	14.1	26.7	30.0	-3.3
128.88	14.3	12.1	26.4	30.0	-3.6
160.37	12.8	14.8	27.6	30.0	-2.4
200.48	12.1	15.6	27.7	30.0	-2.3
212.66	12.6	14.8	27.4	30.0	-2.6
225.55	13.1	14.2	27.3	30.0	-2.7
322.19	17.8	16.8	34.6	37.0	-2.4

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value