SAR COMPLIANCE TESTING OF IWATSU MODEL IX-PS6

WIRELESS DEVICE

FINAL TECHNICAL REPORT

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I. Introduction

The U.S. Federal Communications Commission (FCC) has adopted limits of human exposure to RF emissions from mobile and portable devices that are regulated by the FCC [1]. The FCC has also issued Supplement C (Edition 97-01) to OET Bulletin 65 defining both the measurement and the computational procedures that should be followed for evaluating compliance of mobile and portable devices with FCC limits for human exposure to radiofrequency emissions [2].

The Iwatsu Model IX-PS6 Wireless Device FCC ID# BD6ADIX-PS can radiate a maximum power of up to 49-50 mW in one of a total of 34 channels each of bandwidth 0.3 MHz in the frequency band 1920.05 to 1929.95 MHz. Photographs of the Iwatsu Model IX-PS6 Wireless Device without and with a jacket (with front plastic cover) for holster mount is shown in Figs. 1a, b, respectively. The maximum power outputs measured for this device by the Communication Certification Laboratory (CCL Inc.) for three representative channels at the low-frequency, mid-frequency, and high-frequency bands are given in Table 1. Since the device may be used both as a handheld device held against the ear as well as mounted on a holster against the waist, it has been tested for SAR distributions for both of these modes of operation using the experimental phantom models shown in Figs. 2a, b, respectively. Whereas a head-shaped phantom previously described in the literature [3] shown in Figs. 2a is used when the device is held against the ear, a planar tissue-simulant model shown in Figs. 2b is used because of the relatively flat region of the human body in immediate vicinity of a holster-mounted wireless device. As recommended in [2], the Iwatsu Model IS-PS6 Wireless Device was placed against the left ear with the antenna located towards the front of the head. This allows the antenna to be in close proximity to the model of the head resulting in higher SARs allowing, thereby, the worst case determination of absorbed energy in the user's head [4]. Also as

recommended in [2], the SAR distributions were measured without the model of a hand to determine the worst case SARs.

For each of the two configurations, the SAR measurements are performed for maximum power output for channels 4, 15, and 32 corresponding to the low-frequency subband (1920.95 MHz), the midband (1924.25 MHz) and the high-frequency subband (1929.35 MHz), respectively. To simulate the placement against the waist for holster-mounted configuration, the wireless device is placed at the bottom of the planar model with the metallic mount on the enclosing jacket being the closest to the tissue-simulant fluid.

II. The Tissue-Simulant Models

For measurements of the SAR distributions for the Iwatsu Model IX-PS6 Wireless Device, we have used the Utah Experimental Model that is described in detail in [3]. This model uses a lossy outer shell of the following approximate dimensions:

> Axial length from chin to top of the head = 26 cm
> Distance from location of the ear canal to top of the head = 14.7 cm
> Width from side to side = 16.5 cm

These dimensions are typical for adult human beings. The shell thickness of the head and neck model is approximately 4-7 mm, which is typical of the human skull thickness. The thickness for the ear region is, however, considerably less and is only about 3 mm.

This experimental model shown in Fig. 2a has, in the past, been used for comparison of the measured peak 1-g SARs with those obtained with the Utah FDTD Code for ten wireless telephones, five at 835 MHz and five for PCS (1900 MHz) frequencies [see Table 2]. The numerical SARs were obtained using the anatomically-based, 15-tissue Utah model of the head and neck with a resolution of $1.974 \times 1.974 \times 3.0$ mm that has been described in the scientific literature through numerous publications (see e.g. references 4, 5). The measured and calculated 1-g SARs for these ten telephones, including some research test samples from diverse manufacturers using a variety of radiating antennas for different source-based time-averaged powers are compared in Table 2 [3]. Even though widely different peak 1-g SARs

2

from 0.13 to 5.41 W/kg are obtained because of the variety of antennas and handsets, agreement between the calculated and the measured data is excellent and generally within $\pm$ 25 percent.

These tests validate the Utah Experimental Phantom Model as being capable of giving peak 1-g SARs that are in good agreement with the SARs obtained with the realistic, anatomically-based model of the human head and neck both at 835 and 1900 MHz.

