SAR TEST REPORT

Equipment Under Test	:	Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN
Model No.	:	LG-C398 (Add: LG-C393, LG-C396, LG-C397, LG-C399, LGC393, LGC396, LGC397, LGC398, LGC399, C396, C397, C398, C399)
Applicant	:	LG Electronics MobileComm U.S.A., Inc.
Address of Applicant	:	1000 Sylvan Avenue Englewood Cliffs, NJ 07632
FCC ID	:	ZNFC399
Device Category	:	Portable Device
Exposure Category	:	General Population/Uncontrolled Exposure
Date of Receipt	:	2012-12-14
Date of Test(s)	:	2013-02-07 ~ 2013-02-10
Date of Issue	:	2013-02-14

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:

Tested by	**:**	**Minhyuk Han**	**2013-02-14**
Approved by	**:**	**Denny Ham**	**2013-02-14**

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APPENDIX

A. DASY4 SAR Report

B. Uncertainty Analysis

C. Calibration certificate

1. General Information

1.1 Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, 435-040, Korea
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371
Homepage : All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx

1.2 Details of Manufacturer

Manufacturer : LG Electronics Inc.
Address : 60-39, Gasan-dong, Gumchon-gu, Seoul, 153-023, Korea
Contact Person : smyung - Lee
Phone No. : 82-2-2033-4606
E-mail : smyung.lee@lge.com

1.3 Version of Report

Version Number	Date	Revision
00	2013-01-31	Initial issue
01	2013-02-14	Revision 01
02	2013-02-14	Revision 02

1.4 Description of EUT(s)

EUT Type	: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN
Model	: LG-C398 (Add: LG-C393, LG-C396, LG-C397, LG-C399, LGC393, LGC396, LGC397, LGC398, LGC399, C396, C397, C398, C399)
Serial Number	: 210KPQJ242084
Mode of Operation	: GSM850, PCS1900, 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)
Body worn Accessory	: Audio Accessory
Tx Frequency Range	: 824.2 ㎒ ~ 848.8 ㎒ (GSM850) 1850.2 ㎒ ~ 1909.8 ㎒ (PCS1900) 2412 ㎒ ~ 2462 ㎒ (WLAN) 2402 ㎒ ~ 2480 ㎒ (Bluetooth)
Battery Type	: 3.7 V d.c. (Lithum-ion Battery)

Equipment Class	**Band**	**Reported SAR**	
		1g Head (W/kg)	**1g Body-Worn (W/kg)**
PCE	GSM/GPRS/EDGE Rx Only 850	0.547	0.661
	GSM/GPRS/EDGE Rx Only 1900	1.064	0.150
DTS	2.45 ㎓ WLAN	0.500	N/A
DSS	Bluetooth	N/A	
Simultaneous SAR per KDB 690783 D01v01r02		**1.564**	**0.979**

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**	**31.20**	**28.20**
	Nominal	30.70	27.70
GPRS (GMSK, 3 Tx slot)	**Maximum**	**29.70**	**26.70**
	Nominal	29.20	26.20
GPRS (GMSK, 4 Tx slot)	**Maximum**	**28.20**	**25.20**
	Nominal	27.70	24.70

Average power for Production					
Mode	Nominal & Maximum	a	b	g	n
2.45 ㎓ WLAN	**Maximum**		**13.60**	**11.50**	
	Nominal		12.90	10.80	
Bluetooth	**Maximum**	**7.50**			
	Nominal	6.80			

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(CMU200). 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 DASY4 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 ㎜. 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 ㎜ 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 ㎜. 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	½·δ·ln(2) ± 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: Δx_{Area}, Δy_{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: Δx_{Zoom}, Δy_{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 1st 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 4 professional system). A Model ET3DV6 1782 E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant. The DASY4 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.

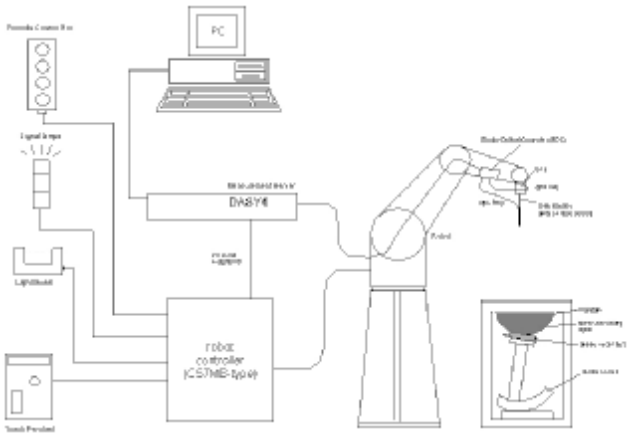


Fig a. The microwave circuit arrangement used for SAR system verification

• 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 2000.

• DASY4 software: V4.7 Build80.

• 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

ET3DV6 E-Field Probe

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

Calibration : In air from 10 ㎒ to 2.5 ㎓ In brain simulating tissue (accuracy ± 8 %)

Frequency : 10 ㎒ to >6 ㎓; Linearity: ±0.2 ㏈ (30 ㎒ to 3 ㎓)

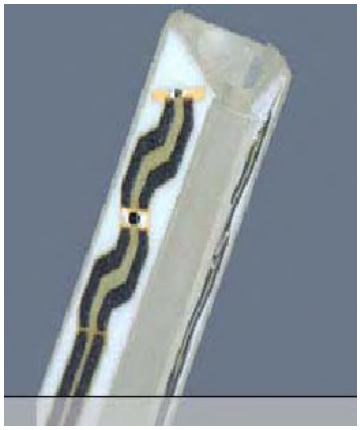
Directivity : ±0.2 ㏈ in brain tissue (rotation around probe axis)
±0.4 ㏈ in brain tissue (rotation normal to probe axis)

Dynamic Range : 5 μW/g to >100 mW/g; Linearity: ±0.2 ㏈

Srfce. Detect : ±0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces

Dimensions : Overall length: 330 mm
Tip length: 16 mm
Body diameter: 12 mm
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm

Application : General dosimetry up to 3 ㎓ Compliance tests of mobile phone


ET3DV6 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

Shell Thickness: 2.0 ㎜ ± 0.1 ㎜

Filling Volume: Approx. 25 liters

SAM Phantom

DEVICE HOLDER

Construction In combination with the Twin SAM PhantomV4.0/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 +/- 10 % from the target SAR values. These tests were done at 835 ㎒, 1900 ㎒, 2450 ㎒. 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 ± 2) ° C, the relative humidity was in the range (55 ± 5）% 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.

