

SAR TEST REPORT

Equipment Under Test	:	GSM & WCDMA Phone with Bluetooth and WLAN
Model No.	:	LG-E450f
Applicant	:	LG Electronics MobileComm U.S.A., Inc.
Address of Applicant	:	1000 Sylvan Avenue Englewood Cliffs, NJ 07632
FCC ID	:	ZNFE450F
Device Category	:	Portable Device
Exposure Category	:	General Population/Uncontrolled Exposure
Date of Receipt	:	2012-12-24
Date of Test(s)	:	2013-02-07 ~ 2013-02-09
Date of Issue	:	2013-02-12

Standards:



FCC OET Bulletin 65 supplement C
IEEE 1528, 2003
ANSI/IEEE C95.1, C95.3

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Korea Co., Ltd. or testing done by SGS Korea Co., Ltd. in connection with distribution or use of the product described in this report must be approved by SGS Korea Co., Ltd. in writing.

Tested by	:	Jongwon Ma		2013-02-12
Approved by	:	Denny Ham		2013-02-12

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APPENDIX

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- C. Calibration certificate

1. General Information

1.1 Testing Laboratory

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1.2 Details of Manufacturer

Manufacturer : LG Electronics MobileComm U.S.A., Inc.
 Address : 1000 Sylvan Avenue Englewood Cliffs, NJ 07632
 Contact Person : joonsoo-Park
 Phone No. : 82-2-2033-1153
 E-mail : joonsoo-park@lge.com

1.3 Version of Report

Version Number	Date	Revision
00	2013-01-25	Initial issue
01	2013-02-05	Revision 01
02	2013-02-10	Revision 02
03	2013-02-12	Revision 03

1.4 Description of EUT(s)

EUT Type	: GSM & WCDMA Phone with Bluetooth and WLAN			
Model	: LG-E450f			
Serial Number	: N/A			
Mode of Operation	: GSM850, PCS1900, WCDMA V, WLAN, Bluetooth			
Duty Cycle	: 8.3(GSM), 8.3(GPRS 1Tx Slot), 4.15(GPRS 2Tx Slot), 2.77(GPRS 3Tx Slot), 2.075(GPRS 4Tx Slot), 1(WCDMA V), 1(WLAN)			
Body worn Accessory	: Audio Accessory			
Tx Frequency Range	: 824.2 MHz ~ 848.8 MHz (GSM850) 1850.2 MHz ~ 1909.8 MHz (PCS1900) 826.4 MHz ~ 846.6 MHz (WCDMA V) 2412 MHz ~ 2462 MHz (WLAN) 2402 MHz ~ 2480 MHz (Bluetooth)			
Battery Type	: 3.8V d.c. (Lithium-ion Battery)			
Equipment Class	Band	Reported SAR		
		1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)
PCE	GSM/GPRS/EDGE Rx Only 850	0.523	0.863	1.118
	GSM/GPRS/EDGE Rx Only 1900	0.416	0.477	0.523
	WCDMA V	0.426	0.812	0.812
DTS	2.45 GHz WLAN	0.174	0.085	0.085
DSS	Bluetooth	N/A		
Simultaneous SAR per KDB 690783 D01v01r02		0.697	0.948	1.203

1.5 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 44798 D01v05.

Burst Average power for Production					
Mode	Nominal & Maximum	GSM850		PCS1900	
Voice	Maximum	33.20		30.20	
	Nominal	32.70		29.70	
GPRS (GMSK, 1 Tx slot)	Maximum	33.20		30.20	
	Nominal	32.70		29.70	
GPRS (GMSK, 2 Tx slot)	Maximum	30.70		27.70	
	Nominal	30.20		27.20	
GPRS (GMSK, 3 Tx slot)	Maximum	29.20		26.20	
	Nominal	28.70		25.70	
GPRS (GMSK, 4 Tx slot)	Maximum	28.20		25.20	
	Nominal	27.70		24.70	
Average power for Production					
Mode	Nominal & Maximum	WCDMA V			
RMC 12.2K	Maximum	23.2			
	Nominal	22.7			
Average power for Production					
Mode	Nominal & Maximum	a	b	g	n
2.45 GHz WLAN	Maximum		16.50	12.50	11.50
	Nominal		16.00	12.00	11.00
Bluetooth	Maximum	3.70			
	Nominal	3.20			

1.6 Test Environment

Ambient temperature	: (22 ± 2) ° C
Tissue Simulating Liquid	: (22 ± 2) ° C
Relative Humidity	: (55 ± 5) % R.H.

1.7 Operation Configuration

The device in GSM was controlled by using a Communication tester(Agilent: 5155C). Communication between the device and the tester was established by air link. And the client provided a special driver and test program which can control the frequency and power of the WLAN module. Measurements were performed at the lowest, middle and highest channels of the operating band. The EUT was set to maximum power level during all tests and at the beginning of each test the battery was fully charged.

The DASY5 system measures power drift during SAR testing by comparing e-field in the same location at the beginning and at the end of measurement. Based on the RF Power and antenna separation distance, stand-alone BT SAR and simultaneous SAR evaluation are not required.

1.8 EVALUATION PROCEDURES

- Power Reference Measurement Procedures

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 2.5 mm for an EX3DV4 probe type).

1.9 SAR Measurement Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2 and 3: Area Scan & Zoom Scan Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)

3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

< Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01 >

		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	$\frac{1}{2} \delta \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location		30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}, \Delta y_{Area}$		≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid $\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
	$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.			

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

1.10 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (Speag DASY 5 professional system). A Model EX3DV4 3862 E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant. The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimeter probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

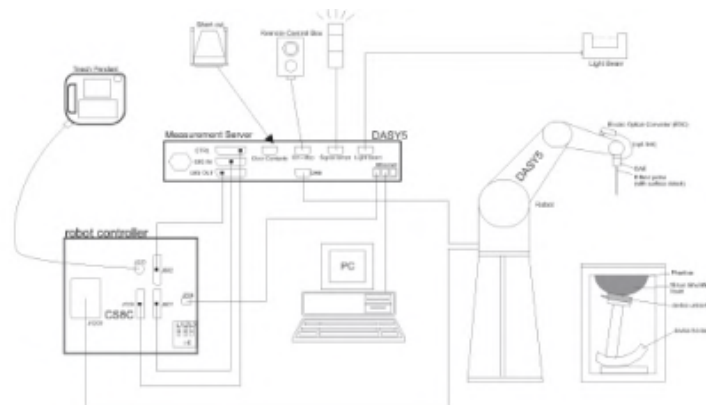


Fig a. The microwave circuit arrangement used for SAR system verification

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM phantom enabling testing body usage.
- The device holder for flat phantom.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

1.11 System Components

EX3DV4 E-Field Probe

- Construction** : Symmetrical design with triangular core.
Built-in shielding against static charges.
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
- Calibration** : Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 835 and HSL1900.
Additional CF-Calibration for other liquids and frequencies upon request.
- Frequency** : 10 MHz to 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
- Directivity** : ± 0.3 dB in HSL (rotation around probe axis)
 ± 0.5 dB in tissue material (rotation normal to probe axis)
- Dynamic Range** : $10\mu\text{W/g}$ to > 100 mW/g;
Linearity: ± 0.2 dB (noise: typically $< 1\mu\text{W/g}$)
- Dimensions** : Overall length: 337 mm (Tip length: 20 mm)
Tip diameter: 2.5 mm (Body diameter: 12 mm)
Distance from probe tip to dipole centers: 1 mm
- Application** : High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%
- Construction** : Symmetrical design with triangular core.
Built-in shielding against static charges.
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)



EX3DV4 E-Field Probe

NOTE:

1. The Probe parameters have been calibrated by the SPEAG. Please reference "APPENDIX C" for the Calibration Certification Report.

SAM Phantom

Construction: The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. 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 the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot



SAM Phantom

Shell Thickness: 2.0 mm \pm 0.1 mm

Filling Volume: Approx. 25 liters

DEVICE HOLDER

Construction In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Device Holder

1.12 SAR System verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within \pm 10 % from the target SAR values. These tests were done at 835 MHz, 1900 MHz, 2450 MHz. The tests for EUT were conducted within 24 hours after each verification. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was in the range $(22 \pm 2)^\circ\text{C}$, the relative humidity was in the range $(55 \pm 5) \% \text{ R.H.}$ and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

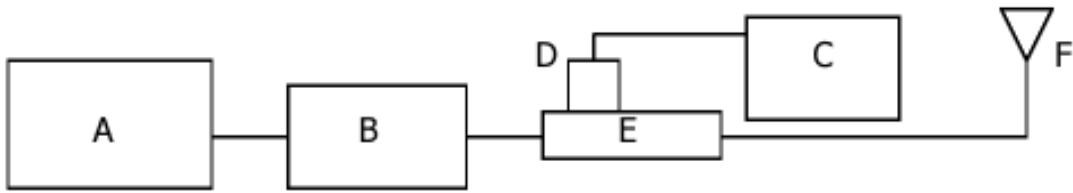


Fig b. The microwave circuit arrangement used for SAR system verification

- A. Agilent Model E4421B Signal Generator
- B. EMPOWER Model 2001-BBS3Q7ECK Amplifier
- C. Agilent Model E4419B Power Meter
- D. Agilent Model 9300H Power Sensor
- E. Agilent Model 86205A Directional RF Bridges
- F. Reference dipole Antenna



Photo of the dipole Antenna

System Verification Results

Verification Kit	Probe S/N	Tissue	Target SAR 1 g from Calibration Certificate (1 W)	Measured SAR 1 g (0.1 W)	Measured SAR 1 g (1 W)	Deviation (%)	Date	Liquid Temp. (°C)
D835V2 S/N: 490	3862	835 MHz Head	9.39 W/kg	0.912 W/kg	9.12 W/kg	-2.88	02/08/2013	22.9
D835V2 S/N: 490	3862	835 MHz Body	9.35 W/kg	0.986 W/kg	9.86 W/kg	5.45	02/09/2013	22.8
D1900V2 S/N: 5d033	3862	1900 MHz Head	39.4 W/kg	3.92 W/kg	39.20 W/kg	-0.51	02/07/2013	22.5
D1900V2 S/N: 5d033	3862	1900 MHz Body	39.9 W/kg	4.33 W/kg	43.30 W/kg	8.52	02/07/2013	22.4
D2450V2 S/N: 734	3862	2450 MHz Head	52.8 W/kg	4.93 W/kg	49.30 W/kg	-6.63	02/09/2013	22.7
D2450V2 S/N: 734	3862	2450 MHz Body	50.2 W/kg	4.63 W/kg	46.30 W/kg	-7.77	02/08/2013	22.6

Table 1. Results system verification

1.13 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Speag Model DAK-3.5 Dielectric Probe in conjunction with Agilent E5070B Network Analyzer(300 kHz - 3 GHz) by using a procedure detailed in Section V.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			Permittivity	Conductivity	Simulated Tissue Temp(°C)
835	Head	Measured, 02/08/2013	41.77	0.90	22.9
		Recommended Limits	41.5	0.90	21.0 ~ 23.0
		Deviation(%)	<u>0.65</u>	<u>0.00</u>	-
	Body	Measured, 02/09/2013	54.37	0.94	22.8
		Recommended Limits	55.2	0.97	21.0 ~ 23.0
		Deviation(%)	<u>-1.50</u>	<u>-0.09</u>	-
1900	Head	Measured, 02/07/2013	40.19	1.41	22.5
		Recommended Limits	40.0	1.40	21.0 ~ 23.0
		Deviation(%)	<u>0.48</u>	<u>0.71</u>	-
	Body	Measured, 02/07/2013	52.23	1.57	22.4
		Recommended Limits	53.3	1.52	21.0 ~ 23.0
		Deviation(%)	<u>-2.00</u>	<u>3.29</u>	-
2450	Head	Measured, 02/09/2013	38.52	1.81	22.7
		Recommended Limits	39.2	1.80	21.0 ~ 23.0
		Deviation(%)	<u>-1.73</u>	<u>0.56</u>	-
	Body	Measured, 02/08/2013	50.75	1.92	22.6
		Recommended Limits	52.7	1.95	21.0 ~ 23.0
		Deviation(%)	<u>-3.70</u>	<u>-1.54</u>	-

The composition of the brain tissue simulating liquid

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99 +% Pure Sodium Chloride

Sugar: 98 +% Pure Sucrose

Water: De-ionized, 16 MΩ⁺ 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

1.14 Test System Validation

Per FCC KDB 865664 D02v01, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the require tissue-equivalent media for system validation, according to the procedures outlined in IEEE 1528-2003 and FCC KDB 865664 D01v01. Since frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probe and tissue dielectric parameters has been included.

f (MHz)	Date	Probe S/N	Probe Cal point	Tissue Type	Dielectric Parameters		CW Validation			Modulated Validation		
					Permitt ivity	Condu ctivity	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR
835	02/08/2013	3862	835	Head	41.77	0.90	PASS	PASS	PASS	GMSK	PASS	N/A
1900	02/07/2013	3862	1900	Head	40.19	1.41	PASS	PASS	PASS	GMSK	PASS	N/A
2450	02/09/2013	3862	2450	Head	38.52	1.81	PASS	PASS	PASS	OFDM	N/A	PASS
835	02/08/2013	3862	835	Body	54.37	0.94	PASS	PASS	PASS	GMSK	PASS	N/A
1900	02/07/2013	3862	1900	Body	52.23	1.57	PASS	PASS	PASS	GMSK	PASS	N/A
2450	02/08/2013	3862	2450	Body	50.75	1.92	PASS	PASS	PASS	OFDM	N/A	PASS

< SAR System Validation Summary >

1.15 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (“SAR”) in Section 4.2 of “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” ANSI/IEEE C95.3–2003, Copyright 2003 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in “Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields,” NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz

should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .4)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR (Partial)	1.60 m W/g	8.00 m W/g
Partial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Partial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

Table .2 RF exposure limits

2. Instruments List

Maunfacturer	Device	Type	Serial Number	Cal Date	Cal Interval	Cal Due
Stäubli	Robot	RX90BL	F12/5LP8A1/01	N/A	N/A	N/A
Schmid& Partner Engineering AG	Dosimetric E-Field Probe	EX3DV4	3862	02/04/2013	Annual	02/04/2014
Schmid& Partner Engineering AG	835 Mhz System Validation Dipole	D835V2	490	05/16/2012	Biennial	05/16/2014
Schmid& Partner Engineering AG	1900 Mhz System Validation Dipole	D1900V2	5d033	05/23/2012	Biennial	05/23/2014
Schmid& Partner Engineering AG	2450 Mhz System Validation Dipole	D2450V2	734	05/17/ 2012	Biennial	05/17/ 2014
Schmid& Partner Engineering AG	Data acquisition Electronics	DAE4	1340	07/10/2012	Annual	07/10/2013
Schmid& Partner Engineering AG	Software	DASY52 V52.8.02	-	N/A	N/A	N/A
Schmid& Partner Engineering AG	Phantom	SAM Phantom V4.0	TP-1720 TP-1721	N/A	N/A	N/A
Agilent	Network Analyzer	E5070B	MY42100282	01/03/2013	Annual	01/03/2014
Schmid& Partner Engineering AG	Dielectric Assessment Kit	DAK-3.5	1046	4/3/2012	Annual	04/03/13
Agilent	Power Meter	E4419B	GB43311125	07/01/2012	Annual	07/01/2013
Agilent	Power Sensor	E9300H	MY41495314	09/18/2012	Annual	09/18/2013
			MY41495307	09/18/2012	Annual	09/18/2013
Agilent	Signal Generator	E4421B	MY42082477	03/29/2012	Annual	03/29/2013
Empower RF Systems	Power Amplifier	2001-BBS3Q7ECK	1032 D/C 0336	03/31/2012	Annual	03/31/2013
Agilent	Directional RF Bridges	86205A	MY31402302	07/03/2012	Annual	07/03/2013
Microlab	LP Filter	LA-15N LA-30N	N/A	09/14/2012	Annual	09/14/2013
R & S	Spectrum Analyzer	FSV30	100768	03/29/2012	Annual	03/29/2013
Agilent	Attenuator	8491B	50566	09/14/2012	Annual	09/14/2013
Agilent	8960 Series 10 Wireless Communications Test SEL	5155C	GB43345198	03/29/2012	Annual	03/29/2013

3.Summary of Results

3.1 FCC Power Measurement Procedures

Power measurements were performed using a base station simulator under digital average power.

The handset was placed into a simulated call using a base station simulator in shielded chamber. SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5 % occurred, the tests were repeated.

3.2 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. Test highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r02.

3.3 RF Conducted Power

GSM

GSM	Channel	Frequency(MHz)	Burst-Conducted Average Power(dB m)				
			GSM	GPRS			
				1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM 850 Band	128	824.2	33.00	32.95	30.60	29.13	28.18
	190	836.6	33.04	33.01	30.62	29.12	28.17
	251	848.8	33.07	33.05	30.65	29.11	28.17
PCS 1900 Band	512	1850.2	29.99	29.98	27.67	26.16	25.19
	661	1880.0	29.95	29.94	27.53	25.97	25.08
	810	1909.8	29.91	29.89	27.43	25.86	24.91

GSM	Channel	Frequency(MHz)	Calculated Frame-Conducted Average Power(dB m)				
			GSM	GPRS			
				1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM 850 Band	128	824.2	23.97	23.92	24.58	24.87	25.17
	190	836.6	24.01	23.98	24.60	24.86	25.16
	251	848.8	24.04	24.02	24.63	24.85	25.16
PCS 1900 Band	512	1850.2	20.96	20.95	21.65	21.90	22.18
	661	1880.0	20.92	20.91	21.51	21.71	22.07
	810	1909.8	20.88	20.86	21.41	21.60	21.90

WCDMA V

Band	Mode	Channel	Frequency (MHz)	Conducted Power (dBm)		
WCDMA V (RMC)	RMC	4132	826.4	23.13		
	RMC	4183	836.6	23.08		
	RMC	4233	846.6	23.04		
WCDMA V (HSDPA Active)	Sub-test 1	4132	826.4	23.11		
		4183	836.6	23.06		
		4233	846.6	23.01		
	Sub-test 2	4132	826.4	22.14		
		4183	836.6	22.06		
		4233	846.6	22.04		
	Sub-test 3	4132	826.4	21.67		
		4183	836.6	21.60		
		4233	846.6	21.52		
	Sub-test 4	4132	826.4	21.66		
		4183	836.6	21.58		
		4233	846.6	21.45		
			β_c	β_d	$\Delta ACK, \Delta NACK, \Delta CQI$	AGV
	Sub-test 1	2	15	8	-	
	Sub-test 2	12	15	8	-	
	Sub-test 3	15	8	8	-	
Sub-test 4	15	4	8	-		
WCDMA V (HSUPA)	Sub-test 1	4132	826.4	21.00		
		4183	836.6	20.93		
		4233	846.6	20.91		
	Sub-test 2	4132	826.4	20.02		
		4183	836.6	19.92		
		4233	846.6	19.92		
	Sub-test 3	4132	826.4	20.45		
		4183	836.6	20.43		
		4233	846.6	20.45		
	Sub-test 4	4132	826.4	21.01		
		4183	836.6	20.94		
		4233	846.6	20.92		
	Sub-test 5	4132	826.4	22.98		
		4183	836.6	22.95		
		4233	846.6	22.89		
			β_c	β_d	$\Delta ACK, \Delta NACK, \Delta CQI$	AGV
Sub-test 1	11	15	8	20		
Sub-test 2	6	15	8	12		
Sub-test 3	15	9	8	15		
Sub-test 4	2	15	8	17		
Sub-test 5	15	15	8	21		

Bluetooth

Channel	Frequency (MHz)	GFSK (dB m)	8DPSK (dB m)
Low	2402	3.24	0.75
Middle	2441	3.16	0.78
High	2480	2.62	0.26

WLAN

802.11b Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dB m)
2412	1	1	15.21
		2	15.10
		5.5	15.16
		11	14.94
2437	6	1	15.90
		2	15.76
		5.5	15.65
		11	15.54
2462	11	1	16.00
		2	16.34
		5.5	16.10
		11	15.62

802.11g Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dB m)
2412	1	6	12.13
		9	12.01
		12	11.91
		18	11.71
		24	11.54
		36	11.23
		48	10.96
		54	10.85
2437	6	6	12.25
		9	12.11
		12	12.01
		18	11.82
		24	11.61
		36	11.33
		48	11.04
		54	10.95
2462	11	6	12.43
		9	12.28
		12	12.18
		18	11.98
		24	11.79
		36	11.50
		48	11.20
	54	11.11	

802.11n_HT20 Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dB m)
2412	1	MCS0	10.32
		MCS1	10.10
		MCS2	10.33
		MCS3	10.14
		MCS4	9.86
		MCS5	9.61
		MCS6	9.10
2437	6	MCS7	8.40
		MCS0	10.84
		MCS1	10.61
		MCS2	10.42
		MCS3	10.24
		MCS4	9.95
		MCS5	9.68
2462	11	MCS6	9.13
		MCS7	8.99
		MCS0	10.94
		MCS1	10.73
		MCS2	10.53
		MCS3	10.33
		MCS4	10.04
MCS5	9.78		
MCS6	9.70		
MCS7	9.57		

802.11n_HT40 Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dB m)
2422	1	MCS0	9.75
		MCS1	9.70
		MCS2	9.38
		MCS3	9.11
		MCS4	8.66
		MCS5	8.20
		MCS6	8.38
2437	6	MCS7	8.22
		MCS0	10.35
		MCS1	9.95
		MCS2	10.05
		MCS3	9.35
		MCS4	8.88
		MCS5	9.03
2452	11	MCS6	8.58
		MCS7	8.44
		MCS0	10.67
		MCS1	10.30
		MCS2	10.26
		MCS3	10.01
		MCS4	9.60
MCS5	9.25		
MCS6	8.82		
MCS7	8.70		

3.4 SAR Test Exclusions Applied

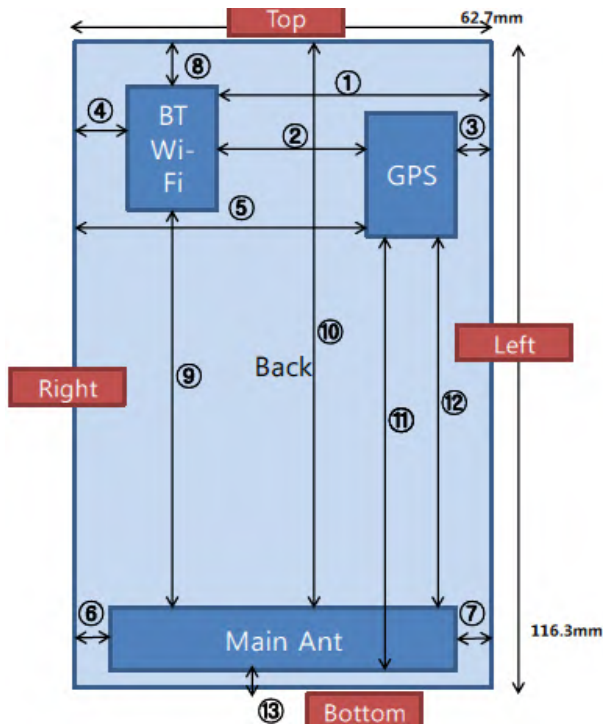
Per FCC KDB 447498 D01v05, the SAR exclusion threshold for distances < 50 mm is defined by the following equation:

$$\frac{\text{Max Power of Channel (mW)}}{\text{Test Separation Distance (mm)}} * \sqrt{\text{Frequency(GHz)}} \leq 3.0$$

Based on the maximum tune-up tolerance limit of Bluetooth & 2.45 GHz WLAN and the antenna to use separation distance,

