

## TEST REPORT (SAR EVALUATION)

**APPLICANT** : Sharp Corporation, Communication Systems Group  
**ADDRESS** : 2-13-1, Iida, Hachihonmatsu, Higashi-Hiroshima City, Hiroshima,  
739-0192, Japan

**PRODUCTS** : Cellular Phone  
**MODEL NO.** : 101SH  
**SERIAL NO.** : 004401/11/354518/6  
**FCC ID** : APYHRO00155

**TEST STANDARD** : FCC/OET Bulletin 65 Supplement C (Edition 01-01)

**TESTING LOCATION** : Japan Quality Assurance Organization  
KITA-KANSAI Testing Center  
1-7-7, Ishimaru, Minoh-shi, Osaka 562-0027, Japan

**TEST RESULTS** : **Passed**

**DATE OF TEST** : September 26 ~ 27, 2011



A handwritten signature in black ink, appearing to read 'K. Shibata', is written over a horizontal line.

Kousei Shibata  
Manager  
Japan Quality Assurance Organization  
KITA-KANSAI Testing Center  
Testing Dept. SAITO EMC Branch  
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan, National Institute of Information and Communications Technology (NICT) of Japan , and Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zürich, Switzerland.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
- The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
- This test report shall not be reproduced except in full without the written approval of JQA.
- VLAC does not approve, certify or warrant the product by this test report.

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**DEFINITIONS FOR ABBREVIATION AND SYMBOLS USED IN THIS TEST REPORT**

<b>EUT</b> : Equipment Under Test	<b>EMC</b> : Electromagnetic Compatibility
<b>AE</b> : Associated Equipment	<b>EMI</b> : Electromagnetic Interference
<b>N/A</b> : Not Applicable	<b>EMS</b> : Electromagnetic Susceptibility
<b>N/T</b> : Not Tested	<b>SAR</b> : Specific Absorption Rate

- indicates that the listed condition, standard or equipment is applicable for this report.

- indicates that the listed condition, standard or equipment is not applicable for this report.

## Documentation

### 1 Test Regulation

Applied Standard : FCC/OET Bulletin 65 Supplement C (Edition 01-01)  
Evaluating Compliance with FCC Guidelines for Human Exposure to Radio-  
frequency Electromagnetic Fields  
*Additional Information for Evaluating Compliance of Mobile and Portable  
Devices with FCC Limits for Human Exposure to Radiofrequency Emissions*

Test Procedure : FCC/OET Bulletin 65 Supplement C (Edition 01-01)  
IEEE Std.1528–2003  
KDB Publication #648474 D01 v01r05 (September 2008)  
KDB Publication #248227 D01 v01r02 (May 2007)

Exposure Limits : ANSI/IEEE Std. C95.1, 1999 Edition

### 2 Test Location

Japan Quality Assurance Organization (JQA)  
KITA-KANSAI Testing Center Testing Department SAITO EMC Branch  
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan  
MINOH Test Site (KITA-KANSAI Testing Center)  
7-7, Ishimaru, 1-chome, Minoh-shi, Osaka, 562-0027, Japan  
KAMEOKA EMC Branch  
9-1, Ozaki, Inukanno, Nishibetsuin-cho, Kameoka-shi, Kyoto, 621-0126, Japan

### 3 Recognition of Test Laboratory

JQA KITA-KANSAI Testing Center Testing Dept. SAITO EMC Branch is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility of Testing Division is registered by the following bodies.

VLAC Code : VLAC-001-2 (Effective through : March 30, 2012)  
BSMI Recognition No. : SL2-IS-E-6006, SL2-IN-E-6006, SL2-AI-E-6006  
(Effective through : September 14, 2013)  
IC Registration No. : 2079E-2 (Effective through : January 25, 2014)  
2079E-3, 2079E-4 (Effective through : July 20, 2014)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI.  
(Effective through : February 22, 2012)

#### 4 Description of the Equipment Under Test

1. Manufacturer : Sharp Corporation, Communication Systems Group  
2-13-1, Iida, Hachihonmatsu, Higashi-Hiroshima City, Hiroshima,  
739-0192, Japan
2. Products : Cellular Phone
3. Model No. : 101SH
4. Serial No. : 004401/11/354518/6
5. Product Type : Pre-production
6. Date of Manufacture : August, 2011
7. Transmitting Frequency : 2412 MHz – 2462 MHz (WLAN 802.11b/g/n)  
2402 MHz – 2480 MHz (Bluetooth)
8. Battery Option : Lithium-ion Battery Pack SHBEC1 (1020mAh)
9. Power Rating : 4.0VDC
10. EUT Grounding : None
11. Device Category : Portable Device (§2.1093)
12. Exposure Category : General Population/Uncontrolled Exposure
13. FCC Rule Part(s) : 15.247
14. EUT Authorization : Certification
15. Received Date of EUT : September 16, 2011

