IST EMC LAB.

E M I S S I O N T E S T R E P O R T

Test report file No. : **03-IST-082/FB** Date of issue : Mar. 25, 2003.

Model / Type No. : CA-B200MT ■ Basic □ Alternate

Kind of product : MP3 Player

Brand name : LIVE MUSIC.

Applicant : CM Tech Co., Ltd.

Manufacturer : CM Tech Co., Ltd.

Address : 4F, Samil B/D, 362-5, Woncheon-Dong, Paldal-Gu, Suwon-City, Kyungki-Do, KOREA.

Test result according to the regulation(s)

■ Positive □ Negative

at page 3.

This test report without appendix consists of 20 pages.
It is not allowed to copy this report even partly without the allowance of the Test Laboratory.
This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

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DIRECTORY

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TEST REGULATIONS

The tests were performed according to the following regulations ;

■ - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

Information of Test Laboratory

IST EMC Lab.

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ENVIRONMENTAL CONDITIONS

Temperature	15
Humidity	33 %
Atmospheric pressure	1014 mbar

TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

☒ Shielded room. No.1 ☐ Compact chamber 2

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 25, 2002	892108/018
3725/2	LISN	EMCO	Aug. 22, 2002	9101-2068
KNW-407	LISN	Hyup-Rip	Aug. 21, 2002	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 25, 2002	357.8810.52

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurments were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :

H. J. Yoon / Research Engineer
IST EMC Lab.

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The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

Location :	☒ Open Site No. 1	☐ Open Site No. 2	☐ Open Site No. 3
Distance :	☒ 3 meters	☐ 10 meters	

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Aug. 16, 2002	861744/004
VULB 9160	Antenna	Schwarzbeck	Jul. 10, 2002	3048

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 “Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for “quasi-peak” within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :

H. J. Yoon / Research Engineer
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EQUIPMENT UNDER TEST

Equipment Description :

Display	FSTN LCD
Weight	37g
Memory	256MB / 128MB / 64MB Flash Memory
Interface	USB
File Transmission Speed	2.7Mbps
Dimension	77 x 30 x 12(mm) : W x H x D
Battery	AAA x 1 (1.5V)
Battery Life	6 Hours (Play / Record)
Output Power	4.5mW x 2(16Ω)

EUT Type :

☒ Table-Top.
☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

☐ Standby.
☒ Operational Condition : - Download files from PC to EUT, Play mode

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No
PC	Vectra VL420 MT	HP	SG23101769
Monitor	529B	DAEWOO	N/A
Keyboard	SK-2502C	HP	M020321663
Mouse(PS/2)	M-S48a	HP	LZE20603927
Mouse(Serial)	M-M28	Logitech	LCA53305547
Printer	A0302380	Northern Telecom	25L9S60856

Connecting Interface Cables & Ports :
- Shielded monitor's signal cable : 1.5m
- Shielded printer's signal cable : 1.5 m
- USB I/O cable : 1.5m
- Earphone cable : 0.85 m

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TEST RESULT

<download mode>

Conducted emissions : 450 kHz - 30 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT

Min. limit margin QP : 25.2, AV : 15.9 dB at 0.252 MHz

Remarks : See test-graph to be attached at pages 12~14.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT

Min. limit margin 16.4 dB at 83.2 MHz

Remarks : See test-graph to be attached at pages 15~19.

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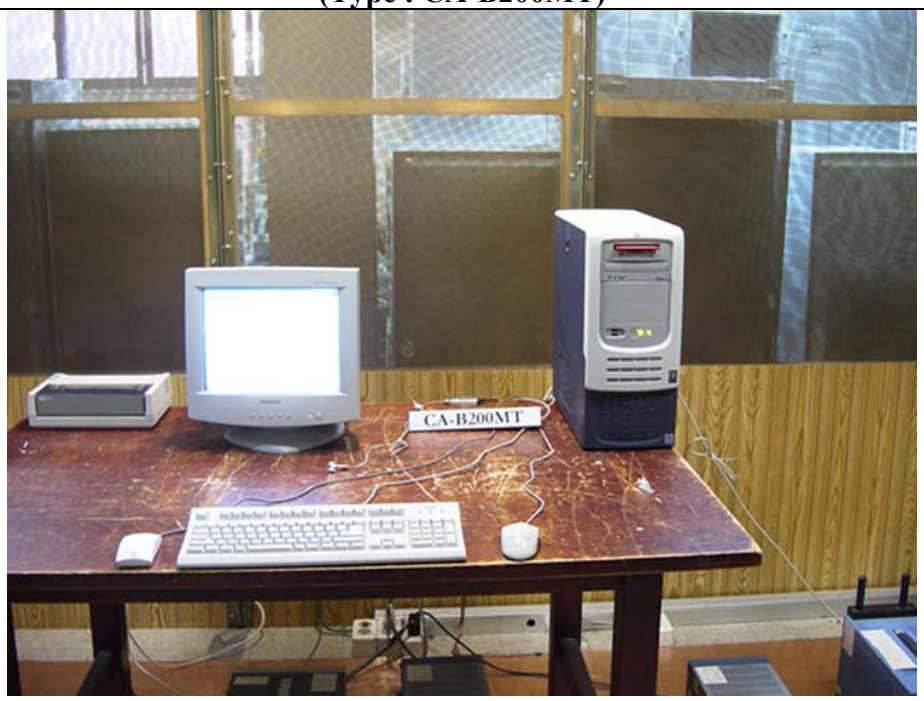
Test Set-Up
(Type : CA-B200MT)