Bluetooth SAR was not required: $(2.11/5 * \sqrt{2.402} = 0.654 < 3.0)$

<The Distance information of Antenna to Edges of EUT>



NO.	distance (mm)
1	46.46
2	25.01
3	4.46
4	4.75
5	40.62
6	1.18
7	1.18
8	3.68
9	87.17
10	106.01
11	85.56
12	79.16
13	1.09

3.5 SAR Data Summary

Ambient Temperature (°C)	23.9
Liquid Temperature (°C)	22.9
Date	02/08/2013

GSM850 Head SAR

Test Mode	EUT Position	Traffic Channel		Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
		Frequency (MHz)	Channel							
GSM	Right Cheek	836.6	190	33.04	33.20	0.04	0.336	1.038	0.349	1.6
	Right Tilt	836.6	190	33.04	33.20	-0.01	0.234	1.038	0.243	
	Left Cheek	836.6	190	33.04	33.20	-0.03	0.373	1.038	0.387	
	Left Tilt	836.6	190	33.04	33.20	0.02	0.230	1.038	0.239	
GPRS 4 Tx	Right Cheek	836.6	190	28.17	28.20	0.05	0.483	1.001	0.483	
	Right Tilt	836.6	190	28.17	28.20	-0.01	0.346	1.001	0.346	
	Left Cheek	836.6	190	28.17	28.20	0.11	0.522	1.001	0.523	
	Left Tilt	836.6	190	28.17	28.20	0.08	0.303	1.001	0.303	

Ambient Temperature (°C)	23.6
Liquid Temperature (°C)	22.8
Date	02/09/2013

GSM850 Body & Hotspot SAR

Test Mode	EUT Position	Slot	Traffic Channel		Distance (mm)	Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel								
GSM	Rear	-	836.6	190	10	33.04	33.20	-0.07	0.815	1.038	0.846	1.6
			842.2	128	10	33.00	33.20	-0.04	0.750	1.047	0.785	
			848.8	251	10	33.07	33.20	-0.03	0.838	1.030	0.863	
GPRS	Front	4 Tx	836.6	190	10	28.17	28.20	0.01	0.705	1.007	0.710	
	Rear	4 Tx	836.6	190	10	28.17	28.20	-0.02	1.11	1.007	1.118	
			842.2	128	10	28.18	28.20	0.01	1.09	1.005	1.095	
			848.8	251	10	28.17	28.20	-0.06	1.05	1.007	1.057	
	Left	4 Tx	836.6	190	10	28.17	28.20	-0.07	0.919	1.007	0.925	
			842.2	128	10	28.18	28.20	-0.06	0.761	1.005	0.765	
			848.8	251	10	28.17	28.20	-0.03	0.908	1.007	0.914	
	Right	4 Tx	836.6	190	10	28.17	28.20	0.04	0.853	1.007	0.859	
			842.2	128	10	28.18	28.20	0.00	0.731	1.005	0.735	
			848.8	251	10	28.17	28.20	0.02	0.906	1.007	0.912	
	Bottom	4 Tx	836.6	190	10	28.17	28.20	0.17	0.106	1.007	0.107	

PCS1900 Head SAR

Ambient Temperature (°C)	23.4
Liquid Temperature (°C)	22.5
Date	02/07/2013

Test Mode	EUT Position	Traffic Channel		Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
		Frequency (MHz)	Channel							
GSM	Right Cheek	1880.0	661	29.95	30.20	-0.09	0.393	1.059	0.416	1.6
	Right Tilt	1880.0	661	29.95	30.20	-0.06	0.170	1.059	0.180	
	Left Cheek	1880.0	661	29.95	30.20	-0.10	0.222	1.059	0.235	
	Left Tilt	1880.0	661	29.95	30.20	0.04	0.144	1.059	0.152	
GPRS 4 Tx	Right Cheek	1880.0	661	25.08	25.20	0.11	0.411	1.005	0.413	
	Right Tilt	1880.0	661	25.08	25.20	-0.04	0.161	1.005	0.162	
	Left Cheek	1880.0	661	25.08	25.20	0.16	0.201	1.005	0.202	
	Left Tilt	1880.0	661	25.08	25.20	-0.01	0.135	1.005	0.136	

Ambient Temperature (°C)	23.4
Liquid Temperature (°C)	22.4
Date	02/07/2013

PCS1900 Body & Hotspot SAR

Test Mode	EUT Position	Slot	Traffic Channel		Distance (mm)	Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel								
GSM	Rear	-	1880.0	661	10	29.95	30.20	0.10	0.450	1.059	0.477	1.6
GPRS	Front	4 Tx	1880.0	661	10	25.08	25.20	0.05	0.509	1.028	0.523	
	Rear	4 Tx	1880.0	661	10	25.08	25.20	-0.03	0.488	1.028	0.502	
	Left	4 Tx	1880.0	661	10	25.08	25.20	0.13	0.081	1.028	0.083	
	Right	4 Tx	1880.0	661	10	25.08	25.20	0.00	0.250	1.028	0.257	
	Bottom	4 Tx	1880.0	661	10	25.08	25.20	-0.01	0.208	1.028	0.214	

WCDMA FDD V Head SAR

Ambient Temperature (°C)	23.9
Liquid Temperature (°C)	22.9
Date	02/08/2013

EUT Position	Traffic Channel		Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
	Frequency (MHz)	Channel							
Right Cheek	836.4	4182	23.08	23.2	-0.06	0.360	1.028	0.370	1.6
Right Tilt	836.4	4182	23.08	23.2	0.10	0.241	1.028	0.248	
Left Cheek	836.4	4182	23.08	23.2	0.12	0.414	1.028	0.426	
Left Tilt	836.4	4182	23.08	23.2	0.09	0.230	1.028	0.236	

WCDMA FDD V Body & Hotspot SAR

Ambient Temperature (°C)	23.6
Liquid Temperature (°C)	22.8
Date	02/09/2013

Test Mode	EUT Position	Traffic Channel		Distance (mm)	Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
		Frequency (MHz)	Channel								
RMC	Front	836.4	4182	10	23.08	23.20	0.01	0.492	1.028	0.506	1.6
	Rear	836.4	4182	10	23.08	23.20	0.01	0.790	1.028	0.812	
	Left	836.4	4182	10	23.08	23.20	0.00	0.668	1.028	0.687	
	Right	836.4	4182	10	23.08	23.20	-0.01	0.632	1.028	0.650	
	Bottom	836.4	4182	10	23.08	23.20	-0.07	0.052	1.028	0.053	

WLAN Head SAR

Ambient Temperature (°C)	23.6
Liquid Temperature (°C)	22.7
Date	02/09/2013

Test Mode	EUT Position	Data Rate	Traffic Channel		Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel							
802.11b	Right Cheek	1	2462	11	16.00	16.50	-0.04	0.105	1.122	0.118	1.6
	Right Tilt	1	2462	11	16.00	16.50	0.04	0.076	1.122	0.085	
	Left Cheek	1	2462	11	16.00	16.50	-0.07	0.155	1.122	0.174	
	Left Tilt	1	2462	11	16.00	16.50	0.11	0.114	1.122	0.128	
	Right Cheek	2	2462	11	16.34	16.50	-0.06	0.092	1.038	0.095	
	Right Tilt	2	2462	11	16.34	16.50	-0.03	0.075	1.038	0.078	
	Left Cheek	2	2462	11	16.34	16.50	0.13	0.151	1.038	0.157	
	Left Tilt	2	2462	11	16.34	16.50	0.04	0.110	1.038	0.114	

Ambient Temperature (°C)	23.9
Liquid Temperature (°C)	22.6
Date	02/08/2013

WLAN Body & Hotspot SAR

Test Mode	EUT Position	Data Rate	Traffic Channel		Distance (mm)	Measured Power [dB m]	Tune-Up Limit [dB m]	Power Drift(dB)	1 g SAR (W/kg)	Scaling Factor	Scaling SAR (1g)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel								
802.11b	Front	1	2462	11	10	16.00	16.50	-0.03	0.027	1.122	0.030	1.6
	Rear	1	2462	11	10	16.00	16.50	0.09	0.076	1.122	0.085	
	Right	1	2462	11	10	16.00	16.50	0.10	0.046	1.122	0.052	
	Top	1	2462	11	10	16.00	16.50	0.05	0.031	1.122	0.035	
	Front	2	2462	11	10	16.34	16.50	0.15	0.026	1.038	0.027	
	Rear	2	2462	11	10	16.34	16.50	-0.08	0.075	1.038	0.078	
	Right	2	2462	11	10	16.34	16.50	0.18	0.045	1.038	0.047	
	Top	2	2462	11	10	16.34	16.50	0.06	0.030	1.038	0.031	

SAR Test Notes

General Notes :

- The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC/OET Bulletin 65, Supplement C [June 2001] and FCC KDB Publication 447498 D01v05.
- All modes of operation were investigated, and worst-case results are reported.
- Battery is fully charged for all readings and the standard batteries are the only options.

4. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
7. Per FCC KDB Publication 648474 D04v01, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
8. Per FCC KDB Publication 865664 D01v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see section 3.7 for variability analysis.

GSM Test Notes :

1. Justification for reduced test configurations per KDB Publication 941225 Dv03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR.
2. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> 1/2$ dB, instead of the middle channel, the highest output power channel must be used.

WCDMA Notes :

1. WCDMA mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> 1/2$ dB, instead of the middle channel, the highest output power channel must be used.

WLAN Notes :

1. Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes.
2. WLAN transmission was verified using a spectrum analyzer.
3. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is < 1.6 W/kg and the reported 1g averaged SAR is < 0.8 W/kg, SAR testing on other default channels was not required.

3.6 FCC Multi-TX SAR considerations

3.6.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as Bluetooth devices which may simultaneously transmit with the licensed transmitter.

3.6.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1,iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. When standalone SAR is not required to be measured per FCC KDB 447498 D01v05 4.3.2.2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(\text{GHz})}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Mode	Frequency	Maximum Allowed Power	Separation Distance	Estimated SAR
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	3.70	10	0.049

<Tablet.3 Estimated SAR >

3.6.3 The Simultaneous Transmission possibilities are listed as below

No	Capable TX Configuration	Head SAR	Body SAR
1	WWAN (GSM850, PCS1900, WCDMA V) + WLAN 2.4 GHz	O	O
2	WWAN (GSM850, PCS1900, WCDMA V) + Bluetooth	X	O
3	WWAN (GSM850, PCS1900, WCDMA V) + WLAN 2.4 GHz + Bluetooth	X	X

3.6.4 Head SAR Simultaneous Transmission Analysis

Simultaneous Transmission Summation Scenario with 2.45GHz WLAN (Head to Ear)

Simultaneous TX	Configuration	GSM850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Head	Right Touch	0.349	0.118	0.467
	Right Tilt	0.243	0.085	0.328
	Left Touch	0.387	0.174	0.561
	Left Tilt	0.239	0.128	0.367
	Configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.416	0.118	0.534
	Right Tilt	0.180	0.085	0.265
	Left Touch	0.235	0.174	0.409
	Left Tilt	0.152	0.128	0.280
	Configuration	GPRS850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.483	0.118	0.601
	Right Tilt	0.346	0.085	0.431
	Left Touch	0.523	0.174	0.697
	Left Tilt	0.303	0.128	0.431
	Configuration	GPRS1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.413	0.118	0.531
	Right Tilt	0.162	0.085	0.247
	Left Touch	0.202	0.174	0.376
	Left Tilt	0.136	0.128	0.264
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Right Touch	0.370	0.118	0.488	
Right Tilt	0.248	0.085	0.333	
Left Touch	0.426	0.174	0.600	
Left Tilt	0.236	0.128	0.364	

3.6.5 Body SAR Simultaneous Transmission Analysis

Simultaneous Transmission Summation Scenario with 2.45GHz WLAN (Body-Worn at 10mm)

Simultaneous TX	configuration	GSM850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Body	Rear	0.863	0.085	0.948
	configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Rear	0.477	0.085	0.562
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Rear	0.812	0.085	0.897

Simultaneous Transmission Summation Scenario with Bluetooth (Body-Worn at 10mm)

Simultaneous TX	configuration	GSM850 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
Body	Rear	0.863	0.049	0.912
	configuration	GSM1900 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Rear	0.477	0.049	0.526
	configuration	WCDMA V SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Rear	0.812	0.049	0.861

3.6.6 Hotspot SAR Simultaneous Transmission Analysis

Simultaneous Transmission Summation Scenario with 2.45GHz WLAN (Body-Worn at 10mm)

Simultaneous TX	configuration	GPRS850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Hotspot SAR	Front	0.710	0.030	0.740
	Rear	1.118	0.085	1.203
	Left	0.925	-	0.925
	Right	0.912	0.052	0.964
	Bottom	0.107	-	0.107
	Top	-	0.035	0.035
	configuration	GPRS1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Front	0.523	0.030	0.553
	Rear	0.502	0.085	0.587
	Left	0.083	-	0.083
	Right	0.257	0.052	0.309
	Bottom	0.214	-	0.214
	Top	-	0.035	0.035
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Front	0.506	0.030	0.536
	Rear	0.812	0.085	0.897
	Left	0.687	-	0.687
	Right	0.650	0.052	0.702
	Bottom	0.053	-	0.053
	Top	-	0.035	0.035

Simultaneous Transmission Summation Scenario with Bluetooth (Body-Worn at 10mm)

Simultaneous TX	configuration	GPRS850 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
Body SAR	Front	0.710	0.049	0.759
	Rear	1.118	0.049	1.167
	Left	0.925	-	0.925
	Right	0.912	0.049	0.961
	Bottom	0.107	-	0.107
	Top	-	0.049	0.049
	configuration	GPRS1900 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Front	0.523	0.049	0.572
	Rear	0.502	0.049	0.551
	Left	0.083	-	0.083
	Right	0.257	0.049	0.306
	Bottom	0.214	-	0.214
	Top	-	0.049	0.049
	configuration	WCDMA V SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Front	0.506	0.049	0.555
	Rear	0.812	0.049	0.861
	Left	0.687	-	0.687
	Right	0.650	0.049	0.650
	Bottom	0.053	-	0.053
	Top	-	0.049	0.049

Notes.

1. The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. Therefore, no volumetric SAR summation is required since the numerical sums are below the limit.
2. Bluetooth SAR was not required to be measured per KDB 447498D01v05
3. Hotspot Mode Per FCC KDB Publication 941225 D06v01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

3.7 Repeated SAR Measurement

Test Mode	EUT Position	Traffic Channel		Distance (mm)	Measured 1 g SAR (W/kg)	1 st Repeated 1 g SAR (W/kg)	Deviation (%)
		Frequency (Mhz)	Channel				
GPRS	Rear(4Tx)	836.6	190	10	1.11	1.00	-9.91

<Note>

1. Per KDB 865664 D01v01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg.
2. Per KDB 865664 D01v01, if the deviation among the repeated measurement is $\leq 20\%$ and the measured SAR < 1.45 W/kg, only one repeated measurement is required.
3. The deviation is the difference in percentage between original and repeated measured SAR.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

Appendix

List

Appendix A	DASY5 Report (Plots of the SAR Measurements)	- 835 MHz, 1900 MHz, 2450 MHz Verification Test - GSM850 Test - PCS1900 Test - WLAN Test
Appendix B	Uncertainty Analysis	
Appendix C	Calibration Certificate	- PROBE - DAE - DIPOLE



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Appendix A

Test Plot - DASY5 Report

835 MHz Verification Test_Head

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [850MHz System Verification.da53:0](#)

Input Power : 100 mW

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:490

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.896 \text{ S/m}$; $\epsilon_r = 41.766$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

System Verification/850MHz System Verification/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.14 W/kg

System Verification/850MHz System Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

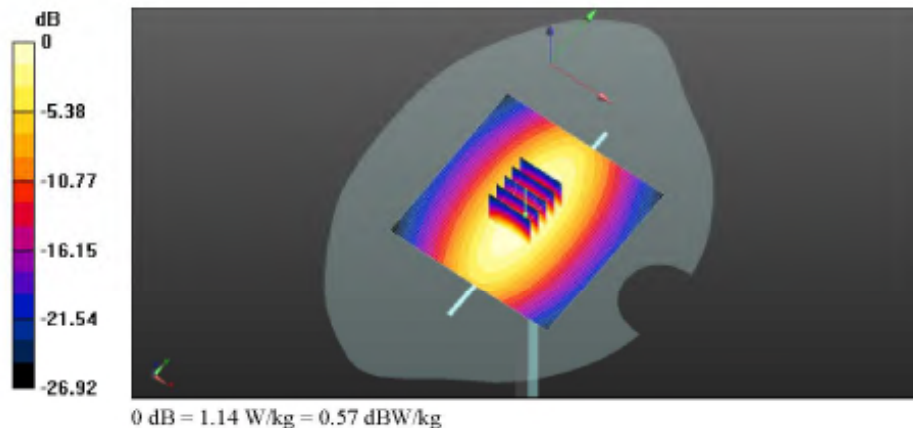
dx=8mm, dy=8mm, dz=5mm

Reference Value = 36.474 V/m; Power Drift = 0.00 dB

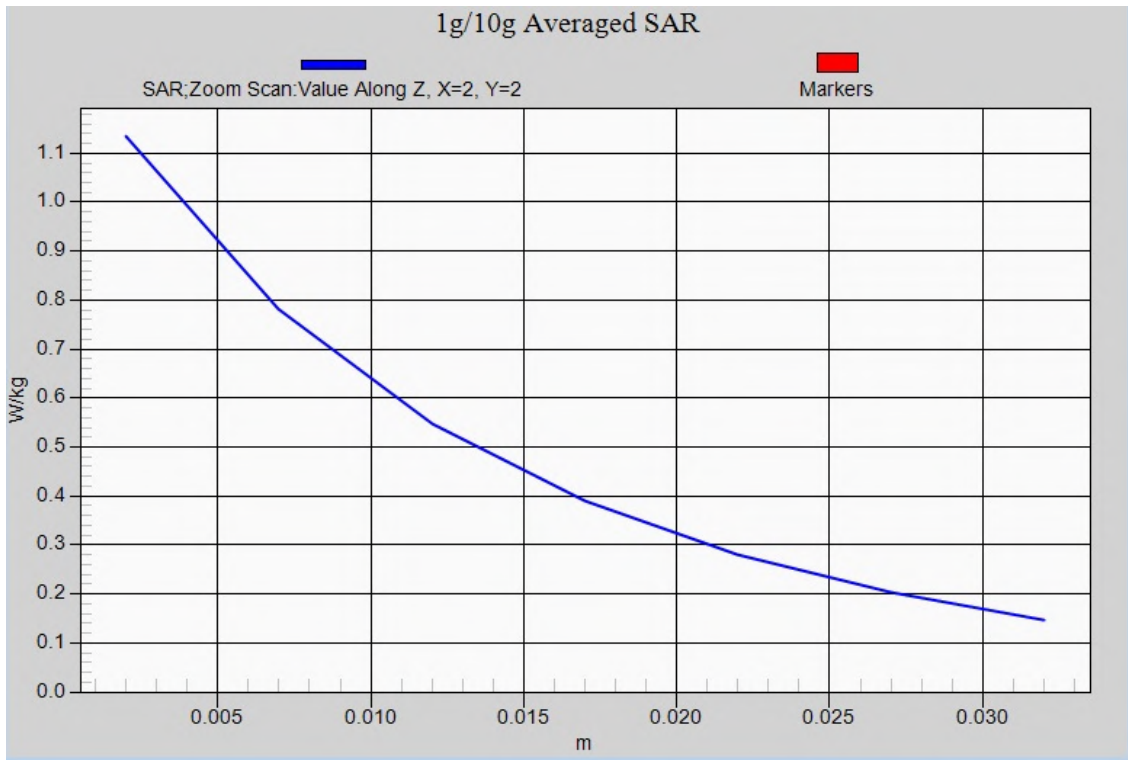
Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.912 W/kg; SAR(10 g) = 0.606 W/kg

Maximum value of SAR (measured) = 1.14 W/kg



Z Scan



835 MHz Verification Test_Body

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [850MHz System Verification.da53:0](#)

Input Power : 100 mW

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:490

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.942 \text{ S/m}$; $\epsilon_r = 54.371$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

System Verification/850MHz System Verification/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.24 W/kg

System Verification/850MHz System Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

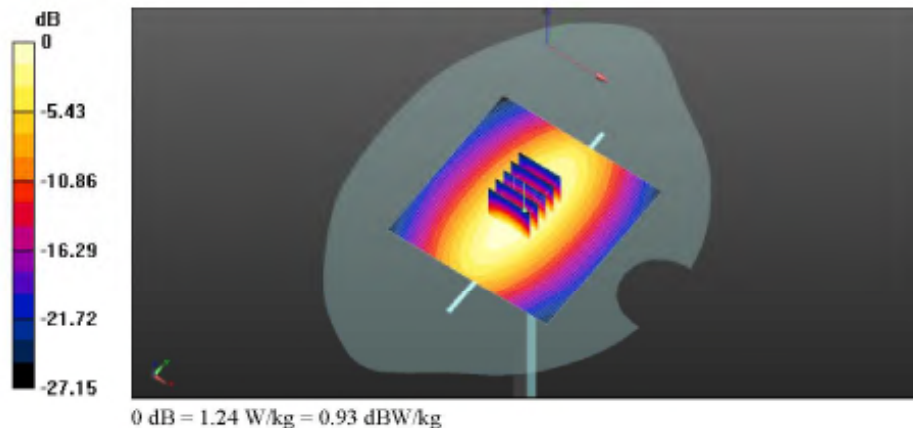
dx=8mm, dy=8mm, dz=5mm

Reference Value = 37.577 V/m; Power Drift = -0.11 dB

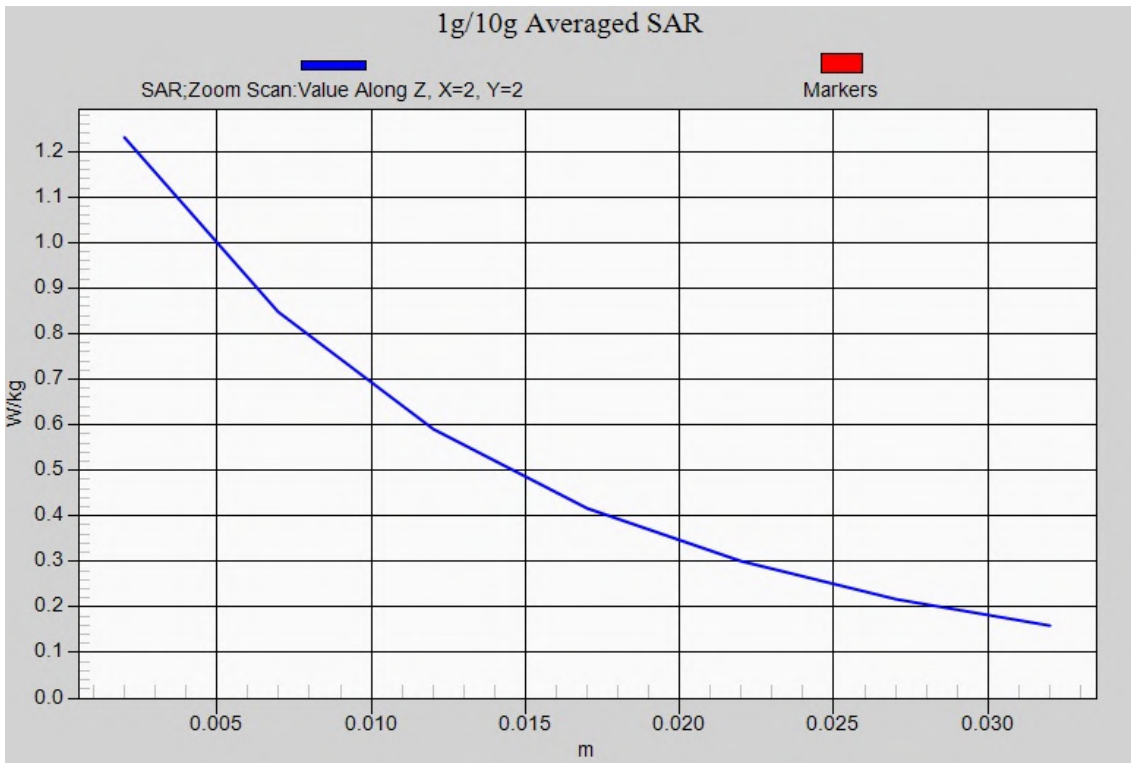
Peak SAR (extrapolated) = 1.43 W/kg

SAR(1 g) = 0.986 W/kg; SAR(10 g) = 0.655 W/kg

Maximum value of SAR (measured) = 1.23 W/kg



Z Scan



1900 MHz Verification Test_Head

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [1900MHz System Verification.da53-0](#)

