



EMC RESEARCH INSTITUTE



EMI TEST REPORT

Emission of electromagnetic disturbance

Test Report No. : ERI-FCC04-0019
Equipment : MP3 Player
Name of basic model : MR-L900
Family model : MR-L900C, MR-L900D, MR-L900E, MR-L900F
Manufacturer : CENIX DIGICOM CO., LTD.
Applicant : CENIX DIGICOM CO., LTD.
Tested date : 2004. 4. 6 – 4. 7
Issued date : 2004. 4. 9
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: SANG-KYU, LEE

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
2. LABORATORY INFORMATION
3. EQUIPMENT UNDER TEST INFORMATION(EUT)
 - 3.1 Identification of the EUT
 - 3.2 Additional information about the EUT
 - 3.3 Peripheral equipment
4. CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL
 - 4.1 Operating environment
 - 4.2 Test set-up and test procedures
 - 4.3 Operation Conditions
 - 4.4 Test instrument
 - 4.5 Test results (Test mode: Upload & Download mode)
5. RADIATED DISTURBANCE: 30MHz – 1000MHz
 - 5.1 Operating environment
 - 5.2 Test set-up
 - 5.3 Test conditions
 - 5.4 Test instrument
 - 5.5 Test results (Test mode: Upload mode)
 - 5.6 Test results (Test mode: Download mode)
 - 5.7 Test results (Test mode: Play mode)
 - 5.8 Test results (Test mode: FM Tuner mode)

APPENDIX

(None)

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 : Keun-Woo, Park
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, YONGIN-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-L900
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-L900	MR-L900C	Model name
	MR-L900D	Model name
	MR-L900E	Model name
	MR-L900F	Model name

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT.

Description	Model No.	Serial No.	Manufacture
PC	MTC2	00043-535-216-229	Dell Asia Pacific Sdn.
Mouse	M-S48a	LZS01267642	Logitech
Keyboard	SDM4510UH	4M030902	-
Printer	C6427A	CN13V1B1SZ	HP
Monitor	PN15VT	P181H80R807018	-

4. CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL

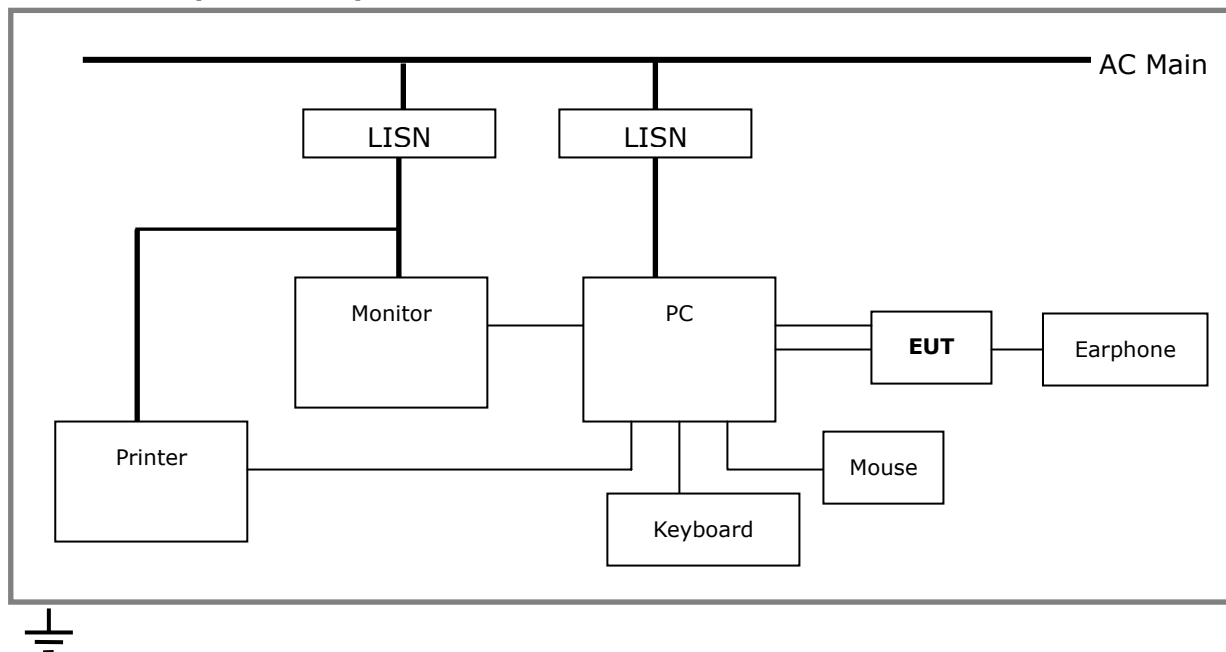
: Frequency range 0.15 MHz to 30 MHz

4.1 Operating environment

Temperature : 22.0 °C

Relative Humidity : 32.0 %

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

Upload & Download mode, play mode

4.4 Test instrument

Instrument	Model No	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100022	R&S	2004. 06. 16	x
L.I.S.N.	ESH3-Z5	100029	R&S	2004. 11. 11	x
	ESH3-Z5	100031	R&S	2005. 01. 06	x
Shield room	8 × 6 × 3.3m/H	-	-	-	x

4.5 Test results (Test mode: Upload & Download mode)

Date of test: Apr 06, 2004

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

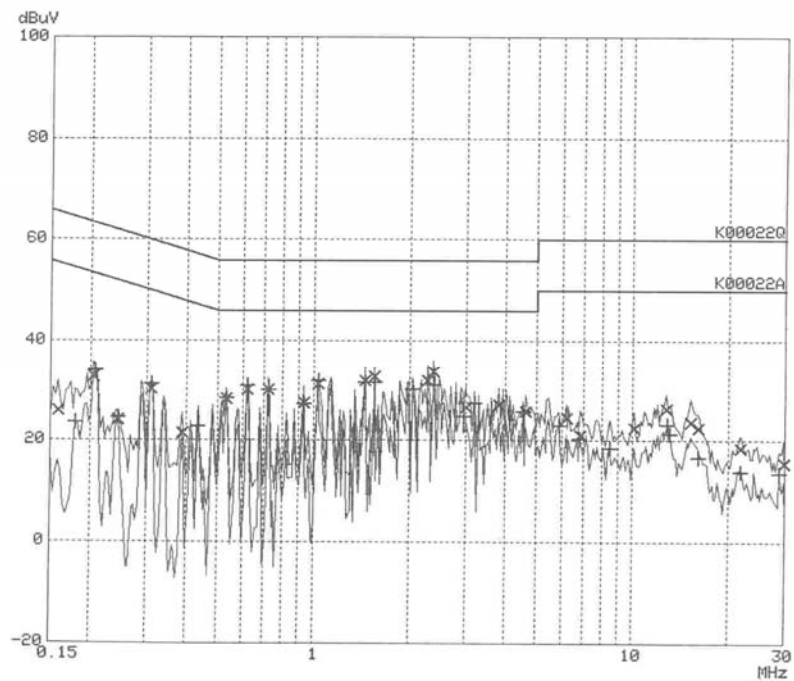
Frequency	Tested	LISN	Meter		Limits	
Range	Freq.		Reading			
			QP	AV	QP	AV
[MHz]	[MHz]		[dBuV]		[dBuV]	
0.15 - 30(MHz)	0.180	N	41.5	41.9	64.5	54.5
	0.186	N	38.1	38.7	64.2	54.2
	0.291	N	29.5	27.5	60.4	50.4
	1.032	N	30.9	31.5	56.0	46.0
	1.449	N	32.3	31.8	56.0	46.0
	1.548	N	33.1	32.4	56.0	46.0
	2.271	N	31.5	30.6	56.0	46.0
	2.373	N	33.3	30.1	56.0	46.0
	2.997	N	25.9	26.8	56.0	46.0
	5.370	N	26.1	23.8	60.0	50.0

<5 : mean less than 5dB

Other frequency keep over 20dB margin.