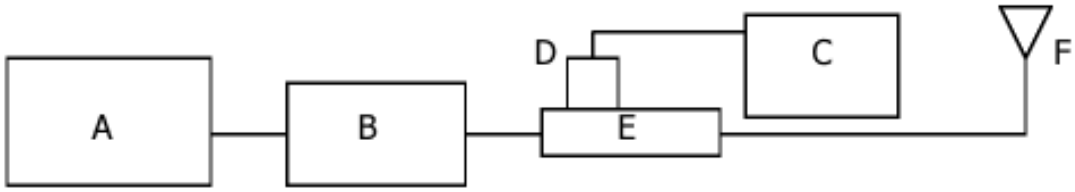


Fig b. The microwave circuit arrangement used for SAR system verification

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)	Normalized SAR 1 g (1 W)	Deviation (%)	Date	Liquid Temp. (°C)
D835V2 S/N: 490	1782	835 ㎒ Head	9.39 W/kg	0.942 W/kg	**9.42 W/kg**	**0.32**	02/07/2013	22.9
D835V2 S/N: 490	1782	835 ㎒ Body	9.35 W/kg	0.965 W/kg	**9.65 W/kg**	**3.21**	02/08/2013	22.5
D1900V2 S/N: 5d033	1782	1900 ㎒ Head	39.4 W/kg	3.89 W/kg	**38.90 W/kg**	**-1.27**	02/09/2013	22.3
D1900V2 S/N: 5d033	1782	1900 ㎒ Body	39.9 W/kg	3.97 W/kg	**39.70 W/kg**	**-0.50**	02/09/2013	22.1
D2450V2 S/N: 734	1782	2450 ㎒ Head	52.8 W/kg	5.55 W/kg	**55.50 W/kg**	**5.11**	02/10/2013	21.6

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 ㎑ - 3 ㎓) by using a procedure detailed in Section V.

f (㎒)	Tissue type	Limits / Measured	Dielectric Parameters		
			Permittivity	Conductivity	Simulated Tissue Temp(℃)
835	Head	Measured, 02/07/2013	43.1	0.91	22.9
		Recommended Limits	41.5	0.90	21.0 ~ 23.0
		Deviation(%)	**3.86**	**1.11**	-
	Body	Measured, 02/08/2013	52.8	0.94	22.5
		Recommended Limits	55.2	0.97	21.0 ~ 23.0
		Deviation(%)	**-4.35**	**-3.09**	-
1900	Head	Measured, 02/09/2013	41.5	1.43	22.3
		Recommended Limits	40.0	1.40	21.0 ~ 23.0
		Deviation(%)	**3.75**	**2.14**	-
	Body	Measured, 02/09/2013	52.7	1.53	22.1
		Recommended Limits	53.3	1.52	21.0 ~ 23.0
		Deviation(%)	**-1.13**	**0.66**	-
2450	Head	Measured, 02/10/2013	38.7	1.79	21.6
		Recommended Limits	39.2	1.80	21.0 ~ 23.0
		Deviation(%)	**-1.28**	**-0.56**	-

The composition of the muscle 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 (㎒)									
	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		
					Permittivity	Conductivity	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR
835	02/07/2013	1782	835	Head	43.1	0.91	PASS	PASS	PASS	GMSK	PASS	N/A
1900	02/09/2013	1782	1900	Head	41.5	1.43	PASS	PASS	PASS	GMSK	PASS	N/A
2450	02/10/2013	1782	2450	Head	38.7	1.79	PASS	PASS	PASS	OFDM	N/A	PASS
835	02/08/2013	1782	835	Body	52.8	0.94	PASS	PASS	PASS	GMSK	PASS	N/A
1900	02/09/2013	1782	1900	Body	52.7	1.53	PASS	PASS	PASS	GMSK	PASS	N/A

< 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 ㎑ to 300 ㎓,’’ 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 ㎑ to 6 ㎓. Portable devices that transmit at frequencies above 6 ㎓ 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 ㎓ 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	F03/5W05A1/A/01	N/A	N/A	N/A
Schmid& Partner Engineering AG	Dosimetric E-Field Probe	ET3DV6	1782	04/27/2012	Annual	04/27/2013
Schmid& Partner Engineering AG	835 ㎒ System Validation Dipole	D835V2	490	05/16/2012	Biennial	05/16/2014
Schmid& Partner Engineering AG	1900 ㎒ System Validation Dipole	D1900V2	5d033	05/23/2012	Biennial	05/23/2014
Schmid& Partner Engineering AG	2450 ㎒ System Validation Dipole	D2450V2	734	05/17/ 2012	Biennial	05/17/ 2014
Schmid& Partner Engineering AG	Data acquisition Electronics	DAE3	567	01/25/2013	Annual	01/25/2014
Schmid& Partner Engineering AG	Software	DASY4 V4.7	-	N/A	N/A	N/A
Schmid& Partner Engineering AG	Phantom	SAM Phantom V4.0	TP-1645 TP-1300	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
R&S	Mobile Test Unit	CMU200	109456	07/04/2012	Annual	07/04/2013

