

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E069R-031

AGR No. : A067A-044

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 : Multi Media Player (Peripheral Device for Class B Computing Device)

FCC ID : PBCDVP-570

Model Name : DVP-570HD

Multiple Model Name : N/A

Serial number : N/A

Total page of Report : 15 pages (including this page)


Date of Incoming : June 02, 2006


Date of Issuing : September 13, 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 by: 
Young-Min, Choi / Project 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 MODEL DIFFERENCES.....	4
2.3 RELATED SUBMITTAL(S) / GRANT(S).....	4
2.4 TEST SYSTEM DETAILS.....	4
2.5 TEST METHODOLOGY.....	5
2.6 TEST FACILITY.....	5
3. SYSTEM TEST CONFIGURATION.....	6
3.1 JUSTIFICATION.....	6
3.2 EUT EXERCISE SOFTWARE.....	6
3.3 CABLE DESCRIPTION.....	6
3.5 EQUIPMENT MODIFICATIONS.....	7
3.6 CONFIGURATION OF TEST SYSTEM.....	8
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
5.1.1 Used Power: AC Input.....	9
5.1.2 Used Power: USB Port.....	11
5.2 RADIATED EMISSION TEST.....	13
6. FIELD STRENGTH CALCULATION.....	14
7. LIST OF TEST EQUIPMENT.....	15

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-570
- MODEL NAME : DVP-570HD
- BRAND NAME : abigs
- SERIAL NUMBER : N/A
- DATE : September 13, 2006

DEVICE TYPE	Peripheral Device for Class B Computing Device - Unintentional Radiator
E.U.T. DESCRIPTION	Multi Media 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.

2. GENERAL INFORMATION

2.1 Product Description

The SAROTECH CO., LTD., Model DVP-570HD (referred to as the EUT in this report) is a Multi Media Player that has a function for transmitting of FM broadcasting frequency range and PC peripheral. This report covers a PC peripheral function and the report for FM transmitting shall be issued by another test report. 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)	24 MHz, 25 MHz, 27 MHz and 33 MHz on the Main Board
POWER REQUIREMENT	AC 95-240V, 50/60Hz, 0.5A or DC 5V/2.0A, DC 12V/1.0A from a car battery
NUMBER OF LAYERS	2 Layers: Key Board, Host Board, Sub Board, 6 Layers: Main Board
EXTERNAL CONNECTOR	AC In, DC In, Composite Ports, Component Ports, S-Video, DVI, Optical, Coaxial, USB Port, External IR, FM Antenna Port, LAN Port

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-570HD	SAROTECH CO., LTD.	PBCDVP-570	Multi Media Player(EUT)	Laptop PC & Monitors
PP05LC	Dell Computer	DoC	Laptop PC	-
LT201CB	KTV	N/A	Monitor 1	EUT
N/A	NewQ	N/A	Monitor 2	EUT
SUB-512	Samsung	DoC	Memory Stick	EUT
UP-DP10	Sony Corporation	DoC	Printer	Laptop PC
MO56UOA	Dell Computer	N/A	Mouse	Laptop PC
3453C	U.S. Robotics	CJE-0263	Modem	Laptop PC

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 August 30, 2005. (Registration Number: 340658)

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-370W	N/A
Key Board	SAROTECH CO., LTD.	DVP-355W Key VLD	N/A
USB Board	SAROTECH CO., LTD.	DVP-570HD HV1.0	N/A
Sub Board	SAROTECH CO., LTD.	N/A	N/A
Power Board	SEYANG TECH	SY0103RC	N/A
HDD	SAMSUNG	SP1203N/DOM	N/A

3.2 EUT exercise Software

After connecting the EUT to a laptop PC using the USB cable, the data were continuously read and written from the laptop PC to the EUT.

3.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
Video Out	N	N	BOTH END	1.5	Monitor 1
Audio Out	N	N	BOTH END	1.5	Monitor 1
S-Video	N	N	BOTH END	1.5	Monitor 2
DVI	Y	Y	BOTH END	1.5	Monitor 2
USB	N	Y	BOTH END	1.5	Laptop PC
LAN	N	N	BOTH END	2.0	Laptop PC
Ext. IR In	N	N	EUT END	1.5	-
FM Ant.	N	N	EUT END	1.0	-

