ELECTROMAGNETIC RESEARCH INSTITUTE

EMI TEST REPORT

Emission of electromagnetic disturbance

Test Report No. : ERI-FCC03-0067

Equipment : MP3 Player

Name of basic model : MR-500D

Family model : MR-500E, MR-500F, MR-500G

Manufacturer : CENIX DIGICOM CO., LTD.

Applicant : CENIX DIGICOM CO., LTD.

Tested date : 2003. 9. 30 – 10.1

Issued date : 2003. 10. 16

Test results : PASS

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

/digital devices & peripherals

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	: -
Telephone	: +82-31-245-2900
Facsimile	: +82-31-251-6425

2. LABORATORY INFORMATION

The 10m full-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	: MP3 Player
Model name	: MR-500D
Brand name	: -
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 1.5V

3.2 Additional information about the EUT

Class B,
Family Models List:

Basic Model	Variant Model	Differential point
MR-500D	MR-500E	Model name
	MR-500F	Model name
	MR-500G	Model name

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT.

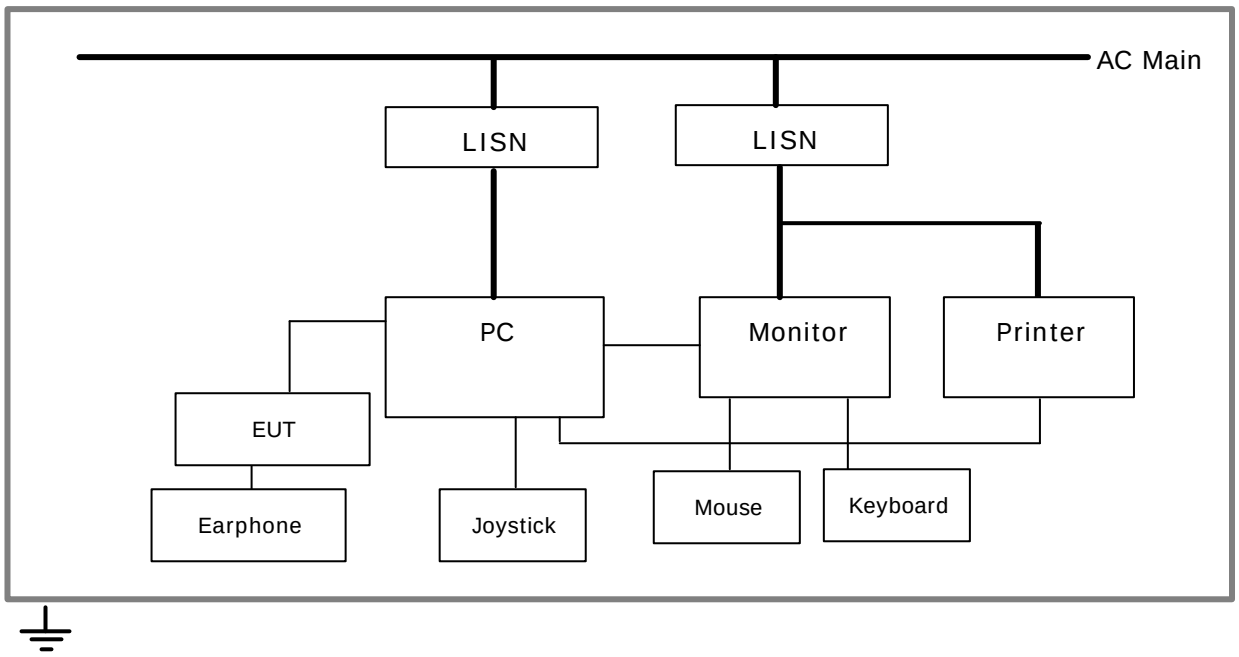
Description	Model No.	Serial No.	Manufacture
Printer	C6427A	CN13V1B1SZ	HP
Joystick	-	LCA70651918	LOGITECH
Mouse	M-S48	LZA82142279	LOGITECH
Keyboard	SDM4510UH	4M020619	SAMSUNG
PC	Dreamsys EZ/AC	5004135400304	SAMBO COMPUTER
Monitor	PN15VT	P181H80R907989	-
Earphone	-	-	-

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

4.1 Operating environment

Temperature : 19.0 ℃
Relative Humidity : 58.0 %

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 0.4m 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.

