ELECTROMAGNETIC RESEARCH INSTITUTE

# EMI COMPLIANCE REPORT

**Emission of electromagnetic disturbance**

**Test Report No.** : ERI-FCC03-0011

**Equipment** : DIGITAL VOICE RECORDER

**Name of basic model** : VR-H500

**FCC ID** : QW6VRH500

**Family model** : VR-H560, VR-H580, SVR-H500

**Manufacturer** : CENIX DIGICOM CO., LTD.

**Applicant** : Gi-Yeon, Lee

**Tested date** : 2003. 2. 10 - 2. 20

**Issued date** : 2003. 2. 26

**Test results** : PASS

**Test Standards** : FCC Part 15 Subpart B (Class B)

**Test Procedure and Items** :

- AC Power line Conducted emissions measurement : ANSI C63.4-1992
- Radiated emissions measurement : ANSI C63.4-1992

**Tested by: GWEON, HUR** **Approved by: UK-CHO, RIM**

The results in this report apply only to the sample tested.
This test report shall not be reproduced except in full, without the written approval of **ERI Laboratory**.

## CONTENTS

## 1. CLIENT INFORMATION

The EUT has been tested by request of :

Company : CENIX DIGICOM CO., LTD.

Address : #584-4 PAJANG-DONG, JANGAN-KU, SUWON-CITY, KYUNGGI-DO, KOREA

Name of contact : Gi-Yeon, Lee

Telephone : +82-31-245-2900

Facsimile : +82-31-251-6425

## 2. LABORATORY INFORMATION

The 10m semi-anechoic chamber and/or EMC facilities are used for these testing. These facilities were accredited by KOLAS, EK, MIC of Korea and FCC of USA.

**Address**

ELECTROMAGNETIC RESEARCH INSTITUTE.

66-6, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

Telephone No. : +82-31-336-1186~7

Facsimile No. : +82-31-336-1184

**Registered No.**

KOLAS : 111

EK : J

MIC : KR0030

FCC Filing No. : 302567

## 3. EQUIPMENT UNDER TEST INFORMATION(EUT)

### 3.1 Identification of the EUT

Type of equipment : DIGITAL VOICE RECORDER

Model name : VR-H500

Brand name : N/A

Manufacturer : CENIX DIGICOM CO., LTD.

Address : #584-4 PAJANG-DONG, JANGAN-KU, SUWON-CITY, KYUNGGI-DO, KOREA

Telephone : +82-31-245-2900

Facsimile : +82-31-251-6425

Country of origin : KOREA

Rating : DC 3V

### 3.2 Additional information about the EUT

Class B

Family Models List:

| Basic Model | Variant Model | Differential point | Memory size |
|---|---|---|---|
| VR-H500 | - | Memory size | 32M |
| | VR-H560 | Memory size | 64M |
| | VR-H580 | Memory size | 128M |
| | SVR-H500 | Memory size | 128M |

### 3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT.

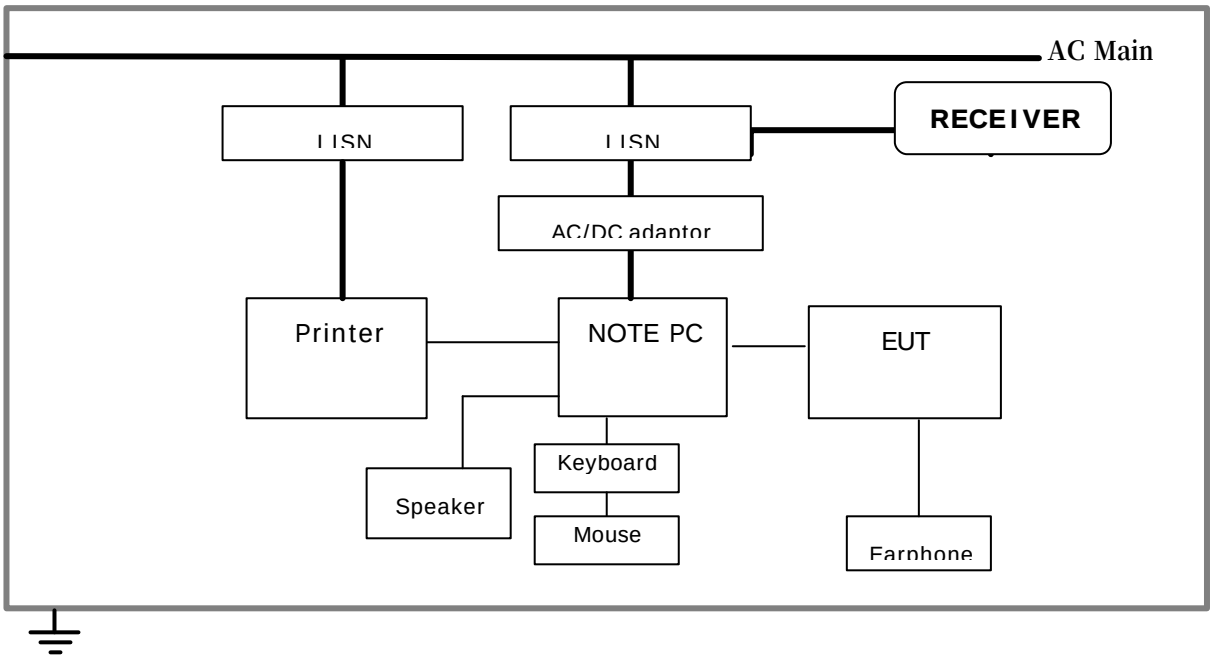
| Description | Model No. | Serial No. | Manufacture |
|---|---|---|---|
| NOTE PC | CM2080 | 5Y17JNZ9R892 | LG electronic Co., Ltd. |
| AC/DC ADAPTOR | ADP-60DB | MJD0124008510 | Delta electronics Co., Ltd |
| PRINTER | C6427A | CN13V1B1SZ | HP |
| KEYBOARD | SDM4510UH | 4M020619 | Samsung electronics Co., Ltd. |
| MOUSE | MOSXUB | N/A | N/A |
| SPEAKER | CAMAC G7 | - | FENGSHIN ELECTRONICS |
| EARPHONE | N/A | N/A | N/A |
| MIC | N/A | N/A | N/A |

