



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E035R-005

Applicant : DIASONIC TECHNOLOGY CO., LTD.
Address : #321-43, Suksu-Dong, Manan-Ku, Anyang-City, Kyungki-Do, Korea.

Manufacturer : DIASONIC TECHNOLOGY CO., LTD.
Address : #321-43, Suksu-Dong, Manan-Ku, Anyang-City, Kyungki-Do, Korea.

Type of Equipment : VOICE RECORDER

FCC ID : P7KDDR4K

Model Name : DDR-4000

Multiple Model Name : PRY900M2

Serial number : N/A

Total page of Report : 13 pages (including this page)

Date of Incoming : April 04, 2003

Date of Issuing : May 12, 2003

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: 
G. W. Lee/ Chief Engineer
EMC Div.
ONETECH Corp.

Reviewed by: 
Y. K. Kwon/ Director
EMC Div.
ONETECH Corp.



CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE.....	3
2. GENERAL INFORMATION	4
2.1 PRODUCT DESCRIPTION	4
2.2 RELATED SUBMITTAL(S) / GRANT(S).....	4
2.3 TEST SYSTEM DETAILS	4
2.4 TEST METHODOLOGY	5
2.5 TEST FACILITY	5
3. SYSTEM TEST CONFIGURATION.....	6
3.1 JUSTIFICATION	6
3.2 EUT EXERCISE SOFTWARE.....	6
3.3 CABLE DESCRIPTION.....	6
3.4 NOISE SUPPRESSION PARTS ON CABLE	7
3.5 EQUIPMENT MODIFICATIONS.....	7
3.6 CONFIGURATION OF TEST SYSTEM.....	7
4. PRELIMINARY TEST	8
4.1 AC POWER LINE CONDUCTED EMISSION TEST.....	8
4.2 RADIATED EMISSION TEST	8
5. FINAL RESULT OF MEASUREMENT	9
5.1 CONDUCTED EMISSION TEST	9
5.2 RADIATED EMISSION TEST	11
6. FIELD STRENGTH CALCULATION	12
7. LIST OF TEST EQUIPMENT.....	13

**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : DIASONIC TECHNOLOGY CO., LTD.
- ADDRESS : #321-43, Suksu-Dong, Manan-Ku, Anyang-City, Kyungki-Do, Korea.
- CONTACT PERSON : Mr. Young-Ju, Kim / Assistant Manager
- TELEPHONE NO : +82-31-474-0852
- FCC ID : P7KDDR4K
- MODEL NAME : DDR-4000
- SERIAL NUMBER : N/A
- DATE : May 12, 2003

DEVICE TYPE	- Unintentional Radiator
E.U.T. DESCRIPTION	VOICE RECORDER
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. GENERAL INFORMATION

2.1 Product Description

The DIASONIC TECHNOLOGY CO., LTD., Model DDR-4000 (referred to as the EUT in this report) is a VOICE RECORDER that is a personal computer peripheral with USB standard port and has functions of MP3 player and FM broadcast receiver. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic (Non Shield Coating)
LIST OF EACH OSC. or CRY. FREQ.(FREQ.>=1MHz)	30MHz on Main Board, 4.5MHz on Audio Board
MULTI-FUNCTION	Voice Recorder, MP3 Player, FM/AM Broadcast Receiver
FM TUNER MODULE MFR./MODEL NAME	TOSHIBA : TUNNER IC – TA2149FN SANYO : PLL IC – LC72133V
NUMBER OF LAYERS	Main Board : 4 Layers, Audio Board : 2 Layers
EXTERNAL CONNECTOR	Audio In/Out, DC In, USB In.

Model Differences:

- The following lists consist of the added model and their differences. The added models are identical to the basic model except for below model difference only.

