



EMC

TEST REPORT

REPORT NO. : F87060402
MODEL NO. : 6511-MU, 6512-MU
DATE OF TEST : June 11, 1998

PREPARED FOR : ACER PERIPHERALS, INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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1.

CERTIFICATION

Issue date: June 24, 1998

Product : USB KEYBOARD
 Trade Name : ACER
 Model No. : 6511-MU, 6512-MU
 Applicant : ACER PERIPHERALS, 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 June 11, 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 VCCI Class B ITE limits of mains terminal interference voltage and radiated interference field strength of applicable standards.

TESTED BY: Leo Hong, DATE: 6/24/98
(Leo Hong)

CHECKED BY: Sharon Hsiung, DATE: 6/24/98
(Sharon Hsiung)

APPROVED BY: Harris W. Lai, DATE: 6/24/98
(Harris W. Lai)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	USB KEYBOARD
Model No.	:	6511-MU, 6512-MU
Power Supply	:	DC 5V
Data Cable	:	Shielded (1.5M)

Note: The EUT is a USB keyboard which is fully compatible with IBM AT and PS/2.

The EUT has two model names , which are identical to each other, except for the following:

Model: 6511-MU (104 Key)

Model: 6512-MU (105 Key)

From the above model names, model: 6511-MU was selected as representative model for the test, and its data is recorded in this report.

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	PERSONAL COMPUTER	HP	D5220B	FCC DoC	Nonshielded Power (1.8m)
2	MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.8m)
4	MODEM	GVC	F-1128V1R6	FK4F1128VR6	Shielded Signal (1.2m) Nonshielded Power (1.8m)
5	MOUSE	HP	M-S34	DZL211029	Shielded Signal (1.8m)

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 an antenna to EUT distance of 10 m on an 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	3544A00941	Dec. 14, 1998
HP Pre-Amplifier	8447D	2944A08312	Sept. 10, 1998
R&S Receiver	ESVS10	844591/010	Sept. 23, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6111A	1500	Sept. 12, 1998
EMCO Turn Table	1060-04	1196	N/A
EMCO Tower	1051	1264	N/A
Open Field Test Site	Site 1	ADT-R01	Sept. 5, 1998

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	ESH3	893495/006	July 23, 1998
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 24, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	Aug. 1, 1998
EMCO-L.I.S.N.	3825/2	9204-1964	July 22, 1998
Shielded Room	Site 2	ADT-C02	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 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	27 °C
Humidity	:	58 %
Atmospheric Pressure	:	1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -18.4 dB at 0.177 MHz Minimum passing margin of radiated emission: -3.1 dB at 144.00 MHz

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC reads a test program to enable all functions.
3. PC sends "H" messages to monitor and monitor display "H" patterns on screen.
4. PC sends "H" messages to modem.
5. PC sends "H" messages to printer, and the printer prints them on paper.
6. Repeat steps 3-6.



4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: **USB KEYBOARD**MODEL: **6511-MU**

