SAR TEST REPORT

Test Report No. : 26LE0301-HO-E

Applicant	:	**Sharp Corporation**
Type of Equipment	:	**Wireless PDA**
Model No.	:	**PV150**
FCC ID	:	**APYNAR0062**
Test standard	:	**FCC47CFR 2.1093** **FCC OET Bulletin 65, Supplement C**
Test Result	:	**Complied**
Max. SAR Measured	:	
GSM 850	:	**Head 0.621W/kg** **Body 0.851W/kg**
PCS 1900	:	**Head 0.418W/kg** **Body 0.823W/kg**

32. 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 : December 1-5, 2006

Tested by :
Miyo Ikuta
EMC Services

Tested by :
Hisayoshi Sato
EMC Services

Approved by :
Hironobu Shimoji
Group Leader of EMC Services

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 1 : Client information

Company Name	Sharp Corporation
Brand name	SHARP
Address	492 Minosho-cho Yamatokoriyama-shi Nara,639-1186,Japan
Telephone Number	+81-743-55-4022
Facsimile Number	+81-743-55-2553
Contact Person	Takahiro Inoue

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

2.1 Identification of E.U.T.

Type of Equipment		Wireless PDA
Model No.		PV150
Serial No.		PVT2-93
Country of Manufacture		Japan
Battery	Model Name :	PV-BL11 (Rechargeable Lithium-ion battery)
	Rating :	DC3.7V/1500mAh
	Manufacture	SHARP
Option Battery		N/A
Accessories		Carring case and Earphone
Condition of EUT		Engineering prototype (Not for sale: This sample is equivalent to mass-produced items.)
Operation Clock		CPU max200MHz
Size of EUT		W:130mm D:63mm H 22.2mm
Receipt Date of Sample		November 14, 2006
Category Identified		Portable device

2.2 Product Description

Radio Specification

	GSM850	**PCS1900**
Equipment Type	Transceiver	Transceiver
Tx frequency	824.20 – 848.8MHz	1850.2MHz - 1909.8MHz
Type of Modulation	GMSK	GMSK
Bandwidth	340kHz	334kHz
Channel Spacing	200kHz	200kHz
Channel Number	124	299
Antenna Type	PIFA	PIFA
Antenna Connector Type	Pin Contact	Pin Contact
Antenna Gain	-2.9dBi max	-1.7dBi max
Max.Transmit Power tested (Antenna port peak power)	31.88dBm (1.54W)	29.19dBm (829.85mW)
Power Supply	DC 4.2 – 3.6V	DC 4.2 – 3.6V

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

4.1.1 GSM850

Max. SAR Measured : Head 0.621W/kg (848.8MHz
Body 0.851W/kg (836.6MHz)

4.1.2 PCS1900

Max. SAR Measured : Head 0.418W/kg (1880.0MHz)
Body 0.823W/kg (1909.8MHz)

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

A communication link was set up with the Universal Radio Communication Tester from R&S.

1. The EUT was command to operate at maximum transmit power (GSM850 (Power class 5) PCS1900 (Power class 0)).

The frequency band and the modulation used in this test are shown as a following.

2. GSM850 (Power class 5)

Frequency band	: 824.2MHz – 848.8MHz
Channel	: 125ch(824.2MHz)
	190ch(836.6MHz)
	251ch(848.8MHz)
Modulation	: GSM,GPRS
Crest factor	: 8.3(GSM),4.2(GPRS)

3. PCS1900 (Power class 0)

Frequency band	: 1850.2MHz – 1909.8MHz
Channel	: 512ch(1850.2MHz)
	661ch(1880.0MHz)
	810ch(1909.8MHz)
Modulation	: GSM,GPRS
Crest factor	: 8.3(GSM),4.2(GPRS)

*The detail of base-station simulator

Item	: Universal Radio Communication Tester
Model Number	: CMU200
Serial Number	: 106223
Manufacture	: Rohde & Schwarz