Input Power : 100 mW

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d033

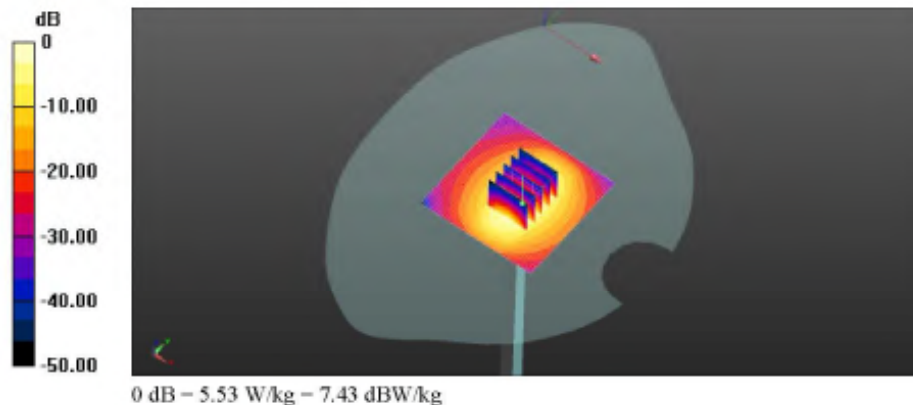
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.41$ S/m; $\epsilon_r = 40.188$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

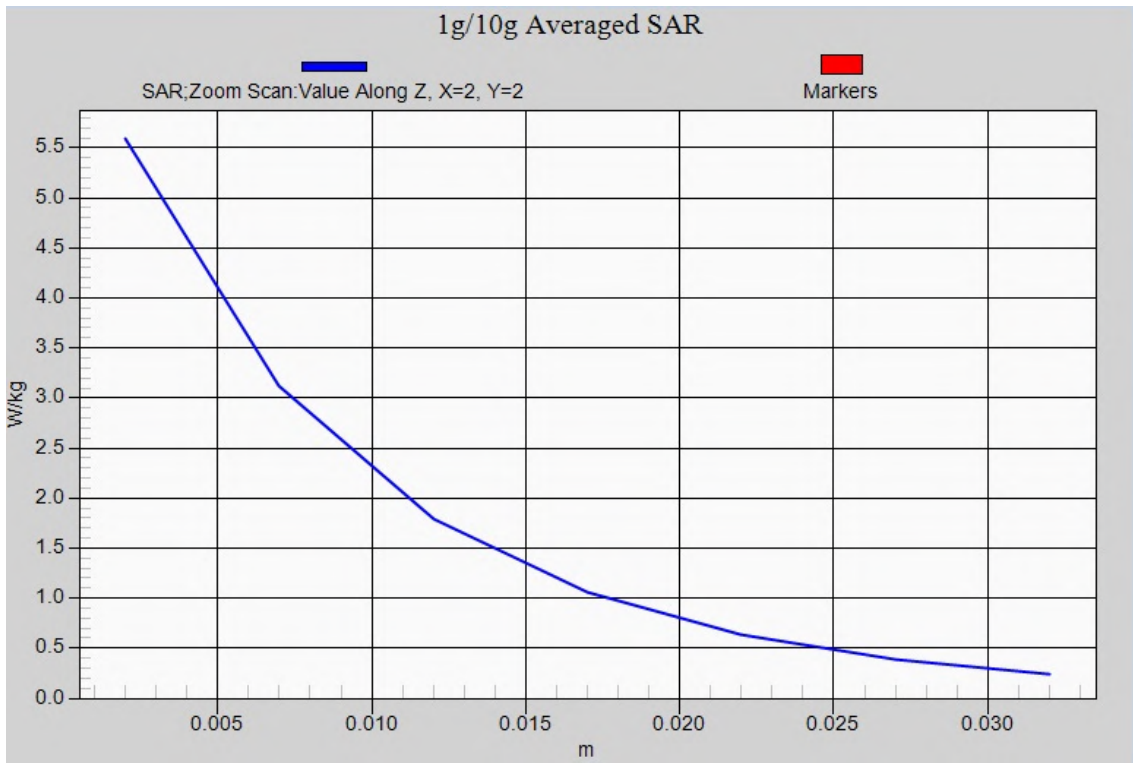
- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

System Verification/1900MHz System Verification/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 5.53 W/kg

System Verification/1900MHz System Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 53.583 V/m; Power Drift = -0.08 dB
 Peak SAR (extrapolated) = 7.05 W/kg
SAR(1 g) = 3.92 W/kg; SAR(10 g) = 2.06 W/kg
 Maximum value of SAR (measured) = 5.60 W/kg



Z Scan



1900 MHz Verification Test_Body

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [1900MHz System Verification.da53-0](#)

Input Power : 100 mW

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d033

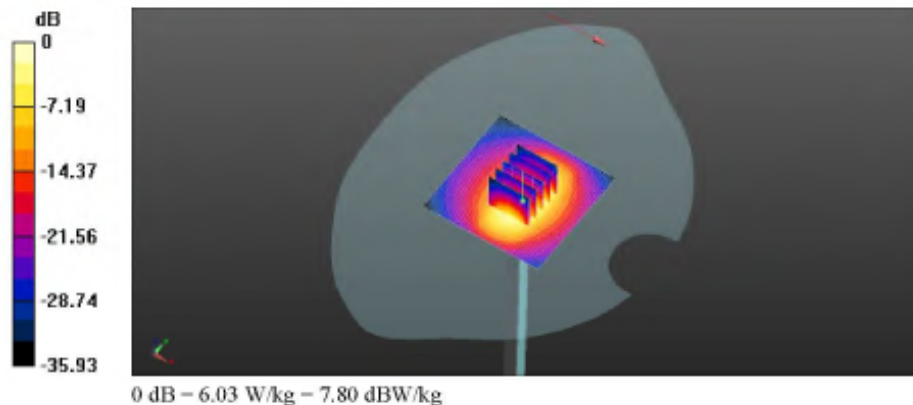
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.565$ S/m; $\epsilon_r = 52.232$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

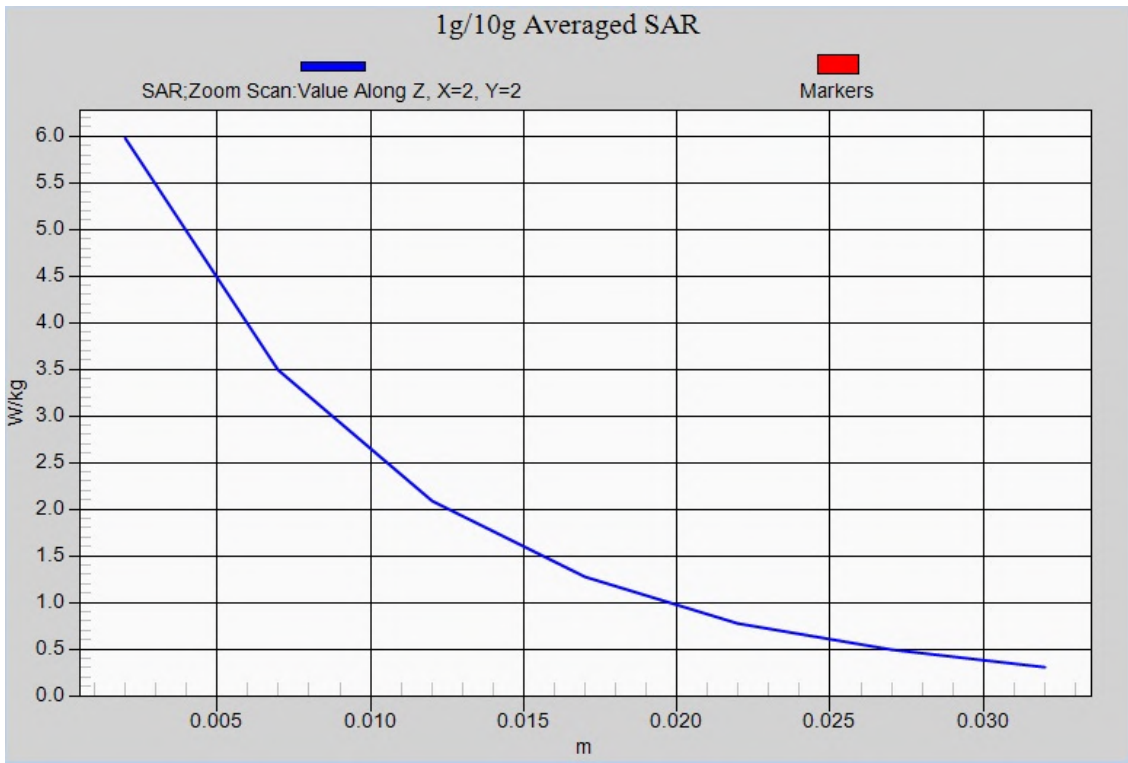
- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

System Verification/1900MHz System Verification/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 6.03 W/kg

System Verification/1900MHz System Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 53.465 V/m; Power Drift = -0.14 dB
 Peak SAR (extrapolated) = 7.59 W/kg
SAR(1 g) = 4.33 W/kg; SAR(10 g) = 2.29 W/kg
 Maximum value of SAR (measured) = 5.99 W/kg



Z Scan



2450 MHz Verification Test_Head

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2450MHz System Verification.da53-0](#)

Input Power : 100 mW

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: 734

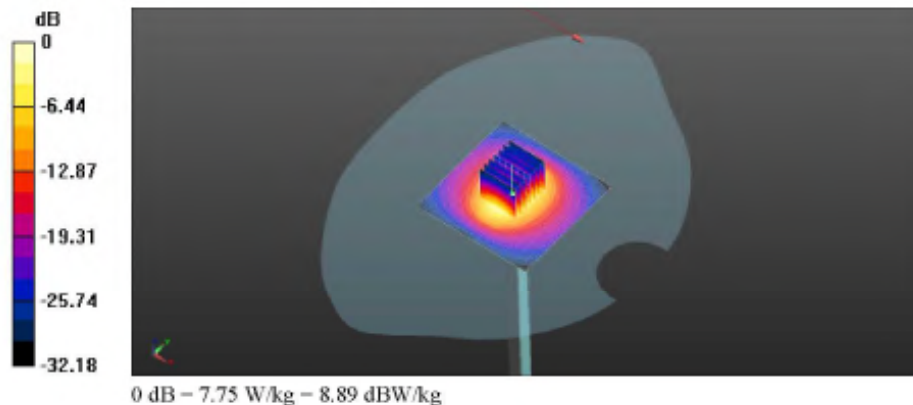
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.813$ S/m; $\epsilon_r = 38.519$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

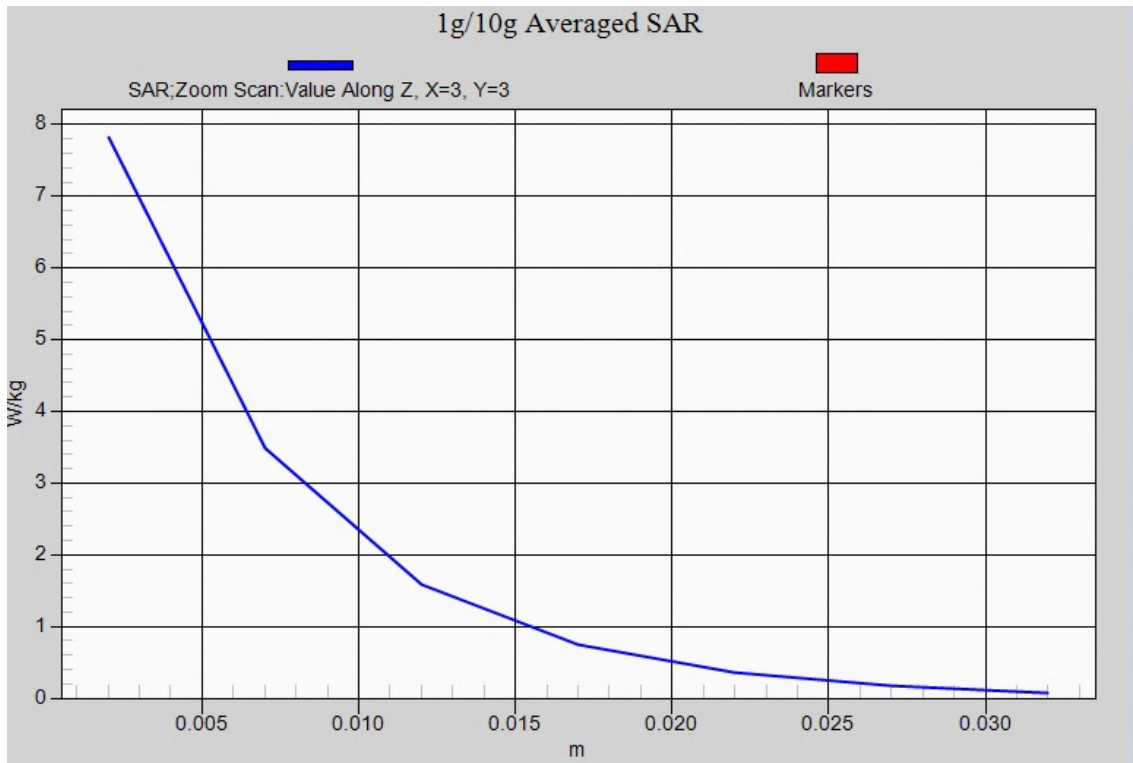
- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

2450MHz System Verification/2450MHz System Verification/Area Scan (91x91x1): Interpolated grid:
 $dx=1.000$ mm, $dy=1.000$ mm
 Maximum value of SAR (interpolated) = 7.75 W/kg

2450MHz System Verification/2450MHz System Verification/Zoom Scan (7x7x7)/Cube 0:
 Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
 Reference Value = 66.273 V/m; Power Drift = 0.01 dB
 Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 4.93 W/kg; SAR(10 g) = 2.22 W/kg
 Maximum value of SAR (measured) = 7.83 W/kg



Z-Scan



2450 MHz Verification Test_Body

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2450MHz System Verification.da53-0](#)

Input Power : 100 mW

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: 734

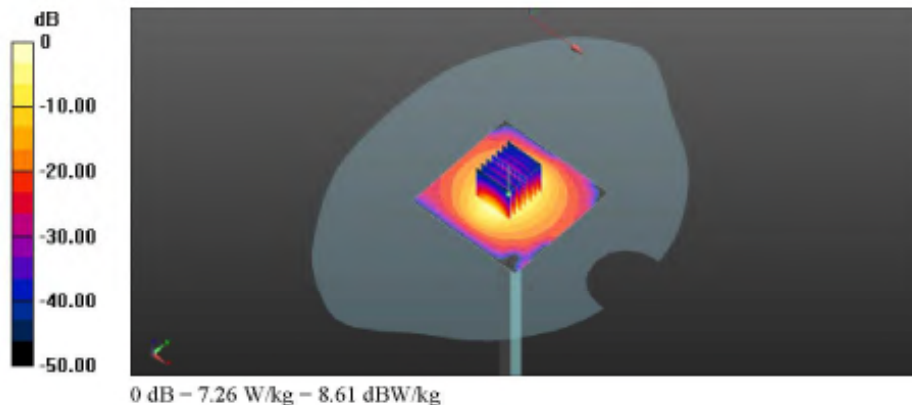
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.923$ S/m; $\epsilon_r = 50.746$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

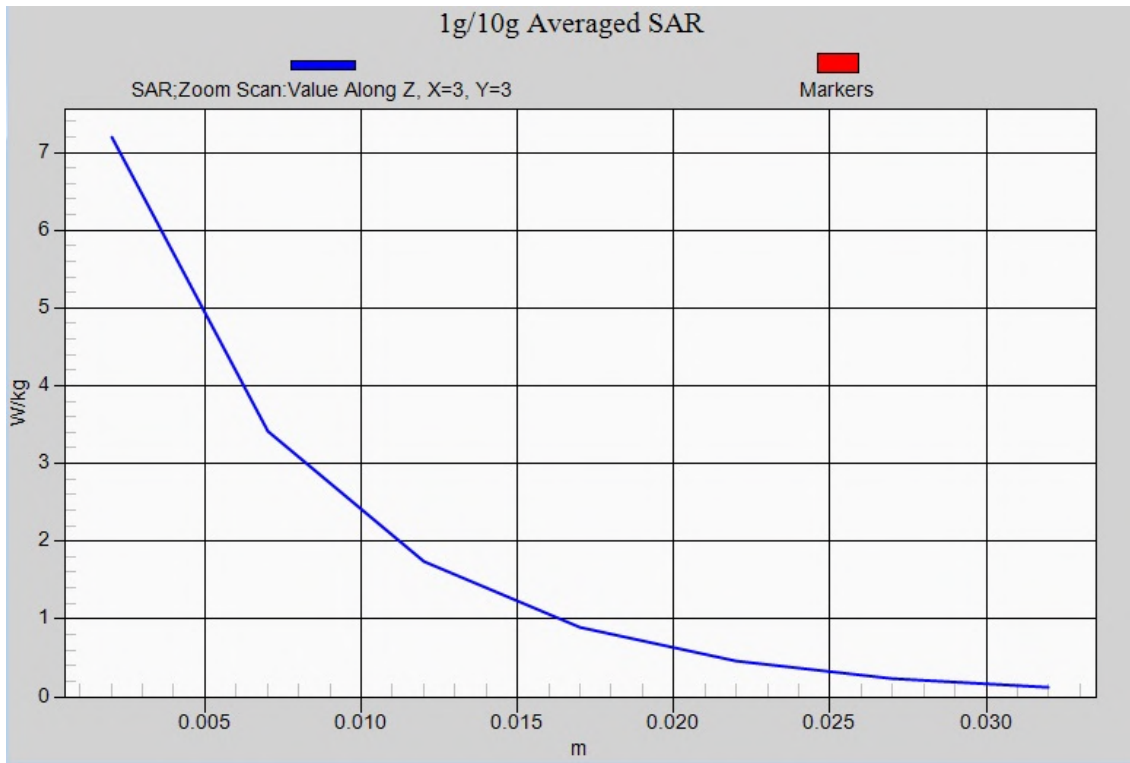
- Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

2450MHz System Verification/2450MHz System Verification/Area Scan (91x91x1): Interpolated grid:
 $dx=1.000$ mm, $dy=1.000$ mm
 Maximum value of SAR (interpolated) = 7.26 W/kg

2450MHz System Verification/2450MHz System Verification/Zoom Scan (7x7x7)/Cube 0:
 Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
 Reference Value = 60.175 V/m; Power Drift = 0.05 dB
 Peak SAR (extrapolated) = 9.93 W/kg
SAR(1 g) = 4.63 W/kg; SAR(10 g) = 2.11 W/kg
 Maximum value of SAR (measured) = 7.21 W/kg



Z-Scan



GSM 850 Head SAR Test

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Right Touch_CH190.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GSM850_Right Touch_CH190/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.389 W/kg

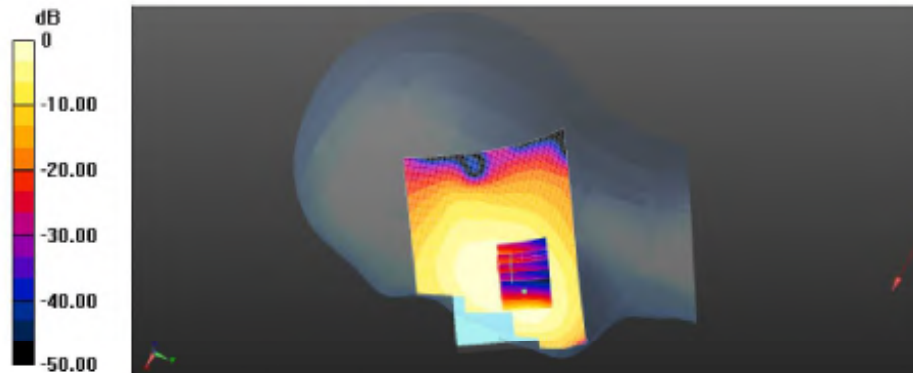
Head/GSM850_Right Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.443 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.433 W/kg

SAR(1 g) = 0.336 W/kg; SAR(10 g) = 0.240 W/kg

Maximum value of SAR (measured) = 0.389 W/kg



0 dB = 0.389 W/kg = -4.10 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Right Tilt_CH190.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GSM850_Right Tilt_CH190/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.272 W/kg

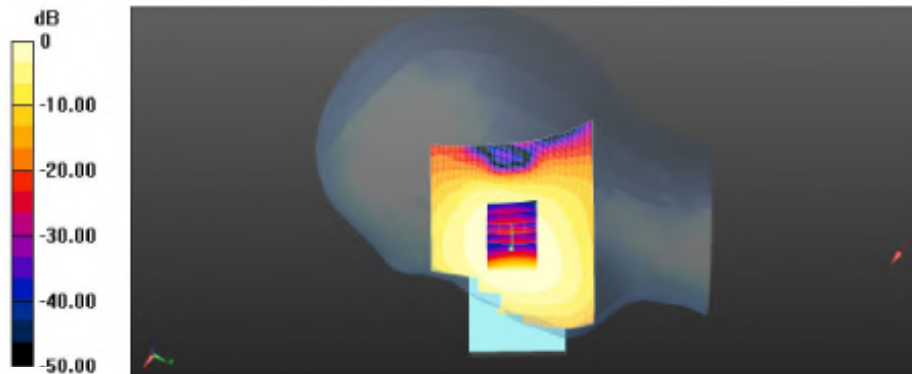
Head/GSM850_Right Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.356 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.287 W/kg

SAR(1 g) = 0.234 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.263 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Left Touch_CH190.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GSM850_Left Touch_CH190/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.423 W/kg

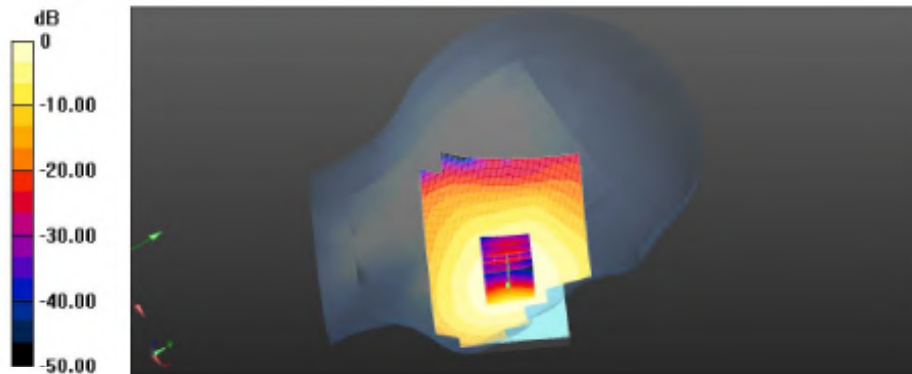
Head/GSM850_Left Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.606 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.452 W/kg

