



RADIO TEST REPORT

Test Report No.: 27AE0172-HO-A

Applicant : Sony Corporation
Type of Equipment : HARD DISK DRIVE
Model No. : VGP-UHDM10
Test standard : FCC Part 15 Subpart C : 2006
Section 15.207 and 15.225
FCC ID : AK8VGPUHDM10
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.

Date of test:

August 30 to September 1, 2006

Tested by:

Hiroka Umeyama
EMC Services

Approved by :

Hironobu Shimoji
Group Leader of EMC Services



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://ulapex.jp/emc/nvlap.htm>

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SECTION 1: Client information

Company Name	:	Sony Corporation
Brand or Trade name	:	SONY
Address	:	6-7-35 Kita-shinagawa, shinagawa-ku, Tokyo, 141-0001 Japan
Telephone Number	:	+81- 3-5448-8716
Facsimile Number	:	+81- 3-5448-8981
Contact Person	:	Michio Kobayashi

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	HARD DISK DRIVE
Model No.	:	VGP-UHDM10
Serial No.	:	DVT-073
Rating	:	DC5.0V
Country of Manufacture	:	Japan
Receipt Date of Sample	:	August 30, 2006
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model No: VGP-UHDM10 is the HARD DISK DRIVE.
The clock frequencies of EUT are 6MHz, 13.56MHz, 24MHz and 480MHz.

Equipment Type	:	Transceiver
Frequency of Operation	:	13.56 MHz
Type of modulation	:	ASK
Method of Frequency Generation	:	Crystal
Antenna Type	:	Loop Antenna
Antenna connector type	:	Wire solder
Antenna gain	:	-51dBi

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2006

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 : Conducted limits
Section 15.225 : Operation within the band 13.110-14.010MHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements <IC>RSS-Gen 7.2.2	Section 15.207 <IC>RSS-Gen 7.2.2	-	N/A	9.7dB 0.15000MHz QP, L	Complied
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.6	Section 15.225(a) <IC>RSS-210 A2.6	Radiated	N/A	74.5dB Ant.: 0 deg.	Complied
3	Spectrum Mask	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.7	Section 15.225(b)(c) <IC> RSS-210 A2.6	Radiated	N/A	44.7dB 13.11MHz 14.01MHz	Complied
4	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.7	Section15.209, Section 15.225 (d) <IC>RSS-210 A2.6	Radiated	N/A	0.2dB 40.680MHz Vertical	Complied
5	Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.5	Section15.225(e) <IC> RSS-210 A2.6	Radiated	N/A	See data	Complied

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15

*These tests were performed without any deviations from test procedure except for additions or exclusions.

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3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	-20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators <IC> -	Section15.215(c) <IC> -	Radiated	N/A	N/A	Complied
2	99% Occupied Band Width	<IC>RSS-Gen 4.4.1	<IC>RSS-Gen 4.4.1	Radiated	N/A	N/A	Complied

3.4 Uncertainty

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 2.6\text{dB}$.
The data listed in this test report has enough margin, more than the site margin.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is $\pm 4.41\text{dB}(3\text{m})/\pm 4.39\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.59\text{dB}(3\text{m})/\pm 4.58\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 4.62\text{dB}(3\text{m})/\pm 4.60\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 5.27\text{dB}$.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.

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3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	N/A	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	2.0 x 2.0 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 5.4 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3 and No.4 semi-anechoic chambers and No.7 shielded room.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The EUT was operated in a manner similar to typical use during the tests.

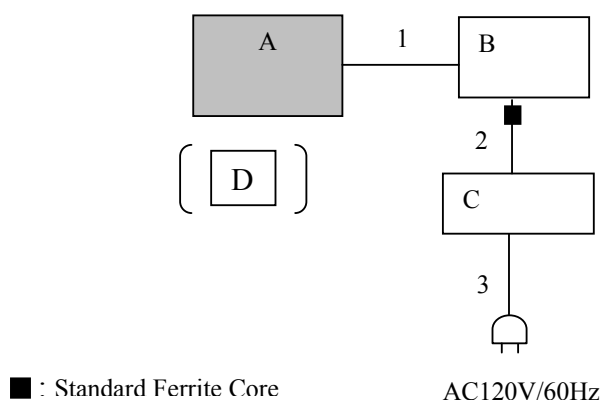
The mode used for test: 13.56MHz Transmitting mode without Wireless Key

[Remarks]

1. Test software are designed and set so that carrier level and modulation remain same regardless of Wireless Key.
2. Power level was checked with Wireless key and without Wireless Key, and the level was same in both cases. Therefore, all the were performed without Wireless Key
3. The carrier frequency 13.56MHz was excluded for Conducted Emission test.

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	HARD DISK DRIVE	VGP-UHDM10	DVT-073	SONY	EUT
B	Note PC	IRX-9272 *1)	EAX2-106	SONY	-
		PCG-351L *2)	UAW-21		
C	AC Adapter (for PC)	ADP-120MB *1)	1478037330140433	SONY	-
		PCGA-AC16V6 *2)	1168188		
D	Wireless Key	-	001	SONY	-

*1) Used for Radiated Emission (below 30MHz) test

*2) Used for all test other than the above

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List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	USB Cable	1.0	Shielded	Shielded
2	DC Cable	1.8	Shielded	Shielded
3	AC Cable	0.7	Unshielded	Unshielded

SECTION 5: Conducted emission

5.1 Operating environment

Test place : No.4 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/ an AMN to the input power source. All unused 50ohm connectors of the LISN/ AMN were resistively terminated in 50ohm when not connected to the measuring equipment. The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a horizontal conducting plane 4.0 x 4.0m and a vertical conducting plane 2.0 x 2.0m in a semi Anechoic Chamber. A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Frequency range : 0.15MHz – 30MHz
EUT position : Table top
EUT operation mode : 13.56MHz Transmitting mode

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in the semi Anechoic Chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains Network (AMN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, with an average detector. The conducted emission measurements were made with the following detector function of the test receiver.
Detector Type : QP and AV
IF Bandwidth : 9kHz

5.5 Test result

Summary of the test results : Pass

SECTION 6: Radiated emission (Fundamental , Spurious Emission and Spectrum Mask)

6.1 Operating environment

The test was carried out in a No.1 and No. 4 semi Anechoic Chambers

Temperature : See data
Humidity : See data

6.2 Test Procedure

The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for each antenna angle 0deg. , 45deg. and 90deg.

Frequency : From 30MHz to 1GHz at distance 3m

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with a QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

The test was made on EUT at the normal use position.

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)

9kHz – 490kHz [Limit at 3m]=[Limit at 300m]-40log (3[m]/300[m])

490kHz – 30MHz[Limit at 3m]=[Limit at 30m]-40log (3[m]/30[m])

6.3 Test result

Summary of the test results : Pass

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SECTION 7: -20dB Bandwidth

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 8: Frequency Tolerance

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 9: 99% Occupied Bandwidth

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test data	: APPENDIX 2
Test result	: Pass