



# EMC

## TEST REPORT

REPORT NO. : F87052807

MODEL NO. : BCD 36HB

DATE OF TEST : June 2, 1998

PREPARED FOR: BEHAVIOR TECH COMPUTER CORP.

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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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## **TABLE OF CONTENTS**

1. CERTIFICATION .....	3
2. GENERAL INFORMATION .....	4
2.1 GENERAL DESCRIPTION OF EUT .....	4
2.2 DESCRIPTION OF SUPPORT UNITS .....	5
2.3 TEST METHODOLOGY AND CONFIGURATION .....	5
3. TEST INSTRUMENTS .....	6
3.1 TEST INSTRUMENTS (EMISSION) .....	6
3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION .....	7
4. TEST RESULTS (EMISSION) .....	8
4.1 RADIO DISTURBANCE .....	8
4.1.1 EUT OPERATION CONDITION .....	8
4.1.2 TEST DATA OF RADIATED EMISSION .....	10
5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN ....	12

**1. CERTIFICATION**

Issue Date: June 4, 1998

Product : CD-ROM DRIVE  
Trade Name : BTC  
Model No. : BCD 36HB  
Applicant : BEHAVIOR TECH COMPUTER CORP.  
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 2, 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: James Chen, DATE: 6/4/98  
( James Chen )

CHECKED BY: Ariel Hsieh, DATE: 6/4/98  
( Ariel Hsieh )

APPROVED BY: Mike Su, DATE: 6/4/98  
( Mike Su )

**ADVANCE DATA TECHNOLOGY CORPORATION**

Accredited Laboratory



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product	:	CD-ROM DRIVE
Model No.	:	BCD 36HB
Power Supply	:	DC 5V/12V (from PC)
Data Cable	:	Nonshielded (IDE cable) (0.8 m)

Note: The EUT is a 36X CD-ROM DRIVE, which is designed to be used within an IBM PC or compatible computer by using the IDE connection.

User could install one sound card in PC to process audio signals from EUT then output audio to speaker via SPK port located on sound card or only connect headphone to headphone jack on front panel of EUT to listen to an audio directly playing from the CD-ROM DRIVE.

The EUT was tested under the following two conditions:

- (1) The EUT played music CD and audio signals were present via headphone port, no sound blaster card was installed.
- (2) The EUT played video demo CD and PC showed continuous pictures on monitor and present stereo audio via sound blaster card.

The maximum emission levels of the above two conditions are recorded together in this report.

For more detailed features, please refer to 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	VECTRA VL 5/133	B94VECTRA500T	Nonshielded Power (1.8m)
2	MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.1m) Nonshielded Power (2.4m)
5	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (2.4m)
6	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.6m)
7	EARPHONE	CAMMA	LH715	N/A	Nonshielded Signal (1.4m)
8	SPEAKER	J-S	J-003	N/A	Nonshielded Signal (1.4m)
9	SOUND CARD	CREATIVE	CT2970	IBACT-SONATE	N/A

## 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	E4411A	US37360834	Sept. 28, 1998
CHASE Preamplifier	CPA9231A/4	3215	Oct. 31, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/002	Jan. 08, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BILOG Antenna	CBL6112	2074	Dec. 25, 1998
CHANCE Turn Table & Tower Controller	ACS-I	N/A	N/A
Open Field Test Site	Site 6	ADT-R06	Dec. 23, 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	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 - 1000 MHz (Radiated Emission)  
Input Voltage : 120 Vac, 60 Hz  
Temperature : 27 °C  
Humidity : 58 %  
Atmospheric Pressure : 996 mbar

TEST RESULT	Remarks
<b>PASS</b>	Minimum passing margin of conducted emission: -12.3 dB at 0.244 MHz Minimum passing margin of radiated emission: -3.0 dB at 169.13 MHz

#### 4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC plays a demo disk via the EUT and sends out audio via sound card installed. The monitor screen shows video of this demo disk.

OR

1. Turn on the power of all equipments.
2. PC reads a test program and runs it to enable all functions.
3. PC sends "H" messages to monitor and monitor displays "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. PC plays a music disk via the EUT and sends out audio signals to earphone via the EUT.
7. Repeat steps 3-7.



**TEST DATA OF CONDUCTED EMISSION**EUT: **CD-ROM DRIVE**MODEL: **BCD 36HB**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL:

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
0.162	52.70	-	47.20	-	65.36	55.36	-12.7	-	-18.2	-
0.244	49.70	-	40.80	-	61.96	51.96	-12.3	-	-21.2	-
0.331	44.70	-	42.20	-	59.43	49.43	-14.7	-	-17.2	-
0.957	28.10	-	31.50	-	56.00	46.00	-27.9	-	-24.5	-
10.562	30.10	-	29.10	-	60.00	50.00	-29.9	-	-30.9	-
22.568	46.20	-	45.20	-	60.00	50.00	-13.8	-	-14.8	-

- 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 levels of other frequencies were very low against the limit.
  5. Margin value = Emission level - Limit value