The head and neck and the upper part of the torso of the model are filled with a liquid with measured electrical properties (dielectric constant and conductivity) close to the average properties of the brain for white and gray matters in the frequency band 1920-1930 MHz. This corresponds to $\varepsilon_r = 43.3$ and $\sigma = 1.22$ S/m. For a composition of 41.0% water, 57.6% sugar, 0.4% salt (NaCℓ) and 1.0% HEC, we have measured the values of $\varepsilon_r = 43.0 \pm 1.2$ and $\sigma = 1.20 \pm 0.04$ S/m at the center band frequency of 1925 MHz using the HP Model 85070 B Dielectric Probe in conjunction with HP Model 8720 C Network Analyzer (50 MHz - 20 GHz). Since these values are very close to the desired values for ε_r and σ, this composition was, therefore, used as the biological phantom material to fill the model shown in Fig. 2a.

To simulate the placement against the waist, a planar box phantom of external dimensions 30 $\times$ 50 cm filled with a tissue-simulant fluid up to a depth of 15.5 cm is used (see Fig. 2b). To maintain flatness of the phantom, the rectangular box is made of acrylic ($\varepsilon_r = 2.56$) of thickness 6.35 mm. The dielectric properties used for the tissue-simulant medium correspond to those for the muscle rather than brain. From the FCC web site, the properties to be used for the center-band frequency of 1925 MHz are: $\varepsilon_r = 54.3$ and $\sigma = 1.46$ S/m. The tissue-simulant fluid uses a composition developed at the University of Utah which consists of 62.0% water, 37.0% sugar, and 1% HEC. The measured dielectric properties for this fluid at the midband frequency of 1925 MHz are as follows: $\varepsilon_r = 52.5 \pm 1.8$ and $\sigma = 1.42 \pm 0.07$ S/m. Thus the measured properties for the muscle-simulant fluid are close to the desired values.

The SAR distributions were measured using the automated 3-D stepper-motor driven SAR measurement system described in [3].

III. The Measured SAR Distributions for the Iwatsu Model IX-PS6 Wireless Device

The peak 1-g SARs measured for channels 4, 15, and 32 for antennas pulled out or left retracted for the head model are given in Table 3. Also given in the same table are the measured peak 1-g SARs when the device mounted in the holster is placed against the bottom of the flat model shown in Fig. 2b. The detailed SAR distributions measured for each of the cases summarized in Table 3 are given in Tables 4-15, respectively.

All of the peak 1-g SARs given in Table 3 are less than the FCC 96-326 Guidelines [1].

IV. Comparison of the Measured 1-g SARs with FCC 96-326 Guidelines

According to the FCC 96-326 Guidelines [1], the peak SAR for any 1-g of tissue should not exceed 1.6 W/kg. For the Iwatsu Model IX-PS6 Wireless Device held either against the head or in a holster against the waist, the measured SARs given in Table 3 vary from 0.014 to 0.062 W/kg, respectively. These values are considerably lower than 1.6 W/kg suggested in the FCC 96-326 Guidelines [1].

REFERENCES

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2. K. Chan, R. F. Cleveland, Jr., and D. L. Means, "Evaluating Compliance With FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields," Supplement C (Edition 97-01) to OET Bulletin 65, December, 1997. Available from Office of Engineering and Technology, Federal Communications Commission, Washington D.C., 20554.

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4. O. P. Gandhi, G. Lazzi and C. M. Furse, "Electromagnetic Absorption in the Human Head and Neck for Mobile Telephones at 835 and 1900 MHz," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 44, pp. 1884-1897, 1996.

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Table 1.   The measured power output of the Iwatsu Model IX-PS6 Wireless Device

Channel	Frequency	Power Output	
		dBm	mW
004	1920.95	16.8	47.9
015	1924.25	16.9	49.0
032	1929.35	16.4	43.7

Table 2. Comparison of the experimentally measured and FDTD-calculated peak 1-g SARs for ten wireless telephones, five each at 835 and 1900 MHz, respectively [3].

	Time-Averaged Radiated Power mW	Using Experimental Model W/kg	Numerical Method W/kg
Cellular Telephones at 835 MHz			
Telephone A	600	4.02	3.90
Telephone B	600	5.41	4.55
Telephone C	600	4.48	3.52
Telephone D	600	3.21	2.80
Telephone E	600	0.54	0.53
PCS Telephones at 1900 MHz			
Telephone A	125	1.48	1.47
Telephone B	125	0.13	0.15
Telephone C	125	0.65	0.81
Telephone D	125	1.32	1.56
Telephone E	99.3	1.41	1.25

Table 3. Summary of the peak 1-g SARs measured for Iwatsu Model
IX-PS6 Wireless Device.