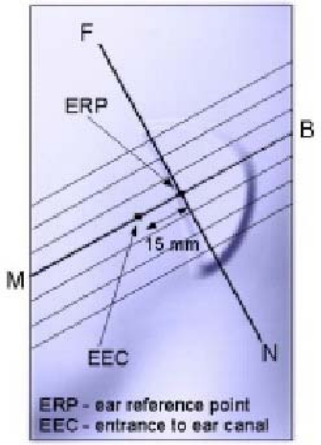
5.2 Description of the head test setup

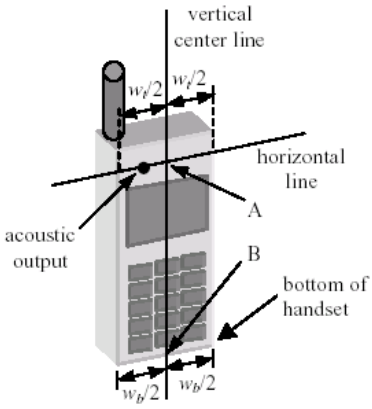
According to the OET 65, IEEE1528, and IEC62209-1 this EUT was tested on the "Cheek/Touch" and "Ear/Tilt" positions at the left head and right head section of the SAM phantom.

5.2.1 Initial ear position

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom.

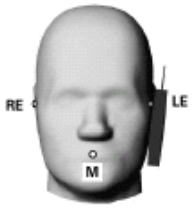
The device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".

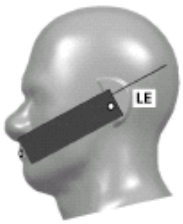


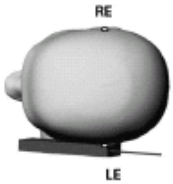


5.2.2 Cheek position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line.
This test position is established:
i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
ii) (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

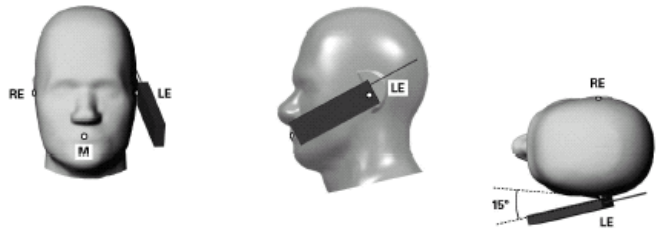






5.2.3 Tilt position

If the earpiece of the handset is not in full contact with the phantom's ear spacer and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer. Otherwise the handset should be moved away from the cheek perpendicular to the line passes through both "ear reference points" for approximate 2-3 cm. While it is in this position, the handset is tilted away from the mouth with respect to the "test device reference point" by 15°. After the tilt, it is then moved back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously.



5.2.4 Antenna position

The antenna of this EUT was built-in antenna.

5.3 Method of measurement (Head SAR)

Step1. The searching for the worst position

Step2. The changing to the Low and High channels
The test was performed at the worst conditions of Step1.

5.4 Description of the Body-worn test setup and Method

The tests were performed in the EUT with the carring case and ear phone. (Refer to the Appendix1)
This EUT was tested on the " Rear" position at the flat section of SAM phantom.
In addition, the tests were performed in the Low, Mid, and the High channels and the modulations were performed in each GSM and GPRS.

