



UL Apex Co., Ltd.

Test report No. : 26CE0050-HO-6a
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FCC ID : AK8PSP1001B
Issued date : October 31, 2005
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SAR TEST REPORT

Test Report No. : 26CE0050-HO-6a

Applicant : Sony Computer Entertainment Inc.
Type of Equipment : PSP
Model No. : PSP-1001
FCC ID : AK8PSP1001B
Test standard : FCC47CFR 2.1093
FCC OET Bulletin 65, Supplement C
Test Result : Complied
Max. SAR Measured : 0.115W/kg (Body, 2412MHz)

1. This test report shall not be reproduced except 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 the above standard. We hereby certify that the data contain a true representation of the SAR profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test : October 27, 2005

Tested by :

Miyo Ikuta
EMC Services

Approved by :

Hironobu Shimaji
Group Leader of EMC Services

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SECTION 1 : Client information

Company Name	Sony Computer Entertainment Inc.
Brand name	Sony
Address	2-6-21 Minami-Aoyama, Minato-ku, Tokyo, 107-0062, Japan
Telephone Number	+81-3-6483-8625
Facsimile Number	+81-3-6483-8626
Contact Person	Tatsuya Suzuki

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

2.1 Identification of E.U.T.

Type of Equipment	PSP			
Model No.	PSP-1001			
Serial No.	01-TSP110F-0000007-PSP1100, 01-TSP110F-0000051-PSP1100			
Country of Manufacture	Japan			
AC Adapter* ¹⁾	Model Name :	ADP-553SR	ACC-115	-
	Rating (output) :	DC5V	DC5V	-
Battery* ²⁾	Type :	Li-ion Battery	Li-ion Battery	Li-ion Battery
	Model Name :	PSP-110	PSP-110	PSP-280
	Rating :	DC3.6V/1800mAh	DC3.6V/1800mAh	DC3.6V/2200mAh
	Manufacturer	Matsushita	Sony	Sony
Accessories	Earphone, USB cable			
Condition of EUT	Production prototype (Not for sale: This sample is equivalent to mass-produced items.)			
Operation Clock	44MHz			
Receipt Date of Sample	October 11, 2005			
Category Identified	Portable device			

*¹⁾ : AC Adapter: Either ADP-553SR or ACC-115 will be included in the same package of PSP-1001.

*²⁾ : Battery: Any one of PSP-110, PSP-110, or PSP-280 will be included in the same package of PSP-1001

2.3 Identification of Wireless LAN Module

2.3.1 Product Description

Radio Specification

Wireless LAN Module (IEEE802.11b)

Equipment Type	Transceiver
Frequency of Operation	2412-2462 MHz
Max.Peak power tested	14.7dBm (29.5mW)
Intermediate frequency	2437MHz
Type of Modulation	DSSS
Mode of Operation	Simplex
Method of frequency generation	Crystal
Power Supply	DC3.6V

Antenna

Antenna model * ³⁾	UBA-CUW1000	HFS11-SO01
Antenna type	Monopole antenna	Monopole antenna
Antenna Gain	1.0 dBi (Max.)	4.0+/-1.0 dBi
Antenna location	Refer to Appendix 1	

*³⁾ Antenna : Either UBA-CUW1000 or HFS11-SO01 will be installed in PSP-1001.

SECTION 3 : Test standard information

3.1 Requirements for compliance testing defined by the FCC

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).

2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

3.2 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE SPATIAL PEAK(averaged over any 1g of tissue) LIMIT 1.6 W/kg

SECTION 4 : Test result

4.1 Result of Max. SAR value

Max. SAR Measured (IEEE 802.11b) : 0.115 W/kg (Body, 2412MHz)

4.2 Test Location

UL Apex Co., Ltd. Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

SECTION 5 : Operation of E.U.T. during testing

5.1 Operating modes

Operating mode	The frequency band and the modulation used in this test are shown as a following. 1. IEEE 802.11b mode Frequency band : 2412-2462MHz Channel : 1ch(2412MHz), 6ch(2437MHz), 11ch(2462MHz) Modulation : DSSS (DBPSK,DQPSK,CCK) Crest factor : 1
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5.2 Measurement procedure

Two kinds of antennas were measured in each of different EUT (S/N: 01-TSP1100F-0000007-PSP1100 and 01-TSP1100F-0000051-PSP1100).

