ELECTROMAGNETIC EMISSION COMPLIANCE REPORT
FOR FCC CLASS B CERTIFICATION

Test Report No.	**: E049R-093**
Applicant	**: Toodis Co., Ltd.**
Address	**: Rm 207, Uman SK Arcade, 98 Uman-Dong, Paldal-Gu, Suwon-City, Kyunggi-Do, Korea**
Manufacturer	**: Toodis Co., Ltd.**
Address	**: Rm 207, Uman SK Arcade, 98 Uman-Dong, Paldal-Gu, Suwon-City, Kyunggi-Do, Korea**
Type of Equipment	**: Digital Voice Recorder & Multi Player**
FCC ID	**: SMSMPAL-400**
Model Name	**: MPAL-410F**
Multi Model Name	**: MPAL-402F, MPAL-405F**
Serial Number	**: N/A**
Total page of Report	**: 13 pages (including this page)**
Date of Incoming	**: September 15, 2004**
Date of Issuing	**: September 24, 2004**

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: S. C. You / Test Engineer, EMC Div.

Reviewed by: G. W. Lee / Director, EMC Div.

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ONETECH Corp. ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : Toodis Co., Ltd.
-. ADDRESS : Rm 207, Uman SK Arcade, 98 Uman-Dong, Paldal-Gu, Suwon-City, Kyunggi-Do, Korea
-. CONTACT PERSON : Mr. Eui-Chul, Kim / Senior Engineer
-. TELEPHONE NO : +82-31-212-4031
-. FCC ID : SMSMPAL-400
-. MODEL NAME : MPAL-410F
-. SERIAL NUMBER : N/A
-. DATE : September 24, 2004

DEVICE TYPE	UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	Digital Voice Recorder & Multi Player
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2001
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.

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2. GENERAL INFORMATION

2.1 Product Description

The Toodis Co., Ltd., Model MPAL-410F (referred to as the EUT in this report) is a Digital Voice Recorder & Multi Player that is equipped with various functions such as MP4 movie player, MP3 player, voice recorder, FM radio, portable hard disc, image viewer and text viewer. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	12 MHz
NUMBER OF LAYERS	8 Layers
ELECTRICAL RATING	DC 5 V (AA Battery)
DIMENSIONS (W x D x H)	44 x 87 x 23.5 mm
EXTERNAL CONNECTOR	Earphone Jack, Line In, USB

2.2 Model Differences:

-. The following list consists of added model name and their differences:

	Model	Model Differences
Basic Model	MPAL-410F	Memory: 1 GB
Added Model	MPAL-402F	Memory: 256 MB
	MPAL-405F	Memory: 512 MB

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 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
MPAL-410F	Toodis Co., Ltd.	SMSMPAL-400	Digital Voice Recorder & Multi Player (EUT)	Notebook PC
PP01L	DELL Computer Corp.	DoC	Notebook PC	-
ADP-70EB	Delta Electronics	N/A	Adapter	Notebook PC
IGM-4800	CHIC TECHNOLOGY CORP.	DoC	Mouse	Notebook PC
N/A	N/A	N/A	Headphone	EUT
2225C	HP	DSI6XU2225	Printer	Notebook PC

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020-0470	Cardinal	GDE0196	Modem	Notebook PC

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2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 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)

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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	Toodis Co., Ltd.	N/A	N/A
Memory Board	Toodis Co., Ltd.	N/A	N/A

3.2 EUT exercise Software

-. After connecting the EUT to a Notebook computer using USB cable, data were continuously read and written from the HDD of the Notebook computer to the EUT.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Digital Voice Recorder & Multi Player (EUT)	N/A	Y (USB) N (Line In)	1.2 (D) 1.2 (D)
Head Phone	N/A	N	1.2 (D)
Adaptor (for DC)	N	N	1.5 (P), 1.2 (D)
Notebook PC	N	-	1.5 (P)
Modem	N	N	1.2 (P), 1.0 (D)
Mouse	N/A	N	1.2 (D)
Printer	N	Y	1.8 (P), 1.2 (D)

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

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3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Digital Voice Recorder & Multi Player (EUT)	N	N/A	Y	BOTH END
Head Phone	N	N/A	Y	EUT END
Adaptor (for PC)	Y	PC END	Y	PC END
Notebook PC	N	N/A	Y	BOTH END
Modem	N	N/A	Y	BOTH END
Mouse	N	N/A	Y	PC END
Printer	N	N/A	Y	BOTH END

3.5 Equipment Modifications

-. None

3.6 Configuration of Test System

Line Conducted Test **:** The EUT was connected to PC and the power line of PC 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: 2001 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: 2001 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

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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)
Data were continuously read and written from the HDD of the Notebook computer to the EUT	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)
Data were continuously read and written from the HDD of the Notebook computer to the EUT	X

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5. FINAL RESULT OF MEASURMENT

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 : 43 % Temperature: 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)

Type of Test : CLASS B

Result : PASSED BY –5.82 dB at 0.18 MHz under peak detector mode

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EUT : Digital Voice Recorder & Multi Player Date: September 16, 2004

Operating Condition : Data were continuously read and written from the HDD of the Notebook computer to the EUT.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.16	N	50.96	65.46	-14.5
0.18	H	58.88	64.72	-5.82
0.23	H	51.88	62.45	-10.57
0.24	N	44.25	62.27	-18.02
0.29	H	45.05	60.52	-15.47
4.17	H	36.68	56.00	-19.32
Frequency (MHz)	**Line**	**Average (dBuV)**		**Margin (dB)**
		Emission level	**Limits**	
0.18	H	45.62	54.72	-9.10
0.23	H	37.75	52.45	-14.70
0.24	N	35.27	52.27	-17.00
4.06	N	28.37	46.00	-17.63