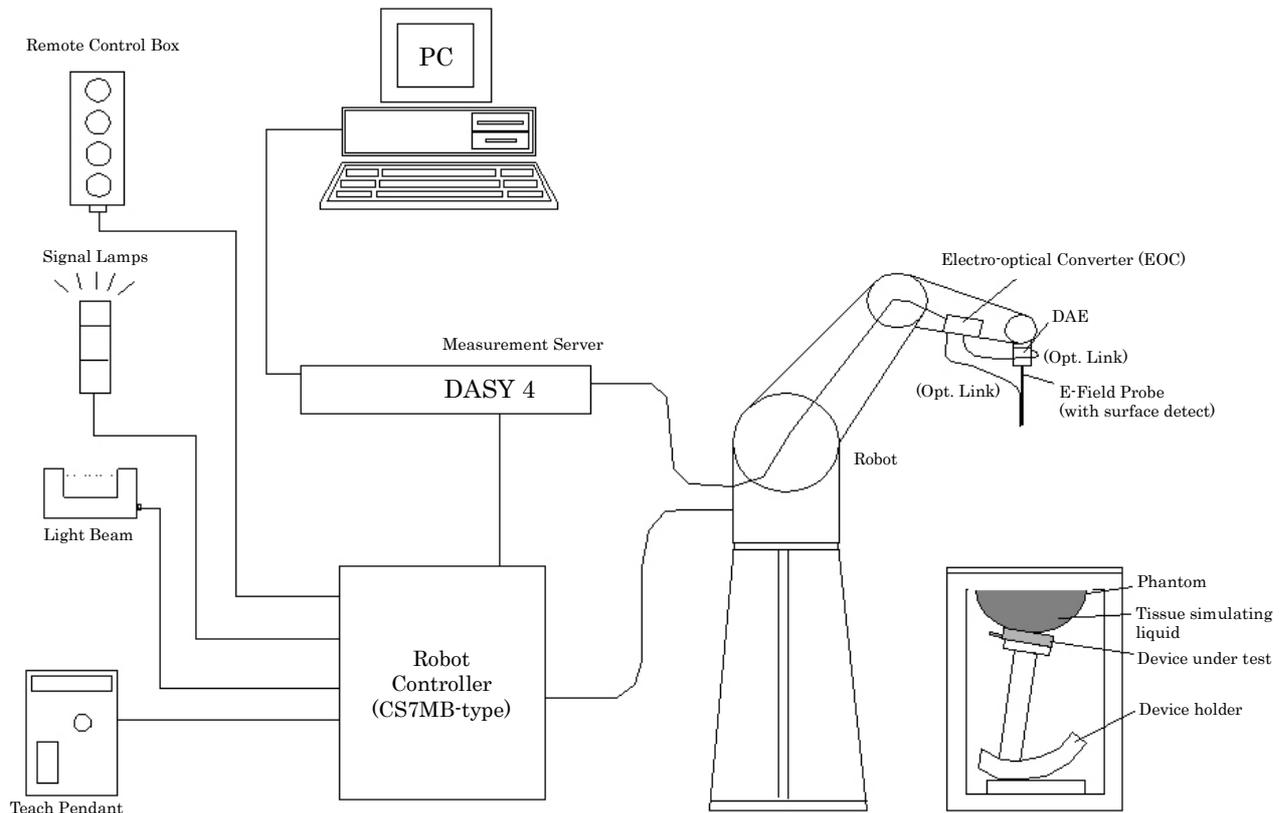
#### 5 Test Results

Mode	CH	Freq. (MHz)	Test Position	1g SAR (mW/g)	Results
WLAN 802.11b 1 Mbps	1	2412	Left Head Touched Keypad Close	0.076	PASSED
	1	2412	Body Rear w/ 1.5cm	0.079	PASSED

**6 Measurement System Diagram**

These measurements are performed using the DASY4 automated dosimetric assessment system (manufactured by Schmid & Partner Engineering AG (SPEAG) in Zürich, Switzerland). It consists of high precision robotics system, cell controller system, DASY4 measurement server, personal computer with DASY4 software, data acquisition electronic (DAE) circuit, the Electro-optical converter (EOC), near-field probe, and the twin SAM phantom containing the equivalent tissue. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF).