1. ANT. UBA-CUW1000 (EUT S/N: 01-TSP1100F-0000007-PSP1100)

The 11b (DSSS) test was performed in the CCK(11Mbps) modulation because it was the highest peak power and data rate.

Step1. The searching for the worst position

Step2. The changing to the batteries

This test was performed at the worst conditions of Step1.

Step3. The changing to the Low and High channels

This test was performed at the worst conditions of Step2.

2. ANT. HFS11-SO01 (EUT S/N: 01-TSP1100F-0000051-PSP1100)

The 11b (DSSS) test was performed in the CCK(11Mbps) modulation because it was the highest peak power and data rate.

Step4. The searching for the worst position

This test was performed in the worst battery of Step2

Step5. The changing to the Low and High channels

This test was performed at the worst conditions of Step4.

3. Distance between EUT and SAM Twin Phantom

Step6. The measurement was performed with the distance,5mm,10mm and 15mm to check if the shortest distance (0mm) may not have the worst value at the conditions of the highest SAR value.As a result, the shortest distance (0mm) had the worst value.

5.3 Test setup of EUT

When users operate or carry the EUT, it could be considered to touch or get close to their bodies. In order to assume this situation, we performed the test at the following positions. Please refer to "APPENDIX 1" for more details.

(1) Front:

The test was performed in touch with Front surface of the EUT to the flat section of SAM Twin phantom.

(2) Back :

The test was performed in touch with Back of the EUT to the flat section of SAM Twin phantom.

(3) Top :

The test was performed in touch with Top surface of the EUT to the flat section of SAM Twin phantom.

(4) Bottom :

The test was performed in touch with Bottom surface of the EUT to the flat section of SAM Twin phantom.

(5) Left Side :

The test was performed in touch with Left Side surface of the EUT to the flat section of SAM Twin phantom.

(6) Front (5mm) :

The measurement opened 5mm distance between EUT and SAM Twin Phantom.

(7) Front (10mm):

The measurement opened 10mm distance between EUT and SAM Twin Phantom.

(8) Front (15mm) :

The measurement opened 15mm distance between EUT and SAM Twin Phantom.

*The test setup photograph is put on appendix 1.

SECTION 6 : Test surrounding

6.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value $\pm$ %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	± 6.8	Normal	1	1	± 6.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	$\sqrt{3}$	$(1-c_p)^{1/2}$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	$\sqrt{3}$	$(c_p)^{1/2}$	± 3.9	∞
Boundary effects	± 2.0	Rectangular	$\sqrt{3}$	1	± 1.2	∞
Probe linearity	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Integration time	± 2.6	Rectangular	$\sqrt{3}$	1	± 1.5	∞
RF ambient conditions	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Mech. constraints of robot	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Probe positioning	± 5.7	Rectangular	1	1	± 5.7	∞
Extrap. and integration	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Test Sample Related						
Device positioning	± 2.9	Rectangular	$\sqrt{3}$	1	± 2.9	18
Device holder uncertainty	± 3.6	Rectangular	$\sqrt{3}$	1	± 3.6	7
Power drift	± 10.0	Rectangular	$\sqrt{3}$	1	± 5.8	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 5.0	Rectangular	1	0.64	± 3.2	∞
Liquid permittivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 5.0	Rectangular	1	0.6	± 3.0	∞
Combined Standard Uncertainty					± 14.298	
Expanded Uncertainty (k=2)					± 28.6	

The test result shows that the power drift exceeded $\pm 5\%$. Therefore, the uncertainty of power drift expanded to $\pm 10\%$. However, the extended uncertainty ($k=2$) of a test is less than 30%.

