ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No.	: E063R-040
AGR No.	: A062A-148
Applicant	: SAROTECH CO., LTD.
Address	: Sarotech Bldg. 320-15, Sungnae-Dong, Gangdong-Gu, Seoul, 134-851, Korea
Manufacturer	: SAROTECH CO., LTD.
Address	: Hanlim Venture Town #204, 689-6, Gumjeong-Dong, Gunpo-City, Kyungki-Do, Korea
Type of Equipment	: Multimedia Player (Peripheral Device for Class B Computing Device)
FCC ID	: PBCDVP-370
Model Name	: DVP-370
Multiple Model Name	: N/A
Serial number	: N/A
Total page of Report	: 14 pages (including this page)
Date of Incoming	: January 24, 2006
Date of Issuing	: March 27, 2006

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 b	1. Jogn-
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	EMC Div.
	ONETECH Corp.

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

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 EMC-002 (Rev.0)

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: SAROTECH CO., LTD.

- -. ADDRESS : Sarotech Bldg. 320-15, Sungnae-Dong, Gangdong-Gu, Seoul, 134-851, Korea
- -. CONTACT PERSON : Mr. Yong-Woo, Lee / Manager
- -. TELEPHONE NO : +82-2-480-5140
- -. FCC ID : PBCDVP-370
- -. MODEL NAME : DVP-370
- -. SERIAL NUMBER : N/A
- -. DATE : March 27, 2006

DEVICE TYPE	Peripheral Device for Class B Computing Device	
	- Unintentional Radiator	
E.U.T. DESCRIPTION	Multimedia Player	
THIS REPORT CONCERNS	ORIGINAL GRANT	
MEASUREMENT PROCEDURES	ANSI C63.4: 2003	
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	Yes	
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE	

-. 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 SAROTECH CO., LTD., Model DVP-370 (referred to as the EUT in this report) is a Multimedia Player that has a function for transmitting of FM broadcasting frequency range and PC peripheral. This report covers a PC peripheral and move playing functions. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Metal	
LIST OF EACH OSC. or CRY.		
FREQ.(FREQ.>=1MHz)	12 MHz and 27 MHz	
POWER REQUIREMENT	AC 95-240V, 50/60Hz, 0.5A	
NUMBER OF LAYERS	1 Layer: Power Board, 2 Layers: Key Board and Sub Board, 4 Layers: Main Board	
EXTERNAL CONNECTOR	AC In, DC In, Ext. IR In, USB, Video Composite Out, Video Component Out,	
	Video S-Vide Out, Audio R/L Out, Optical Out, Coaxial Out, FM Ant.	

2.2 Model Differences

-. The difference(s) compared to the EUT is as follows: None

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
DVP-370	SAROTECH CO., LTD.	TECH CO., LTD. PBCDVP-370 Multimedia Player (EUT)		Notebook PC
PP05LC	DELL COMPUTER CORP.	DoC	Notebook PC	-
2225C	HP	DSI6XU2225	Printer	Notebook PC
M4	Mouse Systems	N/A	Modem	Notebook PC
LT201CL	KTV	N/A	TV (For Movie Playing Mode)	EUT

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. 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 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on April 04, 2003. (Registration Number: 340658)

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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	SAROTECH CO., LTD.	DVP-370 Main V1.01	N/A
Key Board	SAROTECH CO., LTD.	DVP-370A Key V1.0	N/A
Sub Board	N/A	Sub V1.0	N/A
Power Board	SEYANG TECH	SY0103RC Rev.A	N/A
HDD	Seagate	ST380011A	N/A

3.2 EUT exercise Software

The EUT has following 2 operating condition, so two modes were tested and each test results were recorded.

- 1. After connecting the EUT to a notebook PC using the USB cable, the data were continuously read and written from the personal computer to the EUT.
- 2. Movie file in the HDD of the EUT was played during the test.

3.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
Audio Out	Ν	Ν	BOTH END	1.5	-
Video Out	Ν	Ν	BOTH END	1.5	-
AC In	Ν	Ν	EUT END	1.2	-
USB	Y	Y	BOTH END	1.5	РС
FM Out	N	N	EUT END	1.2	-

3.5 Equipment Modifications

-. The R7, 8, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24(key connector line) on the main board were changed to the bead(2000 ohm).

- -. The R12, 13(key connector line) on the main board were changed to the bead(1000 ohm).
- -. The bead(1000 ohm) was added to the R42(22ohm) that is U9 CLKE line on the main board.
- -. The bead(120 ohm) was added to the R34, 35(220hm) that is U3 SYS FL line on the main board.
- -. The R37, 38, 39(U5 SYS line) were changed to the bead(1000 ohm) on the main board.
- -. The bypass capacitor(27pF) was added to the connector J6, pins 3~18, 21, 23, 25, 27, 29, 31 and 33~38 on the main board.
- -. The rating of bead(connector CON1 line, L30) was changed from 1000 ohm to 2000 ohm on the main board.
- -. The rating of bead(connector CON1 line, R36) was changed from 0 ohm to 1000 ohm on the main board.
- -. The L15, 17, 18(S-Video Socket line) were changed to the bead(2000 ohm) on the main board.
- -. The L7, 9, 11(RCA Socket line) were changed to the bead(2000 ohm) on the main board.