SAR(1 g) = 0.373 W/kg; SAR(10 g) = 0.284 W/kg

Maximum value of SAR (measured) = 0.419 W/kg



0 dB = 0.423 W/kg = -3.74 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Left Tilt_CH190.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

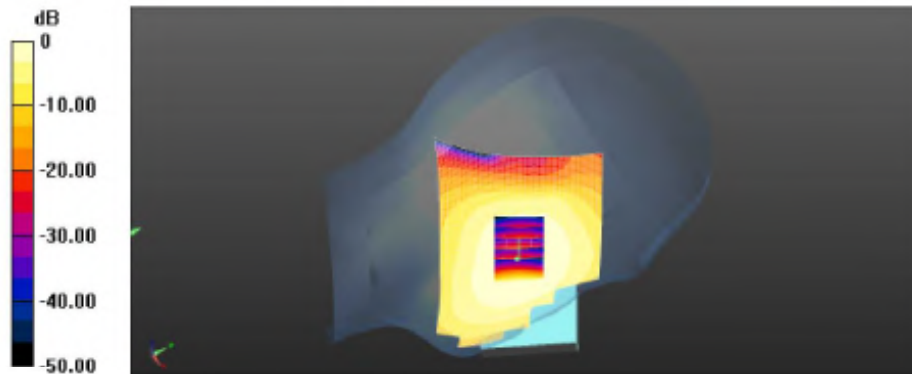
Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GSM850_Left Tilt_CH190/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.265 W/kg

Head/GSM850_Left Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 10.088 V/m; Power Drift = 0.02 dB
 Peak SAR (extrapolated) = 0.285 W/kg
SAR(1 g) = 0.230 W/kg; SAR(10 g) = 0.174 W/kg
 Maximum value of SAR (measured) = 0.262 W/kg



0 dB = 0.265 W/kg = -5.77 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS850_Right Touch_CH190_4TX.da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS850_Right Touch_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.562 W/kg

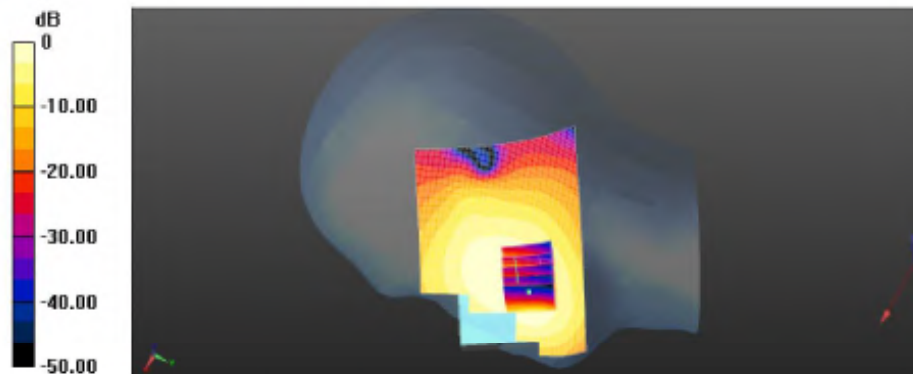
Head/GPRS850_Right Touch_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.198 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.630 W/kg

SAR(1 g) = 0.483 W/kg; SAR(10 g) = 0.347 W/kg

Maximum value of SAR (measured) = 0.565 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Right Tilt_CH190_4TX.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS850_Right Tilt_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.401 W/kg

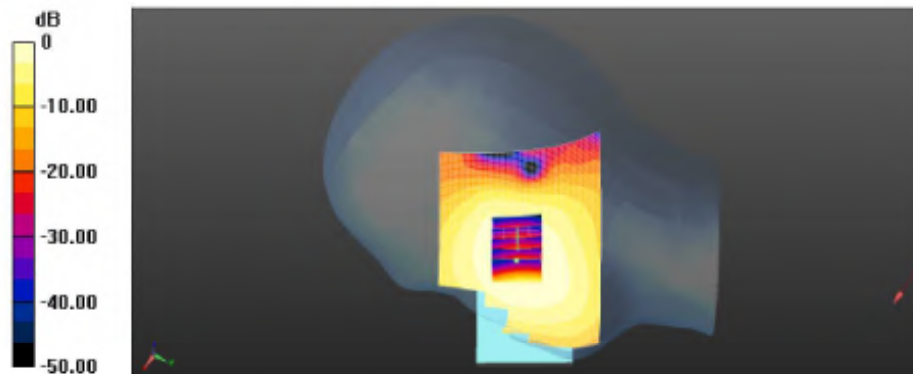
Head/GPRS850_Right Tilt_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.213 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.426 W/kg

SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.266 W/kg

Maximum value of SAR (measured) = 0.390 W/kg



0 dB = 0.401 W/kg = -3.97 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Left Touch_CH190_4TX.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS850_Left Touch_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.596 W/kg

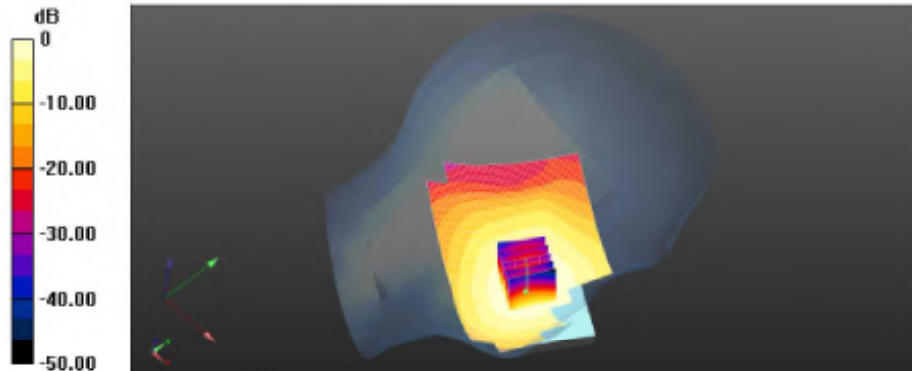
Head/GPRS850_Left Touch_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.498 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.634 W/kg

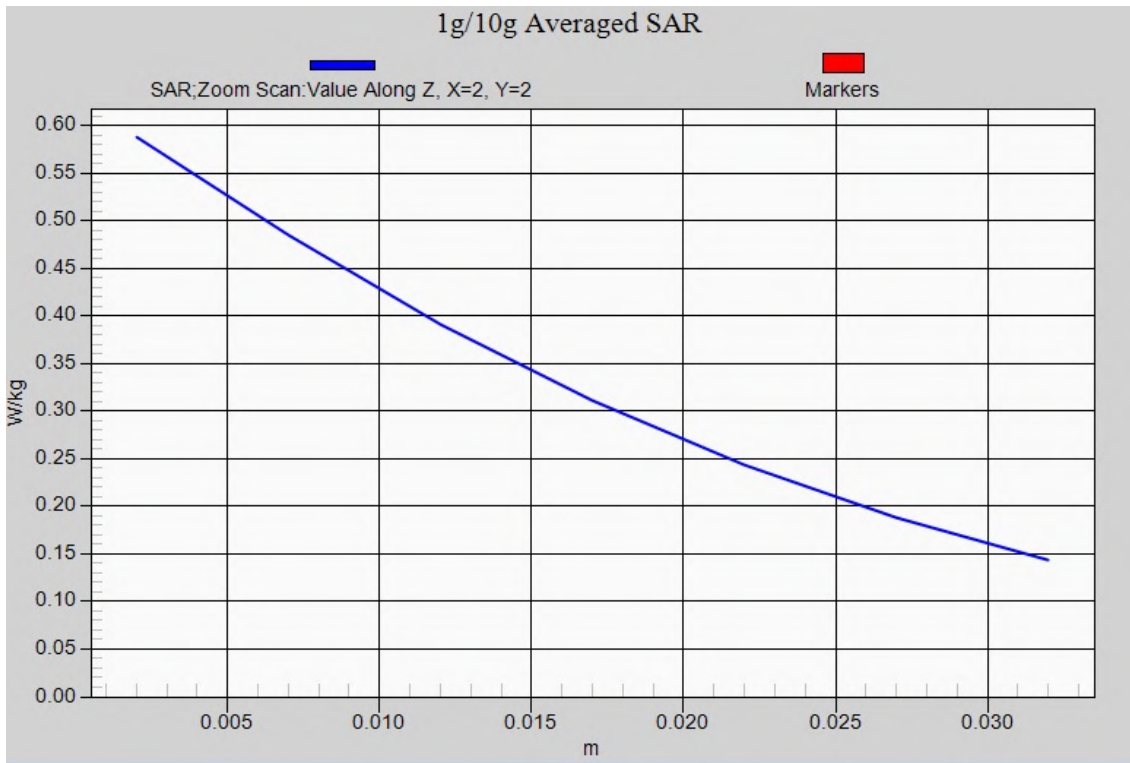
SAR(1 g) = 0.522 W/kg; SAR(10 g) = 0.394 W/kg

Maximum value of SAR (measured) = 0.589 W/kg



0 dB = 0.596 W/kg = -2.25 dBW/kg

Z-Scan



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Left Tilt_CH190_4TX.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.746$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS850_Left Tilt_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.346 W/kg

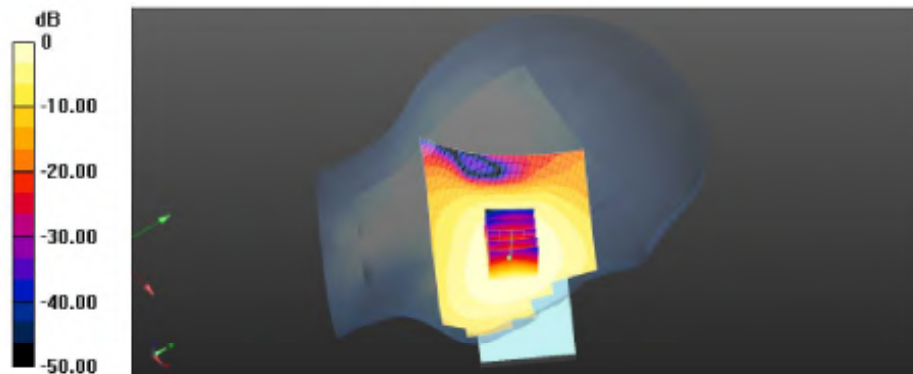
Head/GPRS850_Left Tilt_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.677 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.373 W/kg

SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.235 W/kg

Maximum value of SAR (measured) = 0.342 W/kg



GSM 850 Body SAR Test

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Rear_CH190_Voice.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GSMS850_Rear_CH190_Voice/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.948 W/kg

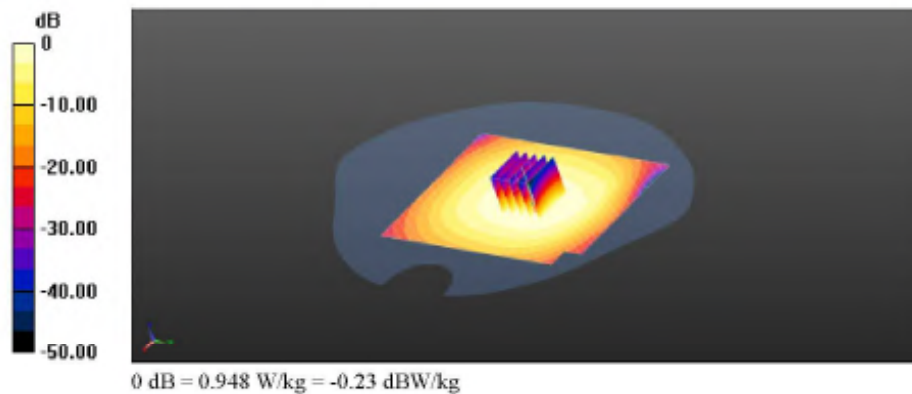
Body/GSMS850_Rear_CH190_Voice/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.077 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.815 W/kg; SAR(10 g) = 0.612 W/kg

Maximum value of SAR (measured) = 0.934 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GSM850_Rear_CH128_Voice.da53-0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 824.2 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 54.513$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GSMS850_Rear_CH128_Voice/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.868 W/kg

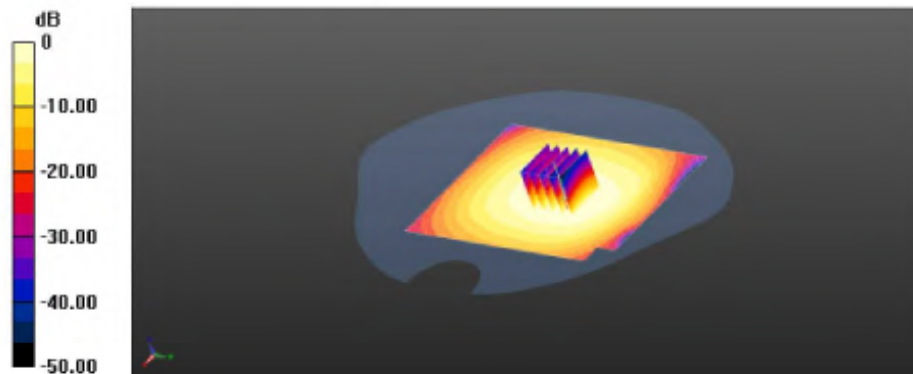
Body/GSMS850_Rear_CH128_Voice/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.666 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.950 W/kg

SAR(1 g) = 0.750 W/kg; SAR(10 g) = 0.562 W/kg

Maximum value of SAR (measured) = 0.865 W/kg



0 dB = 0.868 W/kg = -0.61 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GSM850_Rear_CH251_Voice.da53-0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.956$ S/m; $\epsilon_r = 54.251$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GSMS850_Rear_CH251_Voice/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.971 W/kg

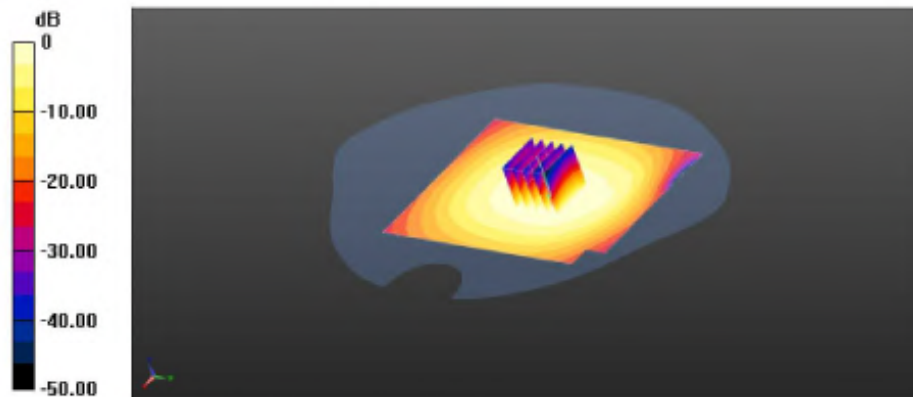
Body/GSMS850_Rear_CH251_Voice/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.441 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.838 W/kg; SAR(10 g) = 0.627 W/kg

Maximum value of SAR (measured) = 0.968 W/kg



0 dB = 0.971 W/kg = -0.13 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS850_Front_CH190_4TX.da53.0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Front_CH190_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.820 W/kg

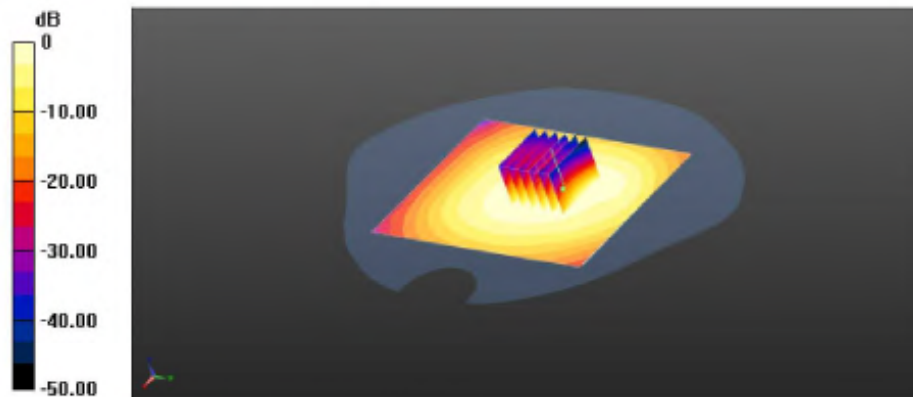
Body/GPRS850_Front_CH190_4TX/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.463 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.884 W/kg

SAR(1 g) = 0.705 W/kg; SAR(10 g) = 0.538 W/kg

Maximum value of SAR (measured) = 0.805 W/kg



0 dB = 0.820 W/kg = -0.86 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Rear_CH190_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Rear_CH190_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 1.30 W/kg

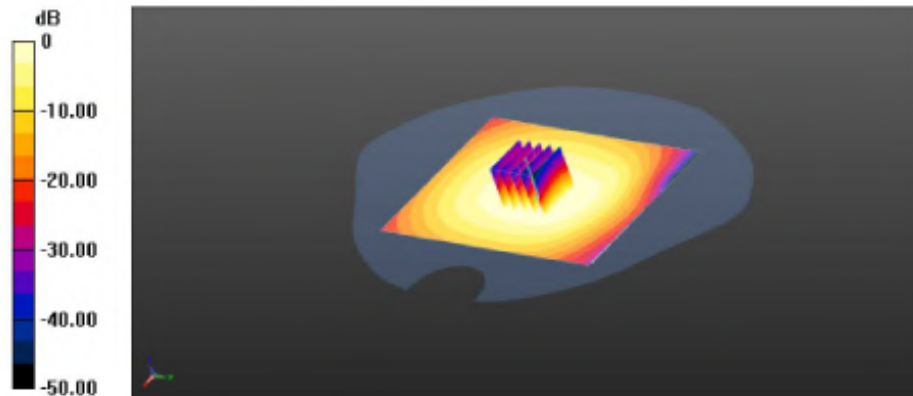
Body/GPRS850_Rear_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 37.337 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.41 W/kg

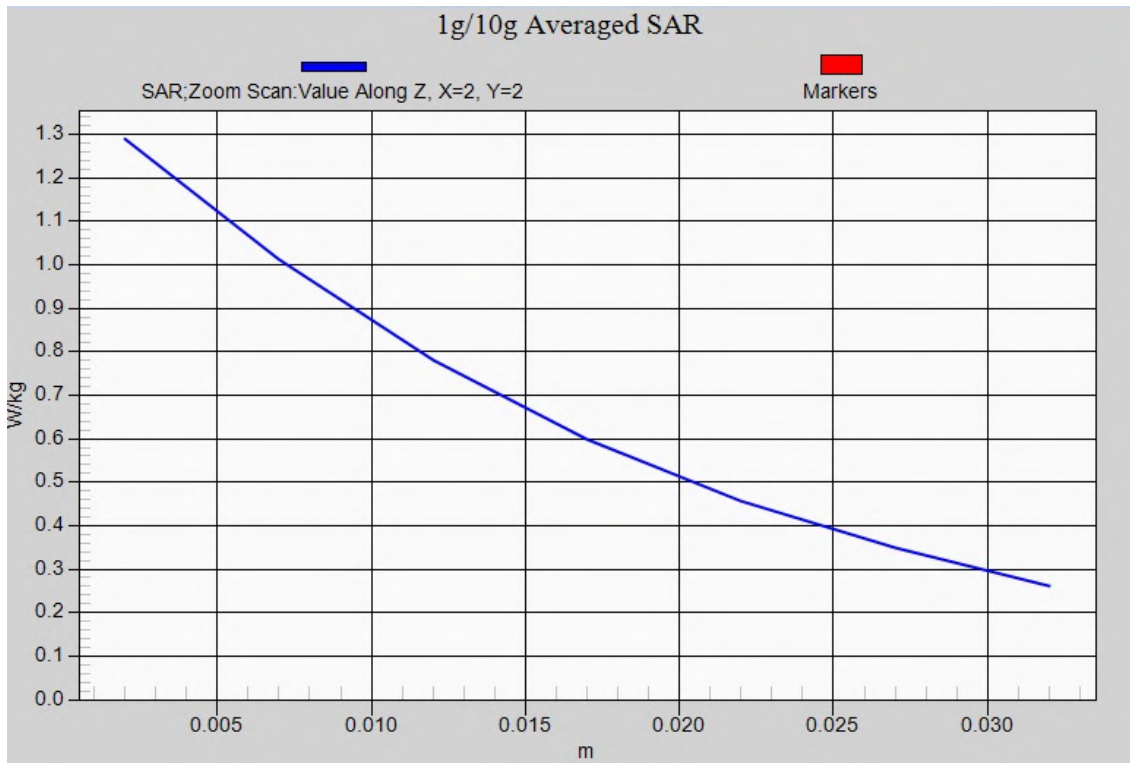
SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.829 W/kg

Maximum value of SAR (measured) = 1.29 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

Z-Scan



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Rear_CH128_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 824.2 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 54.513$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Rear_CH128_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 1.27 W/kg

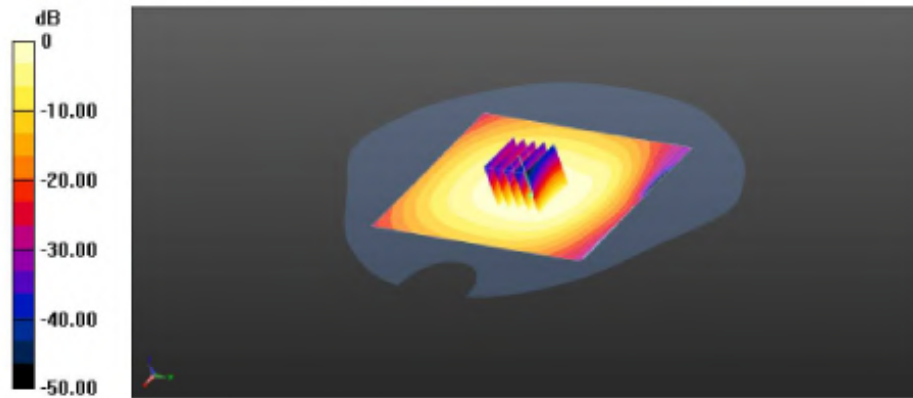
Body/GPRS850_Rear_CH128_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 36.874 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.812 W/kg

Maximum value of SAR (measured) = 1.27 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Rear_CH251_4TX_da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 848.8 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.956$ S/m; $\epsilon_r = 54.251$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Rear_CH251_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 1.23 W/kg

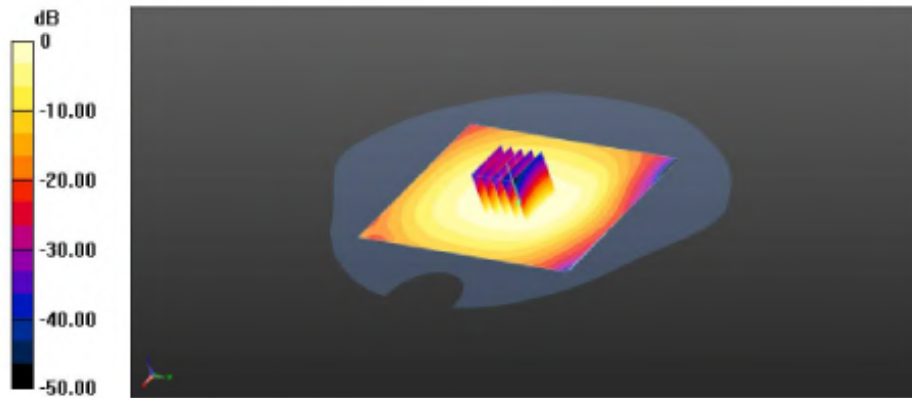
Body/GPRS850_Rear_CH251_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 36.197 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.782 W/kg

Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.23 W/kg = 0.90 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Left Edge_CH190_4TX_da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Left Edge_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.12 W/kg