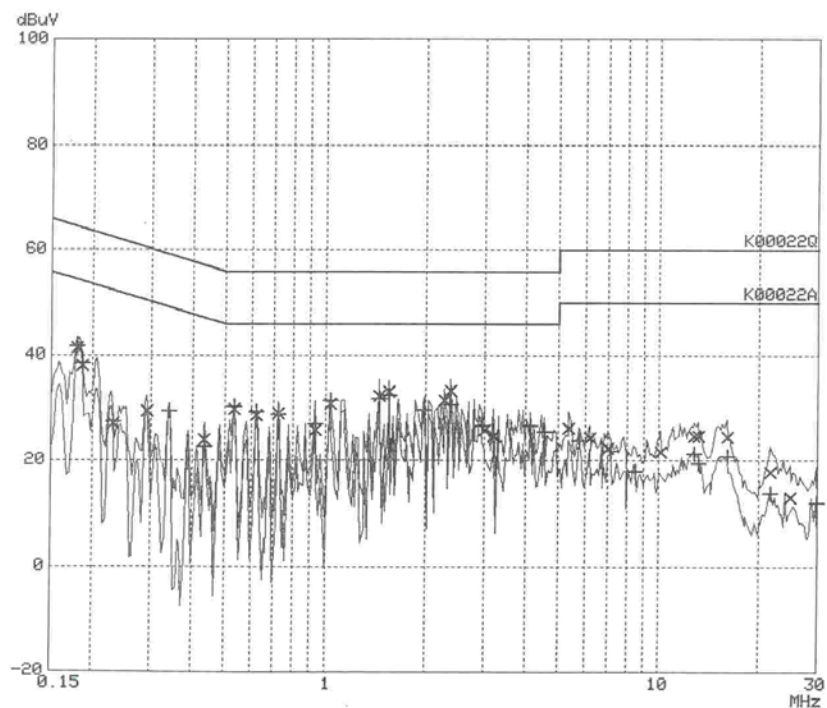
Result: Pass

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



PAGE 1

[Live line]



PAGE 1

[Neutral line]

5. RADIATED DISTURBANCE : 30MHz – 1000MHz

5.1 Operating environment

Temperature : 22.0 °C
Relative Humidity : 33 %

5.2 Test set-up

The frequency range investigated was 30 MHz to 1000 MHz.

All readings are quasi-peak unless stated otherwise.

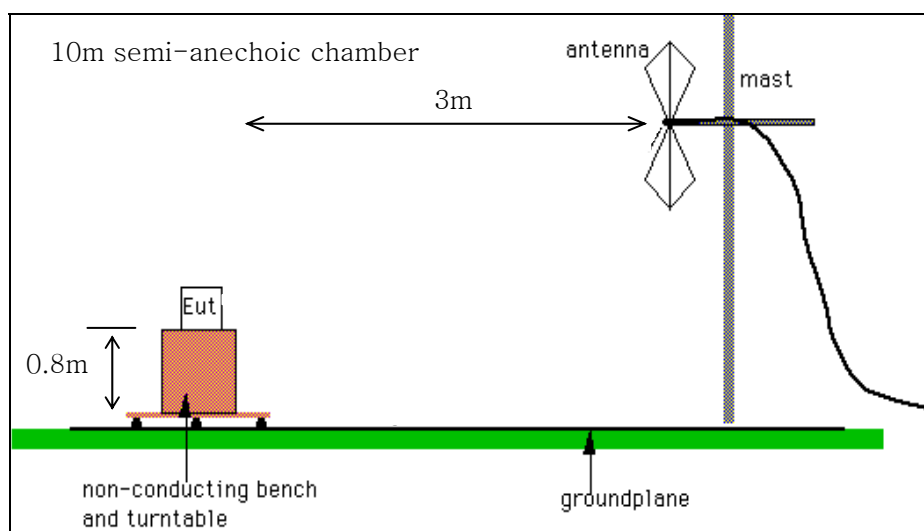
The half-wave dipole antenna was tuned to the frequency found during Preliminary radiated measurements. The EUT, support equipment and Interconnecting cables were re-configured to the set-up to the producing the Maximum emission for the frequency and were placed on top of a 0.8 meter High non-metallic 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

Download & Download mode, play mode, FM tuner mode.