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(㎒)	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	33.18	33.15	30.50	28.97	27.50
	190	836.6	33.17	33.17	30.48	28.95	27.49
	251	848.8	33.18	33.16	30.54	29.01	27.54
PCS 1900 Band	512	1850.2	30.08	30.07	27.49	26.00	24.55
	661	1880.0	30.07	30.06	27.46	25.98	24.55
	810	1909.8	30.10	30.09	27.50	25.99	24.56
GSM	Channel	Frequency(㎒)	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	24.15	24.12	24.48	**24.71**	24.49
	190	836.6	24.14	24.14	24.46	**24.69**	24.48
	251	848.8	24.15	24.13	24.52	**24.75**	24.53
PCS 1900 Band	512	1850.2	21.05	21.04	21.47	**21.74**	21.54
	661	1880.0	21.04	21.03	21.44	**21.72**	21.54
	810	1909.8	21.07	21.06	21.48	**21.73**	21.55

Notes

- CS1 coding scheme was used in GPRS output power measurements and SAR Testing, as a condition where GMSK modulation was ensured. Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.

Bluetooth

Channel	Frequency (㎒)	GFSK (㏈ m)	PI/4DQPSK	8DPSK (㏈ m)
Low	2402	**7.47**	3.97	3.75
Middle	2441	7.34	3.90	3.64
High	2480	6.64	3.01	3.22

WLAN

802.11b Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(㏈ m)
2412	1	1	13.42
		2	13.39
		5.5	**13.60**
		11	13.48
2437	6	1	13.24
		2	12.88
		5.5	13.54
		11	13.26
2462	11	1	12.77
		2	12.75
		5.5	13.02
		11	12.89

802.11g Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(㏈ m)
2412	1	6	11.45
		9	11.34
		12	11.26
		18	11.24
		24	10.66
		36	10.36
		48	10.10
		54	9.85
2437	6	6	11.47
		9	11.39
		12	11.25
		18	11.14
		24	11.36
		36	10.38
		48	9.86
		54	9.72
2462	11	6	10.23
		9	10.20
		12	10.02
		18	9.60
		24	9.80
		36	9.34
		48	9.11
		54	8.87

3.4 SAR Test Exclusions Applied

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

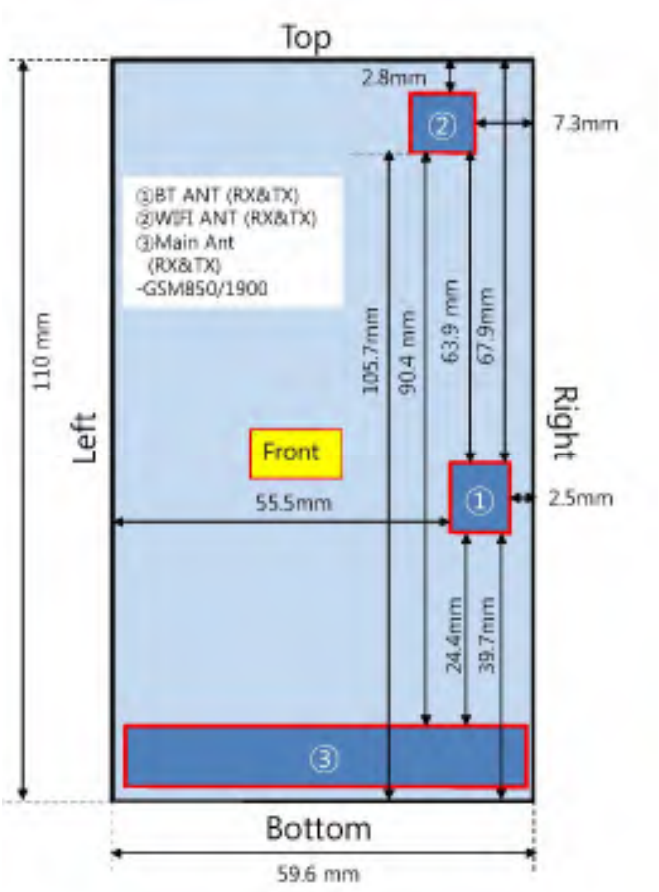
$$\frac{\text{Max Power of Channel (mW)}}{\text{Test Separation Distance (mm)}} * \sqrt{\text{Frequency(GHz)}} \leq 3.0$$

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

Body: 2.45 ㎓ WLAN SAR was not required: (22.91/15 * √2.412 = 2.37 < 3.0)

Head & Body: Bluetooth SAR was not required: (5.58/5 * √2.402 = 1.73 < 3.0)

<The Distance information of Antenna to Edges of EUT>



3.5 SAR Data Summary

Ambient Temperature (°C)	23.8
Liquid Temperature (°C)	22.9
Date	02/07/2013

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 Touch	836.6	190	33.17	33.20	0.180	0.543	1.007	0.547	1.6
	Right Tilt	836.6	190	33.17	33.20	-0.121	0.309	1.007	0.311	
	Left Touch	836.6	190	33.17	33.20	-0.036	0.516	1.007	0.520	
	Left Tilt	836.6	190	33.17	33.20	-0.025	0.315	1.007	0.317	

Ambient Temperature (°C)	23.3
Liquid Temperature (°C)	22.5
Date	02/08/2013

GSM850 Body SAR

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								
GSM	Rear	836.6	190	15	33.17	33.20	0.004	0.656	1.007	0.661	1.6