Channel	Frequency MHz	Antenna	Table # for Detailed SAR Distribution	Peak 1-g SAR W/kg
I. Device held against the model of the head (Fig. 2a)				
004	1920.95	Pulled out	Table 4	0.015
004	1920.95	Left retracted	Table 5	0.031
015	1924.25	Pulled out	Table 6	0.015
015	1924.25	Left retracted	Table 7	0.039
032	1929.35	Pulled out	Table 8	0.014
032	1929.35	Left retracted	Table 9	0.039
II. Device held against the flat phantom (Fig. 2b)				
004	1920.95	Pulled out	Table 10	0.045
004	1920.95	Left retracted	Table 11	0.052
015	1924.25	Pulled out	Table 12	0.052
015	1924.25	Left retracted	Table 13	0.062
032	1929.35	Pulled out	Table 14	0.047
032	1929.35	Left retracted	Table 15	0.054

Table 4.   **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.8 dBm (47.9 mW) at the low subband frequency of 1920.95 MHz (Channel 004).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.015 W/kg

a. At depth of 1 mm

0.023	0.023	0.023	0.022	0.021
0.019	0.019	0.020	0.020	0.020
0.015	0.016	0.017	0.018	0.017
0.015	0.014	0.014	0.014	0.013
0.021	0.017	0.016	0.014	0.013

b. At depth of 3 mm

0.019	0.020	0.019	0.019	0.018
0.017	0.018	0.018	0.018	0.017
0.015	0.016	0.016	0.016	0.015
0.015	0.015	0.015	0.014	0.014
0.018	0.017	0.016	0.015	0.014

c. At depth of 5 mm

0.016	0.017	0.017	0.016	0.016
0.016	0.016	0.016	0.016	0.015
0.015	0.015	0.015	0.015	0.014
0.015	0.015	0.015	0.014	0.014
0.015	0.016	0.015	0.015	0.014

d. At depth of 7 mm

0.014	0.014	0.014	0.014	0.013
0.014	0.014	0.014	0.014	0.013
0.014	0.014	0.014	0.014	0.013
0.014	0.014	0.014	0.014	0.013
0.013	0.014	0.014	0.014	0.014

e. At depth of 9 mm

0.012	0.012	0.012	0.012	0.012
0.013	0.013	0.013	0.012	0.012
0.013	0.013	0.013	0.013	0.012
0.013	0.013	0.013	0.013	0.013
0.011	0.013	0.013	0.013	0.013

Table 5.   **Antenna left retracted.   The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.8 dBm (47.9 mW) at the low subband frequency of 1920.95 MHz (Channel 004).**   The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.031 W/kg

a. **At depth of 1 mm**

0.039	0.039	0.038	0.036	0.034
0.041	0.042	0.041	0.040	0.039
0.043	0.044	0.044	0.043	0.041
0.041	0.043	0.045	0.044	0.042
0.036	0.039	0.040	0.040	0.041

b. **At depth of 3 mm**

0.033	0.033	0.032	0.031	0.029
0.035	0.035	0.035	0.034	0.033
0.037	0.037	0.038	0.037	0.035
0.037	0.038	0.038	0.038	0.036
0.033	0.035	0.036	0.035	0.035

c. **At depth of 5 mm**

0.028	0.028	0.027	0.026	0.025
0.030	0.030	0.030	0.029	0.028
0.032	0.032	0.032	0.031	0.030
0.032	0.033	0.033	0.032	0.031
0.030	0.031	0.031	0.031	0.030

d. **At depth of 7 mm**

0.025	0.023	0.023	0.022	0.021
0.025	0.025	0.025	0.024	0.023
0.027	0.027	0.027	0.026	0.025
0.028	0.028	0.028	0.027	0.026
0.027	0.028	0.027	0.027	0.025

e. **At depth of 9 mm**

0.020	0.020	0.019	0.019	0.018
0.021	0.021	0.021	0.020	0.020
0.023	0.023	0.023	0.022	0.021
0.024	0.024	0.024	0.023	0.023
0.024	0.024	0.024	0.023	0.022