The Robot is connected to the cell controller to allow software manipulation of the robot. The DAE is connected to the EOC. The DAE performs the signal amplification, signal multiplexing, A/D conversion, offset measurements, mechanical surface detection, collision detection, etc. The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the DASY4 measurement server.



## 7 System Components

### 7.1 Probe Specification ET3DV6

Construction : Symmetrical design with triangular core  
Built-in optical fiber for surface detection system  
Built-in shielding against static changes  
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration : In air form 10 MHz to 2.3 GHz  
In head tissue simulating liquid (HSL) and muscle tissue simulating liquid  
835 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
900 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
1450 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
1750 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
1900 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
1950 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )



Frequency : 10 MHz to 2.3 GHz  
Linearity:  $\pm 0.2$  dB (30 MHz to 2.3 GHz)

Directivity :  $\pm 0.2$  dB in HSL (rotation around probe axis)  
 $\pm 0.4$  dB in HSL (rotation normal to probe axis)

Dynamic Range :  $5 \mu\text{W/g}$  to  $>100 \text{ mW/g}$ ; Linearity:  $\pm 0.2$  dB

Surface Detection :  $\pm 0.2$  mm repeatability in air and clear liquids over diffuse reflecting surfaces

Dimensions : Overall length 337 mm  
Tip length 16 mm  
Body diameter 12 mm  
Tip diameter 6.8 mm  
Distance from probe tip to dipole centers 2.7 mm

## 7.2 Probe Specification EX3DV4

Construction : Symmetrical design with triangular core  
Built-in shielding against static charges  
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration : In air from 10 MHz to 6 GHz  
In head tissue simulating liquid (HSL) and  
muscle tissue simulating liquid  
2300 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
2450 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
2600 MHz (accuracy  $\pm 12.0\%$ ;  $k=2$ )  
3500 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )  
5200 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )  
5300 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )  
5500 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )  
5600 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )  
5800 MHz (accuracy  $\pm 13.1\%$ ;  $k=2$ )



Frequency : 10 MHz to 6 GHz  
Linearity:  $\pm 0.2$  dB (30 MHz to 6 GHz)

Directivity :  $\pm 0.3$  dB in HSL (rotation around probe axis)  
 $\pm 0.5$  dB in tissue material (rotation normal to probe axis)

Dynamic Range :  $10 \mu\text{W/g}$  to  $>100 \text{ mW/g}$ ; Linearity:  $\pm 0.2$  dB (noise: typically  $< 1 \mu\text{W/g}$ )

Dimensions : Overall length 337 mm  
Tip length 20 mm  
Body diameter 12 mm  
Tip diameter 2.5 mm  
Distance from probe tip to dipole centers 1 mm

### 7.3 Twin SAM Phantom

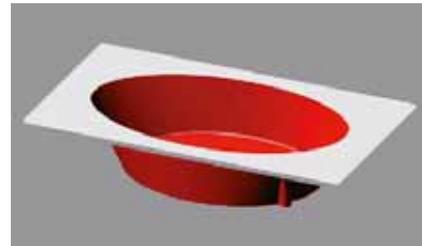
The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.



Shell Thickness :  $2 \pm 0.2$  mm; Center ear point:  $6 \pm 0.2$  mm  
Filling Volume : Volume Approx. 25 liters  
Dimensions :  $810 \times 1000 \times 500$  mm (H  $\times$  L  $\times$  W)

### 7.4 ELI4 Flat Phantom

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.



Shell Thickness :  $2 \pm 0.2$  mm (sagging: <1%)  
Filling Volume : Volume Approx. 30 liters  
Dimensions : Major ellipse axis : 600 mm  
                  Minor axis : 400 mm

**7.5 Mounting Device for Transmitters**

In combination with the Twin SAM Phantom V4.0/V4.0c or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat point).



**7.6 Laptop Extensions Kit for Mounting Device**

Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.) It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4 and SAM v6.0 Phantoms.