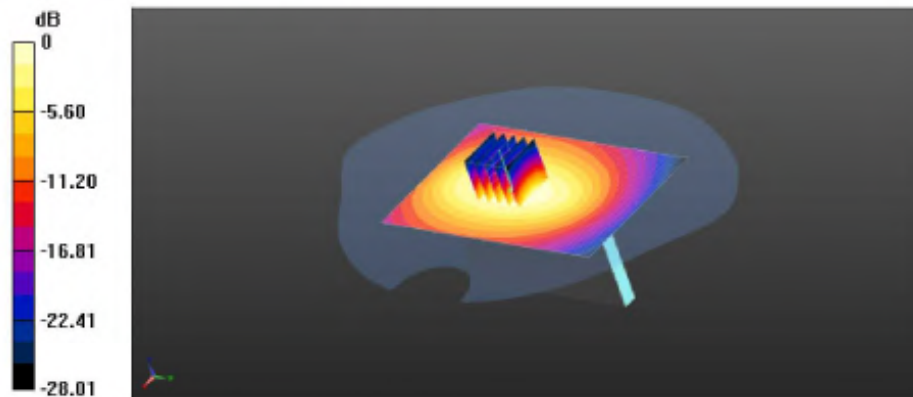
Body/GPRS850_Left Edge_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.845 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.919 W/kg; SAR(10 g) = 0.645 W/kg

Maximum value of SAR (measured) = 1.12 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS850_Left Edge_CH128_4TX_da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 824.2 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 54.513$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Left Edge_CH128_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.916 W/kg

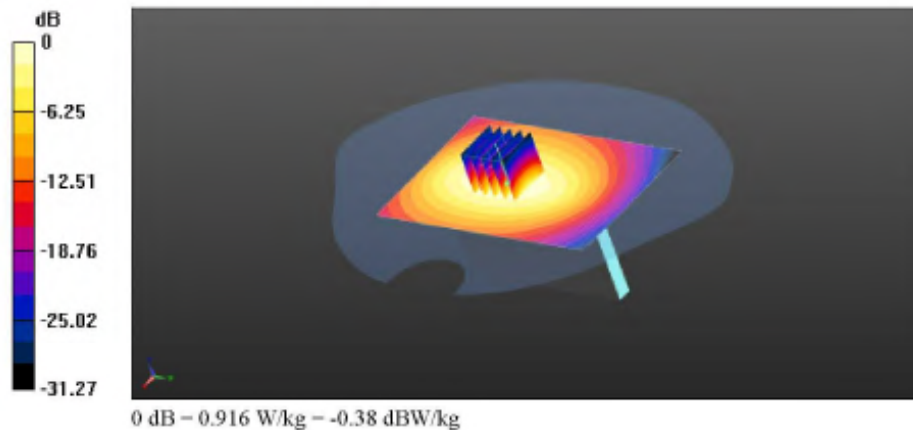
Body/GPRS850_Left Edge_CH128_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.464 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.761 W/kg; SAR(10 g) = 0.532 W/kg

Maximum value of SAR (measured) = 0.923 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Left Edge_CH251_4TX_da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 848.8 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.956$ S/m; $\epsilon_r = 54.251$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Left Edge_CH251_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.11 W/kg

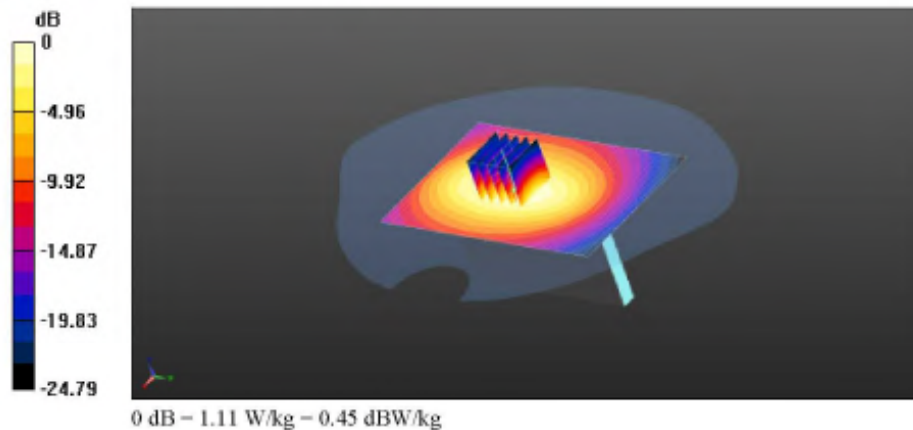
Body/GPRS850_Left Edge_CH251_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.627 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.908 W/kg; SAR(10 g) = 0.636 W/kg

Maximum value of SAR (measured) = 1.10 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Right Edge_CH190_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Right Edge_CH190_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.04 W/kg

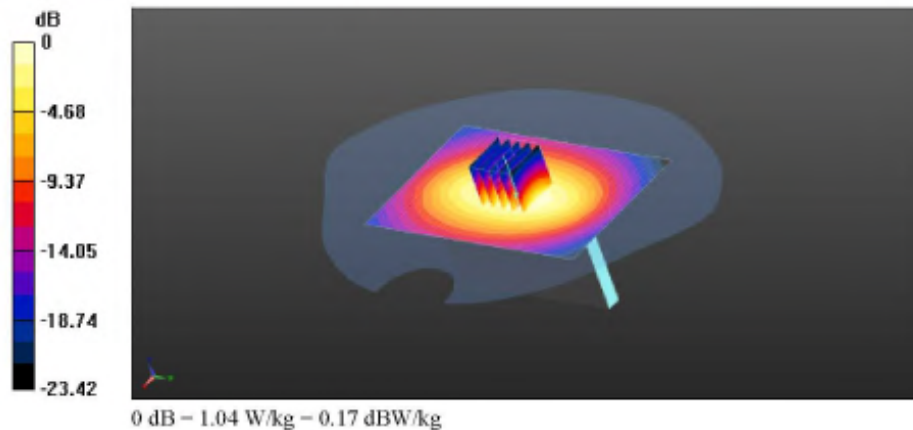
Body/GPRS850_Right Edge_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.657 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.20 W/kg

SAR(1 g) = 0.853 W/kg; SAR(10 g) = 0.586 W/kg

Maximum value of SAR (measured) = 1.05 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Right Edge_CH128_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 824.2 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.932$ S/m; $\epsilon_r = 54.513$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Right Edge_CH128_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.895 W/kg

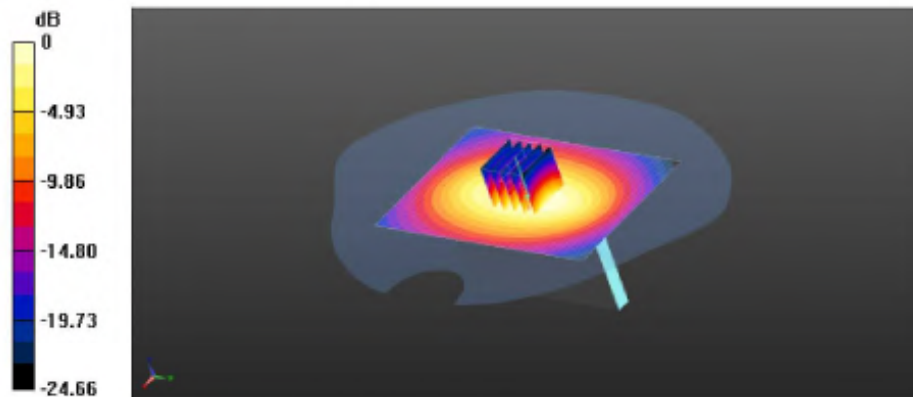
Body/GPRS850_Right Edge_CH128_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.314 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.731 W/kg; SAR(10 g) = 0.504 W/kg

Maximum value of SAR (measured) = 0.896 W/kg



0 dB = 0.895 W/kg = -0.48 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Right Edge_CH251_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 848.8 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.956$ S/m; $\epsilon_r = 54.251$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Right Edge_CH251_4TX/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.11 W/kg

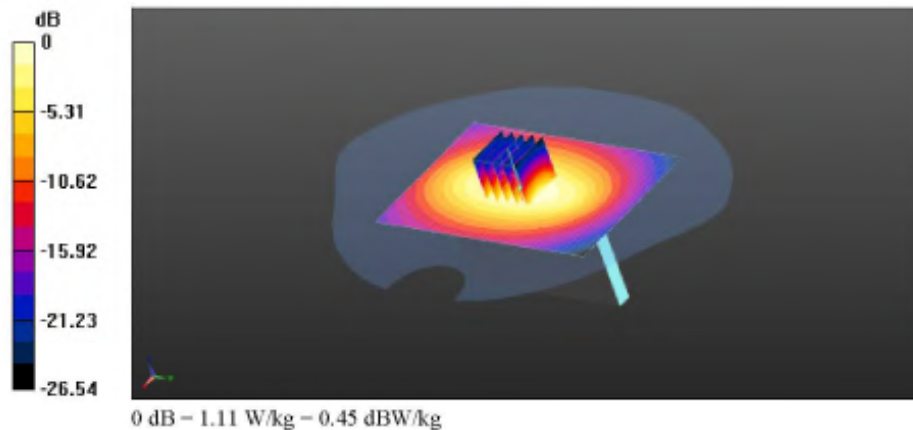
Body/GPRS850_Right Edge_CH251_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.914 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.906 W/kg; SAR(10 g) = 0.614 W/kg

Maximum value of SAR (measured) = 1.12 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS850_Bottom_CH190_4TX.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Bottom_CH190_4TX/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.149 W/kg

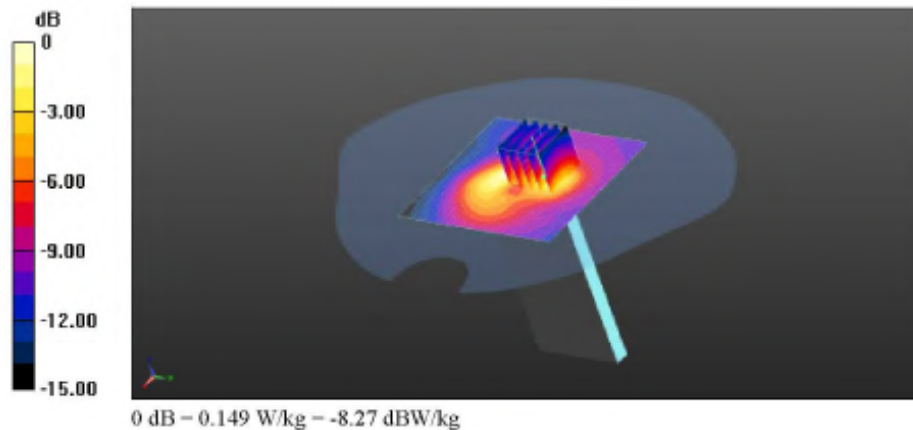
Body/GPRS850_Bottom_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.660 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.199 W/kg

SAR(1 g) = 0.106 W/kg; SAR(10 g) = 0.060 W/kg

Maximum value of SAR (measured) = 0.148 W/kg



PCS1900 Head SAR Test

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [PCS1900_Right Touch_CH661.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/PCS1900_Right Touch_CH661/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.496 W/kg

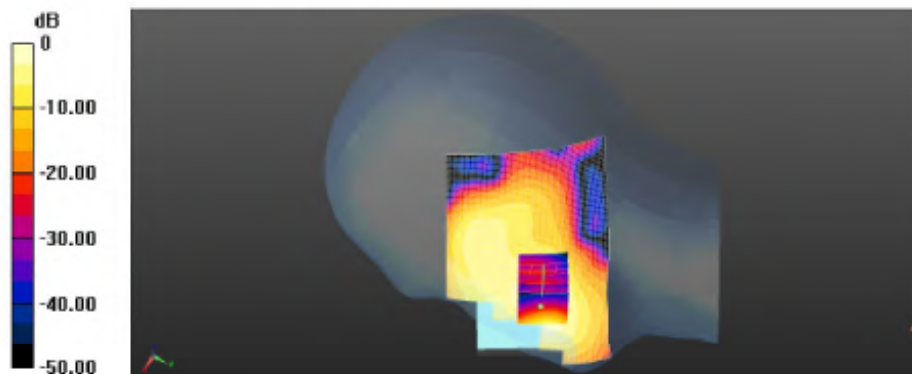
Head/PCS1900_Right Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.159 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.601 W/kg

SAR(1 g) = 0.393 W/kg; SAR(10 g) = 0.241 W/kg

Maximum value of SAR (measured) = 0.484 W/kg



0 dB = 0.496 W/kg = -3.05 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [PCS1900_Right Tilt_CH661.da53-0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

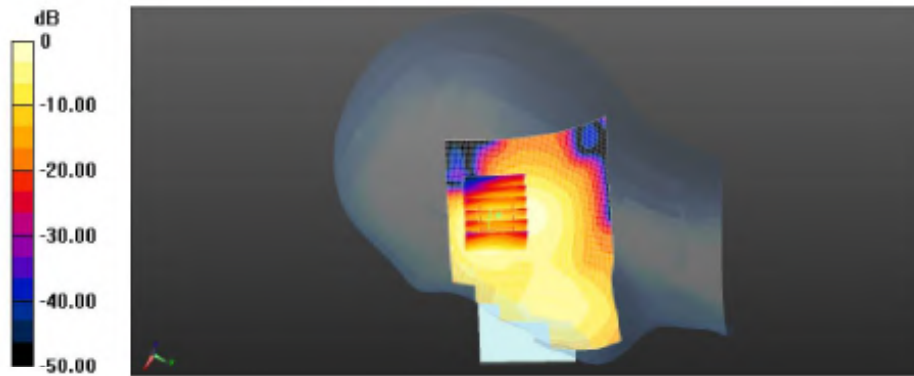
Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/PCS1900_Right Tilt_CH661/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.228 W/kg

Head/PCS1900_Right Tilt_CH661/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 8.345 V/m; Power Drift = -0.06 dB
 Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.170 W/kg; SAR(10 g) = 0.108 W/kg
 Maximum value of SAR (measured) = 0.208 W/kg



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [PCS1900_Left Touch_CH661.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/PCS1900_Left Touch_CH661/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.278 W/kg

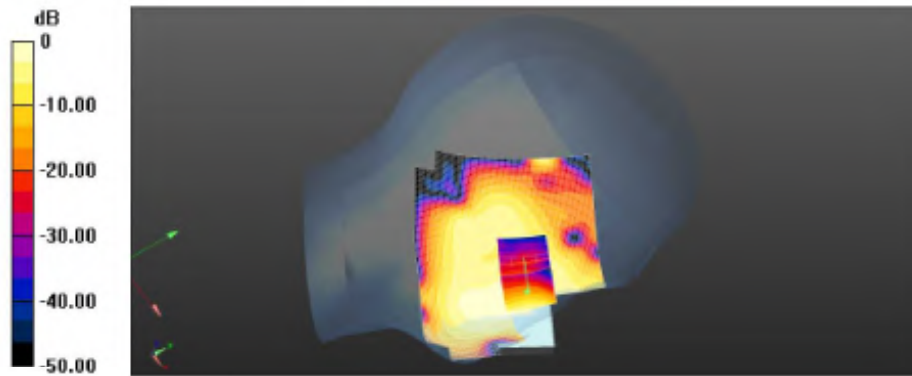
Head/PCS1900_Left Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.242 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.317 W/kg

SAR(1 g) = 0.222 W/kg; SAR(10 g) = 0.145 W/kg

Maximum value of SAR (measured) = 0.276 W/kg



0 dB = 0.278 W/kg = -5.56 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [PCS1900_Left Tilt_CH661.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

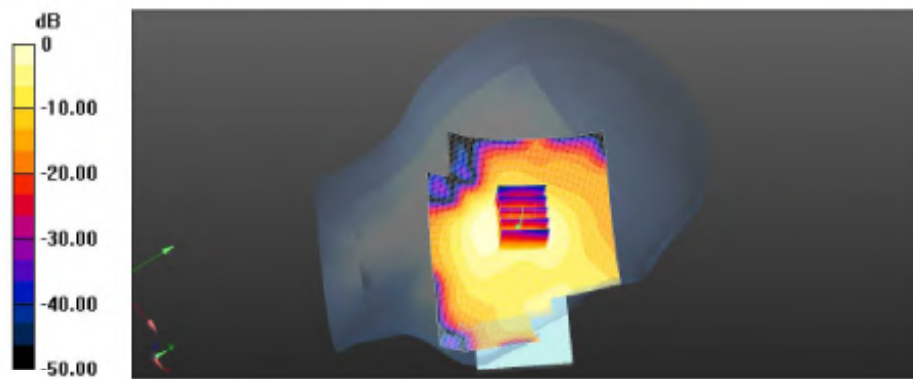
DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/PCS1900_Left Tilt_CH661/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.188 W/kg

Head/PCS1900_Left Tilt_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.205 V/m; Power Drift = 0.04 dB
 Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.088 W/kg
 Maximum value of SAR (measured) = 0.185 W/kg



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Right Touch_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS1900_Right Touch_CH661_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.511 W/kg

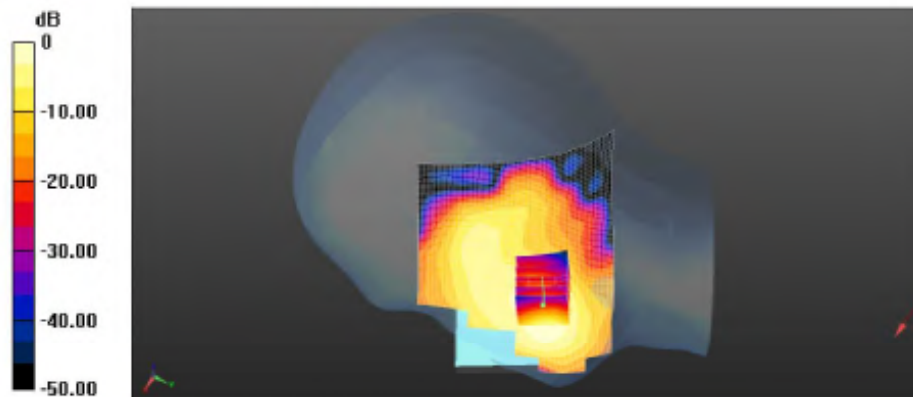
Head/GPRS1900_Right Touch_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.993 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.625 W/kg

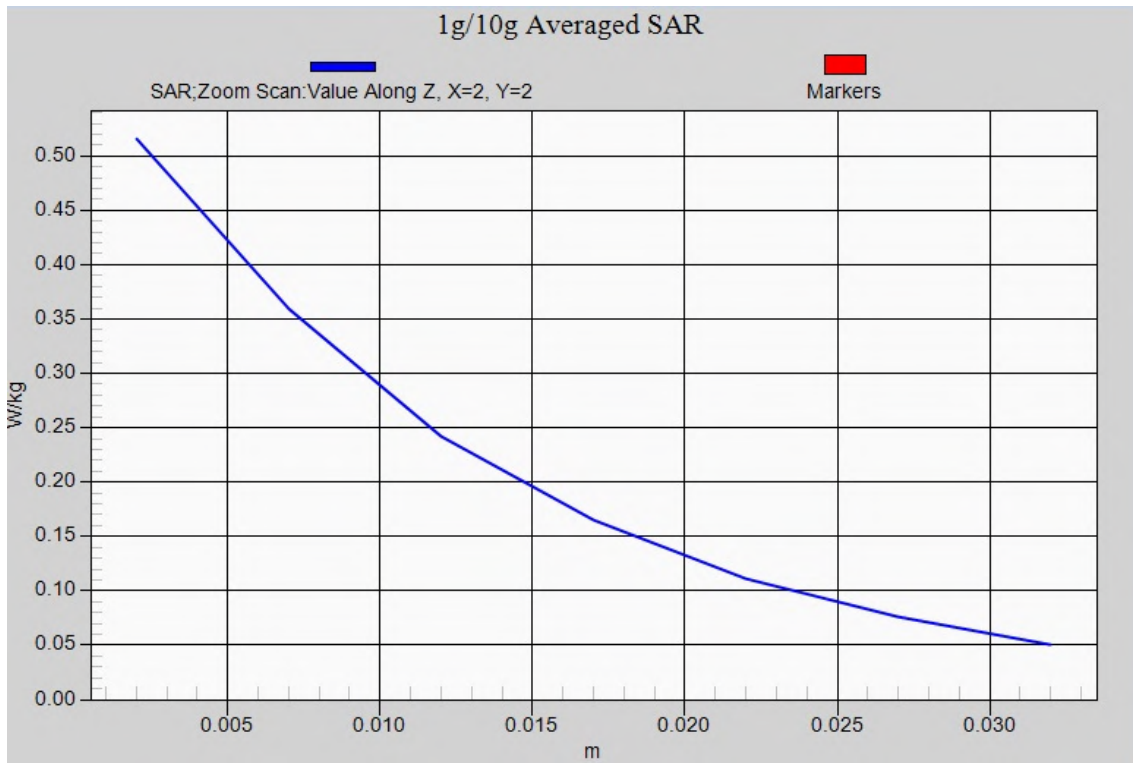
SAR(1 g) = 0.411 W/kg; SAR(10 g) = 0.252 W/kg

Maximum value of SAR (measured) = 0.516 W/kg



0 dB = 0.511 W/kg = -2.92 dBW/kg

Z-Scan



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Right Tilt_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS1900_Right Tilt_CH661_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.228 W/kg

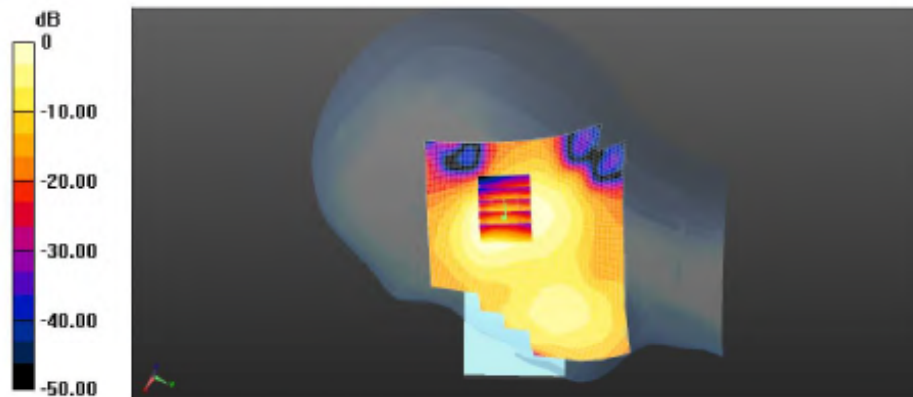
Head/GPRS1900_Right Tilt_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.928 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.232 W/kg

SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.196 W/kg



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Left Touch_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

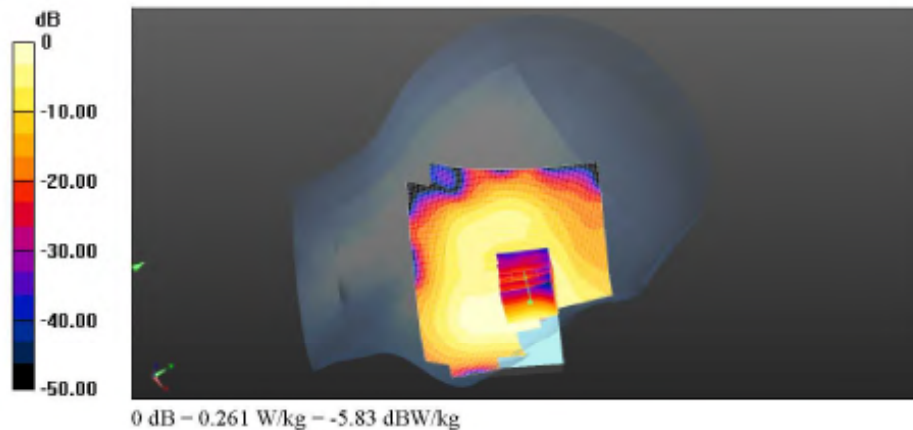
Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS1900_Left Touch_CH661_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.261 W/kg