Table 6. **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.9 dBm (49.0 mW) at the low subband frequency of 1924.25 MHz (Channel 015).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.015 W/kg

a. At depth of 1 mm

0.014	0.014	0.015	0.014	0.014
0.018	0.016	0.015	0.014	0.013
0.024	0.022	0.021	0.019	0.019
0.023	0.024	0.025	0.025	0.024
0.022	0.023	0.023	0.023	0.023

b. At depth of 3 mm

0.015	0.015	0.015	0.015	0.014
0.017	0.016	0.015	0.015	0.015
0.020	0.019	0.019	0.018	0.018
0.019	0.020	0.020	0.020	0.020
0.018	0.019	0.018	0.018	0.018

c. At depth of 5 mm

0.015	0.015	0.015	0.015	0.014
0.016	0.016	0.016	0.015	0.015
0.016	0.017	0.017	0.017	0.016
0.015	0.016	0.016	0.016	0.016
0.015	0.015	0.015	0.015	0.014

d. At depth of 7 mm

0.014	0.014	0.014	0.014	0.014
0.014	0.015	0.015	0.015	0.015
0.013	0.014	0.015	0.015	0.015
0.013	0.013	0.013	0.013	0.013
0.012	0.012	0.012	0.012	0.012

e. At depth of 9 mm

0.013	0.014	0.013	0.013	0.013
0.012	0.013	0.014	0.014	0.014
0.011	0.012	0.013	0.013	0.013
0.010	0.011	0.011	0.011	0.011
0.010	0.010	0.010	0.010	0.010

Table 7.   **Antenna left retracted.   The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.9 dBm (49.0 mW) at the low subband frequency of 1924.25 MHz (Channel 015).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.039 W/kg

a. At depth of 1 mm

0.049	0.052	0.053	0.053	0.051
0.050	0.053	0.056	0.056	0.054
0.048	0.053	0.055	0.056	0.055
0.044	0.048	0.050	0.052	0.052
0.039	0.042	0.044	0.047	0.047

b. At depth of 3 mm

0.043	0.045	0.045	0.045	0.044
0.044	0.046	0.048	0.047	0.046
0.043	0.046	0.048	0.048	0.047
0.040	0.043	0.044	0.046	0.045
0.037	0.039	0.041	0.042	0.042

c. At depth of 5 mm

0.037	0.038	0.038	0.038	0.037
0.038	0.040	0.040	0.040	0.039
0.038	0.040	0.041	0.041	0.040
0.037	0.038	0.039	0.040	0.039
0.035	0.036	0.037	0.037	0.037

d. At depth of 7 mm

0.031	0.032	0.032	0.032	0.031
0.033	0.034	0.034	0.034	0.033
0.033	0.034	0.035	0.035	0.034
0.033	0.034	0.034	0.035	0.034
0.032	0.033	0.033	0.033	0.033

e. At depth of 9 mm

0.027	0.027	0.027	0.027	0.026
0.028	0.029	0.029	0.029	0.028
0.029	0.030	0.030	0.030	0.029
0.029	0.030	0.030	0.030	0.029
0.029	0.030	0.030	0.030	0.029

Table 8. **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.4 dBm (43.7 mW) at the low subband frequency of 1929.35 MHz (Channel 032).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.014 W/kg

a. At depth of 1 mm

0.019	0.020	0.020	0.021	0.020
0.017	0.018	0.019	0.019	0.019
0.014	0.015	0.016	0.017	0.017
0.016	0.014	0.014	0.014	0.014
0.021	0.019	0.016	0.014	0.013

b. At depth of 3 mm

0.017	0.018	0.018	0.018	0.017
0.015	0.016	0.017	0.017	0.017
0.014	0.015	0.015	0.016	0.016
0.015	0.014	0.014	0.014	0.014
0.017	0.017	0.016	0.015	0.014

c. At depth of 5 mm

0.015	0.015	0.015	0.015	0.015
0.014	0.015	0.015	0.015	0.015
0.014	0.014	0.014	0.014	0.014
0.014	0.014	0.014	0.014	0.014
0.015	0.015	0.015	0.014	0.014

d. At depth of 7 mm

0.013	0.013	0.013	0.013	0.013
0.013	0.013	0.013	0.013	0.013
0.013	0.013	0.013	0.013	0.013
0.013	0.013	0.014	0.013	0.013
0.012	0.012	0.013	0.014	0.013

e. At depth of 9 mm

0.012	0.012	0.012	0.011	0.011
0.012	0.012	0.012	0.012	0.012
0.012	0.012	0.012	0.012	0.012
0.011	0.012	0.013	0.012	0.012
0.010	0.011	0.012	0.012	0.013