3.5 Equipment Modifications

- The digital and analog ground on the main board were shorted.
- The L8 and 43 on the main board were shorted.
- The rating of bead(L3, 6, 7, 11, 12, 13, 14, 15, 30, 31, 32, 33, 35, 40, 41, 50) was changed to 300 ohm on the main board VCC input line.
- The R14(330 ohm) was changed to bead(150 ohm) on the main board 33MHz CLK line.
- The R6, 33, 34, 70, 71(33 ohm) were changed to bead(600 ohm) on the main board 33MHz CLK Logic line.
- The R10(22 ohm) was changed to bead(1000 ohm) on the main board Reset line.
- The R21(33 ohm) was changed to bead(150 ohm) on the main board 27MHz CLK line.
- The R113(22 ohm) was changed to bead(220 ohm) on the main board U5 PCLK line.
- The rating of RP7~RP14 were changed from 22 ohm to 43 ohm on the main board DDR SDRAM.
- The rating of R52~R55 and R57~R60 was changed from 22 ohm to 56 ohm on the main board DDR SDRAM.
- The two beads(2000 ohm) were added to the main board Video/Audio output line.
- The rating of C117~C119, C126~C128(47 pF) was changed to 470 pF on the main board Video/Audio output line.
- The rating of C120~C122, C129~C131(22 pF) was changed to 470 pF on the main board Video/Audio output line.
- The rating of L19, 21 was changed to 2000 ohm on the main board Video output line.
- The CMF 90 ohm was added to the Main Board USB Port CMF(Common Mode Filter) L44 line.
- The R148, 148, 150, 155, 156(0 ohm) were changed to the bead(150 ohm) on the main board SCL/SDA line.
- The rating of L36, 38, 39, 45, 46 was changed to 1000 ohm on the main board DVI port line.
- The bypass capacitors(10 nF) were added to the connector pins 4, 6, 13, 25 on the key board.
- The CMF(Common Mode Filter – 90 ohm) was added to the USB board D+/D- line.
- The ground of key board was connected to the ground of main board by wire.
- The ferrite core(E-Tech, SH2915C) was added to the key connector cable.
- The EMI gasket was added to the inside of metal case in order to connection of HDD.
- The resistor(20 Kohm) and Bead(2000 ohm) were added to the sub board antenna line.

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 written by USB Port	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The operating condition
Data were continuously read and written by USB Port	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**5.1.1 Used Power: AC Input**

Humidity Level : 42 % Temperature: 21 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)
Type of Test : CLASS B
Result : PASSED BY -8.83 dB at 22.32 MHz under peak mode

EUT : Multi Media Player Date: September 04, 2006
Operating Condition : Data were continuously read and written by USB Port
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

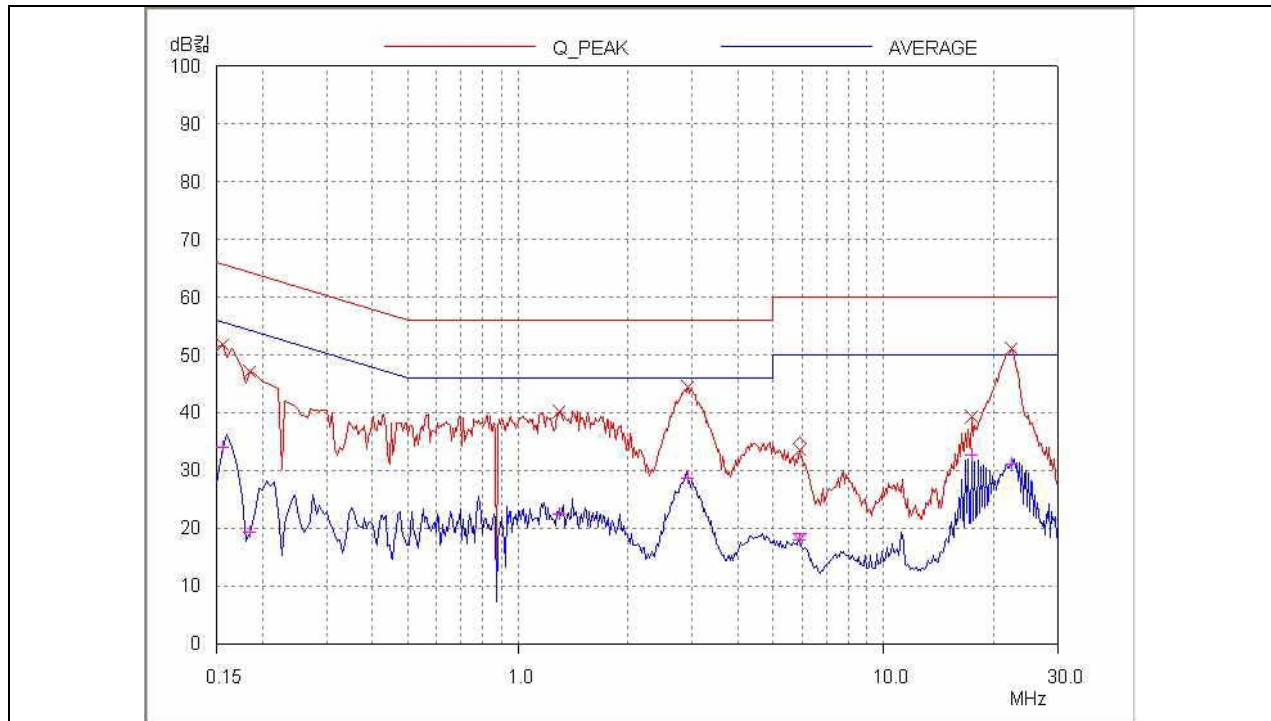
Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.15	H	51.76	65.73	-13.97
1.45	N	40.77	56.00	-10.96
2.84	N	45.04	56.00	-10.96
2.90	H	44.33	56.00	-11.67
21.87	N	50.84	60.00	-9.16
22.32	H	51.17	60.00	-8.83
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
2.84	N	28.63	46.00	-17.37
2.90	H	28.71	46.00	-17.29
21.87	N	31.13	50.00	-18.87
22.32	H	31.03	50.00	-18.97