**7.7 Typical Composition of Ingredients for Liquid Tissue**

Ingredients (% by weight)	Frequency (MHz)					
	835		1900		2450	
	Head	Body	Head	Body	Head	Body
Water	41.45	52.40	54.90	40.40	62.70	73.20
Salt (NaCl)	1.45	1.40	0.18	0.50	0.50	0.04
Sugar	56.00	45.00	0.00	58.00	0.00	0.00
HEC	1.00	1.00	0.00	1.00	0.00	0.00
Bactericide	0.10	0.10	0.00	0.10	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	36.80	0.00
DGBE	0.00	0.00	44.92	0.00	0.00	26.70

- Salt : 99+% Pure Sodium Chloride      Sugar : 98+% Pure Sucrose
- Water : De-ionized, 16 MΩ<sup>+</sup> resistivity      HEC : Hydroxyethyl Cellulose
- DGBE : 99+% Di (ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
- Triton X-100 (ultra pure) : Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

The composition of ingredients is according to FCC/OET Bulletin 65 Supplement C.

## 8 Measurement Process

### Area Scan for Maximum Search :

The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15 mm × 15 mm. The evaluation on the measured area scan gives the interpolated maximum (hot spot) of the measured area.

### Cube Scan for Spatial Peak SAR Evaluation :

The 1g and 10g peak evaluations were available for the predefined cube 5×5×7 scans. The grid spacing was 8 mm × 8 mm × 5 mm. The first procedure is an extrapolation to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume in a 1mm grid (35000 points). In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is moved around until the highest averaged SAR is found. This last procedure is repeated for a 10g cube. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

### Extrapolation :

The extrapolation is based on a least square algorithm. Through the points in the first 3 cm in all z-axis, polynomials of order four are calculated. This polynomial is then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from one another.

### Interpolation :

The maximum interpolated value is searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) are computed by the 3D spline algorithm. The 3D spline is composed of three one-dimensional splines with the "Not a knot" -condition (x, y and z -directions). The volume is integrated with the trapezoidal algorithm.

## 9 Measurement Uncertainties

Uncertainty Component	Tol. (± %)	Prob. Dist.	Div.	$c_i$ (1g)	$c_i$ (10g)	Std. Unc. (± %)		$v_i$
						1g	10g	
<b>Measurement System</b>								
Probe calibration	6.0	N	1	1	1	6.0	6.0	∞
Axial isotropy	4.7	R	√3	0.7	0.7	1.9	1.9	∞
Hemispherical isotropy	9.6	R	√3	0.7	0.7	3.9	3.9	∞
Boundary effect	1.0	R	√3	1	1	0.6	0.6	∞
Linearity	4.7	R	√3	1	1	2.7	2.7	∞
System detection limits	1.0	R	√3	1	1	0.6	0.6	∞
Readout electronics	0.3	N	1	1	1	0.3	0.3	∞
Response time	0.8	R	√3	1	1	0.5	0.5	∞
Integration time	2.6	R	√3	1	1	1.5	1.5	∞
RF ambient conditions – noise	3.0	R	√3	1	1	1.7	1.7	∞
RF ambient conditions – reflections	3.0	R	√3	1	1	1.7	1.7	∞
Probe positioner mechanical tolerance	0.4	R	√3	1	1	0.2	0.2	∞
Probe positioning with respect to phantom shell	2.9	R	√3	1	1	1.7	1.7	∞
Extrapolation, interpolation and integration algorithms for max. SAR evaluation	1.0	R	√3	1	1	0.6	0.6	∞
<b>Test Sample Related</b>								
Test sample positioning	3.4	N	1	1	1	3.4	3.4	23
Device holder uncertainty	2.9	N	1	1	1	2.9	2.9	5
Output power variation – SAR drift measurement	5.0	R	√3	1	1	2.9	2.9	∞
<b>Phantom and Tissue Parameters</b>								
Phantom uncertainty	4.0	R	√3	1	1	2.3	2.3	∞
Liquid conductivity – deviation from target	5.0	R	√3	0.64	0.43	1.8	1.2	∞
Liquid Conductivity – measurement uncertainty	3.2	N	1	0.64	0.43	2.0	1.4	5
Liquid Permittivity – deviation from target	5.0	R	√3	0.6	0.49	1.7	1.4	∞
Liquid Permittivity – measurement uncertainty	3.0	N	1	0.6	0.49	1.8	1.5	5
<b>Combined Standard Uncertainty</b>		RSS				11.0	10.8	
<b>Expanded Uncertainty (95% Confidence Interval)</b>		k=2				<b>22.1</b>	<b>21.5</b>	
NOTES								
1. Tol. : tolerance in influence quantity								
2. Prob. Dist. : probability distributions								
3. N, R : normal, rectangular								
4. Div. : divisor used to obtain standard uncertainty								
5. $c_i$ : sensitivity coefficient								
6. Std. Unc. : standard uncertainty								
7. Measurement uncertainties are according to IEEE Std. 1528 and IEC 62209-1.								