SECTION 7 : Confirmation before testing**7.1 Conducted power**

[11b / 11Mbps] EUT S/N: 01-TSP1100F-0000007-PSP1100(ANT.UBA-CUW1000)						
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Converted [mW]
Low	2412.0	3.09	1.40	10.00	14.49	28.12
Mid	2437.0	3.06	1.40	10.00	14.46	27.93
High	2462.0	3.30	1.40	10.00	14.70	29.51

[11b / 11Mbps] EUT S/N: 01-TSP1100F-0000051-PSP1100(ANT.HFS11-SO01)						
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Converted [mW]
Low	2412.0	3.09	1.40	10.00	14.49	28.12
Mid	2437.0	3.09	1.40	10.00	14.49	28.12
High	2462.0	3.23	1.40	10.00	14.63	29.04

[11b / Check of data rate] EUT S/N: 01-TSP1100F-0000007-PSP1100					
Rate [Mbps]	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
11.0	2437.0	3.06	1.40	10.00	14.46
5.5	2437.0	1.42	1.40	10.00	12.82
2.0	2437.0	-0.24	1.40	10.00	11.16
1.0	2437.0	-0.03	1.40	10.00	11.37

[11b / Check of data rate] EUT S/N: 01-TSP1100F-0000051-PSP1100					
Rate [Mbps]	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]
11.0	2437.0	3.09	1.40	10.00	14.49
5.5	2437.0	1.40	1.40	10.00	12.80
2.0	2437.0	-0.19	1.40	10.00	11.21
1.0	2437.0	-0.01	1.40	10.00	11.39

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)+ Attenuator

UL Apex Co., Ltd.**Head Office EMC Lab.**

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone: +81 596 24 8116

Facsimile: +81 596 24 8124

7.2 Power drift measurement

The power drift was not within $\pm 5\%$ on SAR re-testing with full-charged battery.

Therefore the conducted power was measured in elapsed time.

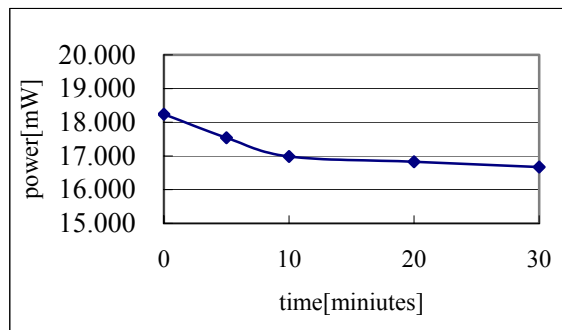
The average power was measured under the condition of Max. power of IEEE802.11b.

As a result, power changed by -8.6% . The result is shown in the following.

So the uncertainty of power drift was expanded to $\pm 10\%$.

2462 MHz(IEEE 802.11b) Average power

Time [Minutes]	Result [dBm]	Converted [mW]	Diviation [%]
-	12.61	18.239	-
After 5	12.44	17.539	-3.8
After10	12.30	16.982	-6.9
After20	12.26	16.827	-7.7
After30	12.22	16.672	-8.6



SECTION 8 : Measurement results

8.1 ANT. UBA-CUW1000

8.1.1 Body 2450MHz SAR

Liquid Depth (cm) : 15.0 Model : PSP-1001
Parameters : $\epsilon_r = 50.3$, $\sigma = 1.99$ Serial No. : 01-TSP1100F-0000007-PSP1100
Ambient temperature (deg.c.) : 24.8 Modulation : DSSS
Relative Humidity (%) : 44 Crest factor : 1
Date : October 27,2005 Measured By : Miyo Ikuta

BODY SAR MEASUREMENT RESULTS										
Frequency			Modulation (Data rate[bps])	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
11b	Step1. Position search									
	6	2437	CCK(11Mbps)	Flat	PSP-110(sony)	Front	0	24.5	24.5	0.087
	6	2437	CCK(11Mbps)	Flat	PSP-110(sony)	Back	0	24.5	24.4	0.059
	6	2437	CCK(11Mbps)	Flat	PSP-110(sony)	Top	0	24.4	24.4	0.051
	6	2437	CCK(11Mbps)	Flat	PSP-110(sony)	Bottom	0	24.4	24.4	0.025
	6	2437	CCK(11Mbps)	Flat	PSP-110(sony)	Left Side	0	24.5	24.5	0.085
	Step2. Batteries Change									
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	24.4	24.3	0.091
	6	2437	CCK(11Mbps)	Flat	PSP-280	Front	0	24.5	24.5	0.090
	Step3. Frequency Change									
	1	2412	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	24.4	24.5	0.090
	11	2462	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	24.5	24.5	0.098
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population								Body SAR: 1.6 W/kg (averaged over 1 gram)		

* The measurement data is put on appendix 3.