## 4. CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL
**: Frequency range 0.15 MHz to 30 MHz**

### 4.1 Operating environment

Temperature : 25.0 ℃
Relative Humidity : 65.0 %

### 4.2 Test set-up and test procedures




The mains terminal disturbance voltage was measured with the equipment under test(EUT) in a shield room. The EUT was connected to an artificial mains network(LISN) placed on the floor. The EUT was placed on non-metallic table 0.8m above the metallic, grounded floor. The distance to other metallic surface was at least 0.8m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

Operation condition : Data download mode

### 4.3 Test instrument

| Instrument | Model No | Serial No. | Makers | Next cal.date | Used |
|---|---|---|---|---|---|
| Test receiver | ESCS30 | 100022 | R&S | 2003. 3. 25 | x |
| L.I.S.N. | ESH3-Z5 | 827246/008 | R&S | 2003. 3. 12 | x |
| | ESH3-Z5 | 831887/018 | R&S | 2003. 3. 12 | |
| Shield room | 8 × 6 × 3.3m/H | - | - | - | x |

**4.4 Test results**

Date of test : Feb 10, 2003.

An overview sweep performed with peak detector & average detector are included in the report **as test reports.**

| Frequency Range | Tested Freq. | LISN | Meter Reading | | Limits | | Margin | |
|---|---|---|---|---|---|---|---|---|
| | | | QP | AV | QP | AV | QP | AV |
| [MHz] | [MHz] | | [dBuV] | | [dBuV] | | [dBuV] | |
| ***0.15-0.5*** | 0.192 | H | 44.0 | 38.9 | 63.9 | 53.9 | 19.9 | 15.0 |
| | 0.264 | H | 27.6 | 24.2 | 60.3 | 50.3 | 32.7 | 26.1 |
| | 0.288 | H | 31.5 | 28.2 | 60.6 | 50.6 | 29.1 | 22.4 |
| | 0.381 | H | 34.2 | 34.8 | 58.2 | 48.2 | 24.0 | 13.4 |
| | 0.477 | H | 33.5 | 33.4 | 56.4 | 46.4 | 22.9 | 13.0 |
| ***0.5-30*** | 2.295 | N | 39.1 | 30.4 | 56.0 | 46.0 | 16.9 | 15.6 |
| | 2.772 | N | 41.0 | 41.5 | 56.0 | 46.0 | 15.0 | 4.5 |
| | 3.540 | N | 40.6 | 41.1 | 56.0 | 46.0 | 15.4 | 4.9 |
| | 4.590 | N | 40.0 | 39.2 | 56.0 | 46.0 | 16.0 | 6.8 |
| | 5.740 | N | 37.8 | 37.5 | 60.0 | 50.0 | 22.2 | 12.5 |
| | 6.980 | N | 35.6 | 34.5 | 60.0 | 50.0 | 24.4 | 15.5 |
| | | | | | | | | |
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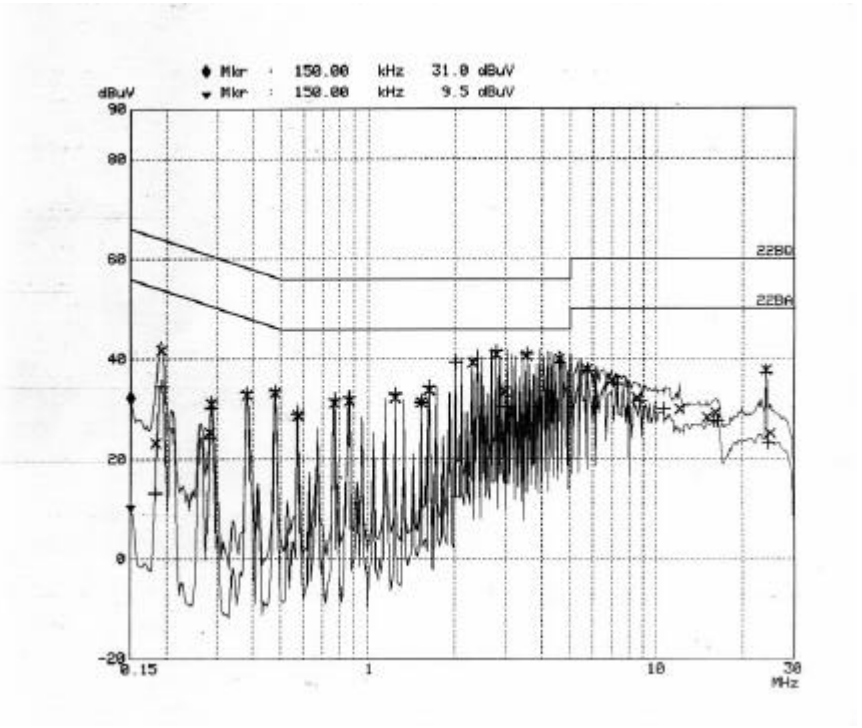
| | | | | | | | | |