Conducted emission : 450kHz ~ 30MHz

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Test Set-Up
(Type : CA-B200MT)

Radiated emission : 30MHz ~ 1000MHz

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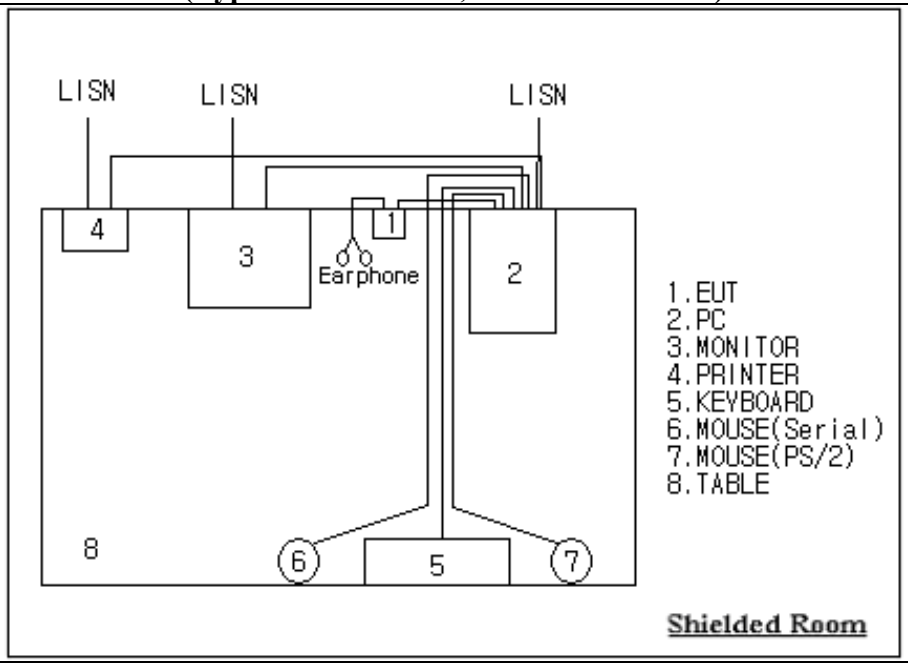
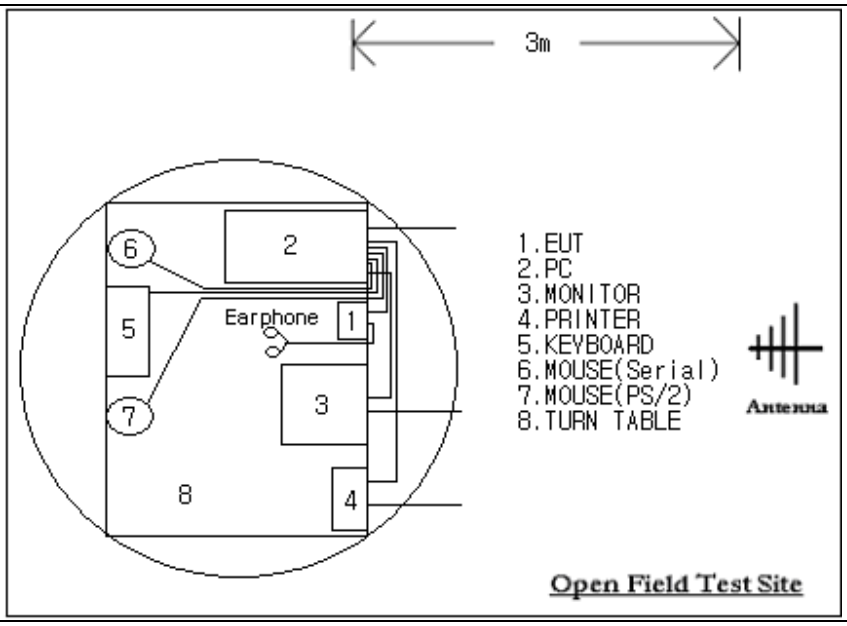
Test Set-Up
(Type : CA-B200MT, Mode : down load)