ADT CO. SITE 5  
CISPR 22 CLASS B

02. Jun 98 09:38

EUT: BCD 36HB  
Operator: JAMES CHEN  
Test Spec: LISN : L  
Comment: AC 110V 60Hz

**Report No. F87052807**

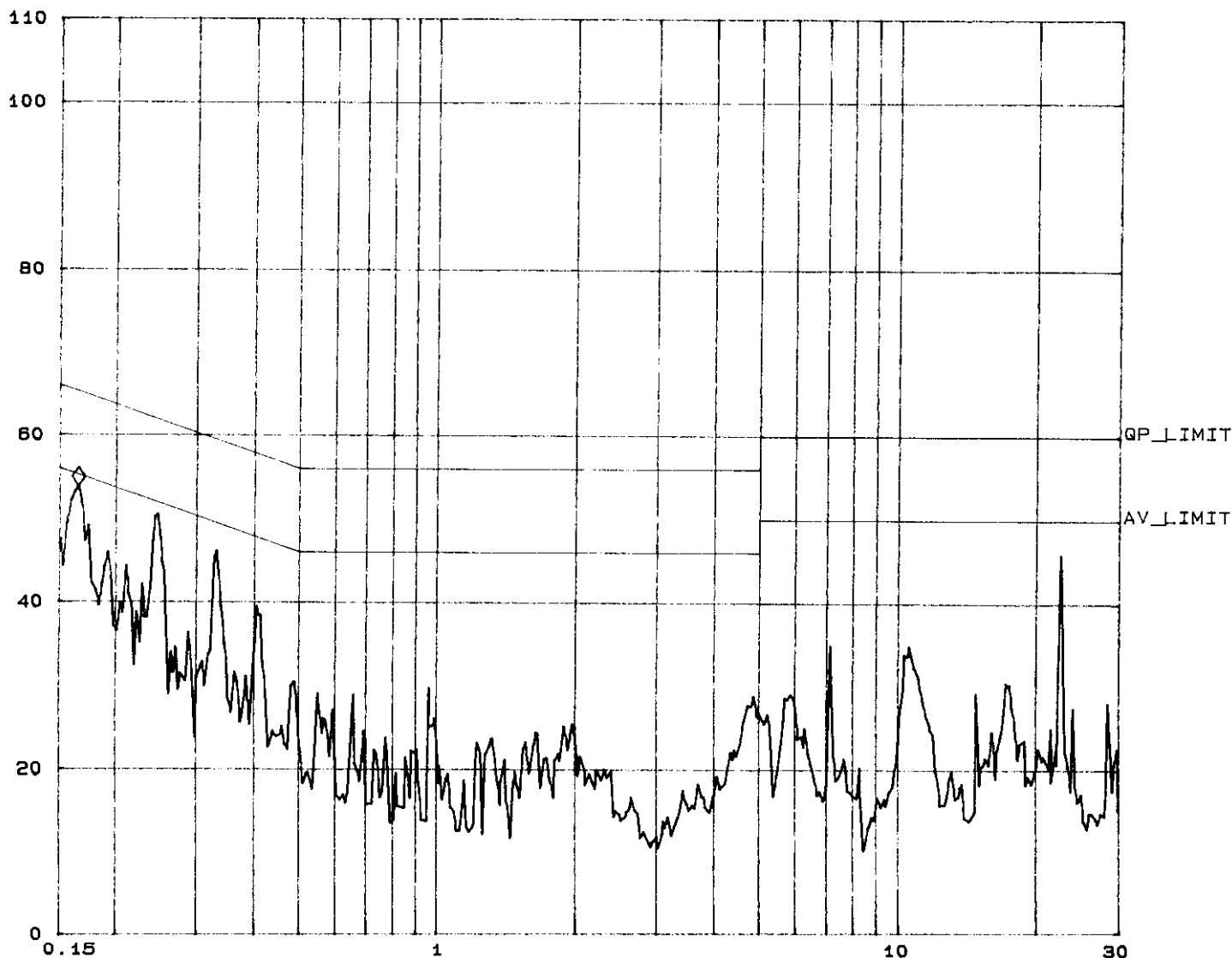
**Page 9-1**

**Tested by James Chen**

**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

dBuV      ◇ Mkr : 165.00    kHz    53.8 dBuV



ADT CO. SITE 5  
CISPR 22 CLASS B

02. Jun 98 09:50

EUT: BCD 36HB  
Operator: JAMES CHEN  
Test Spec: LISN : N  
Comment: AC 110V 60Hz