8.2 ANT. HFS11-SO01**8.2.1 Body 2450MHz SAR**

Liquid Depth (cm)	: 15.0	Model	: PSP-1001
Parameters	: $\epsilon_r = 50.3$, $\sigma = 1.99$	Serial No.	: 01-TSP1100F-0000051-PSP1100
Ambient temperature (deg.c.)	: 24.8	Modulation	: DSSS
Relative Humidity (%)	: 44	Crest factor	: 1
Date	: October 27, 2005	Measured By	: Miyo Ikuta

BODY SAR MEASUREMENT RESULTS OF MODEL1(Ant.HFS11-SO01)										
Frequency			Modulation (Data rate[bps])	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
11b	Step4. Position search									
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	24.0	24.0	0.100
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Back	0	24.0	24.0	0.037
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Top	0	24.0	24.0	0.067
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Bottom	0	24.0	24.0	0.018
	6	2437	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Left Side	0	23.9	23.9	0.074
	Step5. Frequency Change									
	1	2412	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	23.9	23.9	0.115
	11	2462	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	0	23.9	23.9	0.107
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population								Body SAR: 1.6 W/kg (averaged over 1 gram)		

BODY SAR MEASUREMENT RESULTS (Ant.HFS11-SO01)										
Frequency			Modulation (Data rate[bps])	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Distance between EUT and SAM phantom										
11b	Step1. Position search									
	11	2462	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	5	23.9	23.9	0.045
	11	2462	CCK(11Mbps)	Flat	PSP-110(Maysushita)	Front	10	23.9	23.9	0.020
	11	2462	CCK(11Mbps)	Flat	PSP-110(Matsushita)	Front	15	23.9	23.9	0.017
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body SAR: 1.6 W/kg		
Spatial Peak Uncontrolled Exposure / General Population								(averaged over 1 gram)		

* The measurement data is put on appendix 3.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone: +81 596 24 8116