**10 Equipment Under Test Modification**

- No modifications were conducted by JQA to achieve compliance to the limitations.  
 - To achieve compliance to the limitations, the following changes were made by JQA during the compliance test.

The modifications will be implemented in all production models of this equipment.

Applicant : Not Applicable

Date : Not Applicable

Typed Name : Not Applicable

Position : Not Applicable

Signatory : Not Applicable

**11 Responsible Party**Responsible Party of Test Item (Product)

Responsible Party :	
Contact Person :	_____
	Signatory

**12 Deviation from Standard**

- No deviations from the standard described in clause 1.  
 - The following deviations were employed from the standard described in clause 1.
-

**13 Summary****General Remarks :**

The EUT was tested according to the requirements of the following standard.

FCC/OET Bulletin 65 Supplement C (Edition 01-01)

The test configuration is shown in clause 14 to 15.

The conclusion for the test items of which are required by the applied regulation is indicated under the test results.

Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

**Test Results :**

The "as received" sample:

- fulfill the test requirements of the regulation mentioned on clause 1.
- doesn't fulfill the test requirements of the regulation mentioned on clause 1.

Reviewed by:

Tested by:



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Shigeru Kinoshita  
Deputy Manager  
JQA KITA-KANSAI Testing Center  
Testing Dept. SAITO EMC Branch



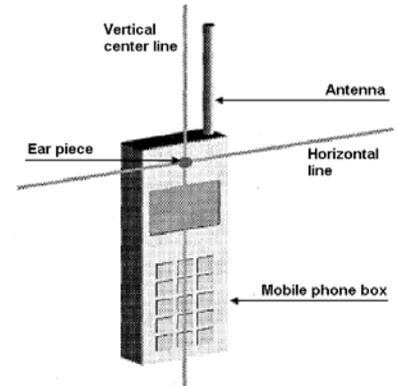
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Yasuhisa Sakai  
Deputy Manager  
JQA KITA-KANSAI Testing Center  
Testing Dept. SAITO EMC Branch

**14 Test Arrangement**

**14.1 Cheek-Touch Position**

1. Position the device with the vertical center line of the body of the device and the horizontal line crossing the center of the ear piece in a plane parallel to the sagittal plane of the phantom.
2. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the center of the ear piece with the line RE-LE.
3. Translate the mobile phone box towards the phantom with the ear piece aligned with the line RE-LE until the phone touches the ear.
4. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



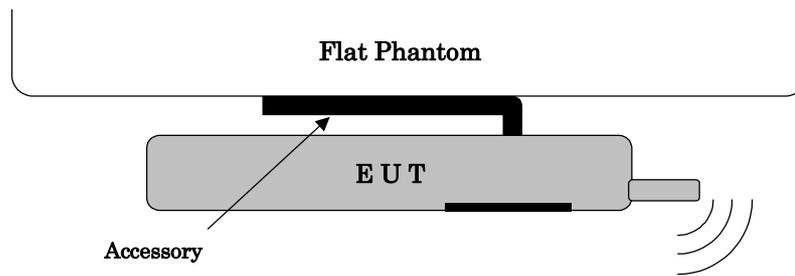
**14.2 Ear-Tilt Position**

1. Position the device in the “Cheek/Touch Position”.
2. While maintaining the device in the reference plane and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



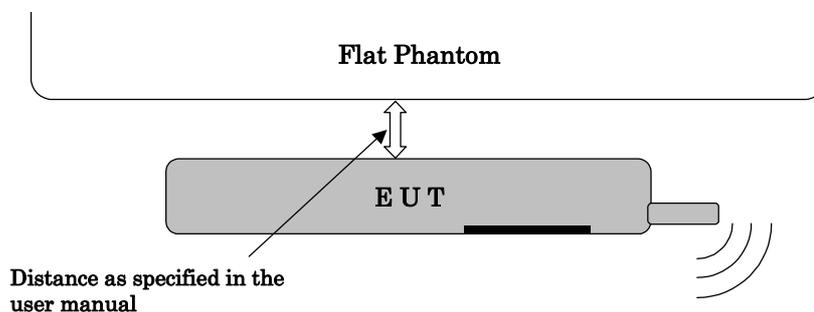
**14.3 Body-worn Configuration**

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. Both the physical spacing to the body of the user as dictated by the accessory and the materials used in an accessory affect the SAR produced by the transmitting device. For purpose of determining test requirements, accessories may be divided into two categories: those that do not contain metallic components and those that do.