Line Conducted Emission Tabulated Data

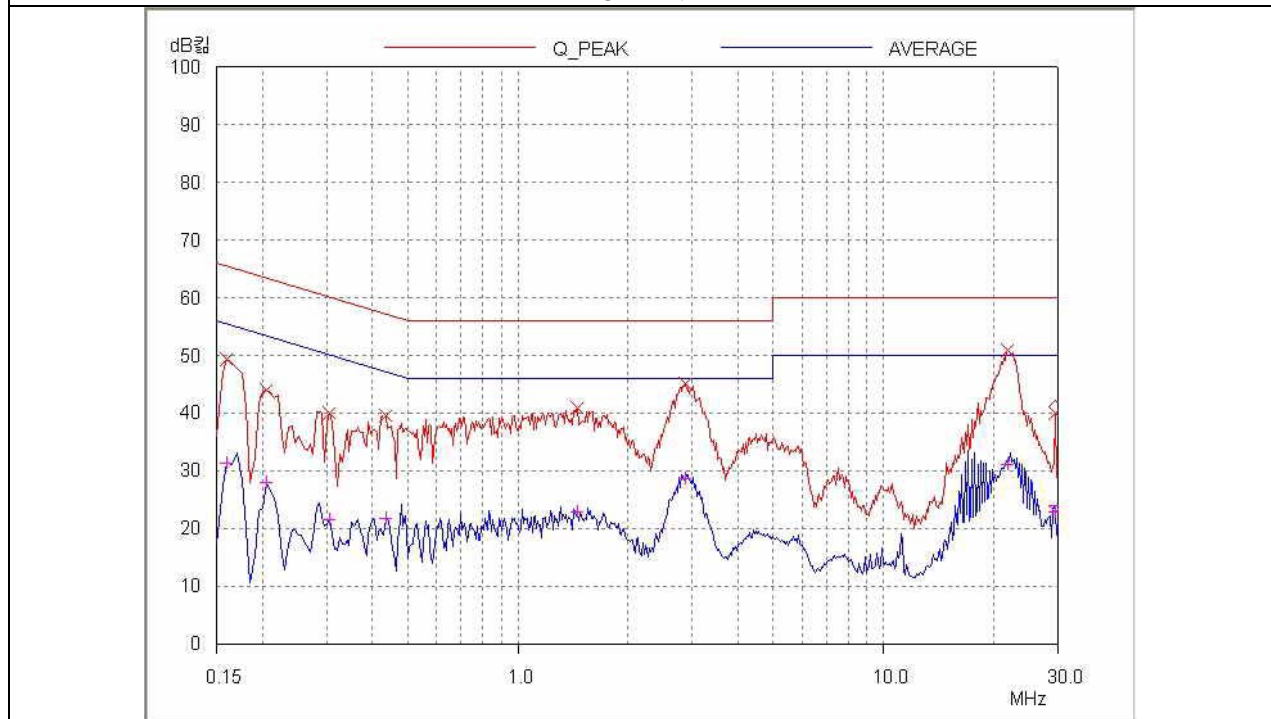
Remark : "H": Hot Line, "N": Neutral line



Tested by: In-Sub, Youn / Test Engineer



HOT LINE



NEUTRAL LINE

It should not be reproduced except in full, without the written approval of ONETECH.