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

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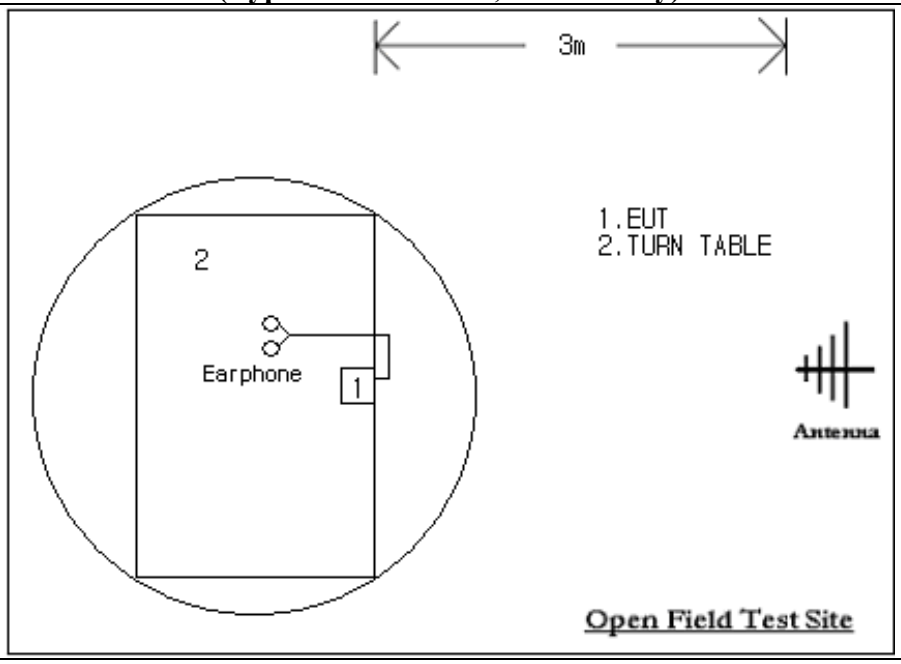
Test Set-Up
(Type : CA-B200MT, Mode : Play)



Picture 3 : Radiated emission 30MHz ~ 1000MHz

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Conducted Emission Test Data

Type : CA-B200MT
Manufacturer : CM Tech Co., Ltd
Operation mode : download mode
Date : Mar. 13, 2003

Highest Emissions ralative to the limit

Frequency [MHz]	Reading [dBμV]		Insertion Loss [dB]	Cable Loss [dBμV]	Phase (*L1/ **N)	Limit [dBμV]		Margin [dB]	
	Q-peak	AV				Q-peak	AV	Q-peak	AV
0.150	30.2	9.4	0.2	0.5	L1*	66.0	56.0	35.1	45.9
0.252	30.1	23.2	0.2	0.5		61.7	51.7	30.9	27.8
0.379	30.1	28.9	0.2	0.4		58.3	48.3	27.6	18.8
0.505	26.5	25.8	0.2	0.4		56.0	46.0	28.9	19.6
6.561	24.8	12.4	0.1	0.7		60.0	50.0	34.5	36.9
13.752	28.0	20.7	0.1	0.7		60.0	50.0	31.2	28.5
0.150	29.3	9.7	0.1	0.5	N**	66.0	56.0	36.1	45.7
0.252	35.9	35.2	0.1	0.5		61.7	51.7	25.2	15.9
0.379	30.9	28.4	0.1	0.4		58.3	48.3	26.9	19.4
6.560	38.8	20.0	0.1	0.7		60.0	50.0	20.5	29.3
13.750	36.0	28.4	0.2	0.7		60.0	50.0	23.1	20.7
21.667	25.7	21.3	0.2	0.7		60.0	50.0	33.4	27.8
*L1 : Live Line **N : Neutral Line									