5.4 Test instrument

Instrument	Model No.	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2005.02.06	x
Biconical Antenna	VHA9103	91031950	Schwarzbeck	2004.05.26	x
Log-Periodic Antenna	UHALP9108A	0392	Schwarzbeck	2004.05.26	x
Antenna Mast	MA240	N/A	HD	-	x
Turn Table	DT430S	N/A	HD	-	x

5.5 Test results <Test mode: Upload mode>

Date of test: Apr 07, 2004

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]
39.50	V	15.04	15.39	1.20	31.63	40.00
127.90	H	22.99	13.10	2.20	38.29	43.50
141.40	V	17.23	14.42	2.30	33.95	43.50
192.00	H	16.67	16.40	2.70	35.77	43.50
256.10	H	15.21	17.35	3.20	35.76	46.00
319.90	H	25.31	13.69	3.60	42.60	46.00
449.50	H	15.77	16.27	4.20	36.24	46.00
832.40	H	13.33	21.18	6.10	40.61	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: Download mode >

Date of test: Apr 07, 2004

Tested Frequency	ANT Pol.	Meter Reading	Antenna Factor	Cable Loss	Results	Limits
[MHz]		[A] [dBuV/m]	[B] [dB]	[C] [dB]	[A+B+C] [dBuV/m]	[dBuV/m]
96.20	H	21.38	9.22	2.00	32.60	43.50
127.90	H	21.08	13.10	2.20	36.38	43.50
192.00	H	17.17	16.40	2.70	36.27	43.50
256.10	H	15.55	17.35	3.20	36.10	46.00
319.90	H	24.81	13.69	3.60	42.10	46.00
449.34	H	16.64	16.27	4.20	37.11	46.00
832.19	H	13.13	21.18	6.10	40.41	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: Play mode >

Date of test: Apr 07, 2004

Tested Frequency	ANT Pol.	Meter Reading	Antenna Factor	Cable Loss	Results	Limits
[MHz]		[A] [dBuV/m]	[B] [dB]	[C] [dB]	[A+B+C] [dBuV/m]	[dBuV/m]
136.00	H	21.10	14.10	2.30	37.50	43.50
146.80	H	21.80	14.70	2.40	38.90	43.50
158.30	H	22.50	15.30	2.40	40.20	43.50
169.70	H	21.50	15.70	2.50	39.70	43.50
430.10	H	21.13	16.27	4.20	41.60	46.00
521.70	H	20.26	17.34	4.30	41.90	46.00
668.40	H	16.80	19.50	5.20	41.50	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.

5.8 Test results < Test mode: FM tuner mode>

Date of test: Apr 07, 2004.

T.	Tested	Meter Reading (quasi-peak)		Limits	Margins	
Frequency	Frequency	H	V		H	V
[MHz]	[MHz]	[dBuV/m]	[dBuV/m]		[dBuV/m]	[dBuV/m]
87.5	98.2	-	14.4	43.5	-	29.1
	196.4	19.5	-	43.5	24.0	-
	294.6	-	-	46.0	-	-
	392.8	-	-	46.0	-	-
	491.0	-	-	46.0	-	-
	589.2	-	-	46.0	-	-
	687.4	-	-	46.0	-	-
	785.6	-	-	46.0	-	-
	883.8	-	-	46.0	-	-
	982.0	-	-	54.0	-	-
98.0	108.7	15.8	-	43.5	27.7	-
	217.4	20.3	-	43.5	25.7	-
	326.1	-	-	46.0	-	-
	434.8	-	-	46.0	-	-
	543.5	-	-	46.0	-	-
	652.2	-	-	46.0	-	-
	760.9	-	-	46.0	-	-
	869.6	-	-	46.0	-	-
	978.3	-	-	54.0	-	-
108.0	118.7	-	15.2	43.5	-	28.3
	237.4	-	-	46.0	-	-
	356.1	-	-	46.0	-	-
	474.8	-	-	46.0	-	-
	593.5	-	-	46.0	-	-
	712.2	-	-	46.0	-	-
	830.9	-	-	46.0	-	-
	949.6	-	-	46.0	-	-
Others	117.10	19.8	-	43.5	23.7	-
	256.10	24.3	-	46.0	21.7	-
	-	-	-	-	-	-
	-	-	-	-	-	-

* Meter reading: **Loss include**
* Margins : **[Limits] - [Meter reading]**
* Receiving Antenna Mode: **Horizontal, Vertical**
* 10m chamber
* <5 : mean less than 5dB

Result: Pass

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