4.3 Operation Conditions

Up & download mode, play mode

4.4 Test instrument

Instrument	Model No	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2004. 1. 24	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2004. 3. 19	x
	ESH3-Z5	831887/018	R&S	2004. 3. 19	x
Shield room	8 × 6 × 3.3m/H	-	-	-	x

4.5 Test results

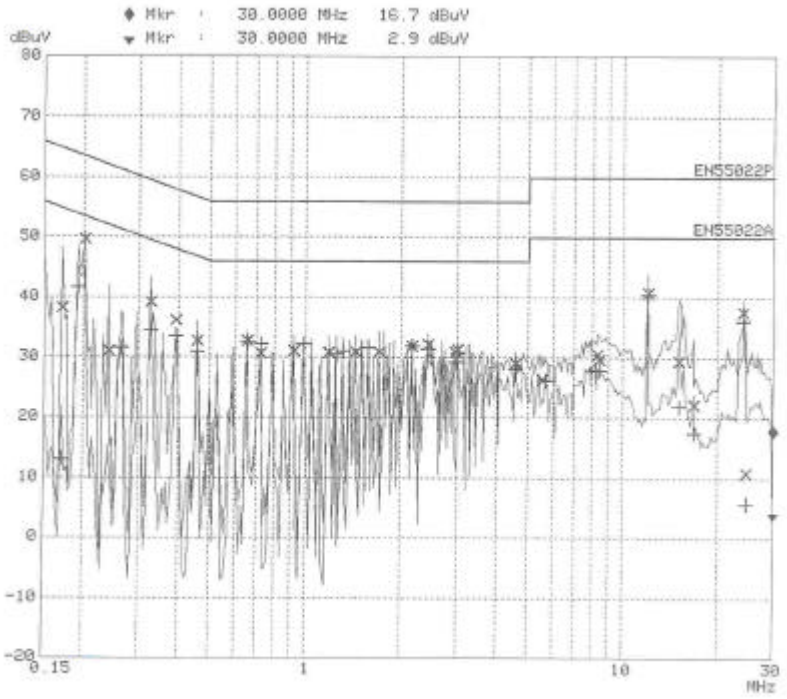
Date of test: Sep 30, 2003
An overview sweep performed with peak detector & average detector are included in the report **as test reports.**

Frequency	Tested	LISN	Meter		Limits	
Range	Freq.		Reading			
			QP	AV	QP	AV
[MHz]	[MHz]		[dBuV]		[dBuV]	
0.15 - 30(MHz)	0.174	N	39.4	16.2	64.7	54.7
	0.195	N	56.1	46.4	63.1	53.1
	0.258	N	43.9	27.7	61.5	51.5
	0.393	N	36.4	35.6	58.0	48.0
	0.456	N	36.5	36.6	56.7	46.7
	0.654	N	36.6	35.9	56.0	46.0
	0.720	N	36.9	36.7	56.0	46.0
	1.242	N	37.0	35.7	56.0	46.0
	2.421	N	35.3	32.0	56.0	46.0
	11.980	N	46.2	44.3	60.0	50.0