Ambient Temperature (°C)	23.5
Liquid Temperature (°C)	22.3
Date	02/09/2013

PCS1900 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 Touch	1880.0	661	30.07	30.20	0.195	0.507	1.030	0.522	1.6
	Right Tilt	1880.0	661	30.07	30.20	0.025	0.285	1.030	0.294	
	Left Touch	1880.0	661	30.07	30.20	-0.077	0.913	1.030	0.940	
	Left Touch	1850.2	512	30.08	30.20	0.011	0.883	1.028	0.908	
	Left Touch	1909.8	810	30.10	30.20	-0.051	1.02	1.023	1.043	
	Left Tilt	1880.0	661	30.07	30.20	-0.045	0.280	1.030	0.288	
	Left Touch	1909.8	810	30.10	30.20	0.002	1.04	1.023	1.064	

Ambient Temperature (°C)	23.5
Liquid Temperature (°C)	22.1
Date	02/09/2013

PCS1900 Body SAR

Test Mode	EUT Position	Traffic Channel		Distance (㎜)	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 (㎒)	Channel								
GSM	Rear	1880.0	661	15	30.07	30.20	0.036	0.146	1.030	0.150	1.6

Ambient Temperature (°C)	23.1
Liquid Temperature (°C)	21.6
Date	02/10/2013

WLAN Head SAR

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 (㎒)	Channel							
Right Ear	Cheek	1	2412	1	13.60	13.60	-0.046	0.342	1.000	0.342	1.6
	Tilt	1	2412	1	13.60	13.60	-0.023	0.314	1.000	0.314	
Left Ear	Cheek	1	2412	1	13.60	13.60	0.020	0.500	1.000	0.500	
	Tilt	1	2412	1	13.60	13.60	-0.030	0.417	1.000	0.417	

SAR Test Notes

General Notes :

1. 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.
2. All modes of operation were investigated, and worst-case results are reported.
3. 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.

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 require. 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 a 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.

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

Mode	Frequency	Maximum Allowed Power	Separation Distance	Estimated SAR
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2441	7.5	15	0.078
WLAN	2437	13.6	15	0.318

<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) + WLAN 2.4 GHz	O	O
2	WWAN (GSM850, PCS1900) + Bluetooth	X	O
3	WWAN (GSM850, PCS1900) + 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	G5M850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Head	Right Touch	0.547	0.342	0.889
	Right Tilt	0.311	0.314	0.625
	Left Touch	0.520	0.500	1.020
	Left Tilt	0.317	0.417	0.734
	Configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.522	0.342	0.864
	Right Tilt	0.294	0.314	0.608
	Left Touch	1.064	0.500	**1.564**
	Left Tilt	0.288	0.417	0.705

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	0.661	0.318	**0.979**
	configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Rear	0.150	0.318	0.468

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	0.661	0.078	0.739
	configuration	GSM1900 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Rear	0.150	0.078	0.228

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 and WLAN SAR was not required to be measured per KDB 447498D01v05

3.7 Repeated SAR Measurement

Test Mode	EUT Position	Traffic Channel		Measured 1 g SAR (W/kg)	1st Repeated 1 g SAR (W/kg)	Deviation (%)
		Frequency (㎒)	Channel			
GSM1900	Left Touch	1909.8	810	1.02	1.04	1.96

<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 ≤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	DASY4 Report (Plots of the SAR Measurements)	- 835 ㎒, 1900 ㎒, 2450 ㎒ Verification Test - GSM850 Test - PCS1900 Test - WLAN Test
Appendix B	Uncertainty Analysis	
Appendix C	Calibration Certificate	- PROBE - DAE - DIPOLE

Appendix A

Test Plot – DASY4 Report

835 ㎒ Verification Test_Head

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: Verification 835 MHz_Head.da4

Input Power : 100 mW

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

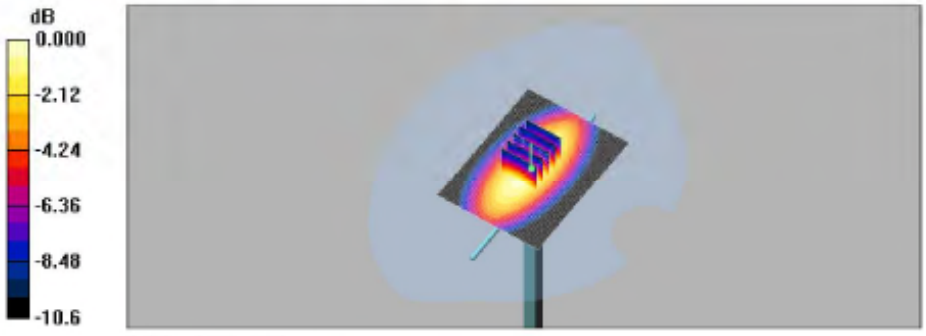
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Verification 835 MHz_Head

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.909 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.4, 6.4, 6.4); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

