



# EMC

## TEST REPORT

REPORT NO. : F87072908  
MODEL NO. : G2R600A, H2R450A  
DATE OF TEST : July 30, 1998

PREPARED FOR : DEXIN CORP.

ADDRESS : 20F, 37, SEC. 2, SAN-MING RD.,  
PAN-CHIAO CITY, TAIPEI HSIEN, TAIWAN

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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**1. CERTIFICATION**

Issue Date: July 31, 1998

Product : MOUSE  
Trade Name : DEXIN  
Model No. : G2R600A, H2R450A  
Applicant : DEXIN 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 July 30, 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: John Liao , DATE: 7/31/98  
( John Liao )

CHECKED BY: Sharon Hsiung , DATE: 7/31/98  
( Sharon Hsiung )

APPROVED BY: Mike Su , DATE: 7/31/98  
( Mike Su )

**ADVANCE DATA TECHNOLOGY CORPORATION**

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## **2. GENERAL INFORMATION**

### **2.1 GENERAL DESCRIPTION OF EUT**

|                   |   |                  |
|-------------------|---|------------------|
| Product           | : | MOUSE            |
| Model No.         | : | G2R600A, H2R450A |
| Power Supply Type | : | DC 5V (from PC)  |
| Data Cable        | : | Shielded (1.5m)  |

Note: The EUT has two models, which are identical to each other in all aspects except for their indexes.

- Model: G2R600A
- Model: H2R450A

From the above models, model G2R600A was selected as the representative during the test and only its data is recorded in this report.

For more detailed features description, 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          | D5220     | Doc approved | Nonshielded Power (1.8m)                           |
| 2   | MONITOR           | ADI         | 937G      | BR8937G      | Shielded Signal (1.5m)<br>Nonshielded Power (1.8m) |
| 3   | KEYBOARD          | FORWARD     | FDA-104GA | F4ZDA-104G   | Shielded signal (1.4m)                             |
| 4   | PRINTER           | HP          | C2145A    | B94C2145X    | Shielded Signal (1.2m)<br>Nonshielded Power (1.9m) |
| 5   | MODEM             | DATATRONICS | 1200CK    | E2050V1200CK | Shielded signal (1.5m)<br>Nonshielded Power (1.9m) |
| 6   | VGA CARD          | GORDIA      | DSV3365   | LUT-DSV3365  | 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 3m and 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<br>UHA 9105 | E101051<br>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    | 828109/007 | July 22, 1999    |
| ROHDE & SCHWARZ Artificial Mains Network | ESH2-Z5   | 892107/003 | July 20, 1999    |
| EMCO L.I.S.N.                            | 3825/2    | 9504-2359  | July 20, 1999    |
| Shielded Room                            | Site 3    | ADT-C03    | 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<br>(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<br>(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<br>(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 : 30 °C

Humidity : 56 %

Atmospheric Pressure : 997 mbar

| TEST RESULT | Remarks                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PASS</b> | Minimum passing margin of conducted emission: -19.6 dB at 10.527 MHz<br>Minimum passing margin of radiated emission: -3.0 dB at 199.43 MHz |

#### 4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.



## 4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **MOUSE**MODEL: **G2R600A**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: *John Liang*

| 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 |
| 0.153  | 41.90     | -  | 40.70     | -  | 65.84     | 55.84 | -23.9            | -  | -25.1 | -  |
| 0.570  | 19.70     | -  | 29.00     | -  | 56.00     | 46.00 | -36.3            | -  | -27.0 | -  |
| 1.945  | 25.60     | -  | 30.60     | -  | 56.00     | 46.00 | -30.4            | -  | -25.4 | -  |
| 10.527 | 40.40     | -  | 38.10     | -  | 60.00     | 50.00 | -19.6            | -  | -21.9 | -  |
| 20.478 | 28.80     | -  | 32.20     | -  | 60.00     | 50.00 | -31.2            | -  | -27.8 | -  |
| 28.634 | 31.20     | -  | 31.30     | -  | 60.00     | 50.00 | -28.8            | -  | -28.7 | -  |

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.