Table 9. **Antenna left retracted. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device radiating a time-averaged power of 16.4 dBm (43.7 mW) at the low subband frequency of 1929.35 MHz (Channel 032).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.039 W/kg

a. At depth of 1 mm

0.049	0.051	0.050	0.049	0.047
0.052	0.054	0.053	0.052	0.050
0.051	0.055	0.055	0.054	0.052
0.048	0.052	0.054	0.054	0.052
0.045	0.047	0.048	0.049	0.048

b. At depth of 3 mm

0.042	0.043	0.042	0.041	0.040
0.045	0.046	0.045	0.044	0.043
0.045	0.048	0.047	0.047	0.045
0.043	0.047	0.047	0.047	0.045
0.041	0.042	0.044	0.044	0.042

c. At depth of 5 mm

0.036	0.036	0.036	0.035	0.033
0.038	0.039	0.038	0.037	0.036
0.039	0.041	0.041	0.040	0.038
0.039	0.041	0.041	0.040	0.039
0.037	0.038	0.039	0.039	0.037

d. At depth of 7 mm

0.030	0.030	0.030	0.029	0.028
0.033	0.033	0.032	0.031	0.031
0.034	0.035	0.035	0.034	0.033
0.034	0.036	0.035	0.035	0.034
0.033	0.034	0.035	0.034	0.033

e. At depth of 9 mm

0.025	0.025	0.025	0.024	0.023
0.028	0.028	0.027	0.026	0.026
0.029	0.030	0.029	0.027	0.028
0.030	0.031	0.030	0.030	0.029
0.029	0.030	0.031	0.0300	0.029

Table 10. **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device mounted in a holster radiating a time-averaged power of 16.8 dBm (47.9 mW) at the low subband frequency of 1920.95 MHz (Channel 004).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.045 W/kg

a. At depth of 1 mm

0.067	0.073	0.074	0.073	0.070
0.073	0.078	0.081	0.079	0.075
0.076	0.081	0.084	0.082	0.077
0.075	0.081	0.083	0.081	0.076
0.072	0.077	0.078	0.075	0.070

b. At depth of 3 mm

0.051	0.055	0.056	0.055	0.052
0.055	0.059	0.060	0.059	0.056
0.057	0.061	0.063	0.061	0.057
0.056	0.060	0.062	0.060	0.056
0.053	0.057	0.058	0.056	0.052

c. At depth of 5 mm

0.037	0.040	0.041	0.040	0.038
0.040	0.042	0.043	0.043	0.040
0.041	0.044	0.045	0.044	0.041
0.041	0.043	0.044	0.043	0.040
0.038	0.041	0.041	0.040	0.037

d. At depth of 7 mm

0.026	0.028	0.029	0.028	0.027
0.028	0.030	0.030	0.030	0.028
0.029	0.030	0.031	0.030	0.028
0.029	0.030	0.030	0.030	0.028
0.027	0.028	0.028	0.028	0.026

e. At depth of 9 mm

0.018	0.020	0.020	0.019	0.018
0.020	0.020	0.021	0.020	0.020
0.020	0.021	0.021	0.020	0.019
0.020	0.020	0.020	0.020	0.019
0.018	0.019	0.019	0.019	0.018

Table 11. **Antenna left retracted. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device mounted in a holster radiating a time-averaged power of 16.8 dBm (47.9 mW) at the low subband frequency of 1920.95 MHz (Channel 004).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.052 W/kg

a. At depth of 1 mm

0.082	0.086	0.087	0.083	0.077
0.089	0.093	0.093	0.089	0.083
0.091	0.097	0.096	0.092	0.084
0.092	0.096	0.095	0.091	0.083
0.088	0.091	0.090	0.086	0.078

b. At depth of 3 mm

0.061	0.064	0.065	0.062	0.058
0.066	0.069	0.069	0.067	0.062
0.068	0.072	0.071	0.068	0.063
0.068	0.071	0.070	0.067	0.062
0.065	0.067	0.067	0.064	0.058

c. At depth of 5 mm

0.045	0.046	0.047	0.045	0.042
0.048	0.050	0.050	0.048	0.045
0.049	0.052	0.051	0.049	0.046
0.049	0.051	0.050	0.049	0.045
0.047	0.048	0.048	0.046	0.042

d. At depth of 7 mm

0.032	0.033	0.033	0.032	0.030
0.034	0.035	0.035	0.034	0.032
0.035	0.036	0.035	0.034	0.032
0.034	0.036	0.035	0.034	0.032
0.033	0.034	0.033	0.032	0.030

e. At depth of 9 mm

0.023	0.023	0.023	0.023	0.022
0.024	0.025	0.025	0.024	0.023
0.025	0.025	0.025	0.024	0.023
0.024	0.025	0.024	0.024	0.023
0.023	0.023	0.023	0.023	0.021