Report No. F87052807

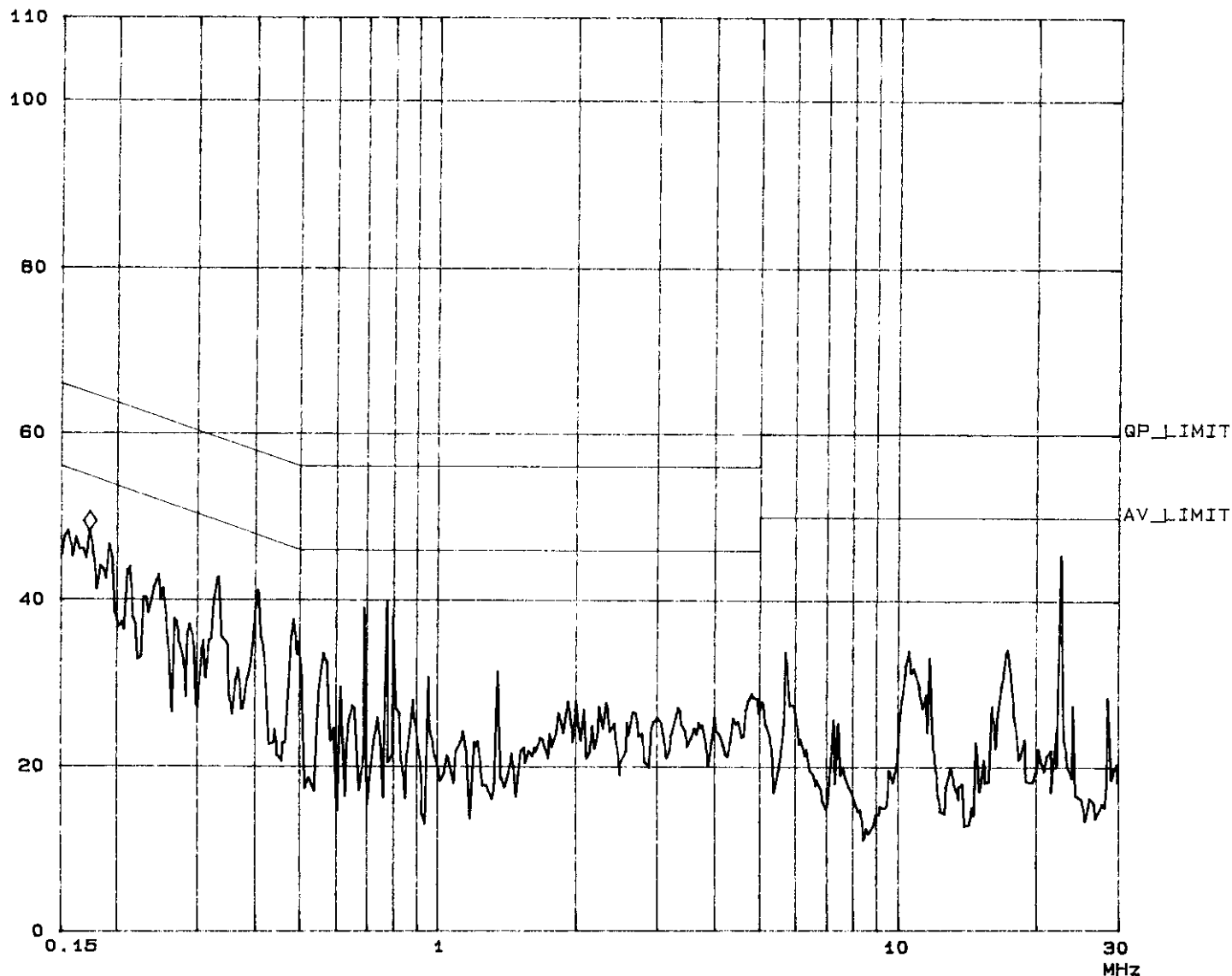
Page 9-2

Tested by James Chen

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpAmp
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

dBuV  $\diamond$  Mkr : 174.00 kHz 48.3 dBuV





#### 4.1.2 TEST DATA OF RADIATED EMISSION

EUT: **CD-ROM DRIVE**MODEL: **BCD 36HB**

ANTENNA: CHASE BILOG CBL6112

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)	Limit (dBuV/m)	Margin (dB)
72.46	8.5	13.0	21.5	30.0	-8.5
125.12	15.0	9.6	24.6	30.0	-5.4
166.13	11.0	10.3	21.3	30.0	-8.7
169.13	10.9	16.1	27.0	30.0	-3.0
198.95	10.4	10.4	20.8	30.0	-9.2
203.08	10.7	9.9	20.6	30.0	-9.4
312.50	16.5	10.3	26.8	37.0	-10.2
436.50	19.4	8.7	28.1	37.0	-8.9

- 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: **CD-ROM DRIVE**MODEL: **BCD 36HB**ANTENNA: **CHASE BILOG CBL6112**POLARITY: **Vertical**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)	Limit (dBuV/m)	Margin (dB)
47.98	10.7	14.1	24.8	30.0	-5.2
60.05	8.3	15.2	23.5	30.0	-6.5
70.00	7.1	15.3	22.4	30.0	-7.6
139.82	13.3	12.2	25.5	30.0	-4.5
152.64	12.7	11.8	24.5	30.0	-5.5
166.12	11.5	10.5	22.0	30.0	-8.0
169.05	11.1	13.3	24.4	30.0	-5.6
198.96	11.7	14.6	26.3	30.0	-3.7
203.10	12.0	11.5	23.5	30.0	-6.5
308.13	15.7	14.4	30.1	37.0	-6.9
808.53	24.4	7.4	31.8	37.0	-5.2
862.25	24.5	8.3	32.8	37.0	-4.2

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