	Model Name	Model Difference
Basic Model	DDR-4000	-
Added Model	PRY900M2	Only type designation because of buyer's request

2.2 Related Submittal(s) / Grant(s)

Original submittal only

2.3 Test System Details

The model numbers for all the equipments that were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
DDR-4000	DIASONIC TECHNOLOGY CO., LTD.	P7KDDR4K	VOICE RECORDER (EUT)	Notebook PC
AEC-3530C	ANOMA ELECTRONIC CO., LTD	N/A	AC/DC ADAPTOR	EUT
S690	Samsung Elec.	DOC	Notebook PC	-
AD-6019(V)	Samsung Elec.	N/A	ADAPTOR	Notebook PC
-	-	N/A	EARPHONE	EUT
P801	Samsung	FSUGMZFT	MOUSE	Notebook PC
2225C	HP	DSI6XU2225	PRINTER	Notebook PC



2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	DIASONIC TECHNOLOGY CO., LTD.	-	N/A
Audio Board	DIASONIC TECHNOLOGY CO., LTD.	-	N/A

3.2 EUT exercise Software

- Play mode and Recording mode
- After connecting the EUT to USB port of a notebook PC, data were continuously uploading and downloading from HDD of the notebook PC to the EUT.
- FM/AM receiving mode
- The EUT was tested on up/downloading mode as the worst case.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
VOICE RECORDER (EUT)	N	Y	1.2 (P), 1.2 (D)
AC/DC ADAPTER (EUT)	N/A	N	1.2 (D)
EARPHONE	N/A	N	1.2 (D)
NOTEBOOK PC	N	-	1.5 (P)
AC/DC ADAPTER (Notebook PC)	N	N	1.2(P), 1.0(D)
MOUSE	N/A	N	1.2(D)
PRINTER	N	Y	1.5(P), 1.5(D)

* The marked "(P)" means the Power Cable and "D" means the I/O Cable.

**3.4 Noise Suppression Parts on Cable**

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
VOICE RECORDER (EUT)	Y	EUT END	Y	BOTH END
AC/DC ADAPTER (EUT)	N	N/A	Y	EUT END
EARPHONE	N	N/A	Y	EUT END
NOTEBOOK PC	-	-	-	-
AC/DC ADAPTER (Notebook PC)	Y	Notebook PC END	Y	Notebook PC END
MOUSE	N	N/A	Y	Notebook PC END
PRINTER	N	N/A	Y	BOTH END

3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There were no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test : The EUT was connected to AC/DC adaptor and AC/DC adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Play mode	
Recoding mode	
FM/AM Receiving mode	
Files Up/Downloading mode	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Play mode	
Recoding mode	
FM/AM Receiving mode	
Files Up/Downloading mode	X

**5. FINAL RESULT OF MEASUREMENT**

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

Humidity Level : 39 % Temperature: 24 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)
 Type of Test : CLASS B
 Result : PASSED BY -28.89 dB at 11.26 MHz

EUT : VOICE RECORDER Date: May 06, 2003
 Operating Condition : Files Up/Downloading mode
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.19	H	24.08	63.82	-39.74
0.27	H	23.72	60.97	-37.25
0.35	H	18.63	58.96	-40.33
11.09	N	29.85	60.00	-30.15
11.26	H	31.11	60.00	-28.89
20.97	N	24.82	60.00	-35.18
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
-				
-				