EMC-002 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-705, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

5.1.2 Used Power: USB PortHumidity Level : 42 %Temperature: 21 °CLimits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)Type of Test : CLASS BResult : PASSED BY -11.52 dB at 3.56 MHz under peak mode

EUT : Multi Media Player

Date: September 04, 2006

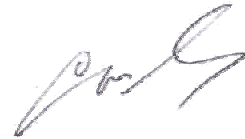
Operating Condition : Data were continuously read and written by USB Port

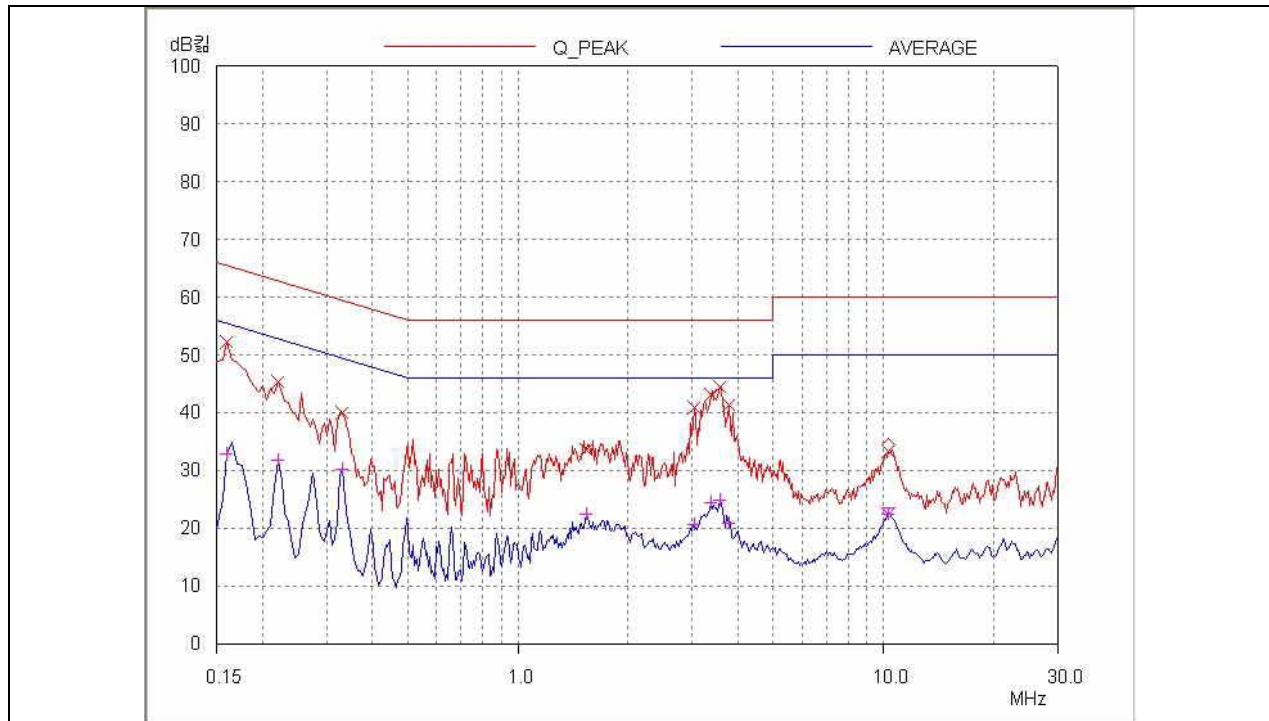
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.16	H	52.31	65.46	-13.15
3.36	H	43.05	56.00	-12.95
3.37	N	43.36	56.00	-12.64
3.53	N	44.31	56.00	-11.69
3.56	H	44.48	56.00	-11.52
3.77	H	41.25	56.00	-14.75
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
3.36	H	24.44	46.00	-21.56
3.37	N	24.75	46.00	-21.25
3.53	N	24.47	46.00	-21.53
3.56	H	24.78	46.00	-21.22