ADT CO. Shielded Room 3  
CISPR 22 CLASS B

30. Jul 98 20:56

EUT: MODEL: G2P600A  
Test Spec: LISN: L  
Comment: FULL SYSTEM

Report No. F87072908

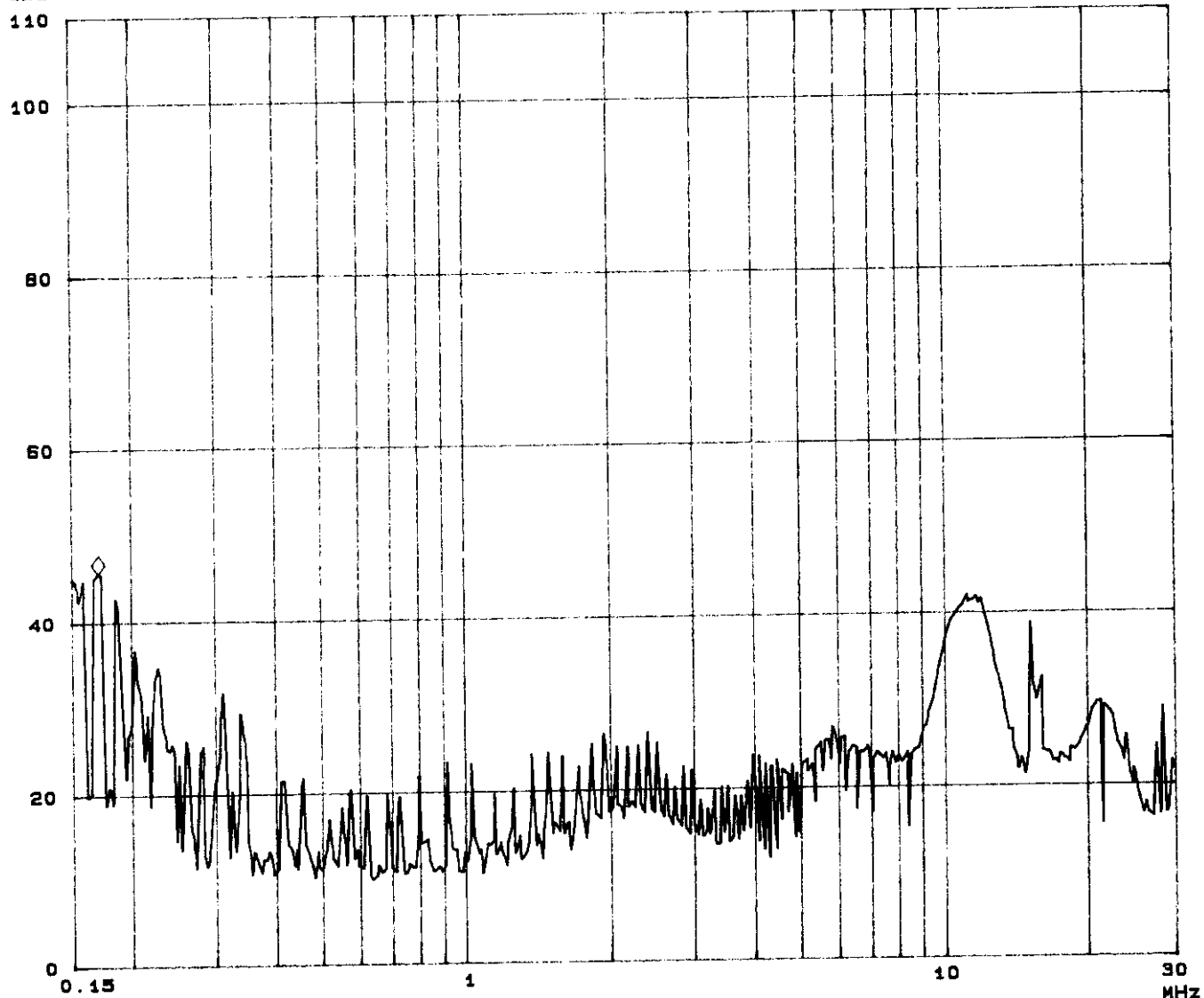
Page 9-1

Tested by John Liao

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    | 10dB  | LN OFF | 60dB  |  |
| 450k        | 5M   | 3k   | 10k               | PK       | 1ms    | 10dB  | LN OFF | 60dB  |  |
| 5M          | 30M  | 3k   | 10k               | PK       | 1ms    | 10dB  | LN OFF | 60dB  |  |