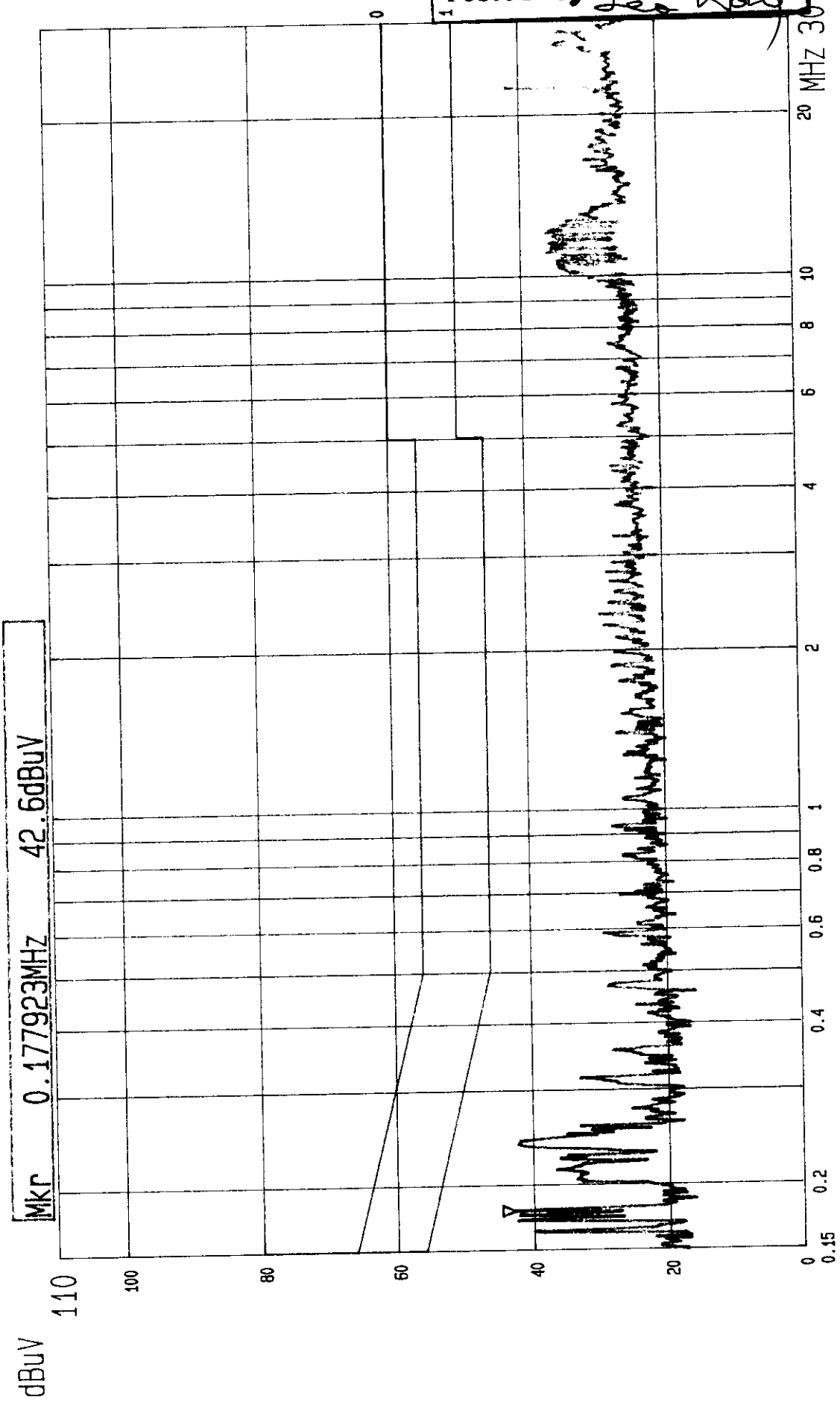
6 dB Band Width: 10 kHz

TEST PERSONNEL:

Lee Amy

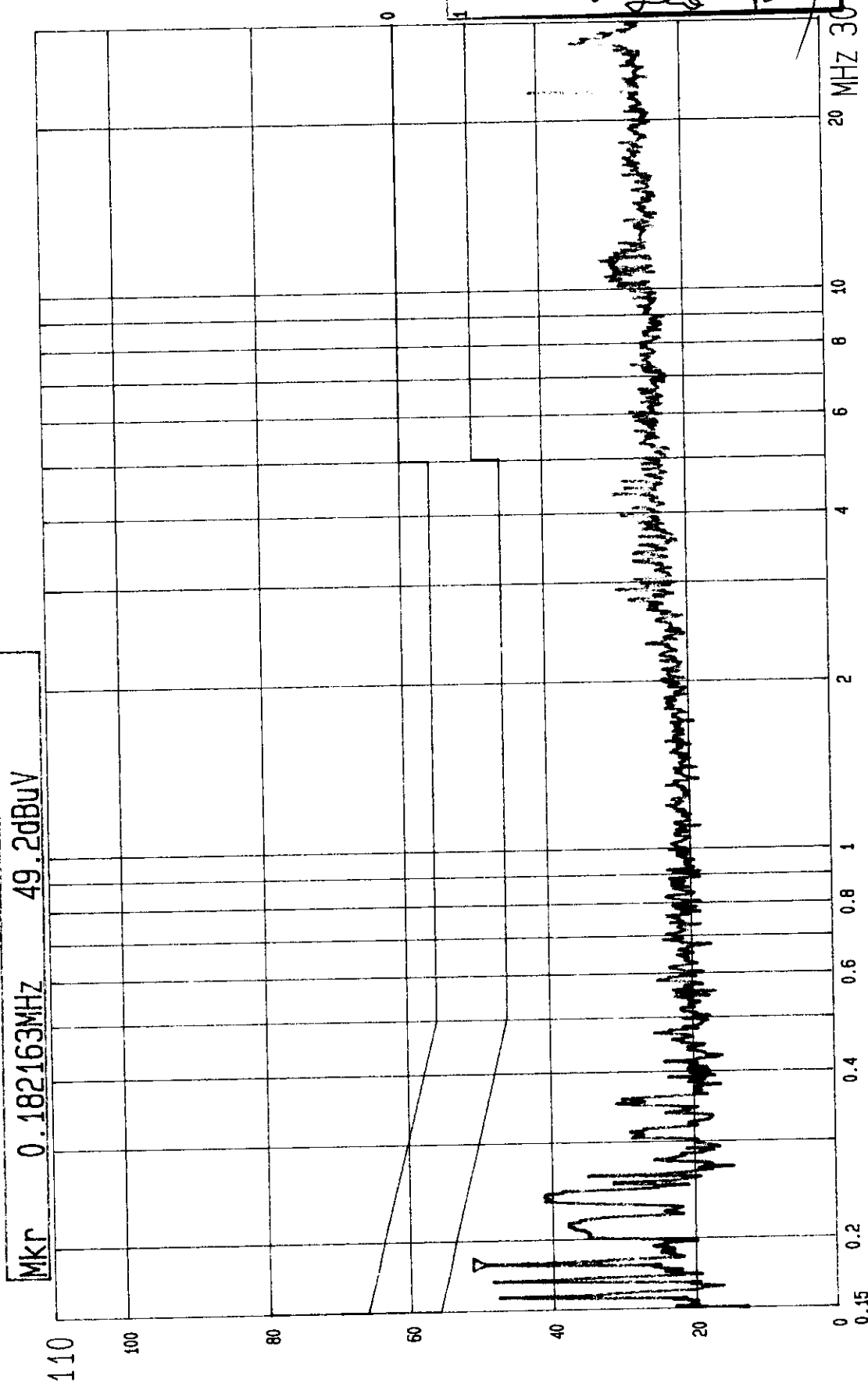
Freq. [MHz]	L Level		N Level		Limit		Margin [dB (μV)]			
	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.177	39.60	-	46.20	-	64.58	54.58	-25.0	-	-18.4	-
0.237	40.10	-	39.50	-	62.19	52.19	-22.1	-	-22.7	-
0.314	30.50	-	28.90	-	59.84	49.84	-29.3	-	-30.9	-
0.587	27.00	-	23.50	-	56.00	46.00	-29.0	-	-32.5	-
11.224	32.40	-	28.50	-	60.00	50.00	-27.6	-	-31.5	-
22.482	39.80	-	39.50	-	60.00	50.00	-20.2	-	-20.5	-

- 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.



--- Date 11.JUN.'98 Time 20:52:55
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)
MODEL : 6511-MU

ADT CORP.
LISN : L



---- Date 11. JUN. '98 Time 20: 56: 45
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)
MODEL : 6511-MU
ADT CORP.
LISN : N



4.1.3 TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD**MODEL: **6511-MU**

ANTENNA: CHASE BILOG CBL6111A

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL:

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
36.27	17.7	6.7	24.4	30.0	-5.6
132.97	14.7	5.5	20.2	30.0	-9.8
144.04	14.2	12.2	26.4	30.0	-3.6
149.99	13.5	10.2	23.7	30.0	-6.3
186.15	12.3	11.2	23.5	30.0	-6.5
216.06	14.3	6.9	21.1	30.0	-8.9
228.07	15.3	5.7	21.0	30.0	-9.0
240.05	16.5	13.9	30.4	37.0	-6.6

- 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.



TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD**

MODEL: **6511-MU**

ANTENNA: CHASE BILOG CBL6111A

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: *Leo King*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
36.28	16.5	9.1	25.6	30.0	-4.4
48.41	11.4	14.9	26.3	30.0	-3.7
108.02	13.2	13.1	26.3	30.0	-3.7
114.55	14.3	12.5	26.8	30.0	-3.2
131.97	16.5	8.6	25.1	30.0	-4.9
144.00	16.5	10.4	26.9	30.0	-3.1
186.16	13.0	11.3	24.3	30.0	-5.7
216.04	14.6	11.3	25.9	30.0	-4.1
228.07	15.3	9.7	25.0	30.0	-5.0

- 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.