*** **Please refer to data graphs at page 13 ~ 14**

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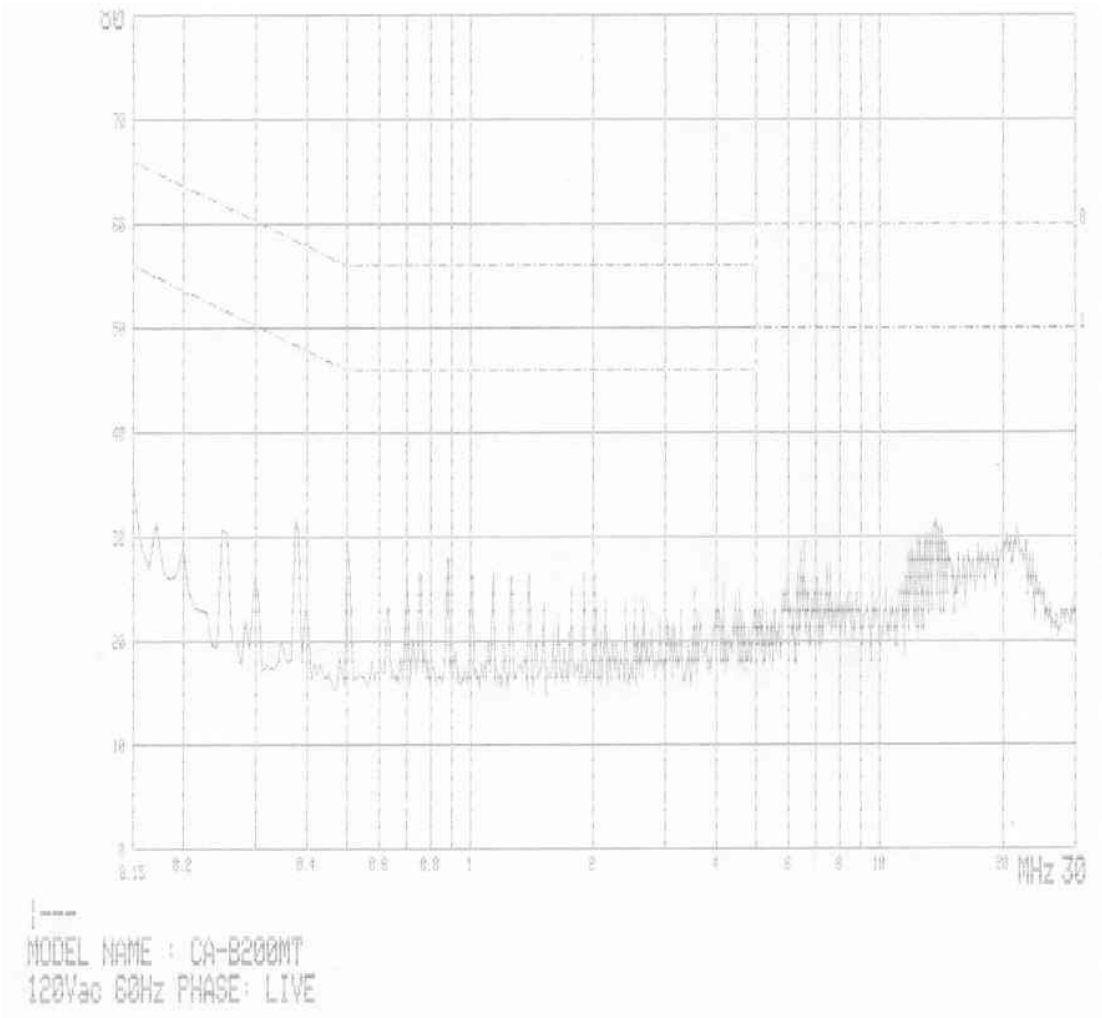