Table 12. **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device Device mounted in a holster radiating a time-averaged power of 16.9 dBm (49.0 mW) at the low subband frequency of 1924.25 MHz (Channel 015).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.052 W/kg

a. At depth of 1 mm

0.077	0.084	0.086	0.085	0.080
0.085	0.092	0.095	0.092	0.087
0.089	0.096	0.098	0.097	0.090
0.088	0.095	0.098	0.095	0.088
0.084	0.090	0.092	0.089	0.082

b. At depth of 3 mm

0.058	0.063	0.065	0.064	0.060
0.064	0.069	0.071	0.069	0.065
0.067	0.071	0.073	0.072	0.067
0.066	0.071	0.072	0.070	0.065
0.062	0.067	0.068	0.065	0.060

c. At depth of 5 mm

0.043	0.046	0.047	0.046	0.043
0.047	0.050	0.051	0.049	0.046
0.048	0.051	0.052	0.051	0.048
0.048	0.051	0.051	0.050	0.046
0.045	0.047	0.048	0.046	0.043

d. At depth of 7 mm

0.031	0.032	0.033	0.032	0.030
0.033	0.035	0.035	0.034	0.032
0.034	0.036	0.036	0.035	0.033
0.033	0.035	0.035	0.034	0.032
0.031	0.032	0.033	0.031	0.029

e. At depth of 9 mm

0.022	0.022	0.023	0.022	0.021
0.023	0.024	0.024	0.023	0.022
0.023	0.024	0.024	0.024	0.022
0.023	0.024	0.024	0.023	0.021
0.021	0.022	0.022	0.021	0.020

Table 13.   **Antenna left retracted.   The SARs measured for the Iwatsu Model IX-PS6 Wireless Device Device mounted in a holster radiating a time-averaged power of 16.9 dBm (49.0 mW) at the low subband frequency of 1924.25 MHz (Channel 015).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.062 W/kg

a. At depth of 1 mm

0.109	0.106	0.105	0.113	0.140
0.091	0.096	0.104	0.130	0.099
0.117	0.115	0.110	0.110	0.095
0.101	0.099	0.067	0.113	0.079
0.089	0.102	0.079	0.063	0.067

b. At depth of 3 mm

0.077	0.081	0.084	0.091	0.098
0.076	0.078	0.081	0.093	0.079
0.082	0.088	0.086	0.083	0.072
0.081	0.078	0.062	0.082	0.062
0.071	0.071	0.059	0.050	0.051

c. At depth of 5 mm

0.054	0.061	0.067	0.071	0.065
0.064	0.063	0.063	0.064	0.062
0.057	0.066	0.067	0.061	0.054
0.062	0.060	0.055	0.056	0.049
0.055	0.048	0.044	0.039	0.037

d. At depth of 7 mm

0.038	0.043	0.052	0.053	0.044
0.054	0.051	0.050	0.043	0.047
0.039	0.049	0.051	0.045	0.041
0.047	0.045	0.047	0.036	0.038
0.043	0.032	0.031	0.031	0.026

e. At depth of 9 mm

0.029	0.030	0.040	0.039	0.032
0.046	0.043	0.041	0.031	0.035
0.030	0.038	0.039	0.033	0.033
0.034	0.035	0.038	0.023	0.030
0.032	0.023	0.023	0.024	0.018

Table 14. **Antenna pulled out. The SARs measured for the Iwatsu Model IX-PS6 Wireless Device Device mounted in a holster radiating a time-averaged power of 16.4 dBm (43.7 mW) at the low subband frequency of 1929.35 MHz (Channel 032).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.047 W/kg

a. At depth of 1 mm

0.078	0.079	0.082	0.086	0.081
0.081	0.081	0.085	0.090	0.078
0.085	0.087	0.097	0.088	0.077
0.083	0.085	0.091	0.084	0.078
0.073	0.083	0.076	0.090	0.069