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- -. The B21, 22, 29(Connector J3 line, 0.1uF) were changed to the resistor(0 ohm) on the main board.
- -. The rating of bead(USB 5V line, L25) was changed from 1000 ohm to 2000 ohm on the main board.
- -. The CMF(90 ohm) was added to the USB D+/- line on the main board.
- -. The bead(Connector J7 line, D5, 6, 1000 ohm) were deleted on the main board.
- -. The bypass capacitor(0.01uF) was added to the connector J6, pins 1 and 39 on the main board.
- -. The D1, 2(Connector J2 line) were deleted on the main board.
- -. The rating of bead(VCC 3.3V line, L4, 31) was changed from 1000 ohm to 2000 ohm on the main board.
- -. The rating of bead(VCC line and AUDVCC line, L2, 3) was changed from 1000 ohm to 2000 ohm on the main board.
- -. The L27(USB GND line) was deleted on the main board.
- -. The L23, 24 were deleted on the main board.
- -. The analog GND was connected to the digital GND on the main board.
- -. The rating of bead(Connector JACK1 line, L1) was changed from 1000 ohm to 2000 ohm on the main board.
- -. The EMI gasket was added between the HDD and inside of top enclosure.
- -. The ferrite core(E-tech, SH2915C) was added to the key connector cable.
- -. The GND wire was connected to the GND of key board.

3.6 Configuration of Test System

Line Conducted Test	: The EUT 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: 2003 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:
	2003 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 operating condition
Data were continuously read and write by USB Port	Х
Movie Playing Mode	Х

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The operating condition
Data were continuously read and write by USB Port	Х
Movie Playing Mode	Х

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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

.1.1 Operating Condition: Data were continuously read and write by USB Port						
Humidity Level	: <u>42 %</u>	Temperature: 21 °C				
Limits apply to	: FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)					
Type of Test	: <u>CLASS B</u>					
Result	: PASSED BY –9.28 dB at 3.06 MHz under peak mode					

EUT

Detector

: Multimedia Player

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

Frequency	Line	Peak (Margin	
(MHz)		Emission level	Q.P Limits	(dB)
0.68	Н	42.11	56.00	-13.89
1.41	Н	42.79	56.00	-13.21
3.02	N	45.65	56.00	-10.35
3.06	Н	46.72	56.00	-9.28
20.45	N	48.28	60.00	-11.72
20.47	Н	49.57	60.00	-10.43
Frequency	Line	Average	Average (dBuV)	
(MHz)		Emission level	Limits	(dB)
3.02	N	24.79	46.00	-21.21
3.06	Н	27.16	46.00	-18.84
20.45	Ν	27.65	50.00	-22.35
20.47	Н	27.91	50.00	-22.09

Line Conducted Emission Tabulated Data

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

Tested by: Sue-Young, Lee/ Test Engineer

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5.1.2 Operating Condition: Movie Playing Mode

: <u>42 %</u>	Temperature: <u>21 °C</u>
: FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)	
: <u>CLASS B</u>	
: PASSED BY -8.82 dB at 2.99 MHz under peak mode	
	: <u>42 %</u> : <u>FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)</u> : <u>CLASS B</u> : <u>PASSED BY -8.82 dB at 2.99 MHz under peak mode</u>

EUT Detector : Multimedia Player

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

Frequency	Line	Peak (Margin	
(MHz)		Emission level	Q.P Limits	(dB)
1.15	Ν	39.95	56.00	-16.05
1.27	Н	42.24	56.00	-13.76
2.99	Н	47.18	56.00	-8.82
3.02	Ν	44.71	56.00	-11.29
21.85	Ν	48.43	60.00	-11.57
22.65	Н	49.02	60.00	-10.98
Frequency	Line	Average	(dBuV)	Margin
(MHz)		Emission level	Limits	(dB)
2.99	Н	30.60	46.00	-15.40
3.02	Ν	26.99	46.00	-19.01
21.85	N	30.12	50.00	-19.88
22.65	Н	29.14	50.00	-20.86

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.

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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.

5.2.1 Operati	ng Condition	: Data w	ere continuous	ly read and w	rite by USB Port			
Humidity Lev	el	: <u>39 %</u> Temperature: <u>17 °C</u>						
Limits apply t	0	: FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)						
Type of Test		: CLASS	B					
Result		: PASSE	D BY -5.22 dB	at 599.78 MHz	<u>Z</u>			
EUT		: Multim	edia Player			Date	: March 13, 2006	
Detector		: CISPR	Quasi-Peak (6 c	B Bandwidth:	120 kHz)			
Frequency Ra	nge	: 30 MHz	z – 1000 MHz					
Distance		: 3 Meter						
Radiated	Emissions	Ant	Correctio	n Factors	Total	FCC C	LASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)	
133.68	17.50	v	13.75	2.27	33.52	43.52	-10.00	
149.19	18.00	Н	14.59	2.31	34.90	43.52	-8.62	
198.10	16.66	Н	16.12	2.80	35.58	43.52	-7.94	
299.39	16.47	Н	20.04	3.79	40.30	46.02	-5.72	
499.59	15.74	v	19.15	5.49	40.38	46.02	-5.64	
599.78	15.43	V	20.07	5.30	40.80	46.02	-5.22	