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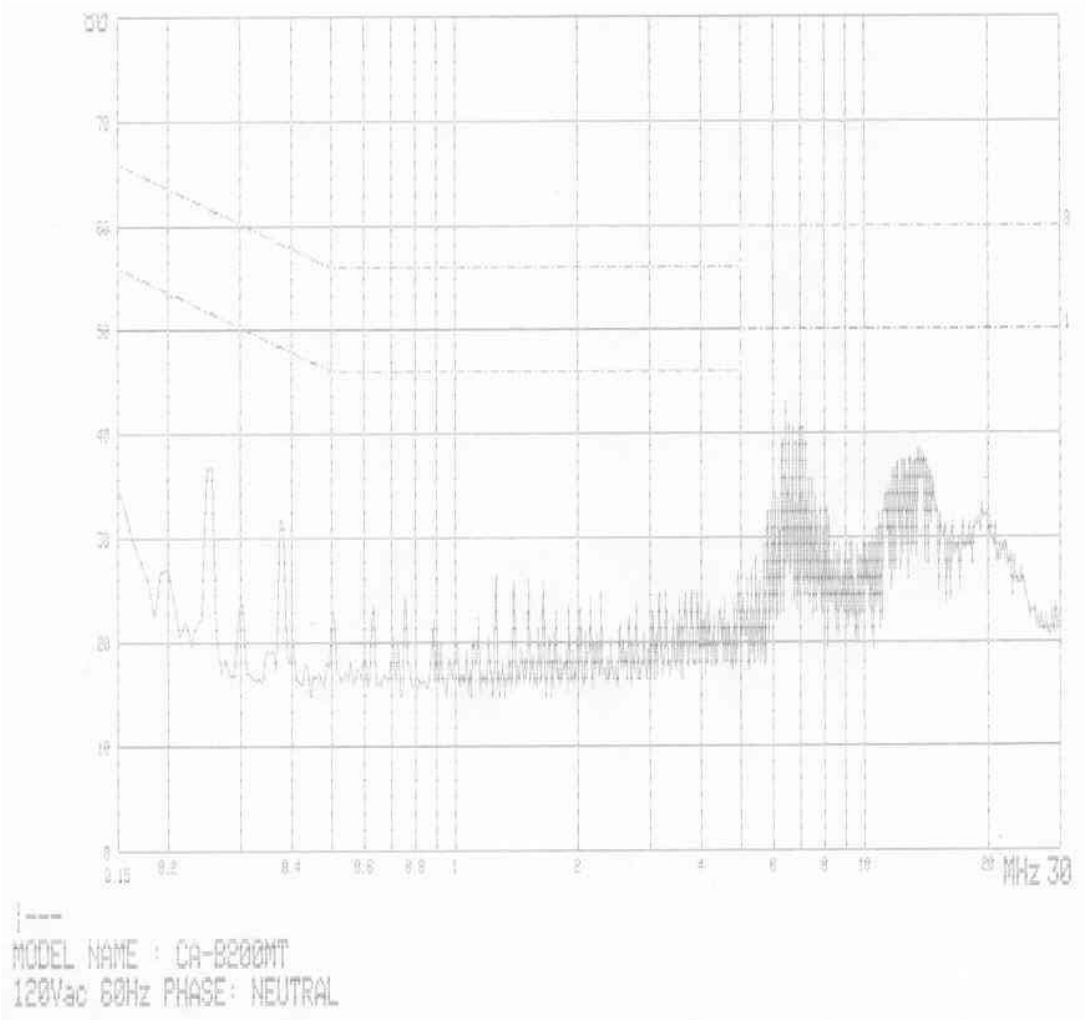

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Radiation Test Data

Type : CA-B200MT
Manufacturer : CM Tech Co., Ltd.
Operation mode : download mode
Test distance : 3 m
Antenna : VULB9160
Date : Mar. 14, 2003.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
83.2	14.5	7.5	1.6	268	100	V	23.6	40.0	16.4
132.6	12.5	10.7	2.1	188	100	V	21.1	43.5	18.5
166.6	10.0	12.3	2.4	213	100	V	23.8	43.5	18.8

* There are no result at play mode.
Please refer to data plot measured in semi-anechoic chamber at page 18~19.

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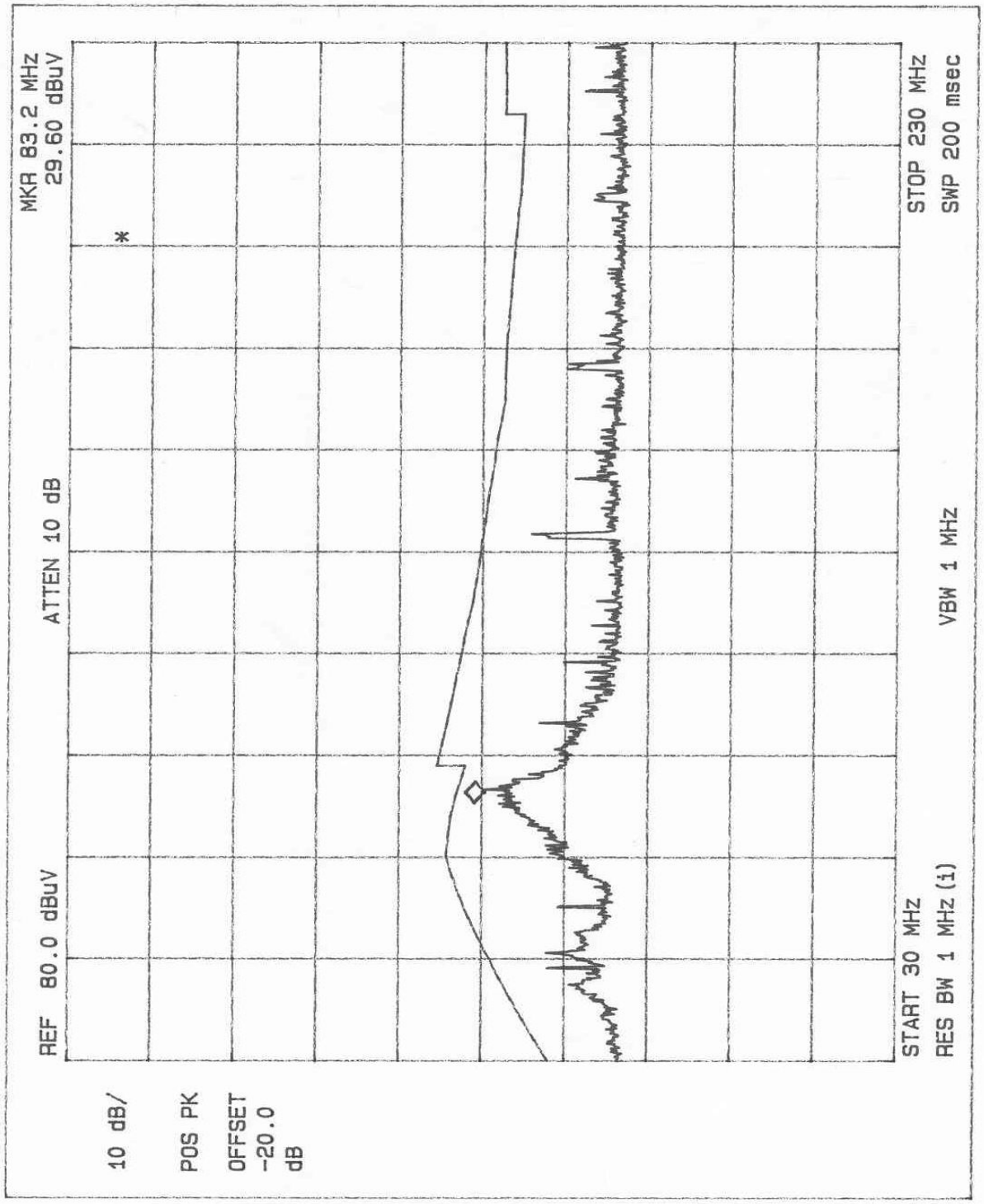
<download mode>