b. At depth of 3 mm

0.061	0.059	0.063	0.064	0.062
0.059	0.060	0.061	0.065	0.060
0.062	0.063	0.070	0.064	0.058
0.061	0.062	0.067	0.062	0.057
0.054	0.060	0.056	0.062	0.054

c. At depth of 5 mm

0.046	0.042	0.047	0.046	0.046
0.041	0.043	0.041	0.045	0.044
0.043	0.045	0.049	0.045	0.042
0.043	0.043	0.047	0.043	0.040
0.038	0.042	0.040	0.040	0.040

d. At depth of 7 mm

0.034	0.028	0.034	0.032	0.034
0.027	0.029	0.026	0.029	0.032
0.029	0.030	0.032	0.030	0.029
0.029	0.029	0.032	0.029	0.027
0.026	0.029	0.028	0.025	0.029

e. At depth of 9 mm

0.025	0.018	0.025	0.022	0.025
0.017	0.020	0.017	0.019	0.023
0.019	0.021	0.021	0.020	0.020
0.019	0.019	0.021	0.019	0.017
0.017	0.019	0.018	0.015	0.019

Table 15.   **Antenna left retracted.   The SARs measured for the Iwatsu Model IX-PS6 Wireless Device Device mounted in a holster radiating a time-averaged power of 16.4 dBm (43.7 mW) at the low subband frequency of 1929.35 MHz (Channel 032).** The SARs in W/kg are measured with a step size of 2 mm for the highest SAR region of the model.

1-g SAR = 0.054 W/kg

a. At depth of 1 mm

0.084	0.090	0.091	0.089	0.083
0.091	0.097	0.098	0.095	0.089
0.094	0.100	0.101	0.097	0.091
0.093	0.099	0.100	0.096	0.089
0.089	0.093	0.094	0.090	0.083

b. At depth of 3 mm

0.063	0.067	0.068	0.066	0.062
0.068	0.072	0.073	0.071	0.066
0.070	0.074	0.075	0.072	0.067
0.069	0.073	0.073	0.071	0.066
0.066	0.069	0.069	0.066	0.061

c. At depth of 5 mm

0.046	0.048	0.049	0.047	0.045
0.049	0.052	0.052	0.051	0.048
0.051	0.053	0.054	0.052	0.048
0.050	0.052	0.052	0.051	0.047
0.047	0.049	0.049	0.047	0.044

d. At depth of 7 mm

0.032	0.034	0.034	0.033	0.031
0.034	0.036	0.036	0.035	0.033
0.035	0.036	0.037	0.036	0.034
0.035	0.036	0.036	0.035	0.033
0.032	0.034	0.033	0.032	0.030

e. At depth of 9 mm

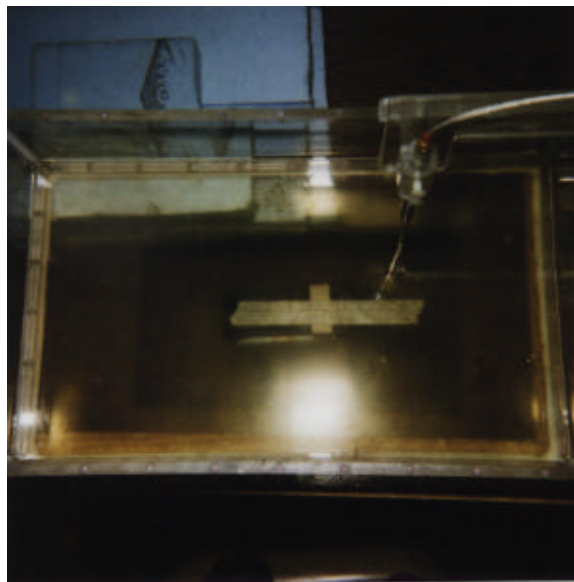|				
0.023	0.023	0.023	0.023	0.022
0.024	0.025	0.025	0.024	0.023
0.024	0.025	0.025	0.024	0.023
0.024	0.024	0.024	0.023	0.022
0.022	0.023	0.022	0.021	0.020

(a)

(b)

Fig. 1. Photographs of Iwatsu Model IX-PS6 Wireless Device without and with a jacket (with front plastic cover) for holster mount.

    a. Without the jacket.
    b. Without and with the jacket for holster mount.

(a)

(b)

Fig. 2. Photographs of the two phantom models used for SAR measurements for the Iwatsu Model IX-PS6 Wireless Device.

    a. The phantom model of the head.
    b. The planar model used for the region of the waist for holster mounted configuration.