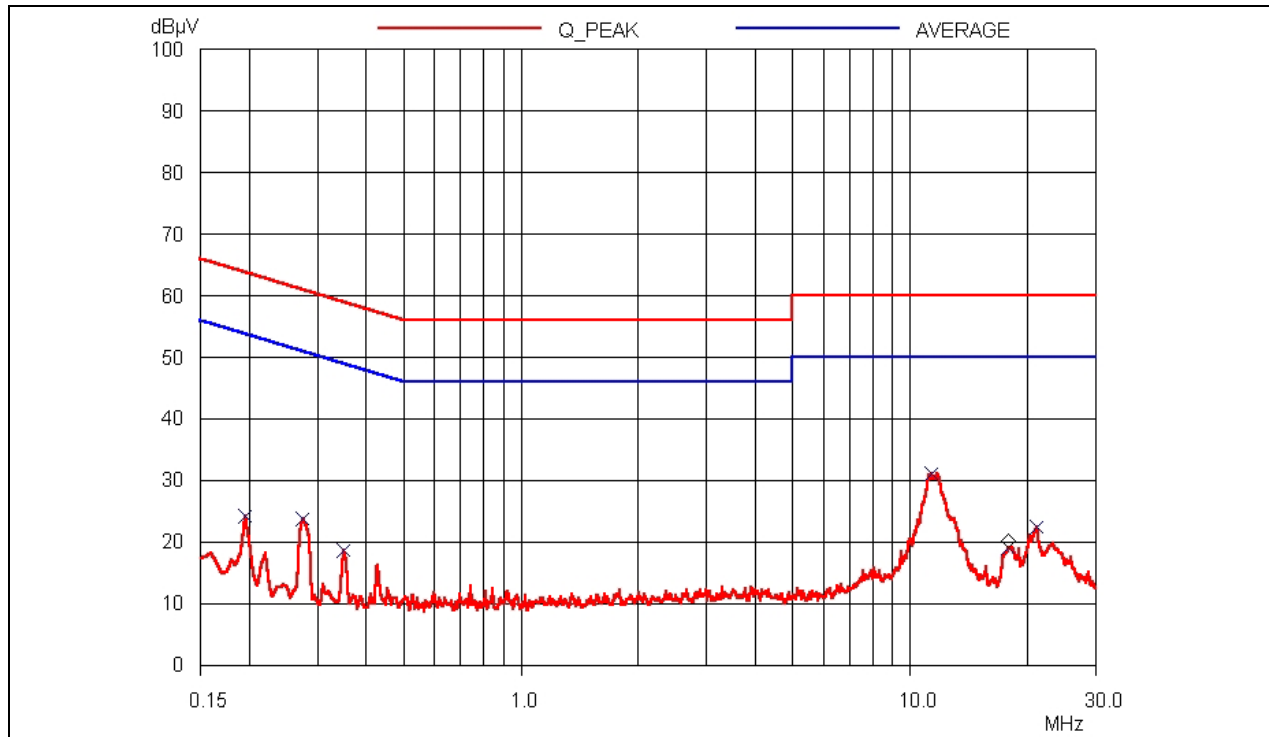
Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