When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.



Lap-held device (e.g. laptop computer)  
 SAR is tested for a lap-held position with the bottom of the computer in direct contact against a flat phantom.

## 15 Procedures used to Establish Test Signal

The following procedures had been used to prepare the EUT for the SAR test.

### 15.1 WLAN

To setup the desire channel frequency and the maximum output power, RF test mode prepared by the manufacturer was used to program the EUT.

#### *Conducted power measurement results*

Mode		Conducted Power (dBm)		
		1 ch (2412 MHz)	6 ch (2437 MHz)	11 ch (2462 MHz)
802.11b	<b>1 Mbps</b>	<b>15.32</b>	<b>14.76</b>	<b>14.19</b>
	2 Mbps	15.35	14.67	14.17
	5.5 Mbps	15.37	14.84	14.20
	11 Mbps	15.34	14.78	14.18
802.11g	6 Mbps	12.15	11.50	11.00
	9 Mbps	12.12	11.52	10.89
	12 Mbps	12.14	11.53	10.96
	18 Mbps	12.14	11.50	10.88
	24 Mbps	12.18	11.45	10.90
	36 Mbps	12.08	11.55	10.96
	48 Mbps	12.12	11.56	10.94
	54 Mbps	12.13	11.52	10.97
802.11n	6.5 Mbps	11.57	10.92	10.38
	13 Mbps	11.54	10.81	10.25
	19.5 Mbps	11.52	10.90	10.36
	26 Mbps	11.52	10.89	10.34
	39 Mbps	11.54	10.89	10.32
	52 Mbps	11.53	10.92	10.34
	58.5 Mbps	11.57	10.92	10.36
	65 Mbps	11.56	10.90	10.40

SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than that measured on the corresponding 802.11b channels.

SAR testing at higher data rates is not required when the maximum average output power for each of these configurations is less than ¼ dB higher than those measured at the lowest data rate.

Maximum conducted power was measured by replacing the antenna with an adapter for conductive measurements, before and after the SAR measurements was done.

## 15.2 Bluetooth

For the Bluetooth operation, the client supplied a special driving program to program the EUT to continually transmit the specified maximum power.

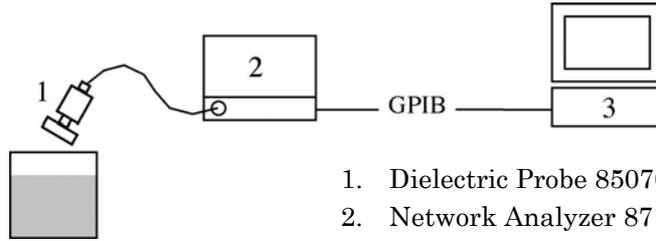
Modulation type : Frequency Hopping Spread Spectrum (FHSS)  
Transmitting Frequency : 2402 MHz (0 ch) – 2480 MHz (78 ch)  
RF Output Power : Max. 2.5 mW (Class 2)

Simultaneous transmission for WLAN with Bluetooth is not occurred and the output of Bluetooth transmitter is  $60 / f_{\text{(GHz)}} [\text{mW}]$ , so the stand-alone SAR evaluation for Bluetooth is not required.

**Appendix A: Test Data**

**A.1 Tissue Verification**

The tissue dielectric parameters of the tissue medium at the middle of a device transmission band should be within  $\pm 5\%$  of the parameters specified at that target frequency. It is verified by using the dielectric probe and the network analyzer.