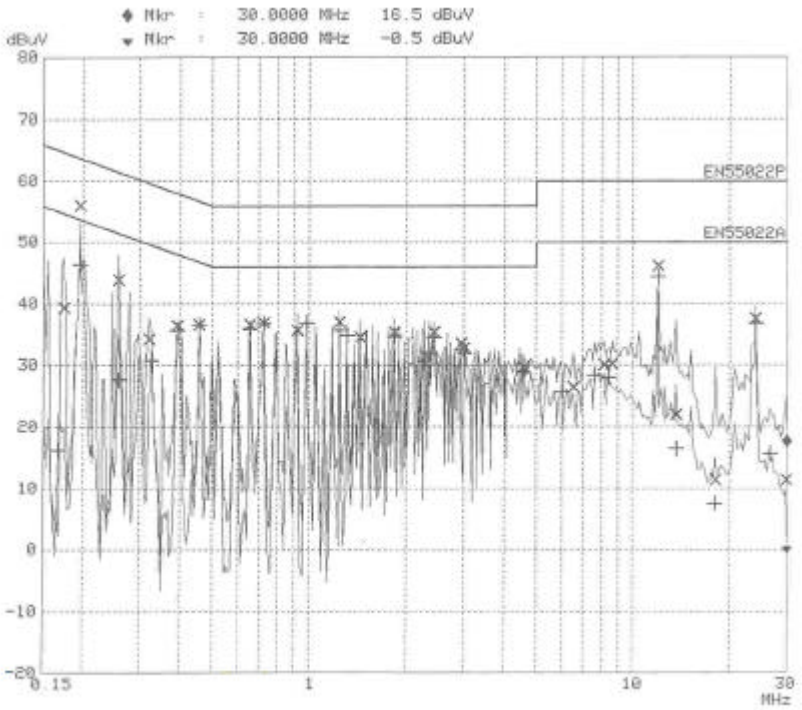
<5 : mean less than 5dB

Other frequency keep over 20dB margin.

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



[Live line]



[Neutral line]

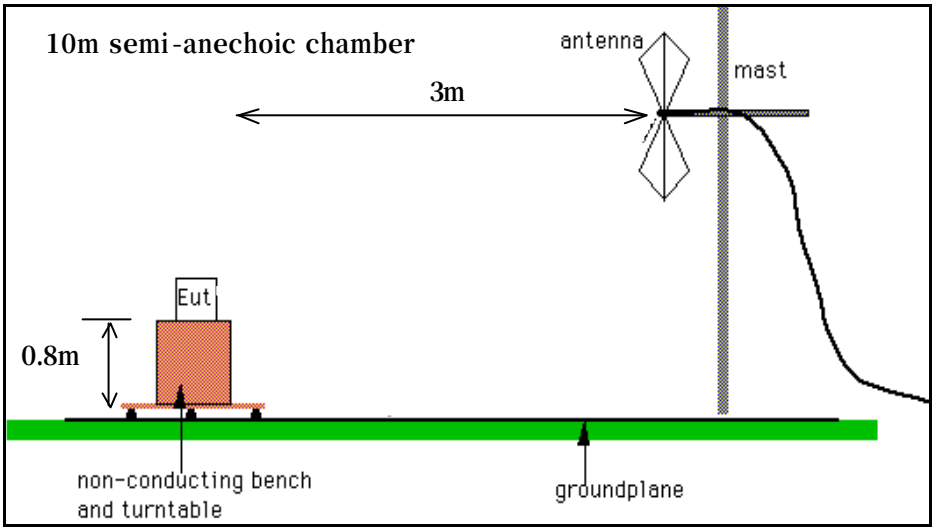
5. RADIATED DISTURBANCE
: 30MHz – 1000MHz

5.1 Operating environment

Temperature : 22.0 ℃
Relative Humidity : 55.0 %

5.2 Test set-up

The frequency range investigated was 30 MHz to 1000 MHz.
All readings are quasi-peak unless stated otherwise.
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.
And this device(EUT) was tested in 3 orthogonal planes.
The antenna measured both horizontal and vertical polarization.



<General test set-up for radiated emissions>

5.3 Operation Conditions

Up & download mode, play mode

5.4 Test instrument

Instrument	Model No.	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2004. 1. 24	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2004. 3. 19	
	ESH3-Z5	831887/018	R&S	2004. 3. 19	
Biconical Antenna	VHA9103	91031950	Schwarzbeck	2004.01.24	x
Log-Periodic Antenna	UHALP9108A	0392	Schwarzbeck	2004.01.23	x
Antenna Mast	MA240	N/A	HD	-	x
Turn Table	DT430S	N/A	HD	-	x

5.5 Test results(Test mode: Up & download mode)

Date of test: Sep 30, 2003

Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Antenna Factor [B] [dB]	Cable Loss [C] [dB]	Results [A+B+C] [dBuV/m]	Limits [dBuV/m]
48.20	V	13.10	12.50	1.70	27.30	40.00
60.40	V	15.01	8.19	1.90	25.10	40.00
71.90	H	10.19	8.38	2.43	21.00	40.00
134.00	V	11.16	11.50	3.20	25.86	43.50
144.00	H	11.18	12.00	3.40	26.58	43.50
229.00	H	7.25	14.60	4.40	26.25	46.00
260.00	V	14.25	15.90	4.80	34.95	46.00
277.00	H	9.12	17.30	5.05	31.47	46.00
350.00	H	10.64	14.30	5.70	30.64	46.00
365.00	H	9.79	14.49	5.82	30.10	46.00
367.00	V	8.36	14.51	5.84	28.71	46.00
413.00	H	8.35	15.80	6.15	30.30	46.00

* 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.