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 ± %	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	√3	$(1-c_p)^{1/2}$	±1.9	∞
Spherical isotropy of the probe	±9.6	Rectangular	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary effects	±2.0	Rectangular	√3	1	±1.2	∞
Probe linearity	±4.7	Rectangular	√3	1	±2.7	∞
Detection limit	±1.0	Rectangular	√3	1	±0.6	∞
Readout electronics	±0.3	Normal	1	1	±0.3	∞
Response time	±0.8	Rectangular	√3	1	±0.5	∞
Integration time	±2.6	Rectangular	√3	1	±1.5	∞
RF ambient Noise	±3.0	Rectangular	√3	1	±1.7	∞
RF ambient Reflections	±3.0	Rectangular	√3	1	±1.7	∞
Probe Positioner	±0.8	Rectangular	√3	1	±0.5	∞
Probe positioning	±9.9	Rectangular	√3	1	±5.7	∞
Max.SAR Eval.	±4.0	Rectangular	√3	1	±2.3	∞
Test Sample Related						
Device positioning	±2.9	Normal	1	1	±2.9	23
Device holder uncertainty	±3.6	Normal	1	1	±3.6	4
Power drift	±5.0	Rectangular	√3	1	±2.9	∞
Phantom and Setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	∞
Liquid conductivity (target)	±5.0	Rectangular	√3	0.64	±1.8	∞
Liquid conductivity (meas.)	±5.0	Rectangular	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Rectangular	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±13.453**	
Expanded Uncertainty (k=2)					**±26.9**	

SECTION 7 : Confirmation before testing

7.1 Output Power Measurement results

Model	:	**PV150**
Modulation	:	**GSM, GPRS**
Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.5**
Relative Humidity (%)	:	**36**
Date	:	**December 1,2006**
Measured By	:	**Miyo Ikuta**

GSM 850 GSM mode

Ch	Frequency [MHz]	P/M Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Convert [mW]
Low	824.2	1.19	30.24	0.37	31.80	1513.6
Mid	836.6	1.15	30.24	0.38	31.77	1503.1
High	848.8	1.26	30.24	0.38	31.88	1541.7

GSM 850 GPRS mode

Ch	Frequency [MHz]	P/M Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Convert [mW]
Low	824.2	1.10	30.24	0.37	31.71	1482.5
Mid	836.6	1.07	30.24	0.38	31.69	1475.7
High	848.8	1.15	30.24	0.38	31.77	1503.1

Model	:	**PV150**
Modulation	:	**GSM, GPRS**
Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.0**
Relative Humidity (%)	:	**40**
Date	:	**December 1, 2006**
Measured By	:	**Hisayoshi Sato**

PCS1900 GSM mode

Ch	Frequency [MHz]	P/M Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Convert [mW]
Low	1850.2	7.68	19.86	0.57	28.11	647.1
Mid	1880.0	8.16	19.86	0.57	28.59	722.8
High	1909.8	8.74	19.86	0.59	29.19	829.9

PCS1900 GPRS mode

Ch	Frequency [MHz]	P/M Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]	Convert [mW]
Low	1850.2	7.67	19.86	0.57	28.10	645.7
Mid	1880.0	8.14	19.86	0.57	28.57	719.4
High	1909.8	8.71	19.86	0.59	29.16	824.1

SECTION 8 : Measurement results

8.1 Head 850MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	ε_r =**40.6**, σ =**0.87**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.5**	Modulation	:	**GSM**
Relative Humidity (%)	:	**33**	Crest factor	:	**8.3**
Date	:	**December 4, 2006**	Measured By	:	**Miyo Ikuta**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum of multi-peak
Step1. Position search								
Mid	836.6	GSM	Left head	Fixed	Cheek	23.3	23.3	**0.515**
Mid	836.6	GSM	Left head	Fixed	Tilt	23.3	23.3	**0.288**
Mid	836.6	GSM	Right head	Fixed	Cheek	23.3	23.3	**0.562**
Mid	836.6	GSM	Right head	Fixed	Tilt	23.3	23.3	**0.336**
Step2. Frequency Change								
Low	824.2	GSM	Right head	Fixed	Tilt	23.3	23.5	**0.426**
High	848.8	GSM	Right head	Fixed	Tilt	23.5	23.6	**0.621**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						**Head SAR: 1.6 W/kg (averaged over 1 gram)**		

*See Appendix 3 for measurement data plots.