dBuV  $\diamond$  MKR : 171.00 kHz 45.4 dBuV



ADT CO. Shielded Room 3  
CISPR 22 CLASS B

30. Jul 98 21:10

EUT: MODEL: G2P800A  
Test Spec: L15N : N  
Comment: FULL SYSTEM

Report No. F87072908

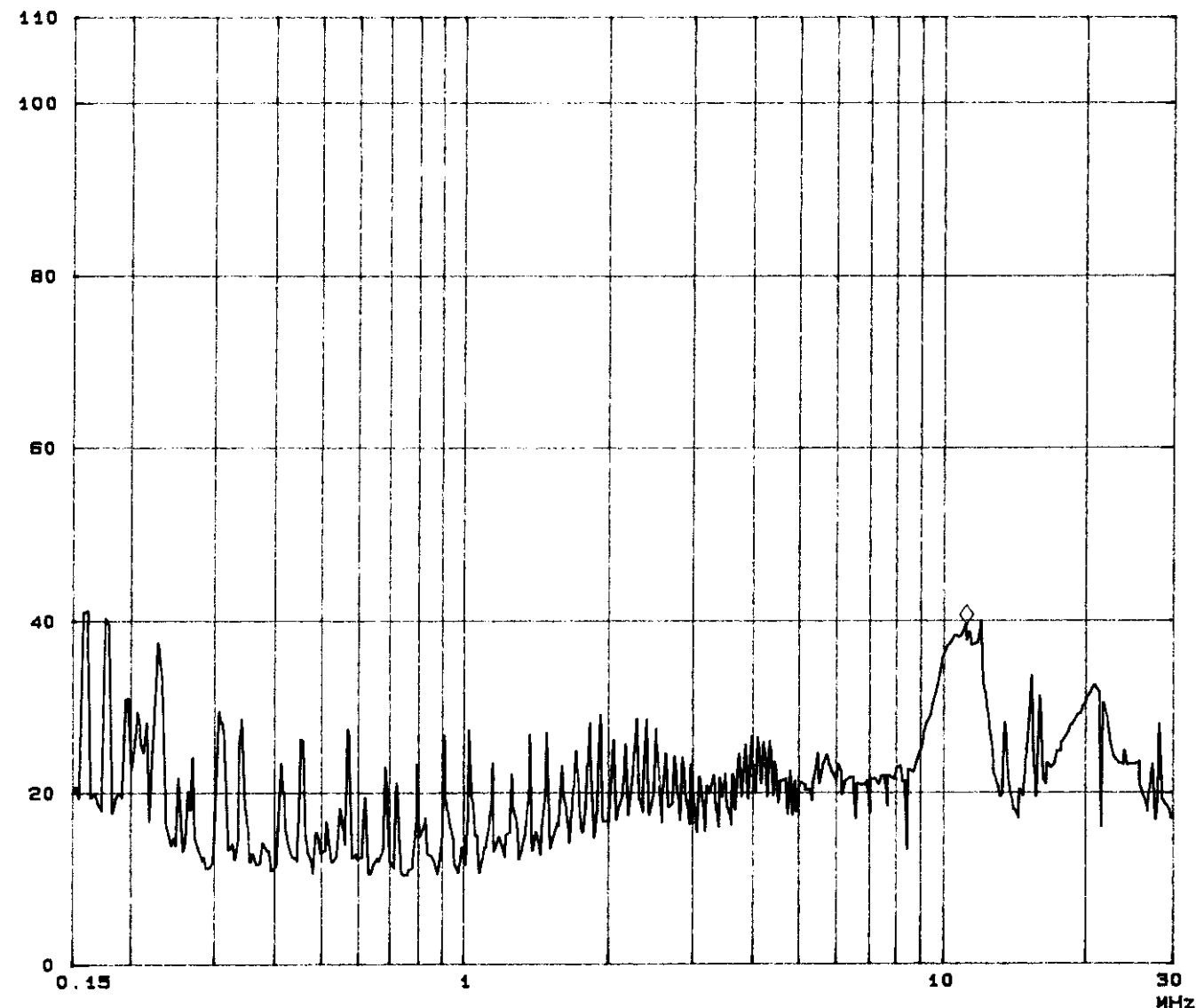
9-2

by John Liao

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    | 10dB  | OFF    | 60dB  |
| 450k        | 5M   | 3k   | 10k               | PK       | 1ms    | 10dB  | OFF    | 60dB  |
| 5M          | 30M  | 3k   | 10k               | PK       | 1ms    | 10dB  | OFF    | 60dB  |

dBuV  $\diamond$  Mkr : 11.10200MHz 39.5 dBuV





### 4.3 TEST DATA OF RADIATED EMISSION

EUT: **MOUSE**MODEL: **G2R600A**

ANTENNA: CHASE BILOG CBL 6112

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: *John Liao*

| Frequency<br>(MHz) | Correction<br>Factor<br>(dB/m) | Reading<br>Data<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|--------------------------------|---------------------------|-------------------------------|-------------------|----------------|
| 120.55             | 15.5                           | 1.6                       | 17.1                          | 30.0              | -12.9          |
| 171.81             | 10.9                           | 6.2                       | 17.1                          | 30.0              | -12.9          |
| 192.25             | 10.6                           | 12.3                      | 22.9                          | 30.0              | -7.1           |
| 199.43             | 10.4                           | 15.7                      | 26.1                          | 30.0              | -3.9           |
| 216.25             | 12.0                           | 7.4                       | 19.4                          | 30.0              | -10.6          |
| 299.14             | 16.2                           | 8.4                       | 24.6                          | 37.0              | -12.4          |
| 432.07             | 19.4                           | 9.5                       | 28.9                          | 37.0              | -8.1           |
| 764.48             | 24.0                           | 5.5                       | 29.5                          | 37.0              | -7.5           |

- 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: **MOUSE**MODEL: **G2R600A**

ANTENNA: CHASE BILOG CBL 6112

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: *John Liao*

| Frequency<br>(MHz) | Correction<br>Factor<br>(dB/m) | Reading<br>Data<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|--------------------------------|---------------------------|-------------------------------|-------------------|----------------|
| 49.48              | 9.9                            | 13.4                      | 23.3                          | 30.0              | -6.7           |
| 114.54             | 14.4                           | 5.5                       | 19.9                          | 30.0              | -10.1          |
| 130.63             | 13.8                           | 13.0                      | 26.8                          | 30.0              | -3.2           |
| 199.43             | 11.8                           | 15.2                      | 27.0                          | 30.0              | -3.0           |
| 216.06             | 12.5                           | 6.3                       | 18.8                          | 30.0              | -11.2          |
| 232.65             | 13.3                           | 16.7                      | 30.0                          | 37.0              | -7.0           |
| 432.08             | 19.2                           | 11.2                      | 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.
  4. Margin value = Emission level - Limit value.