Facsimile: +81 596 24 8124

APPENDIX 1 : Photographs of test setup

Photograph EUT



Photograph Antenna location



Photograph EUT with Accessory



(1) Front



(2) Back



(3) Top



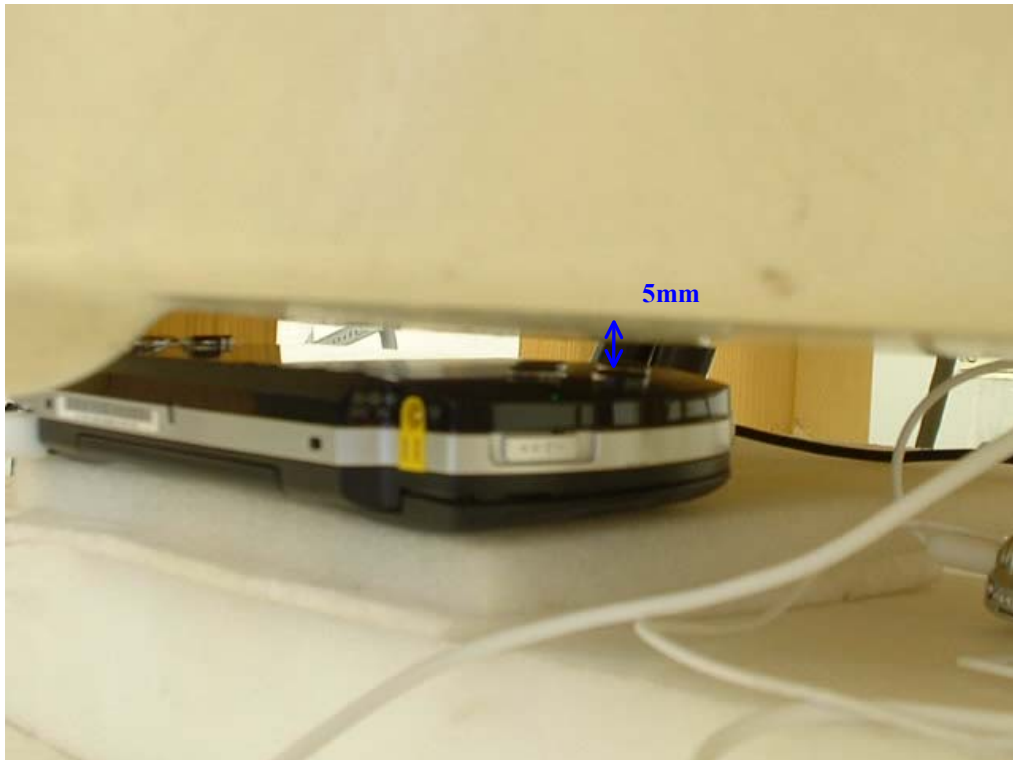
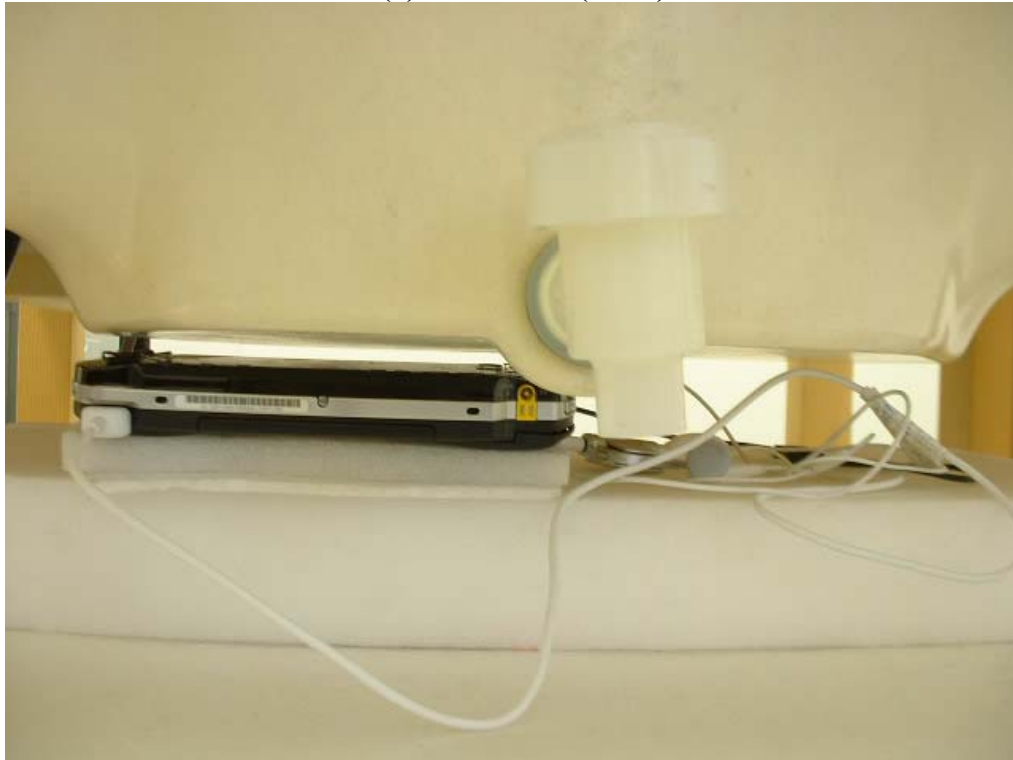
(4) Bottom