8.2 Body-worn 850MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	**ε_r =53.6, σ =0.94**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.5**	Modulation	:	**GSM**
Relative Humidity (%)	:	**36**	Crest factor	:	**8.3**
Date	:	**December 1, 2006**	Measured By	:	**Miyo Ikuta**

BODY-WORN SAR MEASUREMENT RESULTS									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Low	824.2	GSM	Flat	Fixed	Back	0	21.0	21.2	**0.409**
Mid	836.6	GSM	Flat	Fixed	Back	0	21.2	21.3	**0.430**
High	848.8	GSM	Flat	Fixed	Back	0	21.3	21.4	**0.370**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population							**Body SAR: 1.6 W/kg (averaged over 1 gram)**		

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	**ε_r =53.6, σ =0.94**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.5**	Modulation	:	**GPRS**
Relative Humidity (%)	:	**36**	Crest factor	:	**4.2**
Date	:	**December 1, 2006**	Measured By	:	**Miyo Ikuta**

BODY-WORN SAR MEASUREMENT RESULTS									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Low	824.2	GPRS	Flat	Fixed	Back	0	21.4	21.4	**0.806**
Mid	836.6	GPRS	Flat	Fixed	Back	0	21.4	21.5	**0.851**
High	848.8	GPRS	Flat	Fixed	Back	0	21.5	21.7	**0.740**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population							**Body SAR: 1.6 W/kg (averaged over 1 gram)**		

* See Appendix 3 for measurement data plots.

8.3 Head 1900MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	ε_r **=38.6**, σ **=1.45**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.5**	Modulation	:	**GSM**
Relative Humidity (%)	:	**34**	Crest factor	:	**8.3**
Date	:	**December 5, 2006**	Measured By	:	**Miyo Ikuta**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum of multi-peak
Step1. Position search								
Mid	1880.0	GSM	Left head	Fixed	Cheek	22.5	22.5	**0.316**
Mid	1880.0	GSM	Left head	Fixed	Tilt	22.5	22.5	**0.418**
Mid	1880.0	GSM	Right head	Fixed	Cheek	22.5	22.5	**0.307**
Mid	1880.0	GSM	Right head	Fixed	Tilt	22.5	22.5	**0.314**
Step2. Frequency Change								
Low	1850.2	GSM	Left head	Fixed	Tilt	22.5	22.6	**0.335**
High	1909.2	GSM	Left head	Fixed	Tilt	22.6	22.7	**0.339**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						**Head SAR: 1.6 W/kg (averaged over 1 gram)**		

*See Appendix 3 for measurement data plots.

8.4 Body-worn 1900MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	ε_r **=51.0**, σ **=1.55**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GSM**
Relative Humidity (%)	:	**40**	Crest factor	:	**8.3**
Date	:	**December 1, 2006**	Measured By	:	**Hisayoshi Sato**

BODY-WORN SAR MEASUREMENT RESULTS PCS1900									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Low	1850.2	GSM	Flat	Fixed	Back	0	23.0	23.0	**0.300**
Mid	1880.0	GSM	Flat	Fixed	Back	0	23.0	23.0	**0.325**
High	1909.8	GSM	Flat	Fixed	Back	0	23.0	23.0	**0.440**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak Uncontrolled Exposure / General Population**							**Body SAR: 1.6 W/kg** **(averaged over 1 gram)**		

Liquid Depth (cm)	:	**15.0**	Model	:	**PV150**
Parameters	:	ε_r **=51.0**, σ **=1.55**	Serial No.	:	**PVT2-93**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GPRS**
Relative Humidity (%)	:	**40**	Crest factor	:	**4.2**
Date	:	**December 1, 2006**	Measured By	:	**Hisayoshi Sato**

BODY-WORN SAR MEASUREMENT RESULTS PCS1900									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Low	1850.2	GPRS	Flat	Fixed	Back	0	23.2	23.2	**0.476**
Mid	1880.0	GPRS	Flat	Fixed	Back	0	23.2	23.2	**0.521**
High	1909.8	GPRS	Flat	Fixed	Back	0	23.2	23.2	**0.823**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak Uncontrolled Exposure / General Population**							**Body SAR: 1.6 W/kg** **(averaged over 1 gram)**		

* See Appendix 3 for measurement data plots.