1. Dielectric Probe 85070D
2. Network Analyzer 8719ET
3. Personal Computer

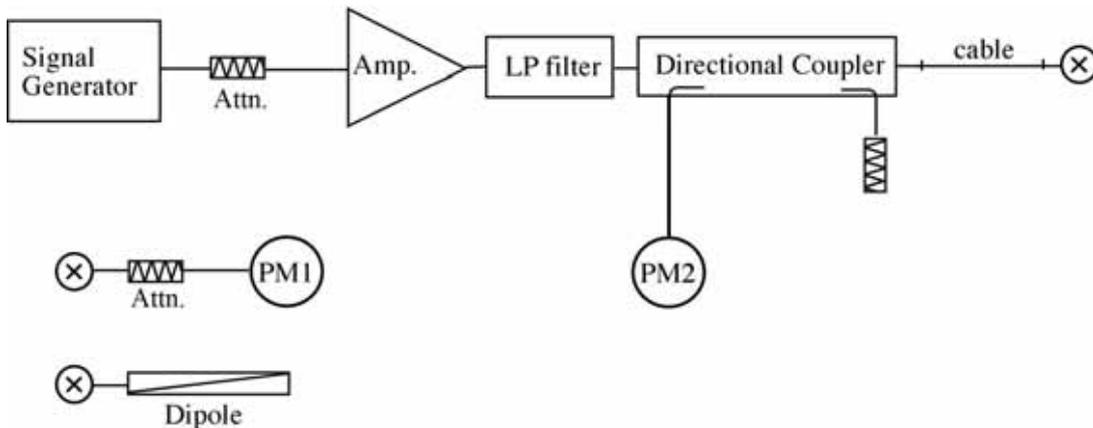
**Tissue Verification Results :**

Ambient Conditions : 22°C 67%				Date : September 26, 2011			
Liquid	Freq. [MHz]	Temp. [°C]	Parameters	Target	Measured	Deviation [%]	Limit [%]
Head	2450	22.0	Permittivity	39.2	39.00	-0.51	$\pm 5$
			Conductivity	1.80	1.847	+2.61	$\pm 5$
Ambient Conditions : 22°C 60%				Date : September 27, 2011			
Body	2450	22.0	Permittivity	52.7	52.03	-1.27	$\pm 5$
			Conductivity	1.95	1.963	+0.67	$\pm 5$

**A.2 System Validation**

The power meter PM1 (including Attenuator) measures the forward power at the location of the validation dipole connector. The signal generator is adjusted for 250 mW at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2.

The dipole antenna is matched to be used near flat phantom filled with tissue simulating solution. A specific distance holder is used in the positioning of the antenna to ensure correct spacing between the phantom and the dipole.



System Validation Dipole : D2450V2, S/N: 714								
Ambient Conditions : 22°C 67%			Depth of Liquid : 15.0 cm			Date : September 26, 2011		
Liquid	Freq. [MHz]	Temp. [°C]	Measured SAR (mW/g)		Normalized to 1 W	Target	Deviation [%]	Limit [%]
Head	2450	22.0	1g	13.2	52.80	53.8	-1.86	± 10
			10g	5.96	23.84	24.9	-4.26	± 10
Ambient Conditions : 22°C 60%			Depth of Liquid : 15.0 cm			Date : September 27, 2011		
Body	2450	22.0	1g	12.7	50.80	50.7	+0.20	± 10
			10g	5.80	23.20	23.4	-0.85	± 10
NOTES :								
1. The results were normalized to 1 W forward power.								
2. The target SAR values of SPEAG validation dipoles are given in the calibration data.								
3. Please refer to attachment for the result presentation in plot format.								

### A.3 SAR Measurement Data

#### A.3.1 Left Head – Keypad Open

802.11b (1 Mbps) – Duty Cycle: 100 %						Date : September 26, 2011	
Test Position	Ch No.	Frequency [MHz]	Tx Power [dBm]	Power Drift [dB]	Limit [mW/g]	1g SAR [mW/g]	Tissue Temp. [°C]
Cheek/Touch	6	2437	14.76	-0.095	1.6	0.013	22.0
Ear/Tilt	6	2437	14.76	0.153	1.6	0.00403	22.0

NOTES :

1. Depth of Liquid : 15.0 cm
2. Transmitter power was measured at the antenna-conducted terminal.
3. Please refer to attachment for the result presentation in plot format.

#### A.3.2 Right Head – Keypad Open

802.11b (1 Mbps) – Duty Cycle: 100 %						Date : September 26, 2011	
Test Position	Ch No.	Frequency [MHz]	Tx Power [dBm]	Power Drift [dB]	Limit [mW/g]	1g SAR [mW/g]	Tissue Temp. [°C]
Cheek/Touch	6	2437	14.76	0.110	1.6	0.014	22.0
Ear/Tilt	6	2437	14.76	0.106	1.6	0.00640	22.0

NOTES :

1. Depth of Liquid : 15.0 cm
2. Transmitter power was measured at the antenna-conducted terminal.
3. Please refer to attachment for the result presentation in plot format.