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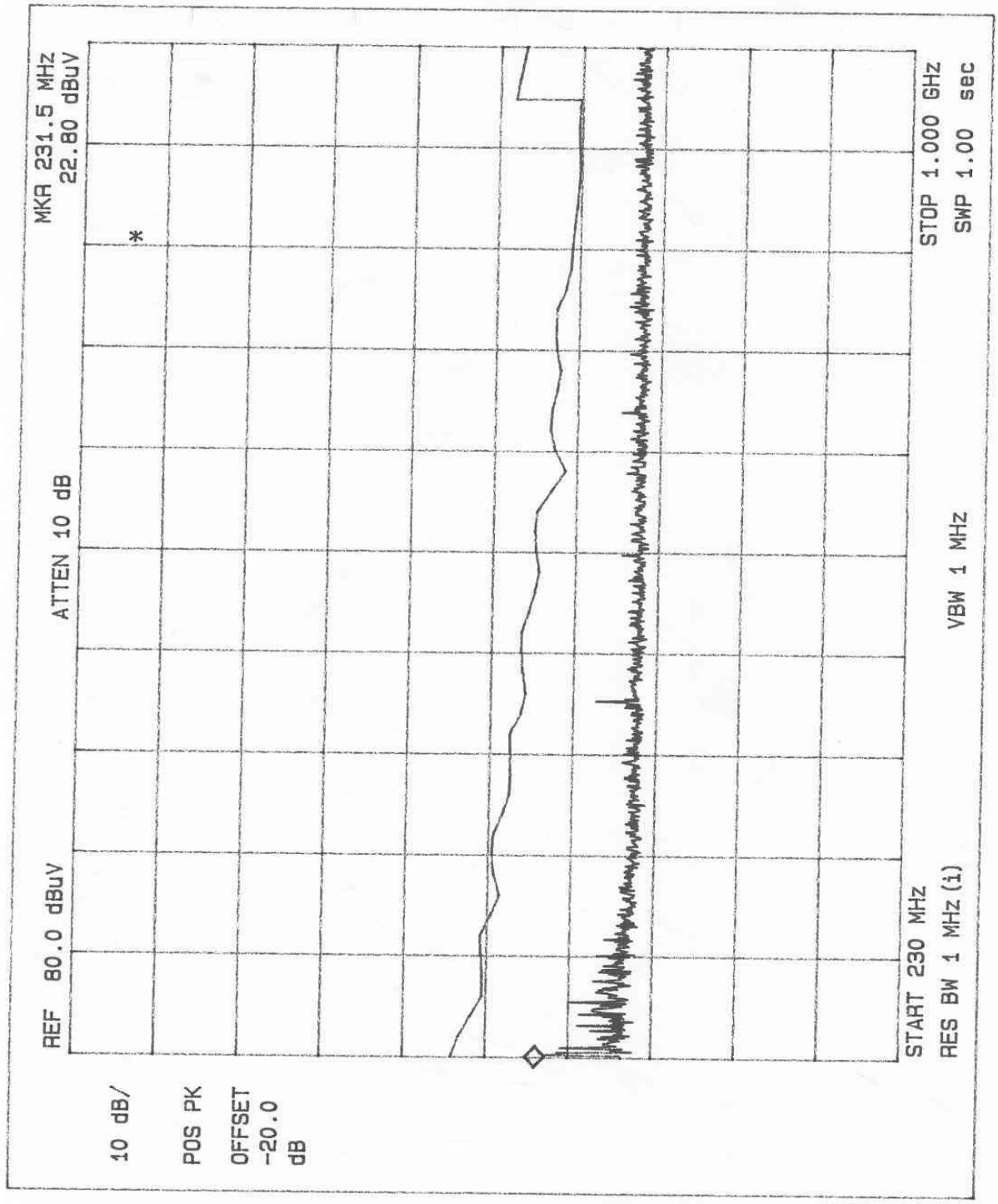
<download mode>