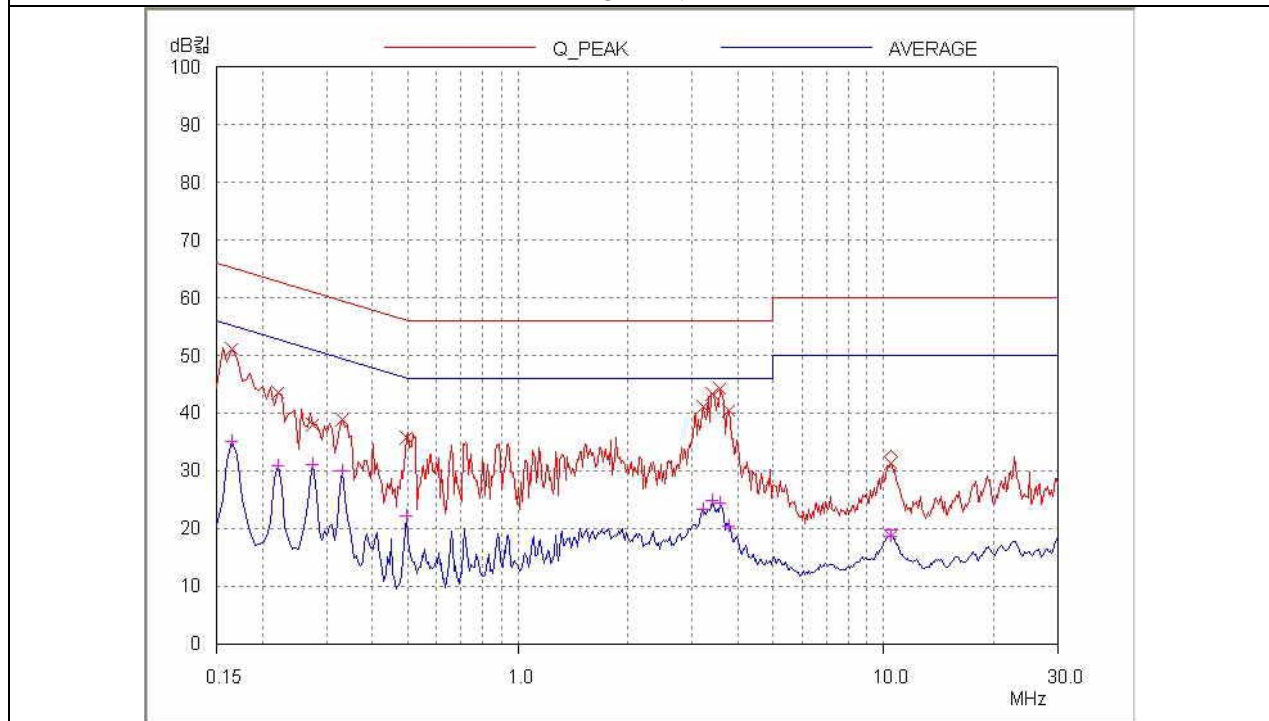
Line Conducted Emission Tabulated Data

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

**Tested by: In-Sub, Youn / Test Engineer**



HOT LINE



NEUTRAL LINE

It should not be reproduced except in full, without the written approval of ONETECH.

EMC-002 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-705, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

5.2 Radiated Emission Test

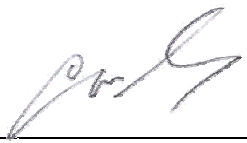
The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 41 % Temperature: 26 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
Type of Test : CLASS B
Result : PASSED BY -5.01 dB at 297.40 MHz

EUT : Multi Media Player Date: July 01, 2006
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Frequency Range : 30 MHz – 1000 MHz
Operating Condition : Data were continuously read and written by USB Port
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)
166.60	18.20	V	15.18	2.40	35.78	43.52	-7.74
233.20	17.40	H	16.96	3.13	37.49	46.02	-8.53
240.20	20.40	H	17.03	3.24	40.67	46.02	-5.35
297.40	17.20	H	20.04	3.77	41.01	46.02	-5.01
364.00	19.70	H	16.23	4.26	40.19	46.02	-5.83
480.00	16.80	H	18.79	5.10	40.69	46.02	-5.33
530.00	15.20	H	19.39	5.38	39.97	46.02	-6.05

Radiated Emissions Tabulated Data


Tested by: In-Sub, Youn / Test Engineer

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	ESVS10	827864/005	DEC/05	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/06	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUN/06	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	MAY/06	12MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	FEB/06	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/06		■
6.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/06	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/06		■
7.	LISN	EMCO	3825/2	9109-1867	JUN/06	12MONTH	■
				9109-1869	JUN/06		
		Schwarzbeck	NSLK 8126	8126-404	JUL/06		■
8.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
9.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
10.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■