ELECTROMAGNETIC RESEARCH INSTITUTE

EMI TEST REPORT

Emission of electromagnetic disturbance

Test Report No. : ERI-FCC03-0052

Equipment : MP3 Player

Name of basic model : MPAL-201F

Family model : N/A

Manufacturer : TOODIS Co., Ltd.

Applicant : TOODIS Co., Ltd.

Tested date : 2003. 7. 24 – 7. 28

Issued date : 2003. 7. 29

Test results : PASS

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

/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: YOUNG-SIK, KIM **Approved by: UK-CHO, RIM**

CONTENTS

1. CLIENT INFORMATION

The EUT has been tested by request of :

Company	: TOODIS Co., Ltd.
Address	: Rm 215, Regent Officetel, 547-8, Kueui-dong, Kwangjin-gu, Seoul 143-709 Korea
Name of contact	: DAVID KANG / chief engineer
Telephone	: +82-31-212-4031
Facsimile	: +82-31-212-4148

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	: MPAL-201F
Brand name	: -
Manufacturer	: TOODIS Co., Ltd.
Address	: Rm 215, Regent Officetel, 547-8, Kueui-dong, Kwangjin-gu, Seoul 143-709 Korea
Telephone	: +82-31-212-4031
Facsimile	: +82-31-212-4148
Country of origin	: KOREA
Rating	: DC 3V

3.2 Additional information about the EUT

Class B, Family model list; (N/A)

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT.

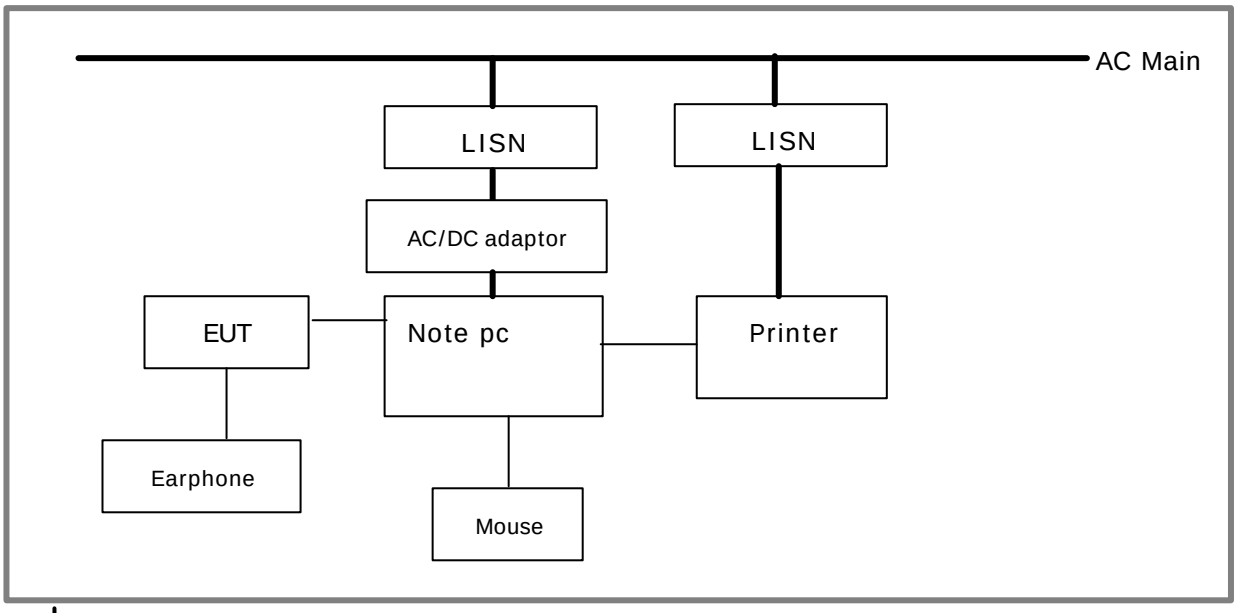
Description	Model No.	Serial No.	Manufacture
AC/DC adaptor	AD-6019	-	SamSung
Note PC	S640	62991DR200269	SamSung
Printer	C6427A	CN13V1B1SZ	HP
Mouse	M-S48a	HCA20211352	Logitech
Earphone	-	-	-

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

4.1 Operating environment

Temperature : 20.0 ℃
Relative Humidity : 69.0 %

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.

Operation condition: During the test, we played on the record file.

4.3 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

4.4 Test results

Date of test: Jul 24, 2003.