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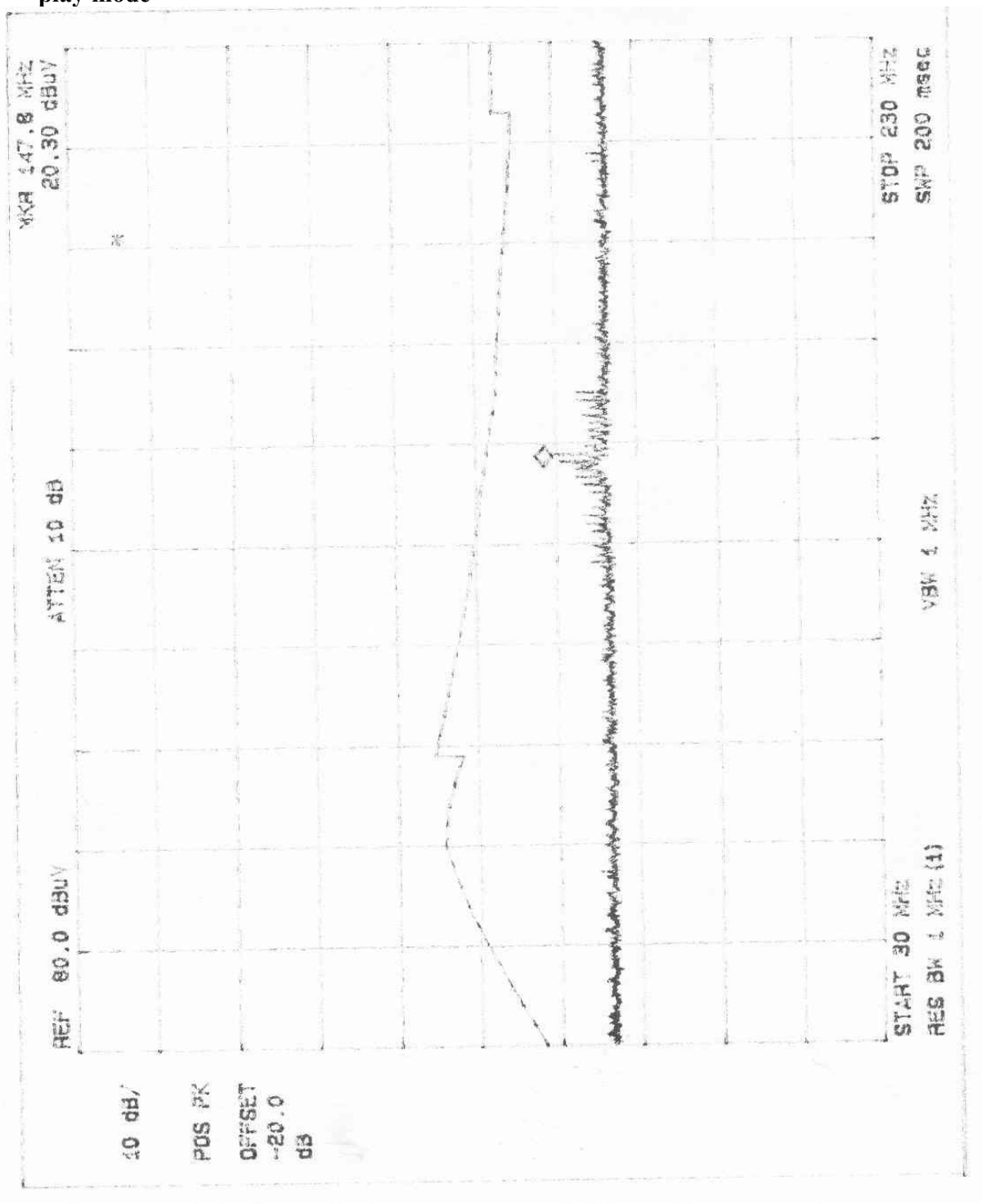
<play mode>