Radiated Emissions Tabulated Data

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5.2.2 Operating Condition: Movie Playing Mode								
Humidity Leve	el :	: <u>39 %</u> Temperature: <u>17 °C</u>						
Limits apply to	o :	: FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)						
Type of Test	:	<u>CLASS B</u>						
Result	:	PASSE	D BY -4.39 dB	at 299.39 MHz				
EUT	:	Multim	edia Player			Date	: March 13, 2006	
Detector	:	CISPR	Quasi-Peak (6 d	B Bandwidth:	120 kHz)			
Frequency Ran	nge :	30 MHz	z – 1000 MHz					
Distance	:	3 Meter						
		Ant Correction Factors Total FCC CLASS B						
Radiated	Emissions	Ant	Correctio	n Factors	Total	FCC C	LASS B	
Radiated Freq.	Emissions Amp.	Ant	Correctio Ant.	n Factors Cable	Total Amp.	FCC C Limit	LASS B Margin	
Radiated Freq. (MHz)	Emissions Amp. (dBuV)	Ant Pol.	Correctio Ant. (dBuV/m)	n Factors Cable (dB)	Total Amp. (dBuV/m)	FCC C Limit (dBuV/m)	LASS B Margin (dB)	
Radiated Freq. (MHz) 80.39	Emissions Amp. (dBuV) 22.95	Ant Pol. V	Correctio Ant. (dBuV/m) 6.44	n Factors Cable (dB)	Total Amp. (dBuV/m) 31.10	FCC C Limit (dBuV/m) 40.00	LASS B Margin (dB) -8.90	
Radiated Freq. (MHz) 80.39 106.55	Emissions Amp. (dBuV) 22.95 19.92	Ant Pol. V V	Correctio Ant. (dBuV/m) 6.44 10.89	n Factors Cable (dB) 1.71 1.90	Total Amp. (dBuV/m) 31.10 32.71	FCC C Limit (dBuV/m) 40.00 43.52	LASS B Margin (dB) -8.90 -10.81	
Radiated Freq. (MHz) 80.39 106.55 183.10	Emissions Amp. (dBuV) 22.95 19.92 15.76	Ant Pol. V V V	Correctio Ant. (dBuV/m) 6.44 10.89 15.64	n Factors Cable (dB) 1.71 1.90 2.80	Total Amp. (dBuV/m) 31.10 32.71 34.20	FCC C Limit (dBuV/m) 40.00 43.52 43.52	LASS B Margin (dB) -8.90 -10.81 -9.32	
Radiated Freq. (MHz) 80.39 106.55 183.10 242.20	Emissions Amp. (dBuV) 22.95 19.92 15.76 20.07	Ant Pol. V V V H	Correctio Ant. (dBuV/m) 6.44 10.89 15.64 17.05	n Factors Cable (dB) 1.71 1.90 2.80 3.28	Total Amp. (dBuV/m) 31.10 32.71 34.20 40.40	FCC C Limit (dBuV/m) 40.00 43.52 43.52 46.02	LASS B Margin (dB) -8.90 -10.81 -9.32 -5.62	
Radiated Freq. (MHz) 80.39 106.55 183.10 242.20 299.39	Emissions Amp. (dBuV) 22.95 19.92 15.76 20.07 17.80	Ant Pol. V V V H H	Correctio Ant. (dBuV/m) 6.44 10.89 15.64 17.05 20.04	n Factors Cable (dB) 1.71 1.90 2.80 3.28 3.79	Total Amp. (dBuV/m) 31.10 32.71 34.20 40.40 41.63	FCC C Limit (dBuV/m) 40.00 43.52 43.52 43.52 46.02 46.02	LASS B Margin (dB) -8.90 -10.81 -9.32 -5.62 -4.39	
Radiated Freq. (MHz) 80.39 106.55 183.10 242.20 299.39 431.10	Emissions Amp. (dBuV) 22.95 19.92 15.76 20.07 17.80 18.49	Ant Pol. V V V V H H H	Correctio Ant. (dBuV/m) 6.44 10.89 15.64 17.05 20.04 17.65	n Factors Cable (dB) 1.71 1.90 2.80 3.28 3.79 4.46	Total Amp. (dBuV/m) 31.10 32.71 34.20 40.40 41.63 40.60	FCC C Limit (dBuV/m) 40.00 43.52 43.52 43.52 46.02 46.02 46.02	LASS B Margin (dB) -8.90 -10.81 -9.32 -5.62 -4.39 -5.42	

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Radiated Emissions Tabulated Data

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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	ESVS10	827864/005	DEC/05	12MONTH	
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/05	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	APR/05	12MONTH	
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	APR/05	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/06	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/06		
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/06	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/06		
10.	LISN	EMCO	3825/2	9109-1867	JUL/05	12MONTH	
				9109-1869	JUL/05		
		Schwarzbeck	NSLK 8126	8126-404	AUG/05		
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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