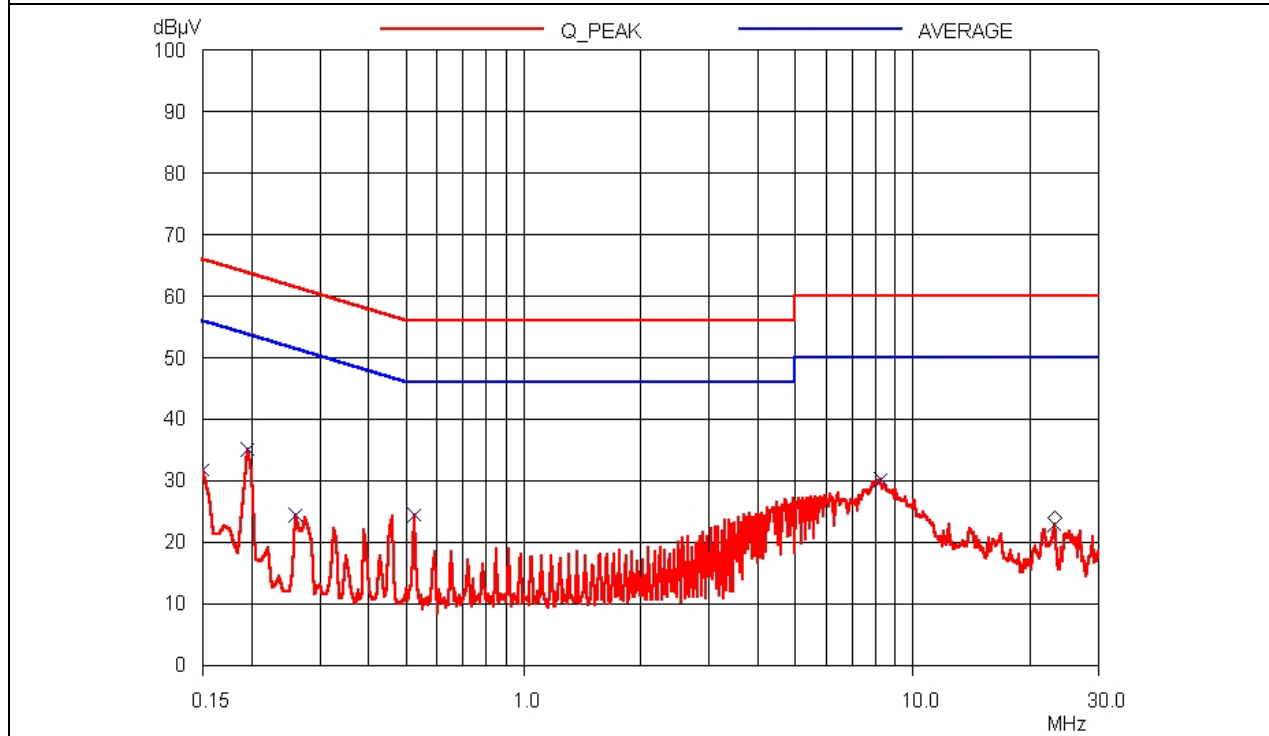
Average data was not measured, because Peak values were under the Average limit.

See next page for an overview sweep performed with peak detector.

Tested by: Sue-Yong, Lee / Test Engineer



HOT LINE



NEUTRAL LINE

This report shall not be reproduced except in full without our written approval.

EMC-003 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)



5.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 44 % Temperature: 18 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
 Type of Test : CLASS B
 Result : PASSED BY -3.09 dB at 48.06 MHz

EUT : VOICE RECORDER Date: March 12, 2003
 Operating Condition : Files Up/Downloading mode.
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
35.95	24.50	V	11.21	0.80	36.51	40.00	-3.49
48.06	25.20	H	10.80	0.91	36.91	40.00	-3.09
60.17	21.10	H	9.38	0.98	31.46	40.00	-8.54
71.93	21.50	H	7.40	1.00	29.90	40.00	-10.10
108.12	21.10	V	12.76	1.19	35.05	43.50	-8.45
120.11	17.40	V	13.46	1.23	32.09	43.50	-11.41
137.45	18.90	V	12.66	1.30	32.86	43.50	-10.64
180.05	14.00	V	16.12	1.45	31.57	43.50	-11.93
204.40	20.30	H	10.93	1.59	32.82	43.50	-10.68
227.60	22.70	H	11.05	1.71	35.46	46.00	-10.54
240.00	19.80	H	11.62	1.78	33.20	46.00	-12.80
382.40	14.30	H	14.78	2.40	31.48	46.00	-14.52
431.80	17.30	H	15.89	2.50	35.69	46.00	-10.31
455.80	20.20	V	16.45	2.56	39.21	46.00	-6.79
471.20	16.70	V	16.86	2.59	36.15	46.00	-9.85

Radiated Emissions Tabulated Data

Tested by: Sue-Yong, Lee / Test Engineer

This report shall not be reproduced except in full without our written approval.

EMC-003 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea
 (TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**7. LIST OF TEST EQUIPMENT**

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	OCT/02	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	APR/03	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/03	12MONTH	■
6.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	APR/03	12MONTH	■
7.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	APR/03	12MONTH	■
8.	LISN	EMCO	3825/2	9109-1867 9109-1869	AUG/02	12MONTH	■
9.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
10.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
11.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■