Head/GPRS1900_Left Touch_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 6.796 V/m; Power Drift = 0.16 dB
 Peak SAR (extrapolated) = 0.282 W/kg
SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.135 W/kg
 Maximum value of SAR (measured) = 0.246 W/kg



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Left Tilt_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.5 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.388$ S/m; $\epsilon_r = 40.277$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(8.36, 8.36, 8.36); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/GPRS1900_Left Tilt_CH661_4TX/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.186 W/kg

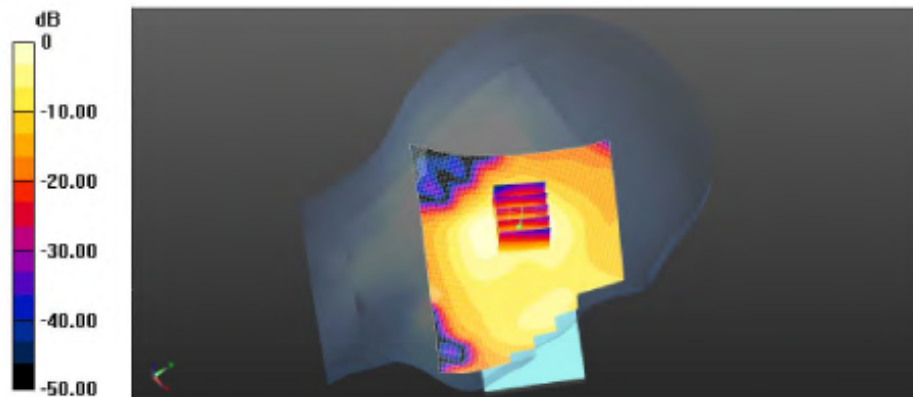
Head/GPRS1900_Left Tilt_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.541 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.214 W/kg

SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.082 W/kg

Maximum value of SAR (measured) = 0.174 W/kg



PCS1900 Body SAR Test

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [PCS1900_Rear_CH661_Voice.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.30042
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/PCS1900_Rear_CH661_Voice/Area Scan (91x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.607 W/kg

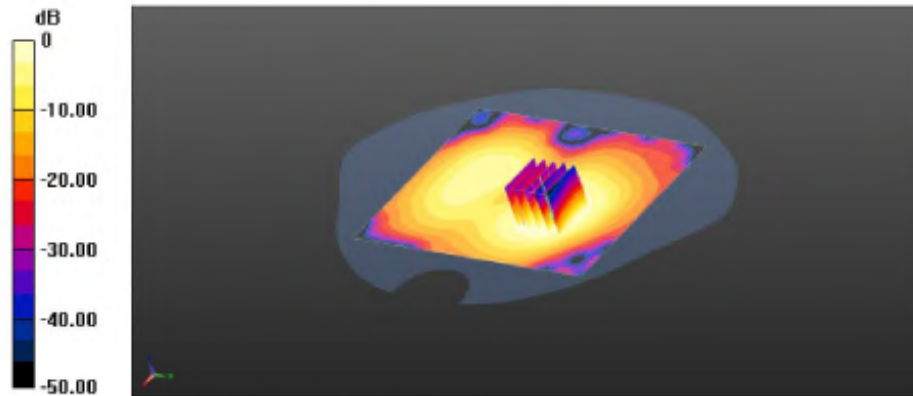
Body/PCS1900_Rear_CH661_Voice/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.135 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.693 W/kg

SAR(1 g) = 0.450 W/kg; SAR(10 g) = 0.277 W/kg

Maximum value of SAR (measured) = 0.570 W/kg



0 dB = 0.607 W/kg = -2.17 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS1900_Front_CH661_4TX.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS1900_Front_CH661_4TX/Area Scan (91x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.660 W/kg

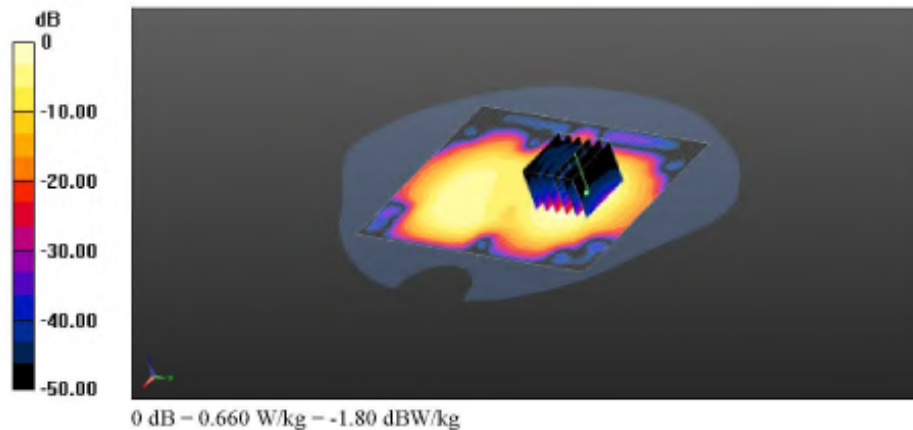
Body/GPRS1900_Front_CH661_4TX/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.987 V/m; Power Drift = 0.05 dB

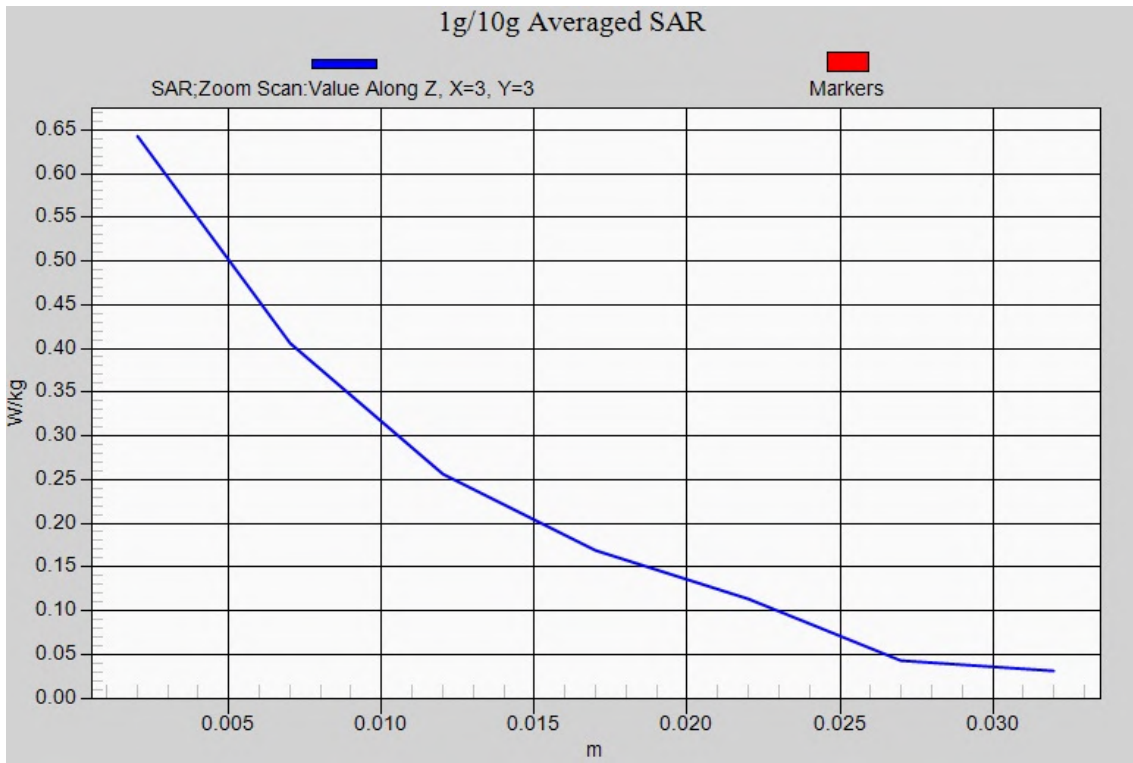
Peak SAR (extrapolated) = 0.790 W/kg

SAR(1 g) = 0.509 W/kg; SAR(10 g) = 0.311 W/kg

Maximum value of SAR (measured) = 0.644 W/kg



Z-Scan



Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS1900_Rear_CH661_4TX.da53:0](#)

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS1900_Rear_CH661_4TX/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.697 W/kg

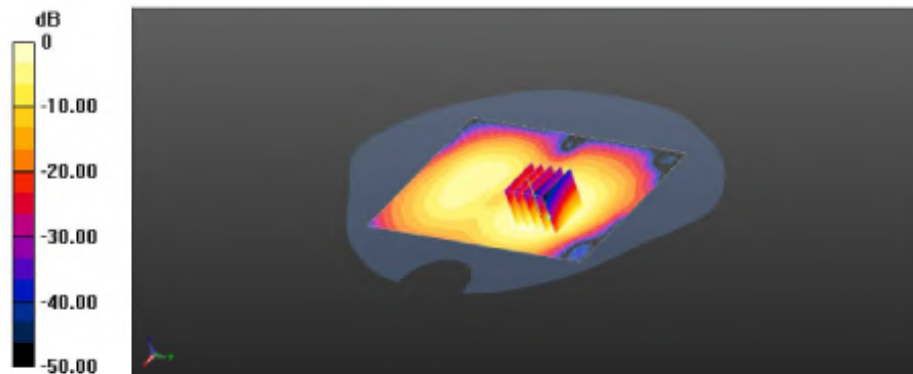
Body/GPRS1900_Rear_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.858 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.734 W/kg

SAR(1 g) = 0.488 W/kg; SAR(10 g) = 0.304 W/kg

Maximum value of SAR (measured) = 0.618 W/kg



0 dB = 0.697 W/kg = -1.57 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Left Edge_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS1900_Left Edge_CH661_4TX/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.111 W/kg

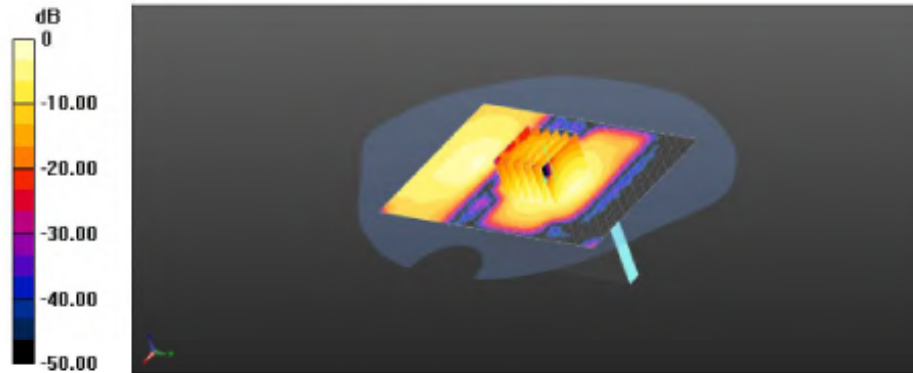
Body/GPRS1900_Left Edge_CH661_4TX/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.740 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.131 W/kg

SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.046 W/kg

Maximum value of SAR (measured) = 0.107 W/kg



0 dB = 0.111 W/kg = -9.55 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Right Edge_CH661_4TX.da53:0

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS1900_Right Edge_CH661_4TX/Area Scan (91x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.364 W/kg

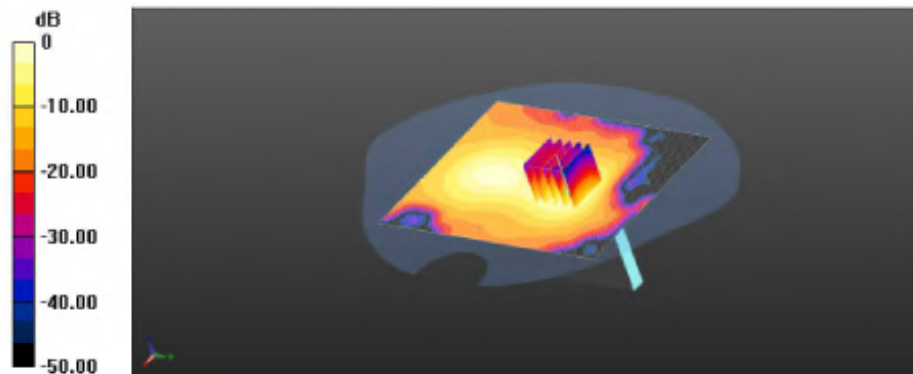
Body/GPRS1900_Right Edge_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.125 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.412 W/kg

SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.141 W/kg

Maximum value of SAR (measured) = 0.337 W/kg



0 dB = 0.364 W/kg = -4.39 dBW/kg

Date: 2013-02-07

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: GPRS1900_Bottom_CH661_4TX.da53-0

Ambient Temp : 23.4 °C Tissue Temp : 22.4 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS1900 4TX; Frequency: 1880 MHz; Duty Cycle: 1:2.07491

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.541$ S/m; $\epsilon_r = 52.313$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.72, 7.72, 7.72); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS1900_Bottom_CH661_4TX/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.306 W/kg

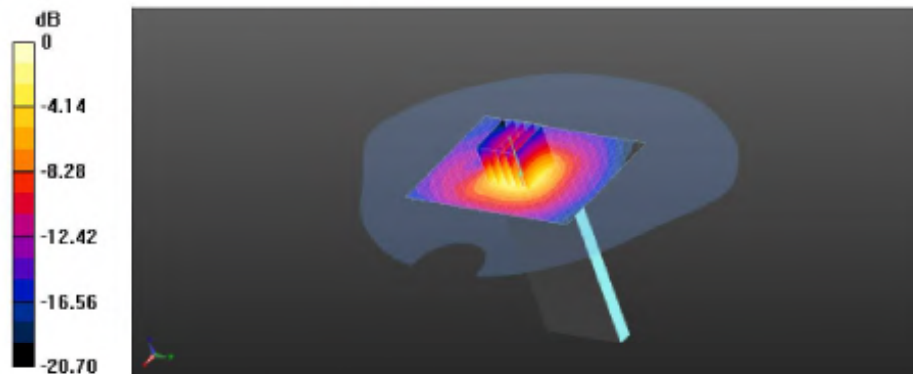
Body/GPRS1900_Bottom_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.132 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.344 W/kg

SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.116 W/kg

Maximum value of SAR (measured) = 0.280 W/kg



0 dB = 0.306 W/kg = -5.14 dBW/kg

WCDMA FDD V Head SAR Test

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Right Touch_CH4182.da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.749$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/WCDMA V_Right Touch_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.415 W/kg

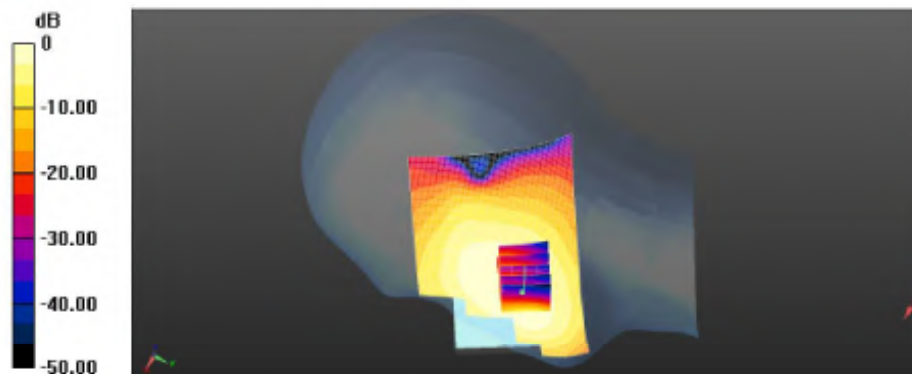
Head/WCDMA V_Right Touch_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.836 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.464 W/kg

SAR(1 g) = 0.360 W/kg; SAR(10 g) = 0.264 W/kg

Maximum value of SAR (measured) = 0.412 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Right Tilt_CH4182.da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.749$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/WCDMA V_Right Tilt_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.279 W/kg

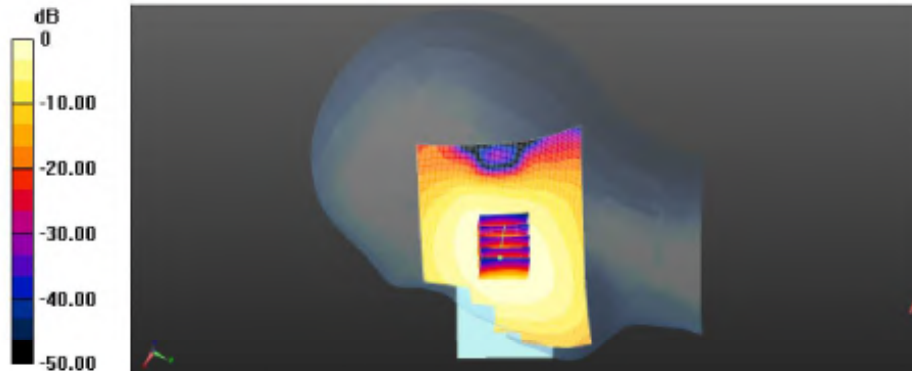
Head/WCDMA V_Right Tilt_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.496 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.241 W/kg; SAR(10 g) = 0.185 W/kg

Maximum value of SAR (measured) = 0.272 W/kg



0 dB = 0.279 W/kg = -5.54 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Left Touch_CH4182.da53.0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.749$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/WCDMA V_Left Touch_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.472 W/kg

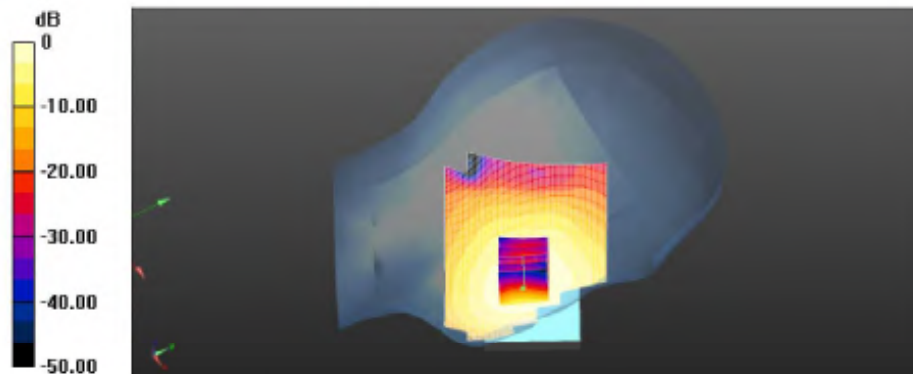
Head/WCDMA V_Left Touch_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.232 V/m; Power Drift = 0.12 dB

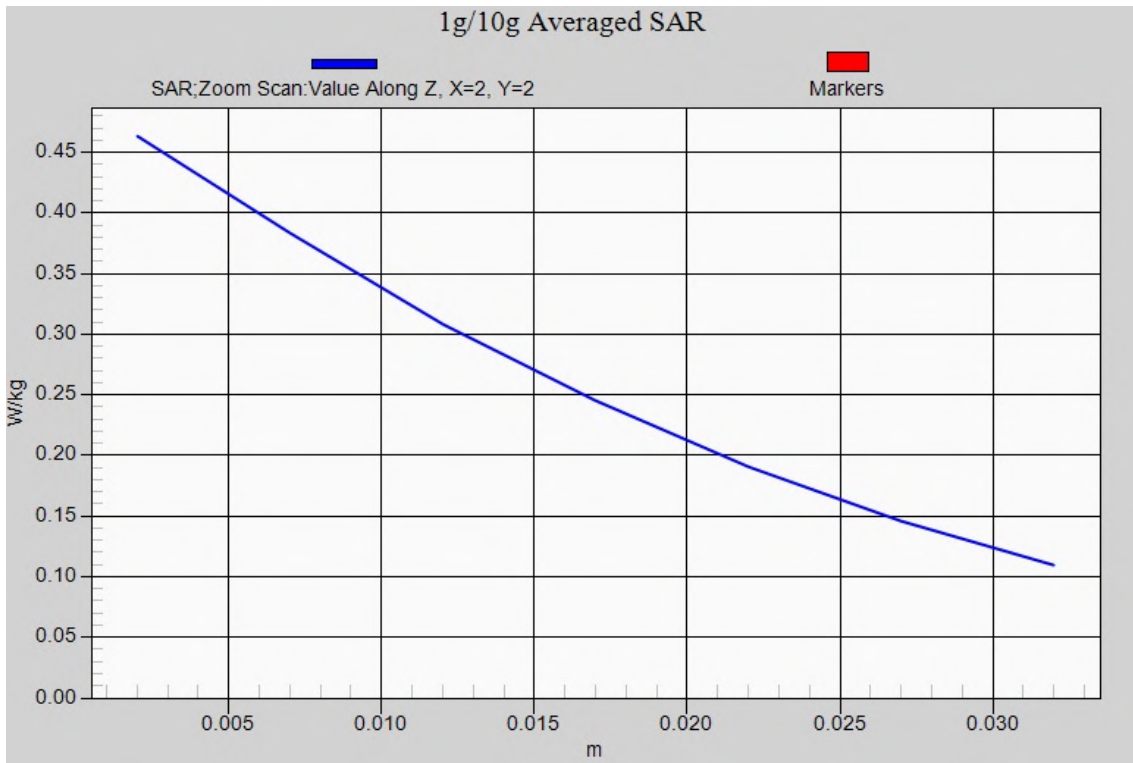
Peak SAR (extrapolated) = 0.506 W/kg

SAR(1 g) = 0.414 W/kg; SAR(10 g) = 0.312 W/kg

Maximum value of SAR (measured) = 0.464 W/kg



Z-Scan



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Left Tilt_CH4182.da53.0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

DUT: LG-E450F; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.897$ S/m; $\epsilon_r = 41.749$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.98, 9.98, 9.98); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/WCDMA V_Left Tilt_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.267 W/kg

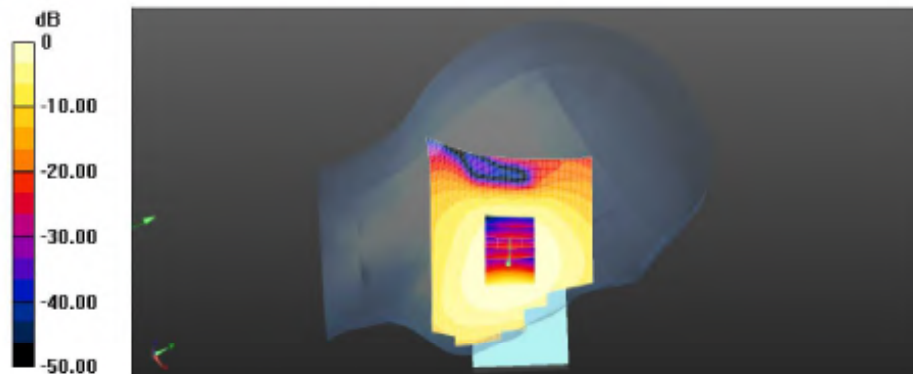
Head/WCDMA V_Left Tilt_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.014 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.230 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.258 W/kg



WCDMA FDD V Body SAR Test

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Front_CH4182.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.362$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/WCDMA V_Front_CH4182/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.568 W/kg