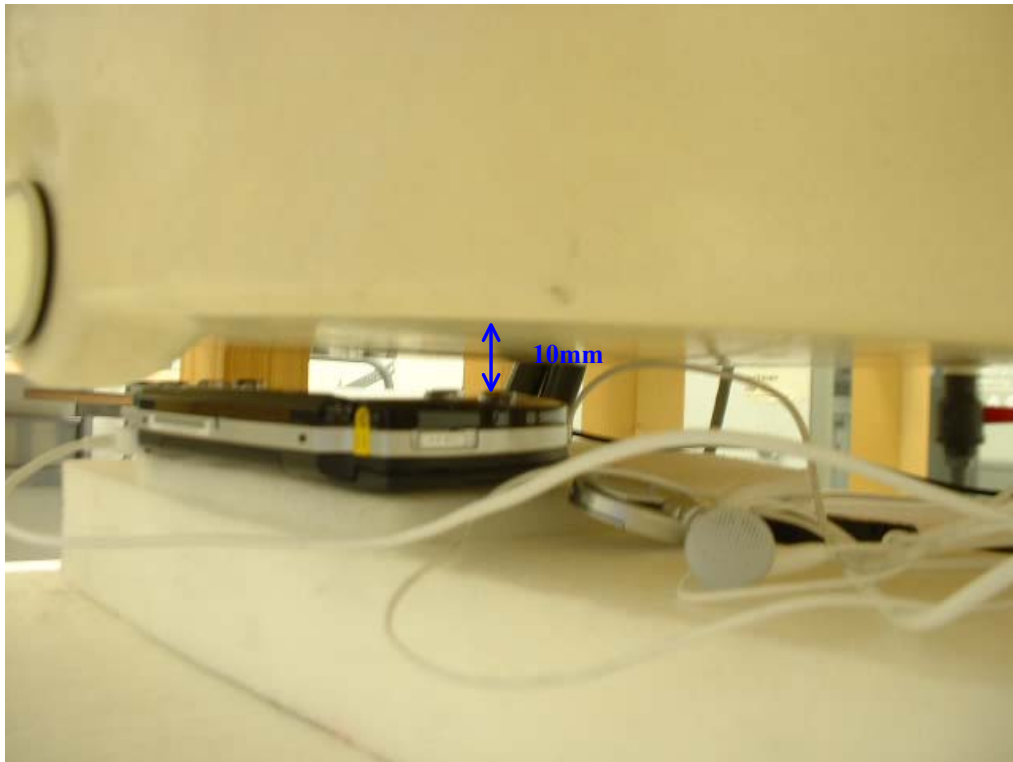
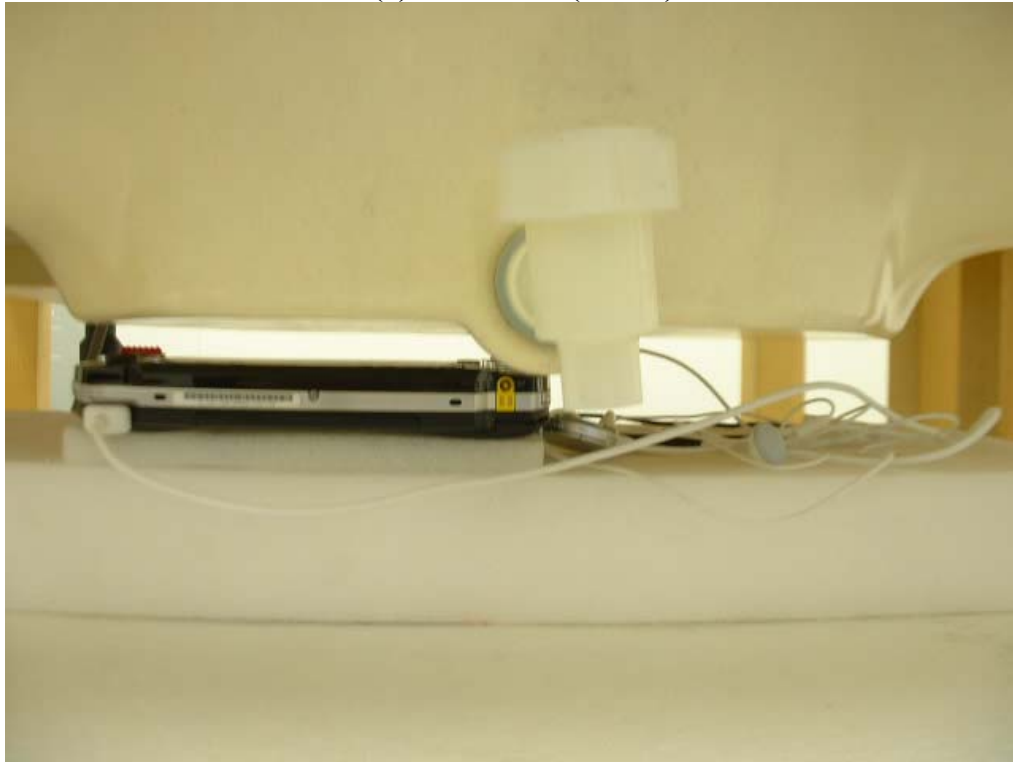
(5) Left Side



(6) Left Front (5mm)



(7) Left Front (10mm)



(8) Left Front (15mm)