* <5 : mean less than 5dB

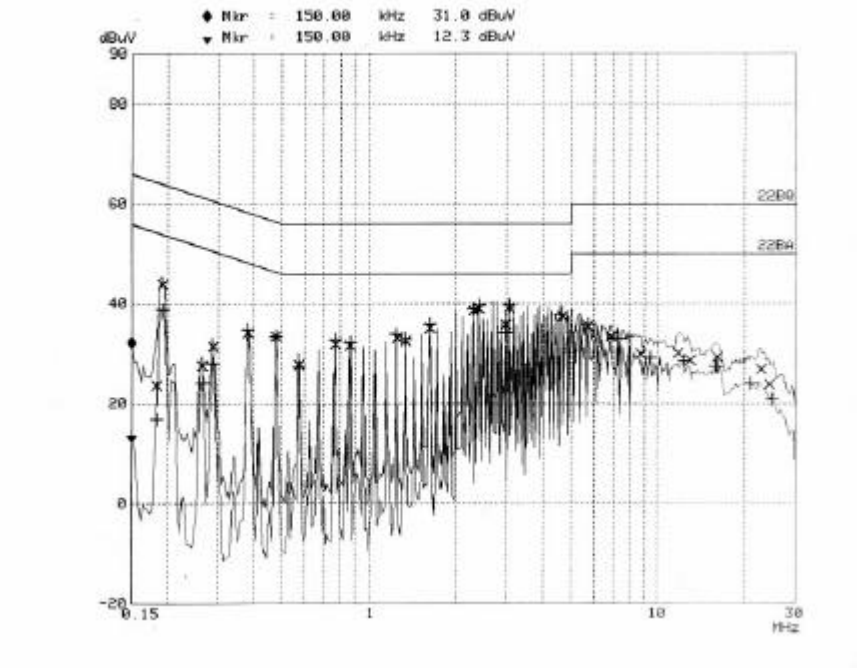
* other frequency keep over 20dB margin.

**Result: Pass**

The measured emissions level of the EUT have found the below of the specified limit.