### A.3.3 Left Head – Keypad Close

802.11b (1 Mbps) – Duty Cycle: 100 %							Date : September 26, 2011
Test Position	Ch No.	Frequency [MHz]	Tx Power [dBm]	Power Drift [dB]	Limit [mW/g]	1g SAR [mW/g]	Tissue Temp. [°C]
Cheek/Touch	1	2412	15.32	-0.019	1.6	0.076	22.0
	6	2437	14.76	0.061		0.069	22.0
	11	2462	14.19	0.099		0.050	22.0
Ear/Tilt	6	2437	14.76	0.026	1.6	0.025	22.0
NOTES : 1. Depth of Liquid : 15.0 cm 2. Transmitter power was measured at the antenna-conducted terminal. 3. Please refer to attachment for the result presentation in plot format.							

### A.3.4 Right Head – Keypad Close

802.11b (1 Mbps) – Duty Cycle: 100 %							Date : September 26, 2011
Test Position	Ch No.	Frequency [MHz]	Tx Power [dBm]	Power Drift [dB]	Limit [mW/g]	1g SAR [mW/g]	Tissue Temp. [°C]
Cheek/Touch	6	2437	14.76	0.035	1.6	0.061	22.0
Ear/Tilt	6	2437	14.76	0.009	1.6	0.016	22.0
NOTES : 1. Depth of Liquid : 15.0 cm 2. Transmitter power was measured at the antenna-conducted terminal. 3. Please refer to attachment for the result presentation in plot format.							

**A.3.5 Body w/ 1.5 cm**

802.11b (1 Mbps) – Duty Cycle: 100 %						Date : September 27, 2011	
Test Position	Ch No.	Frequency [MHz]	Tx Power [dBm]	Power Drift [dB]	Limit [mW/g]	1g SAR [mW/g]	Tissue Temp. [°C]
Front Side	6	2437	14.76	0.046	1.6	0.012	22.0
Rear Side	1	2412	15.32	-0.070	1.6	0.079	22.0
	6	2437	14.76	0.088		0.071	22.0
	11	2462	14.19	0.054		0.068	22.0
Rear Side w/ head set	1	2412	15.32	0.153	1.6	0.070	22.0
NOTES : 1. Depth of Liquid : 15.0 cm 2. Transmitter power was measured at the antenna-conducted terminal. 3. Please refer to attachment for the result presentation in plot format.							

**Appendix C: Test Instruments**

Type	Model	Manufacturer	ID No.	Last Cal.	Interval
E-Field Probe	EX3DV4	SPEAG	S-17	2011/9	1 Year
DAE	DAE3 V1	SPEAG	S-3	2010/11	1 Year
Robot	RX60L	SPEAG	S-7	-----	N/A
Probe Alignment Unit	LB1RX60L	SPEAG	S-13	-----	N/A
Network Analyzer	8719ET	Agilent	B-53	2010/10	1 Year
Dielectric Probe Kit	85070D	Agilent	B-54	-----	N/A
2450MHz Dipole	D2450V2	SPEAG	S-6	2010/11	1 Year
Signal Generator	MG3681A	Anritsu	B-3	2011/9	1 Year
RF Amplifier	A0840-3833-R	R&K	A-34	-----	N/A
Low Pass Filter	LSM2700-3BA	LARK	D-92	2010/11	1 Year
Power Meter	N1914A	Agilent	B-27	2010/12	1 Year
Power Sensor	E9304A	Agilent	B-28	2010/10	1 Year
Power Sensor	E9304A	Agilent	B-29	2010/10	1 Year
Power Meter	N1911A	Agilent	B-63	2011/7	1 Year
Power Sensor	N1921A	Agilent	B-64	2011/7	1 Year
Attenuator	2-10	Weinschel	D-79	2010/10	1 Year

**Appendix D: Attachments**

<b>Exhibit</b>	<b>Contents</b>	<b>No. of page(s)</b>
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3	Dosimetric E-Field Probe – EX3DV4, S/N: 3808	11
4	System Validation Dipole – D2450V2, S/N: 714	9