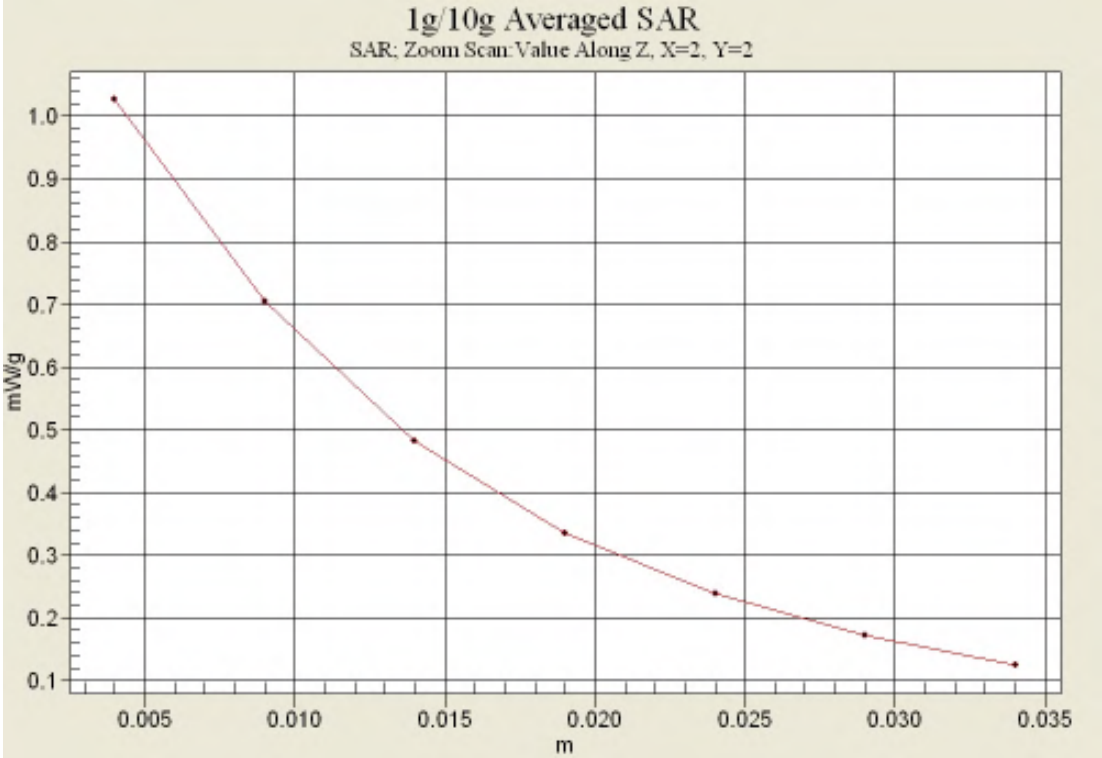
Verification 835 MHz_Head/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Verification 835 MHz_Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.8 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.942 mW/g; SAR(10 g) = 0.619 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Z Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

835 ㎒ Verification Test_Body

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: Verification 835 MHz_Body.da4

Input Power : 100 mW

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

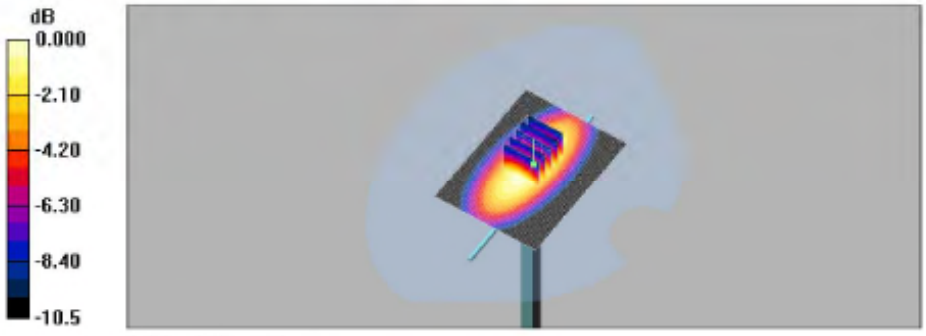
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Verification 835 MHz_Body

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.939 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

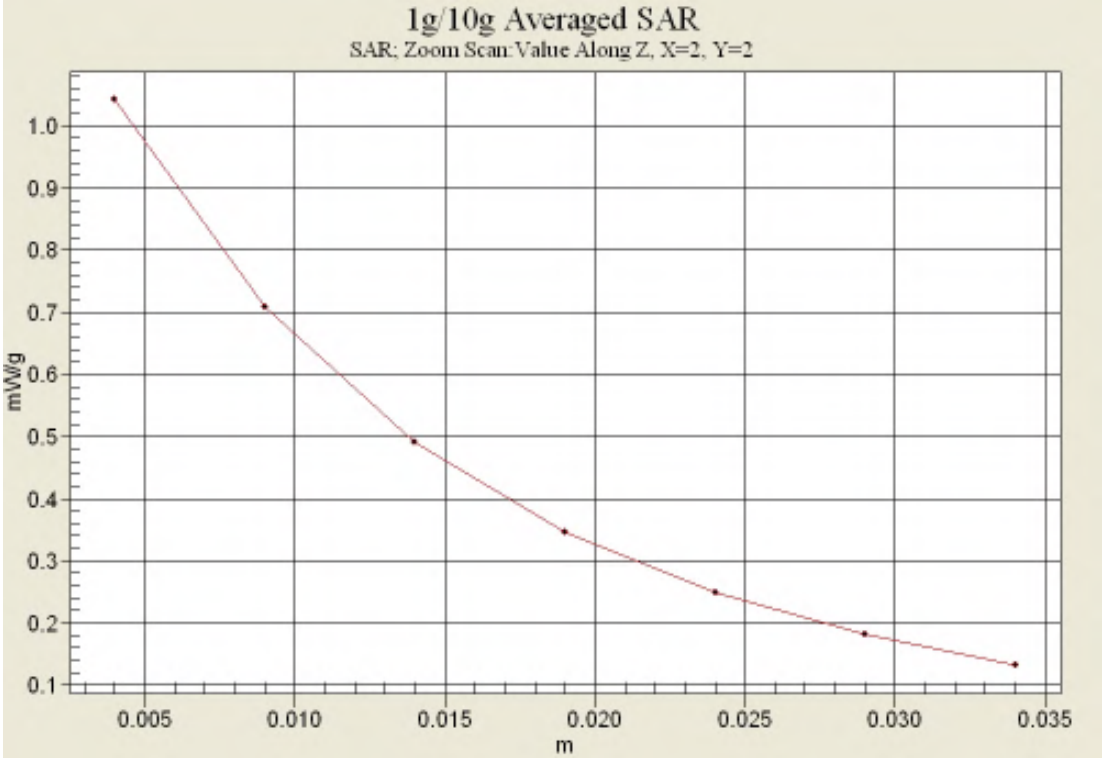
Verification 835 MHz_Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Verification 835 MHz_Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.0 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.965 mW/g; SAR(10 g) = 0.634 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Z Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