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

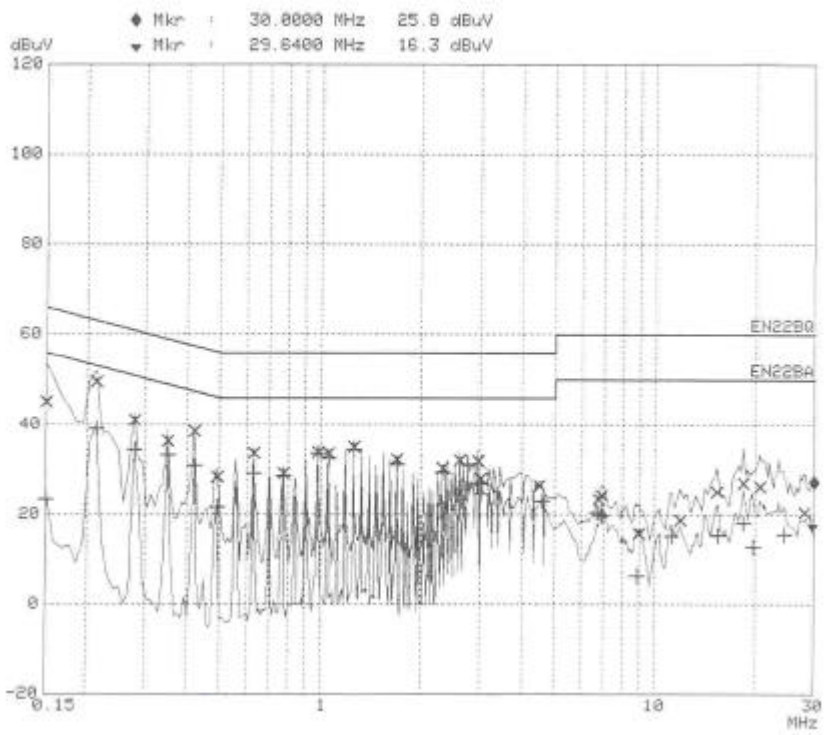
Frequency	Tested	LISN	Meter		Limits	
Range	Freq.		Reading			
			QP	AV	QP	AV
[MHz]	[MHz]		[dBuV]		[dBuV]	
0.15 - 30(MHz)	0.152	N	47.4	22.2	66.0	56.0
	0.204	N	58.8	47.1	63.4	53.4
	0.267	N	43.5	36.8	61.2	51.2
	0.339	N	48.1	35.1	59.2	49.2
	0.411	N	37.2	27.8	57.5	47.5
	0.474	N	38.9	30.8	56.4	46.4
	0.744	N	36.1	33.8	56.0	46.0
	0.951	N	36.8	35.6	56.0	46.0
	1.563	N	35.0	33.7	56.0	46.0

<5 : mean less than 5dB

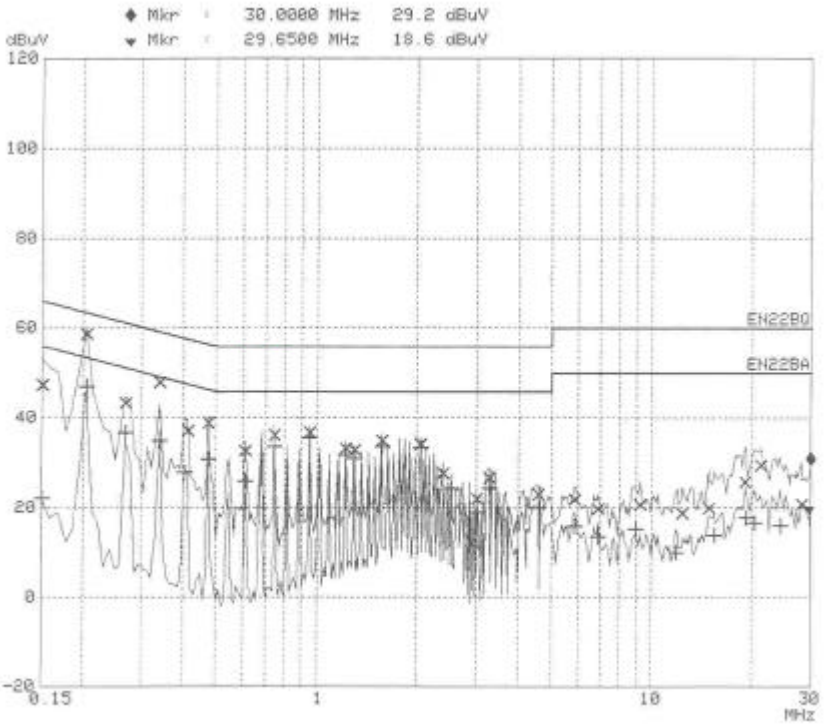
Other frequency keep over 20dB margin.