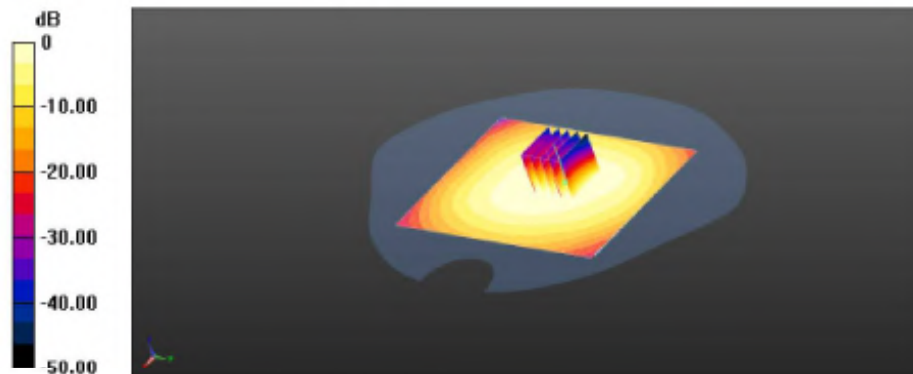
Body/WCDMA V_Front_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.500 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.613 W/kg

SAR(1 g) = 0.492 W/kg; SAR(10 g) = 0.377 W/kg

Maximum value of SAR (measured) = 0.562 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Rear_CH4182.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.362$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/WCDMA V_Rear_CH4182/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.912 W/kg

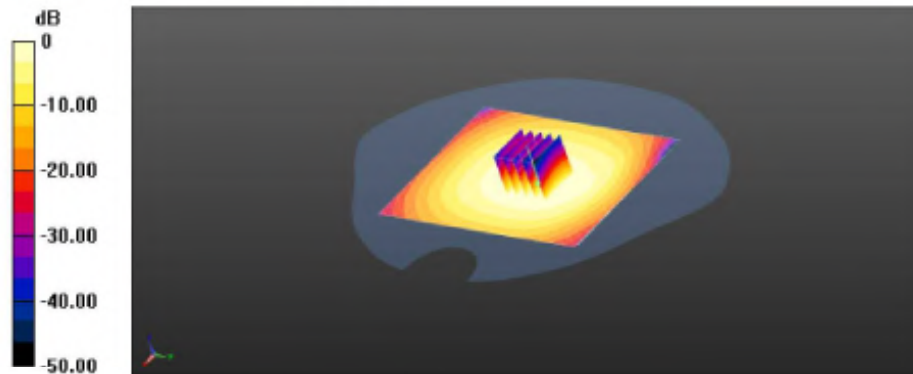
Body/WCDMA V_Rear_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.664 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.999 W/kg

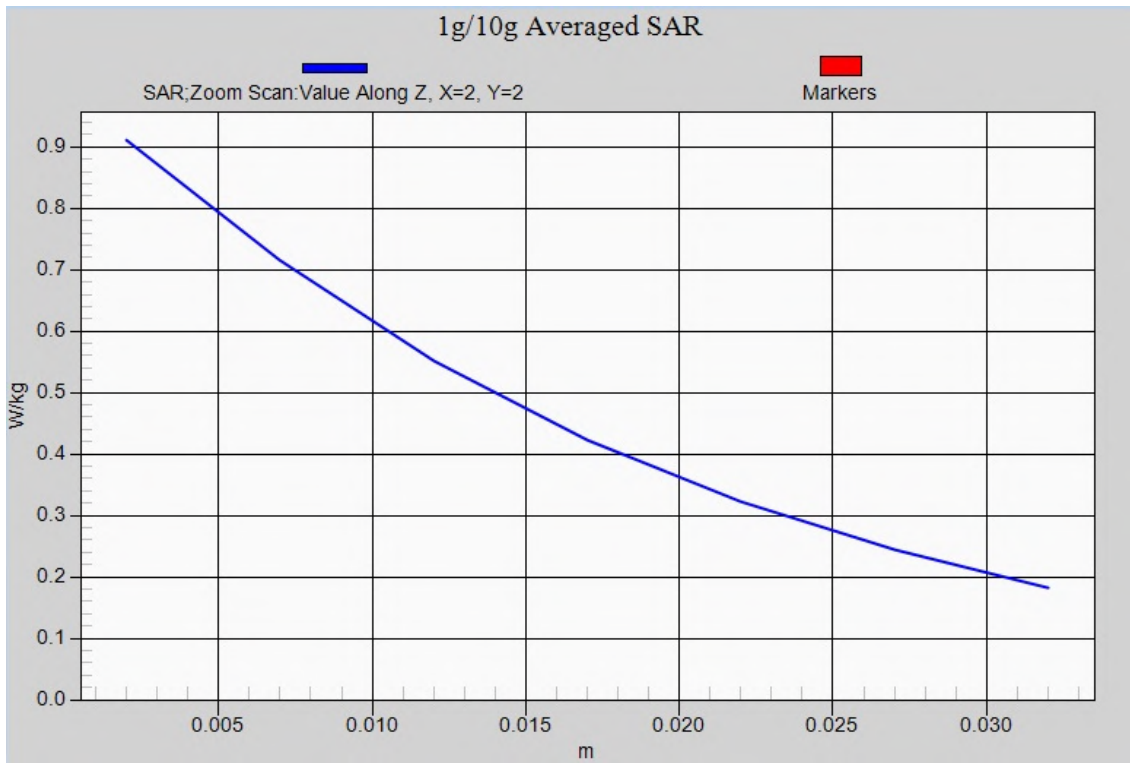
SAR(1 g) = 0.790 W/kg; SAR(10 g) = 0.590 W/kg

Maximum value of SAR (measured) = 0.912 W/kg



0 dB = 0.912 W/kg = -0.40 dBW/kg

Z-Scan



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Left Edge_CH4182.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.362$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/WCDMA V_Left Edge_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.818 W/kg

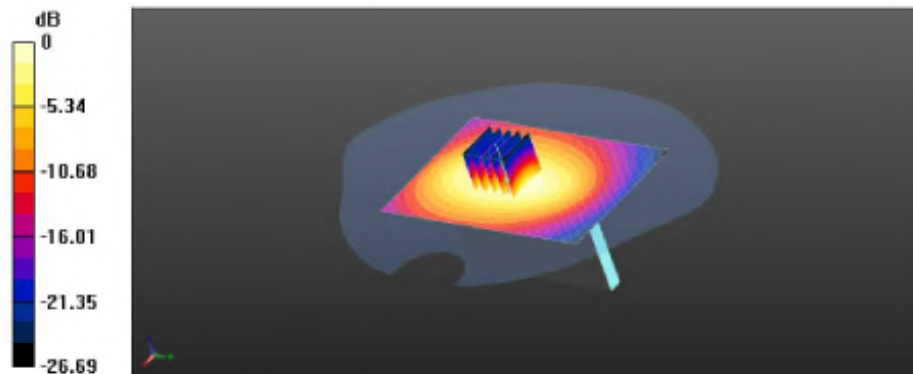
Body/WCDMA V_Left Edge_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.986 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.925 W/kg

SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.465 W/kg

Maximum value of SAR (measured) = 0.813 W/kg



0 dB = 0.818 W/kg = -0.87 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Right Edge_CH4182.da53.0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.362$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/WCDMA V_Right Edge_CH4182/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.773 W/kg

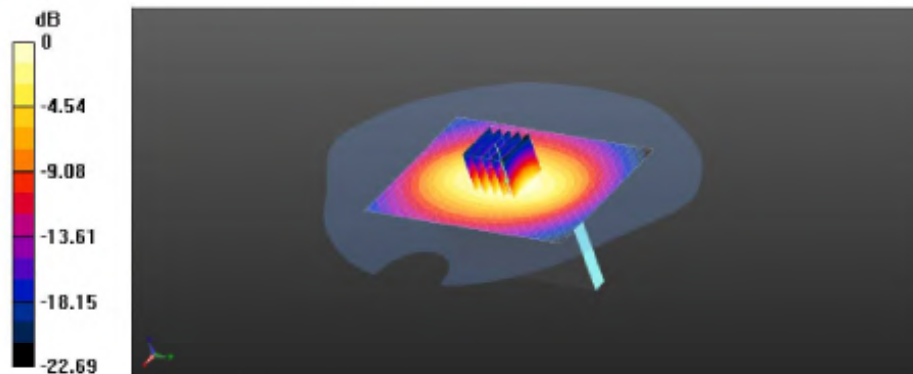
Body/WCDMA V_Right Edge_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.053 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.880 W/kg

SAR(1 g) = 0.632 W/kg; SAR(10 g) = 0.439 W/kg

Maximum value of SAR (measured) = 0.769 W/kg



0 dB = 0.773 W/kg = -1.12 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [WCDMA V_Bottom_CH4182.da53-0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.8 °C

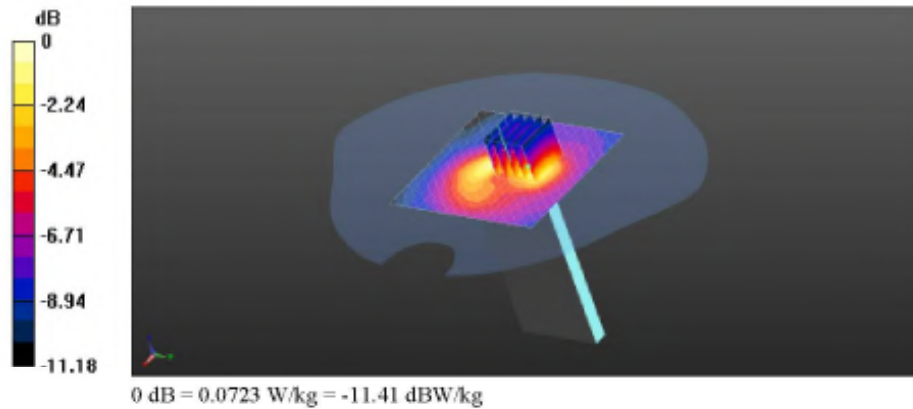
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WCDMA5; Frequency: 836.4 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.362$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/WCDMA V_Bottom_CH4182/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.0723 W/kg

Body/WCDMA V_Bottom_CH4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 6.444 V/m; Power Drift = -0.07 dB
 Peak SAR (extrapolated) = 0.0930 W/kg
SAR(1 g) = 0.052 W/kg; SAR(10 g) = 0.031 W/kg
 Maximum value of SAR (measured) = 0.0714 W/kg



WLAN Head SAR Test

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Right Touch_CH11_Data Retal.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Right Touch_CH11_Data Retal/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.157 W/kg

Head/2.45GHz_Right Touch_CH11_Data Retal/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

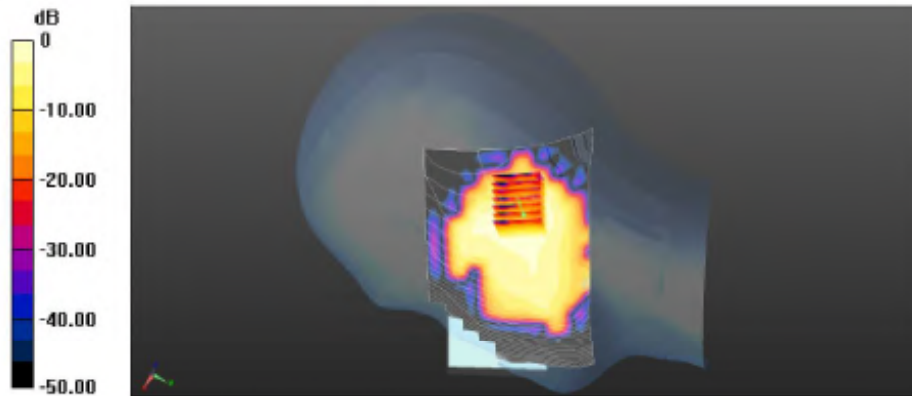
dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.078 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.221 W/kg

SAR(1 g) = 0.105 W/kg; SAR(10 g) = 0.051 W/kg

Maximum value of SAR (measured) = 0.157 W/kg



0 dB = 0.157 W/kg = -8.04 dBW/kg

Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Right Tilt_CH11_Data Reta1.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Right Tilt_CH11_Data Reta1/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.134 W/kg

Head/2.45GHz_Right Tilt_CH11_Data Reta1/Zoom Scan (10x8x7)/Cube 0: Measurement grid:

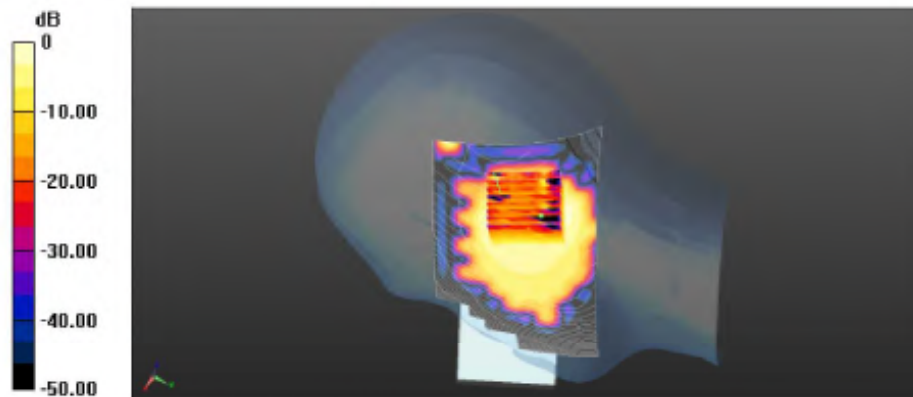
dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.962 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.339 W/kg

SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.025 W/kg

Maximum value of SAR (measured) = 0.169 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Left Touch_CH11_Data Retal.da53-0

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Left Touch_CH11_Data Retal/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.250 W/kg

Head/2.45GHz_Left Touch_CH11_Data Retal/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

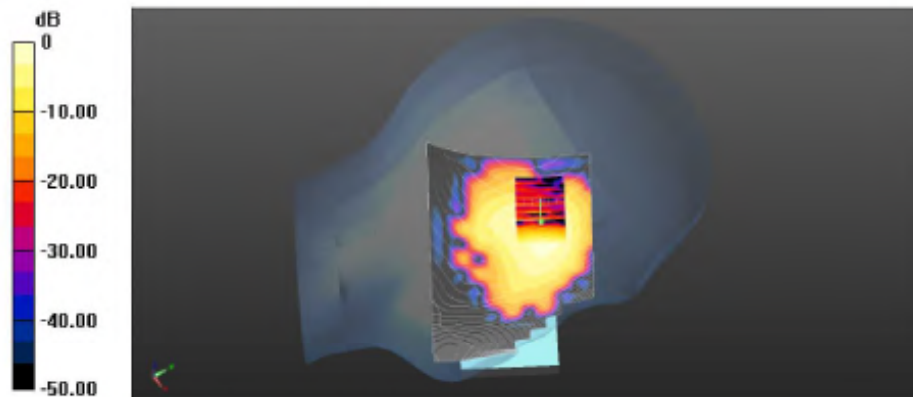
dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.503 V/m; Power Drift = -0.07 dB

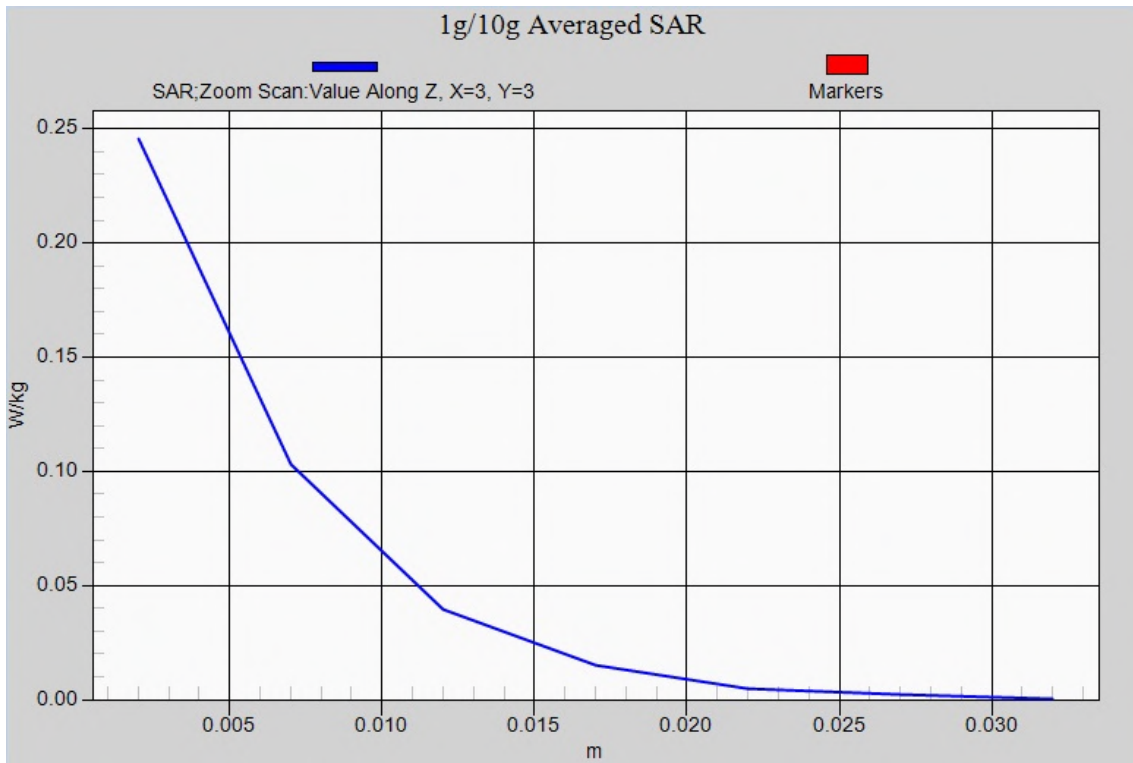
Peak SAR (extrapolated) = 0.350 W/kg

SAR(1 g) = 0.155 W/kg; SAR(10 g) = 0.072 W/kg

Maximum value of SAR (measured) = 0.246 W/kg



Z-Scan



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Left Tilt_CH11_Data Retal.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Left Tilt_CH11_Data Retal/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.182 W/kg

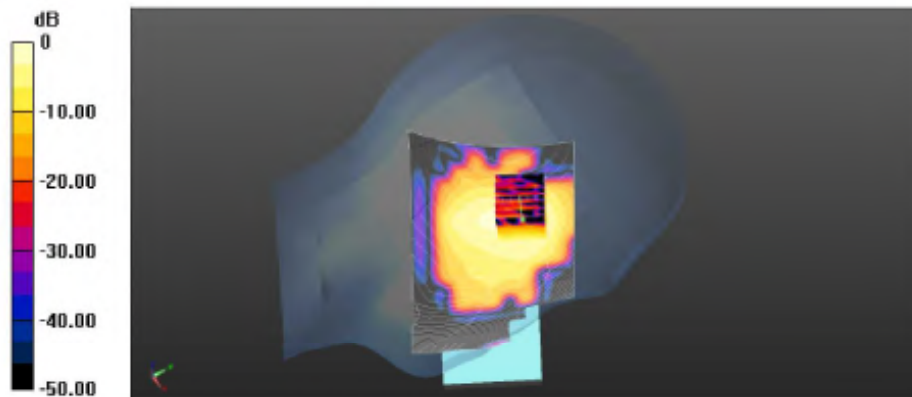
Head/2.45GHz_Left Tilt_CH11_Data Retal/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.014 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.266 W/kg

SAR(1 g) = 0.114 W/kg; SAR(10 g) = 0.052 W/kg

Maximum value of SAR (measured) = 0.175 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Right Touch_CH11_Data Reta2.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Right Touch_CH11_Data Reta2/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.134 W/kg

Head/2.45GHz_Right Touch_CH11_Data Reta2/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

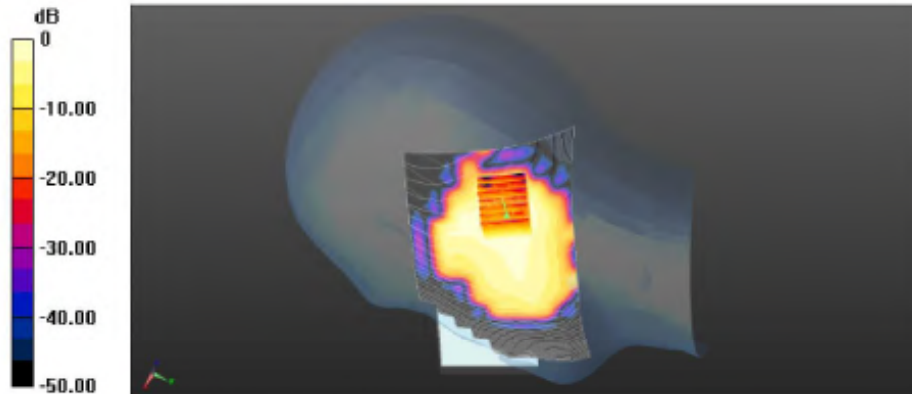
dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.629 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.046 W/kg

Maximum value of SAR (measured) = 0.137 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Right Tilt_CH11_Data Reta2.da53:0

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

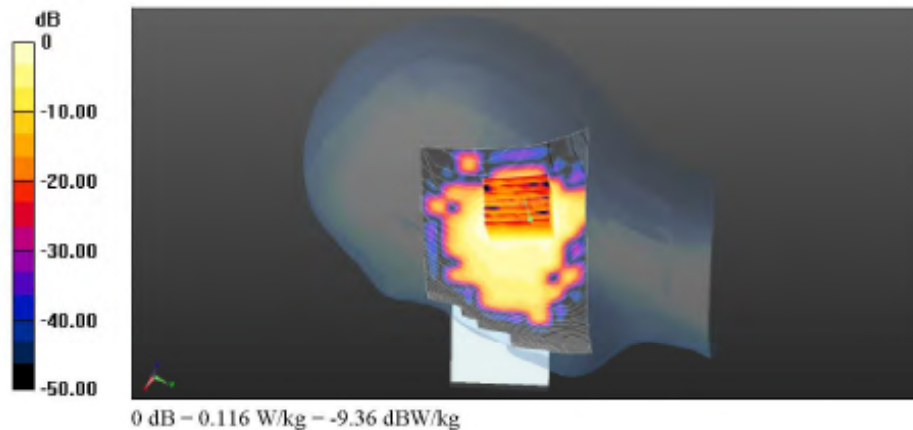
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Right Tilt_CH11_Data Reta2/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.116 W/kg

Head/2.45GHz_Right Tilt_CH11_Data Reta2/Zoom Scan (9x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 7.364 V/m; Power Drift = -0.03 dB
 Peak SAR (extrapolated) = 0.161 W/kg
SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.038 W/kg
 Maximum value of SAR (measured) = 0.113 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Left Touch_CH11_Data Reta2.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

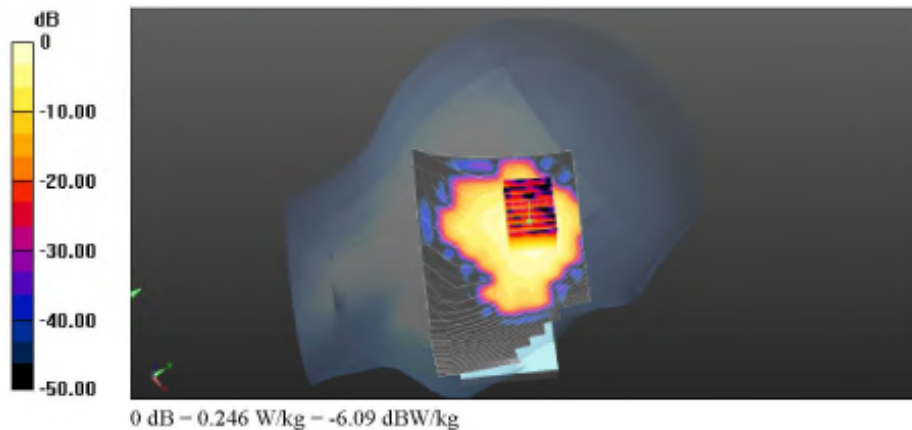
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Left Touch_CH11_Data Reta2/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.246 W/kg