1900 ㎒ Verification Test_Head

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: Verification 1900 MHz_Head.da4

Input Power : 100 mW

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

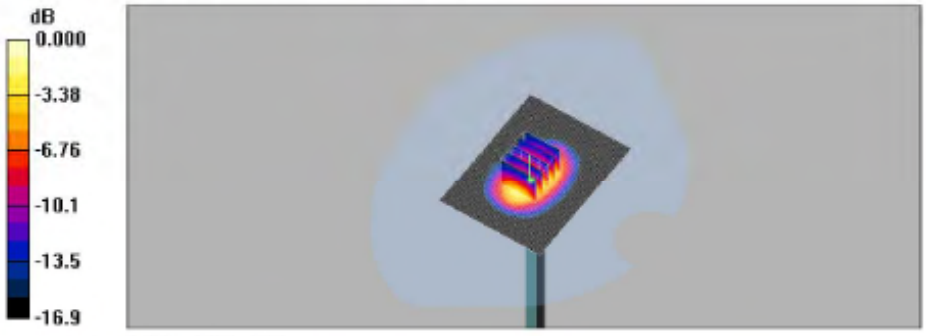
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Verification 1900 MHz_Head

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

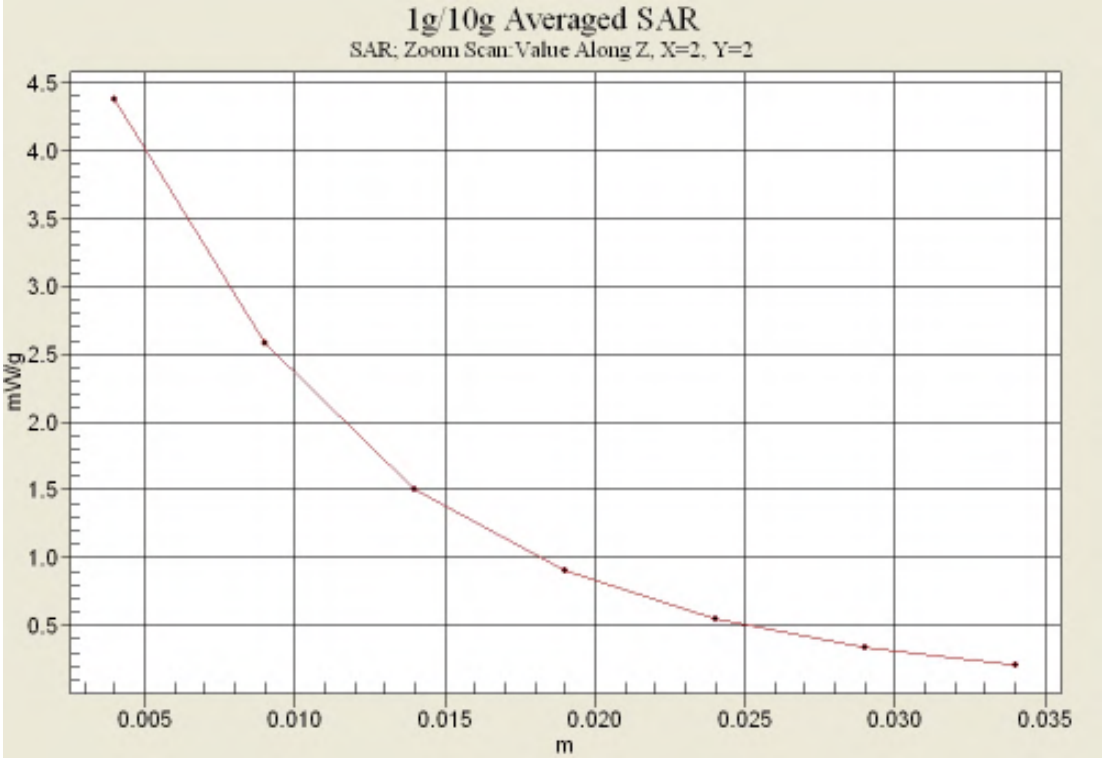
Verification 1900 MHz_Head/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.67 mW/g

Verification 1900 MHz_Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.4 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 6.55 W/kg
SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.09 mW/g
Maximum value of SAR (measured) = 4.38 mW/g



0 dB = 4.38mW/g

Z Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

1900 ㎒ Verification Test_Body

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: Verification 1900 MHz_Body.da4

Input Power : 100 mW

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

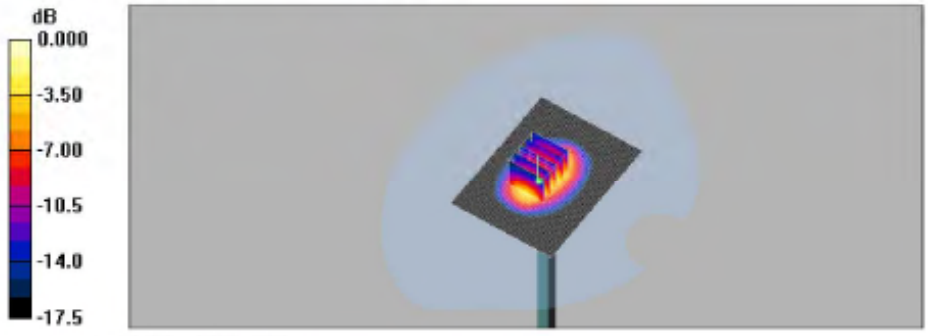
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Verification 1900 MHz_Body