Result: Pass

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



[Live line]



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[Neutral line]

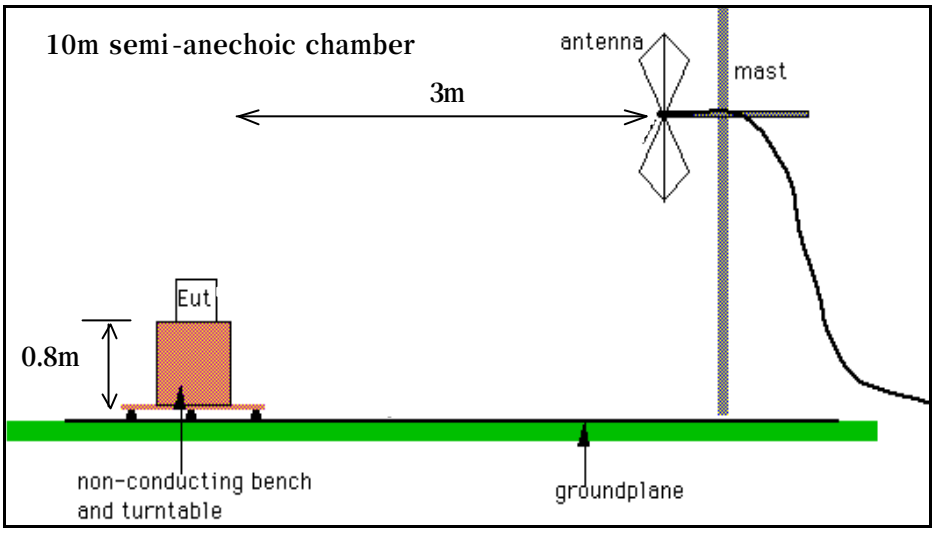
5. RADIATED DISTURBANCE
: 30MHz – 1000MHz

5.1 Operating environment

Temperature : 21.0 ℃
Relative Humidity : 73.0 %

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

During the test, we played on the record file.

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	x
	ESH3-Z5	831887/018	R&S	2004. 3. 19	x

5.5 Test results(Play mode)

Date of test: Jul 28, 2003.

Freq (MHz)	Reading (dBuV/m)	Ant	AF (dB)	CL (dB)	Result (dBuV/m)	Limit (dB)	Margin (dB)
33.40	9.96	V	9.96	18.57	30.03	40.0	9.97
48.20	20.43	H	20.43	12.50	34.63	40.0	5.37
108.30	13.11	H	13.11	11.00	26.51	43.5	16.99
125.20	11.59	V	11.59	13.10	27.29	43.5	16.21
149.50	11.81	H	11.81	14.70	29.21	43.5	14.29
168.40	10.79	H	10.79	15.70	29.39	43.5	14.11
239.90	7.96	H	7.96	16.90	28.36	46.0	17.64
252.10	7.54	H	7.54	17.35	28.39	46.0	17.61
299.30	7.35	H	7.35	19.13	30.28	46.0	15.72
332.00	10.75	V	10.75	13.85	25.50	46.0	20.50
400.00	13.27	V	13.27	15.87	33.24	46.0	12.76
746.00	8.70	H	8.70	20.19	34.29	46.0	11.71

* 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 < Test mode: FM tuner >

Date of test: Jul 28, 2003.

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	-	1.8	43.5	-	41.7
	196.4	-	-	43.5	-	-
	294.6	-	1.3	46.0	-	44.7
	392.8	1.5	-	46.0	44.5	-
	491.0	1.2	-	46.0	44.8	-
	589.2	4.2	-	46.0	41.8	-
	687.4	3.2	-	46.0	42.8	-
	785.6	2.7	-	46.0	43.3	-
	883.8	3.5	-	46.0	42.5	-
	982.0	2.3	-	54.0	51.7	-
98.0	108.7	4.5	-	43.5	39.0	-
	217.4	-	-	46.0	-	-
	326.1	-	-	46.0	-	-
	434.8	4.8	-	46.0	41.2	-
	543.5	-	-	46.0	-	-
	652.2	3.8	-	46.0	42.2	-
	760.9	2.6	-	46.0	43.4	-
	869.6	-	3.7	46.0	-	42.3
	978.3	2.5	-	54.0	51.5	-
108.0	118.7	-	-	43.5	-	-
	237.4	-	-	46.0	-	-
	356.1	-	-	46.0	-	-
	474.8	-	-	46.0	-	-
	593.5	1.2	-	46.0	44.8	-
	712.2	-	2.1	46.0	-	43.9
	830.9	-	-	46.0	-	-
	949.6	2.5	-	46.0	43.5	-

* 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.