Head/2.45GHz_Left Touch_CH11_Data Reta2/Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 7.174 V/m; Power Drift = 0.13 dB
 Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.151 W/kg; SAR(10 g) = 0.070 W/kg
 Maximum value of SAR (measured) = 0.238 W/kg



Date: 2013-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Left Tilt_CH11_Data Reta2.da53:0](#)

Ambient Temp : 23.6 °C Tissue Temp : 22.7 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.827$ S/m; $\epsilon_r = 38.472$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.41, 7.41, 7.41); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Head/2.45GHz_Left Tilt_CH11_Data Reta2/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.184 W/kg

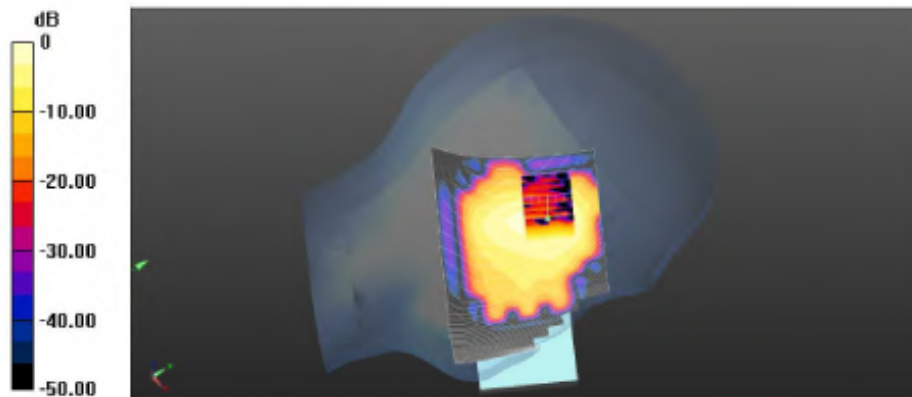
Head/2.45GHz_Left Tilt_CH11_Data Reta2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.082 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.252 W/kg

SAR(1 g) = 0.110 W/kg; SAR(10 g) = 0.051 W/kg

Maximum value of SAR (measured) = 0.174 W/kg



WLAN Body SAR Test

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Front_CH11_Data Rate 1Mbps.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Front_CH11_Data Rate 1Mbps/Area Scan (131x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0432 W/kg

Body/2.45GHz_Front_CH11_Data Rate 1Mbps/Zoom Scan (7x8x7)/Cube 0: Measurement grid:

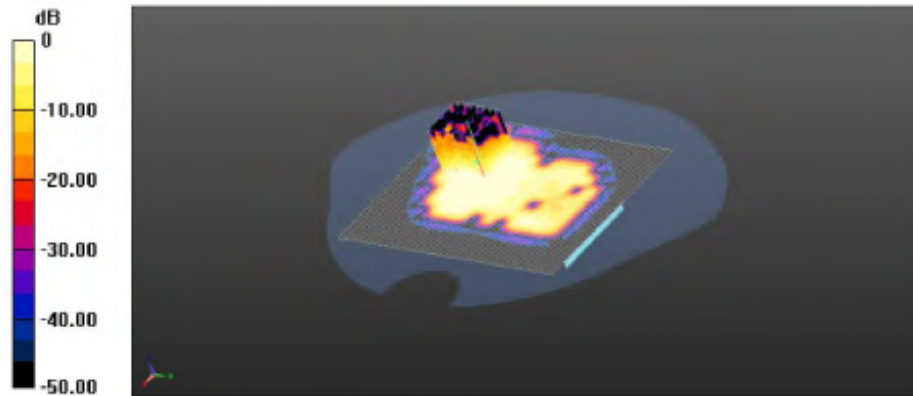
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.291 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.0540 W/kg

SAR(1 g) = 0.027 W/kg; SAR(10 g) = 0.012 W/kg

Maximum value of SAR (measured) = 0.0306 W/kg



0 dB = 0.0432 W/kg = -13.65 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Rear_CH11_Data Rate 1Mbps_da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Rear_CH11_Data Rate 1Mbps/Area Scan (131x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.131 W/kg

Body/2.45GHz_Rear_CH11_Data Rate 1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

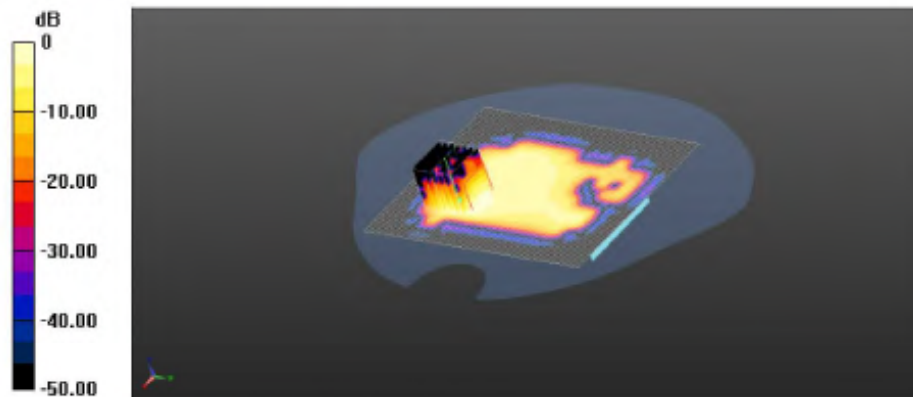
dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.582 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.165 W/kg

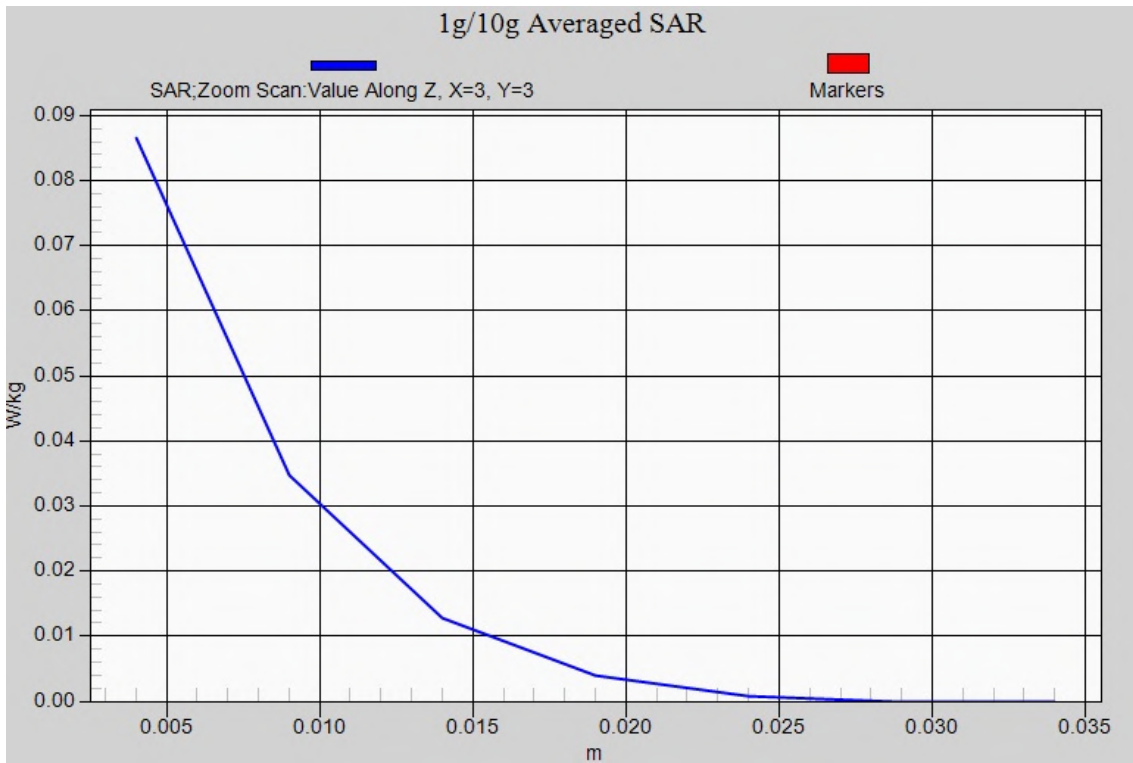
SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.034 W/kg

Maximum value of SAR (measured) = 0.0866 W/kg



0 dB = 0.131 W/kg = -8.83 dBW/kg

Z-Scan



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Right Edge_CH11_Data Rate 1Mbps.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

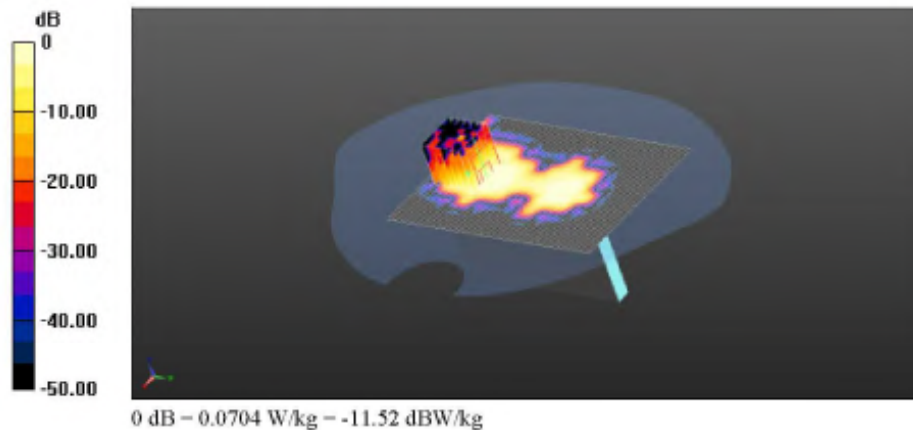
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Right Edge_CH11_Data Rate 1Mbps/Area Scan (111x161x1): Interpolated grid:
 dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.0704 W/kg

Body/2.45GHz_Right Edge_CH11_Data Rate 1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid:
 dx=5mm, dy=5mm, dz=5mm
 Reference Value = 2.844 V/m; Power Drift = 0.10 dB
 Peak SAR (extrapolated) = 0.0930 W/kg
SAR(1 g) = 0.046 W/kg; SAR(10 g) = 0.021 W/kg
 Maximum value of SAR (measured) = 0.0705 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Top_CH11_Data Rate 1Mbps.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

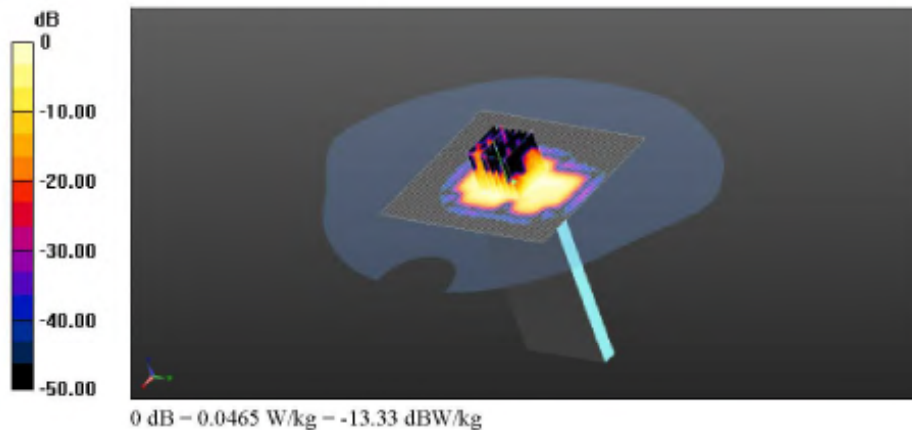
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Top_CH11_Data Rate 1Mbps/Area Scan (111x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.0465 W/kg

Body/2.45GHz_Top_CH11_Data Rate 1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 4.929 V/m; Power Drift = 0.05 dB
 Peak SAR (extrapolated) = 0.0620 W/kg
SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.014 W/kg
 Maximum value of SAR (measured) = 0.0471 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Front_CH11_Data Rate 2Mbps.da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Front_CH11_Data Rate 2Mbps/Area Scan (131x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0448 W/kg

Body/2.45GHz_Front_CH11_Data Rate 2Mbps/Zoom Scan (8x8x7)/Cube 0: Measurement grid:

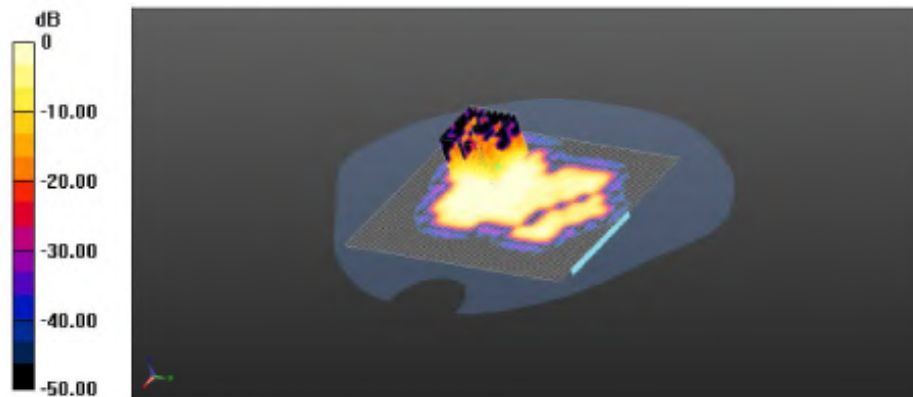
dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.140 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.0540 W/kg

SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.012 W/kg

Maximum value of SAR (measured) = 0.0292 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [2.45GHz_Rear_CH11_Data Rate 2Mbps_da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
- DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Rear_CH11_Data Rate 2Mbps/Area Scan (131x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.130 W/kg

Body/2.45GHz_Rear_CH11_Data Rate 2Mbps/Zoom Scan (8x8x7)/Cube 0: Measurement grid:

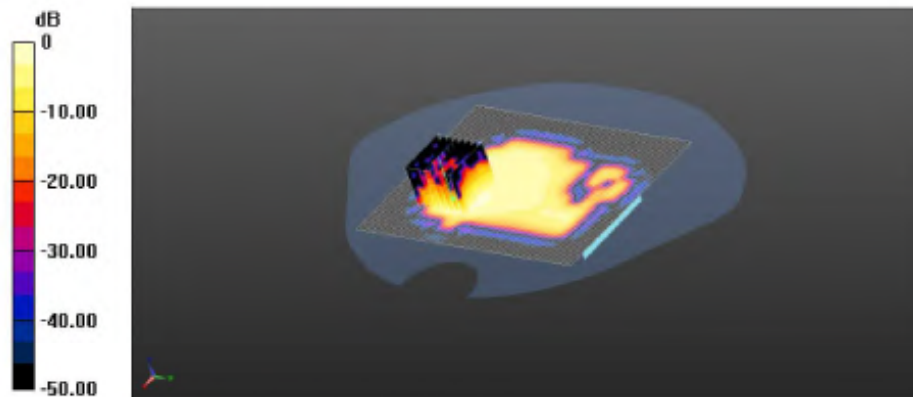
dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.614 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.323 W/kg

SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0845 W/kg



0 dB = 0.130 W/kg = -8.86 dBW/kg

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Right Edge_CH11_Data Rate 2Mbps.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

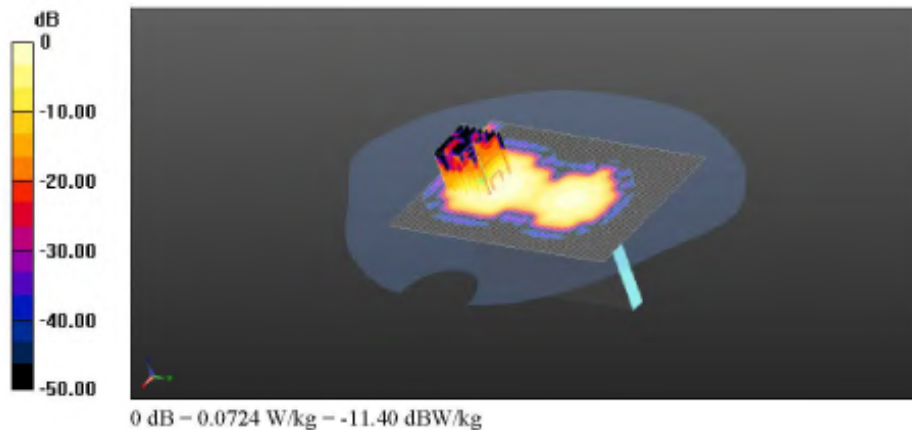
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Right Edge_CH11_Data Rate 2Mbps/Area Scan (111x171x1): Interpolated grid:
 dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.0724 W/kg

Body/2.45GHz_Right Edge_CH11_Data Rate 2Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid:
 dx=5mm, dy=5mm, dz=5mm
 Reference Value = 2.620 V/m; Power Drift = 0.18 dB
 Peak SAR (extrapolated) = 0.0930 W/kg
SAR(1 g) = 0.045 W/kg; SAR(10 g) = 0.021 W/kg
 Maximum value of SAR (measured) = 0.0687 W/kg



Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: 2.45GHz_Top_CH11_Data Rate 2Mbps.da53:0

Ambient Temp : 23.9 °C Tissue Temp : 22.6 °C

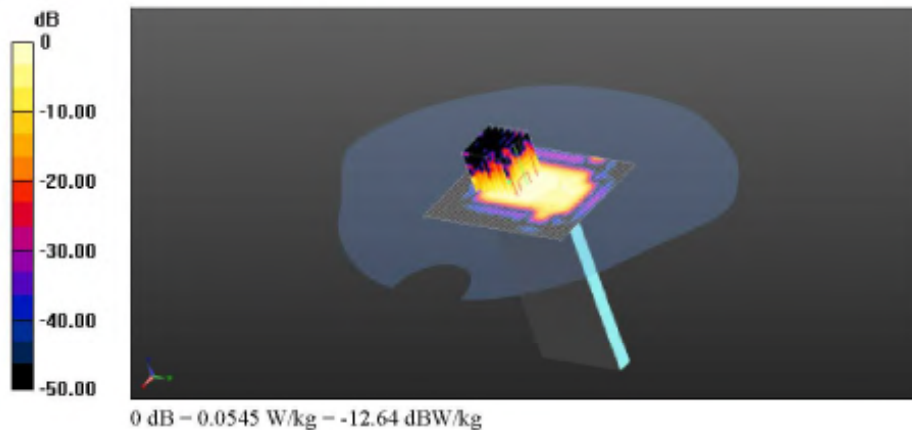
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: WLAN 2.45GHZ; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 50.706$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(7.25, 7.25, 7.25); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1721
 - DASY32 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/2.45GHz_Top_CH11_Data Rate 2Mbps/Area Scan (81x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
 Maximum value of SAR (interpolated) = 0.0545 W/kg

Body/2.45GHz_Top_CH11_Data Rate 2Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 4.761 V/m; Power Drift = 0.06 dB
 Peak SAR (extrapolated) = 0.0790 W/kg
SAR(1 g) = 0.030 W/kg; SAR(10 g) = 0.012 W/kg
 Maximum value of SAR (measured) = 0.0459 W/kg



Repeated SAR Test

Date: 2013-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
 File Name: [GPRS850_Rear_CH190_4TX_Repeated_Test.da53:0](#)

Ambient Temp : 23.9 °C Tissue Temp : 22.9 °C

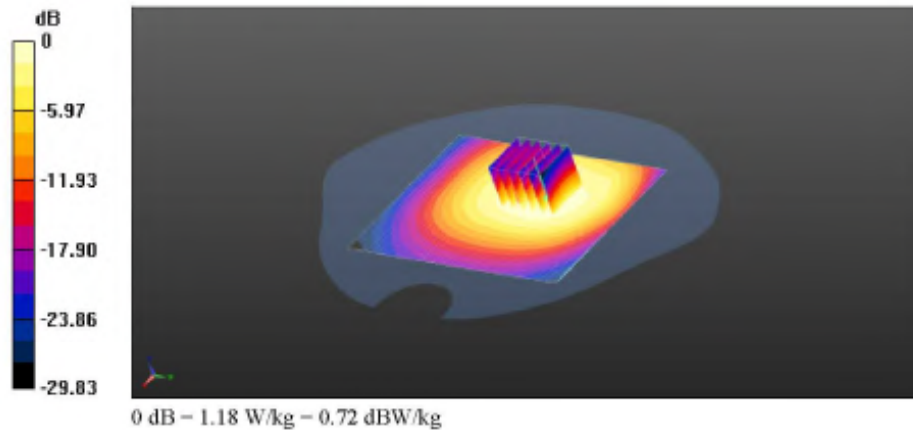
DUT: LG-E450f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: N/A

Communication System: GPRS850 4TX; Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
 Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 54.374$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY52 Configuration:
 - Probe: EX3DV4 - SN3862; ConvF(9.76, 9.76, 9.76); Calibrated: 04.02.2013;
 - Sensor-Surface: 2mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn1340; Calibrated: 10.07.2012
 - Phantom: SAM with CRP; Type: SAM; Serial: TP-1720
 - DASY52 52.8.4(1052)SEMCAD X 14.6.8(7028)

Body/GPRS850_Rear_CH190_4TX_Repeated Test/Area Scan (81x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 1.18 W/kg

Body/GPRS850_Rear_CH190_4TX_Repeated Test/Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 29.650 V/m; Power Drift = -0.01 dB
 Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 1 W/kg; SAR(10 g) = 0.748 W/kg
 Maximum value of SAR (measured) = 1.16 W/kg



Appendix B

Uncertainty Analysis

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

a	b	c	d	e = f(d,k)	g	i = cxg/e	k
Uncertainty Component	Section in P1528	Tol (%)	Prob . Dist.	Div.	Ci (1g)	1g ui (%)	Vi (Veff)
Probe calibration	E.2.1	6.0	N	1	1	6.00	∞
Axial isotropy	E.2.2	0.25	R	1.73	1	0.14	∞
hemispherical isotropy	E.2.2	1.3	R	1.73	1	0.75	∞
Boundary effect	E.2.3	0.4	R	1.73	1	0.23	∞
Linearity	E.2.4	0.3	R	1.73	1	0.17	∞
System detection limit	E.2.5	0.25	R	1.73	1	0.14	∞
Readout electronics	E.2.6	0.3	N	1	1	0.30	∞
Response time	E.2.7	0.8	R	1.73	1	0.46	∞
Integration time	E.2.8	2.6	R	1.73	1	1.50	∞
RF ambient Condition -Noise	E.6.1	3.0	R	1.73	1	1.73	∞
RF ambient Condition - reflections	E.6.1	3.0	R	1.73	1	1.73	∞
Probe positioning- mechanical tolerance	E.6.2	1.5	R	1.73	1	0.87	∞
Probe positioning- with respect to phantom	E.6.3	2.9	R	1.73	1	1.67	∞
Max. SAR evaluation	E.5.2	1.0	R	1.73	1	0.58	∞
Test sample positioning	E.4.2	5.84	N	1	1	5.84	9
Device holder uncertainty	E.4.1	3.6	N	1	1	3.60	∞
Output power variation -SAR drift measurement	6.62	5.0	R	1.73	1	2.89	∞
Phantom uncertainty (shape and thickness tolerances)	E.3.1	6.6	R	1.73	1	3.81	∞
Liquid conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	1.85	∞
Liquid conductivity - measurement uncertainty	E.3.2	0.70	N	1	0.64	0.45	5
Liquid permittivity - deviation from target values	E.3.3	5.0	R	1.73	0.6	1.73	∞
Liquid permittivity - measurement uncertainty	E.3.3	0.56	N	1	0.6	0.34	5
Combined standard uncertainty				RSS		11.22	123
Expanded uncertainty (95% CONFIDENCE INTERVAL)				K=2		22.44	