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

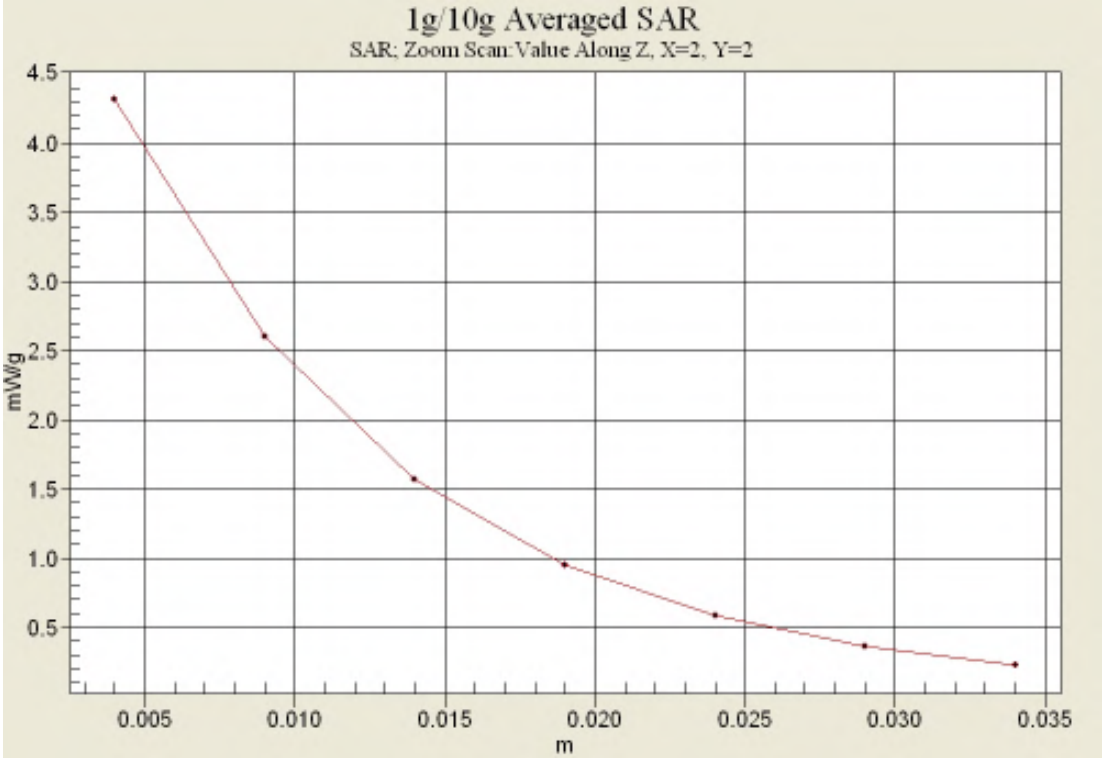
Verification 1900 MHz_Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.59 mW/g

Verification 1900 MHz_Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.5 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 6.80 W/kg
SAR(1 g) = 3.97 mW/g; SAR(10 g) = 2.13 mW/g
Maximum value of SAR (measured) = 4.32 mW/g



0 dB = 4.32mW/g

Z Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

2450 ㎒ Verification Test_Head

Date: 2013-02-10

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: Verification 2450 MHz_Head.da4

Input Power : 100 mW

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

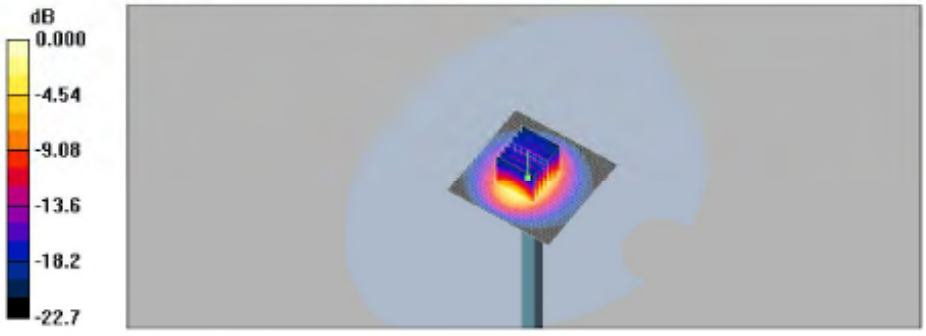
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 734
Program Name: Verification 2450 MHz_Head

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.79 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.48, 4.48, 4.48); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