5.6 Test results(Test mode: Play mode)

Date of test: Sep 30, 2003

Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Antenna Factor [B] [dB]	Cable Loss [C] [dB]	Results [A+B+C] [dBuV/m]	Limits [dBuV/m]
48.20	V	13.10	12.50	1.70	27.30	40.00
60.40	V	15.01	8.19	1.90	25.10	40.00
71.90	H	10.19	8.38	2.43	21.00	40.00
134.00	V	11.16	11.50	3.20	25.86	43.50
144.00	H	11.18	12.00	3.40	26.58	43.50
229.00	H	7.25	14.60	4.40	26.25	46.00
260.00	V	14.25	15.90	4.80	34.95	46.00
277.00	H	9.12	17.30	5.05	31.47	46.00
350.00	H	10.64	14.30	5.70	30.64	46.00
365.00	H	9.79	14.49	5.82	30.10	46.00
367.00	V	8.36	14.51	5.84	28.71	46.00
413.00	H	8.35	15.80	6.15	30.30	46.00

* 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.

5.7 Test results < Test mode: FM tuner >

Date of test: Sep 30, 2003

T.	Tested	Meter Reading (quasi-peak)		Limits	Total Loss	Margins	
Frequency	Frequency	H	V			H	V
[MHz]	[MHz]	[dBuV/m]	[dBuV/m]			[dBuV/m]	[dBuV/m]
87.5	98.2	18.0	-	43.5	11.9	25.5	-
	196.4	22.0	-	43.5	17.8	21.5	-
	294.6	-	-	46.0	24.3	-	-
	392.8	-	-	46.0	21.4	-	-
	491.0	-	-	46.0	23.9	-	-
	589.2	-	-	46.0	26.2	-	-
	687.4	-	-	46.0	28.7	-	-
	785.6	-	-	46.0	30.0	-	-
	883.8	-	-	46.0	31.9	-	-
	982.0	-	-	54.0	33.1	-	-
98.0	108.7	19.1	-	43.5	12.7	24.4	-
	217.4	-	20.5	46.0	18.9	-	25.5
	326.1	-	-	46.0	18.9	-	-
	434.8	-	-	46.0	22.4	-	-
	543.5	-	-	46.0	25.2	-	-
	652.2	-	-	46.0	27.5	-	-
	760.9	-	-	46.0	29.7	-	-
	869.6	-	-	46.0	31.8	-	-
	978.3	-	-	54.0	33.0	-	-
108.0	118.7	18.5	-	43.5	13.7	25.0	-
	237.4	-	22.1	46.0	19.0	-	23.9
	356.1	-	-	46.0	20.1	-	-
	474.8	-	-	46.0	23.4	-	-
	593.5	-	-	46.0	26.3	-	-
	712.2	-	-	46.0	29.1	-	-
	830.9	-	-	46.0	30.7	-	-
	949.6	-	-	46.0	32.1	-	-

* Meter reading: ***Loss include***
* Margins : ***[Limits] – meter reading]***
* Receiving Antenna Mode: ***Horizontal, Vertical***
* 10m chamber
* <5 : mean less than 5dB
*** Measurement uncertainty** (K=2)
30-300MHz : +3.96dB / -4.04dB
300-1000MHz : +3.04dB / -3.00dB

Result: Pass

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

Others

Date of test: Sep 30, 2003.

Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Antenna Factor [B] [dB]	Cable Loss [C] [dB]	Results [A+B+C] [dBuV/m]	Limits [dBuV/m]
33.39	H	6.23	18.57	1.50	26.30	40.00
35.82	V	9.99	16.52	1.60	28.11	40.00
59.87	V	11.76	9.67	1.90	23.33	40.00
150.36	H	10.90	14.99	2.80	28.69	43.50
199.80	V	10.76	16.35	3.10	30.21	43.50
248.22	V	15.94	17.10	3.50	36.54	46.00
326.26	H	20.37	13.85	0.90	35.12	46.00
588.69	V	12.60	18.62	5.10	36.32	46.00
612.35	H	10.28	18.88	5.20	34.36	46.00
811.69	V	12.24	20.84	5.90	38.98	46.00

* Receiving Antenna Mode : ***Horizontal, Vertical***
* Test distance: **3m** (10m Anechoic Chamber)
* <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)