**[Neutral line]**




**[Hot line]**

## 5. RADIATED DISTURBANCE
## : 30MHz – 1000MHz

### 5.1 Operating environment

Temperature : 20.0 ℃
Relative Humidity : 30.0 %

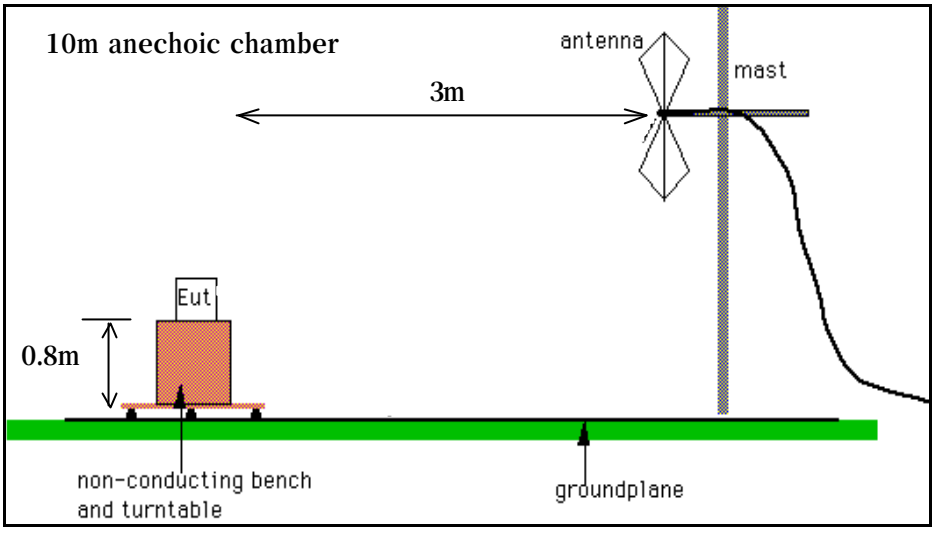
### 5.2 Test set-up

The frequency range investigated was 30 MHz to 1000 MHz.

All readings are quasi-peak unless stated otherwise.

Judgment: Passed by ___ dBuV/m

The half-wave dipole antenna was tuned to the frequency found during Preliminary radiated measurements. The EUT, support equipment and Interconnecting cables were re-configured to the set-up to the producing the Maximum emission for the frequency and were placed on top of a 0.8 meter High non-metallic 1 X 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. The antenna measured both horizontal and vertical polarization.




<General test set-up for radiated emissions>

### 5.3 Operation Conditions

Data download, play mode

### 5.4 Test instrument

| Instrument | Model No. | Serial No. | Makers | Next cal.date | Used |
|---|---|---|---|---|---|
| Test receiver | ESCS30 | 100022 | R&S | 2003. 3. 25 | x |
| L.I.S.N. | ESH3-Z5 | 827246/008 | R&S | 2003. 3. 12 | x |
| | ESH3-Z5 | 831887/018 | R&S | 2003. 3. 12 | |
| Anechoic chamber | 8 ×6 × 3.3m/H | - | Daetong shield | - | x |

### 5.5 Test results(download mode)

Date of test: Feb 18, 2003.

| Tested Frequency [MHz] | ANT Pol. | Meter Reading <Quasi-Peak> [A] [dBuV] | Antenna Factor [B] [dB/m] | Cable Loss [C] [dB] | Results [A+B+C] [dBuV/m] | Limits [dBuV/m] |
|---|---|---|---|---|---|---|
| 36.10 | H | 13.60 | 16.52 | 1.10 | 31.22 | 40.0 |
| 48.20 | H | 21.50 | 12.50 | 1.40 | 35.40 | |
| 216.30 | H | 15.90 | 16.50 | 2.80 | 35.20 | 46.0 |
| 225.10 | V | 16.20 | 16.70 | 2.90 | 35.80 | |
| 312.01 | H | 23.50 | 13.80 | 3.70 | 41.00 | |
| 337.90 | H | 23.70 | 13.80 | 3.70 | 41.20 | |
| 360.20 | H | 21.40 | 14.31 | 3.80 | 39.51 | |
| 480.12 | H | 18.40 | 16.64 | 4.20 | 39.24 | |
| 624.10 | H | 14.20 | 18.80 | 5.20 | 38.20 | |
| 648.10 | H | 16.50 | 18.80 | 5.20 | 40.20 | |

* Receiving Antenna Mode : ***Horizontal, Vertical***

* <5 : mean less than 5dB

*Note : Reading = Test Receiver meter, P= Polarization ✍ POL H = Horizontal POL V = Vertical A = Angle, AF = Antenna Factor CL = Cable Loss Result = Field Strength( AF + CL+ Reading)*

**5.6 Test results(play mode)**

Date of test: Feb 18, 2003.

| Tested Frequency [MHz] | ANT Pol. | Meter Reading <Quasi-Peak> [A] [dBuV] | Antenna Factor [B] [dB/m] | Cable Loss [C] [dB] | Results [A+B+C] [dBuV/m] | Limits [dBuV/m] |
|---|---|---|---|---|---|---|
| 309.24 | H | 22.80 | 13.80 | 3.60 | 40.20 | |
| 339.25 | H | 21.70 | 13.80 | 3.70 | 39.20 | |
| 370.10 | H | 23.00 | 14.31 | 3.80 | 41.11 | **46.0** |
| 400.34 | H | 17.20 | 15.87 | 4.20 | 37.27 | |
| 524.12 | H | 16.00 | 17.34 | 4.30 | 37.64 | |

* Receiving Antenna Mode : ***Horizontal, Vertical***

* <5 : mean less than 5dB

*Note : Reading = Test Receiver meter, P= Polarization ✍ POL H = Horizontal POL V = Vertical A = Angle, AF = Antenna Factor CL = Cable Loss Result = Field Strength( AF + CL+ Reading)*

**Result : Pass**

The measured emissions level of the EUT have found the below of the specified limit.