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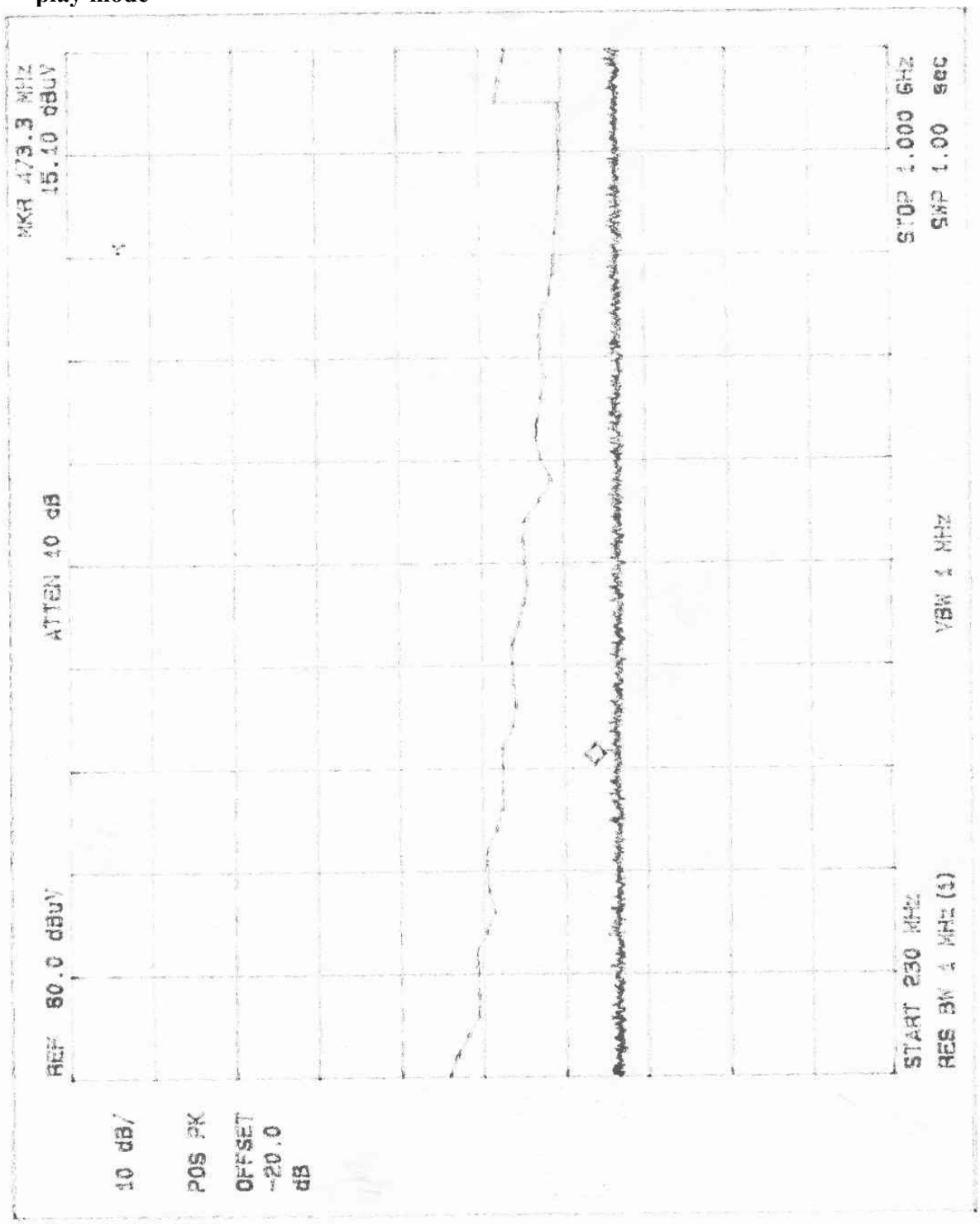
<play mode>



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SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

☒ Kept ☐ Not kept

The equipment under test does

☒ Fulfill the general approval requirements mentioned on page 3.
☐ Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Mar. 13, 2003

End of testing : Mar. 14, 2003

Reviewed by :	Approved by :
Joon H. Lee / EMC Manager IST EMC Lab.	G. Chung / Chief of EMC Lab.

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