Line Conducted Emission Tabulated Data

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

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

Tested by: Sung-Chel, You / Test Engineer

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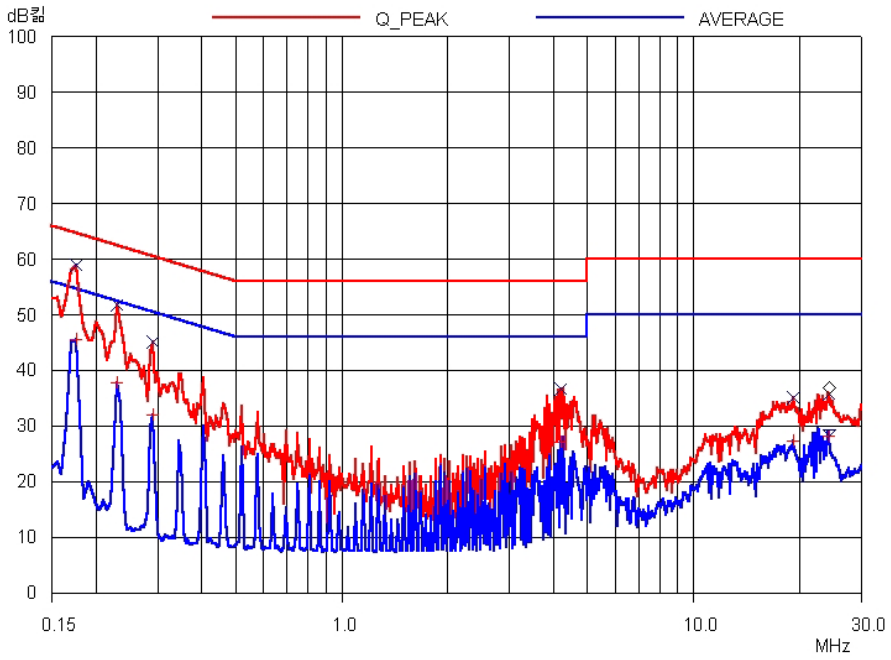
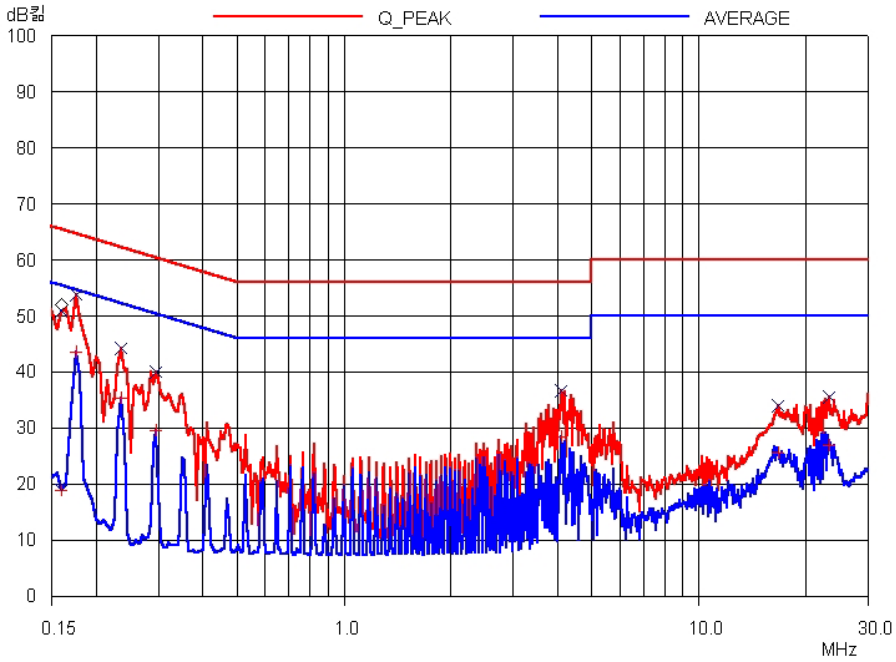


HOT LINE



NEUTRAL LINE

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5.2 Radiated Emission Test

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

Humidity Level : 43 % Temperature: 23 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
Type of Test : CLASS B
Result : PASSED BY -3.04 dB at 112.75 MHz

EUT : Digital Voice Recorder & Multi Player Date: September 15, 2004
Operating Condition : Data were continuously read and written from the HDD of the Notebook computer to the EUT.
Frequency range : 30MHz – 1000MHz
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)
112.75	22.90	V	12.08	1.98	36.96	40.00	-3.04
116.80	11.00	V	12.59	2.10	35.69	40.00	-4.31
120.75	10.20	V	13.03	2.19	35.42	40.00	-4.58
132.75	19.10	V	13.74	1.97	34.81	40.00	-5.19
135.50	19.00	V	13.90	1.95	34.85	40.00	-5.15
254.10	21.10	H	17.23	2.62	40.95	47.00	-6.05
263.90	22.10	H	17.38	2.66	42.14	47.00	-4.86
287.60	19.40	H	20.04	2.80	42.24	47.00	-4.76
335.60	18.30	H	14.22	3.01	35.53	47.00	-11.47
383.60	20.10	H	15.38	3.35	38.83	47.00	-8.17

Radiated Emissions Tabulated Data

Tested by: Sung-Chel, You / Test Engineer

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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)

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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	DEC/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/04	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/04	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	JUL/04	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/04	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	JUL/04	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/04	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/04	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/04		■
9.	Log Periodic antenna	EMCO	3146	9109-3213	FEB/04	12MONTH	
				9109-3217	MAY/04		
		Schwarzbeck	9108-A(494)	62281001	JAN/04		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/04	12MONTH	■
				9109-1869	OCT/03		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■

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