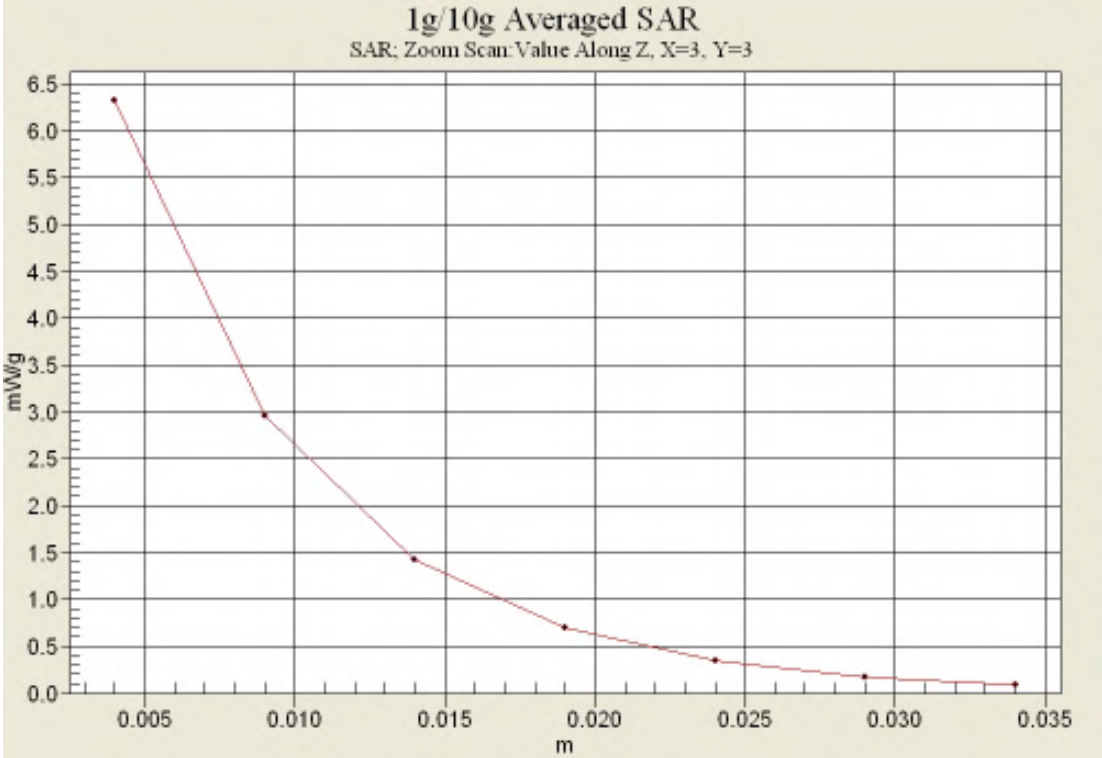
Verification 2450 MHz_Head/Area Scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 6.41 mW/g

Verification 2450 MHz_Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.6 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 12.1 W/kg
SAR(1 g) = 5.55 mW/g; SAR(10 g) = 2.55 mW/g
Maximum value of SAR (measured) = 6.32 mW/g



0 dB = 6.32mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=3, Y=3
mW/g
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM 850 Head SAR Test

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_Right Touch_CH190.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

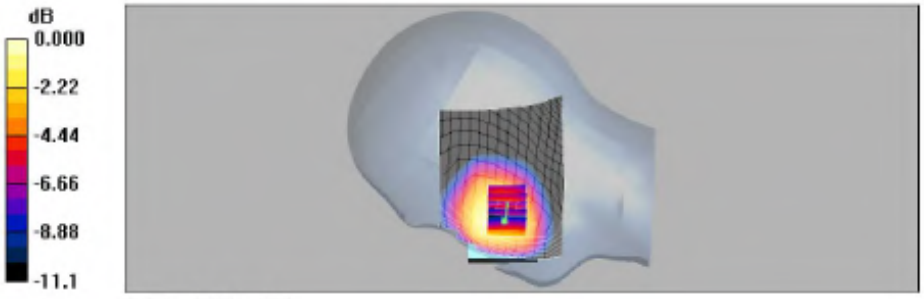
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: GSM850_Right Touch

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.911 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.4, 6.4, 6.4); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_Right Touch_CH190/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.588 mW/g

GSM850_Right Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.93 V/m; Power Drift = 0.180 dB
Peak SAR (extrapolated) = 0.678 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.398 mW/g
Maximum value of SAR (measured) = 0.577 mW/g



0 dB = 0.577mW/g

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_Right Tilt_CH190.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

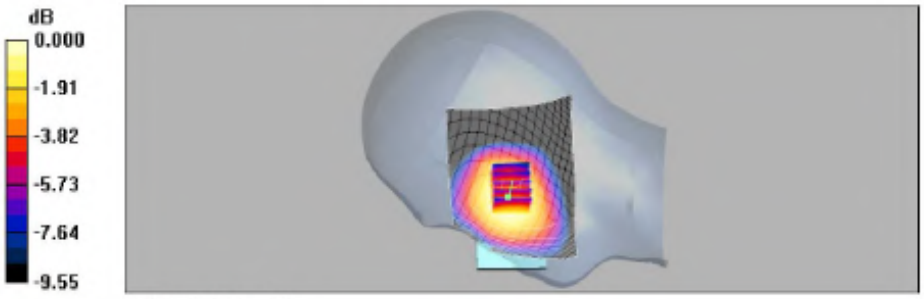
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: GSM850_Right Tilt

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.911 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.4, 6.4, 6.4); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_Right Tilt_CH190/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.331 mW/g

GSM850_Right Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 0.373 W/kg
SAR(1 g) = 0.309 mW/g; SAR(10 g) = 0.235 mW/g
Maximum value of SAR (measured) = 0.324 mW/g



0 dB = 0.324mW/g

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_Left Touch_CH190.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

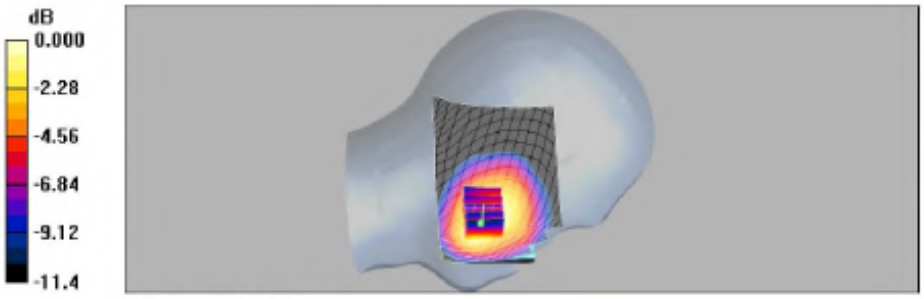
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: GSM850_Left Touch

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.911 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.4, 6.4, 6.4); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

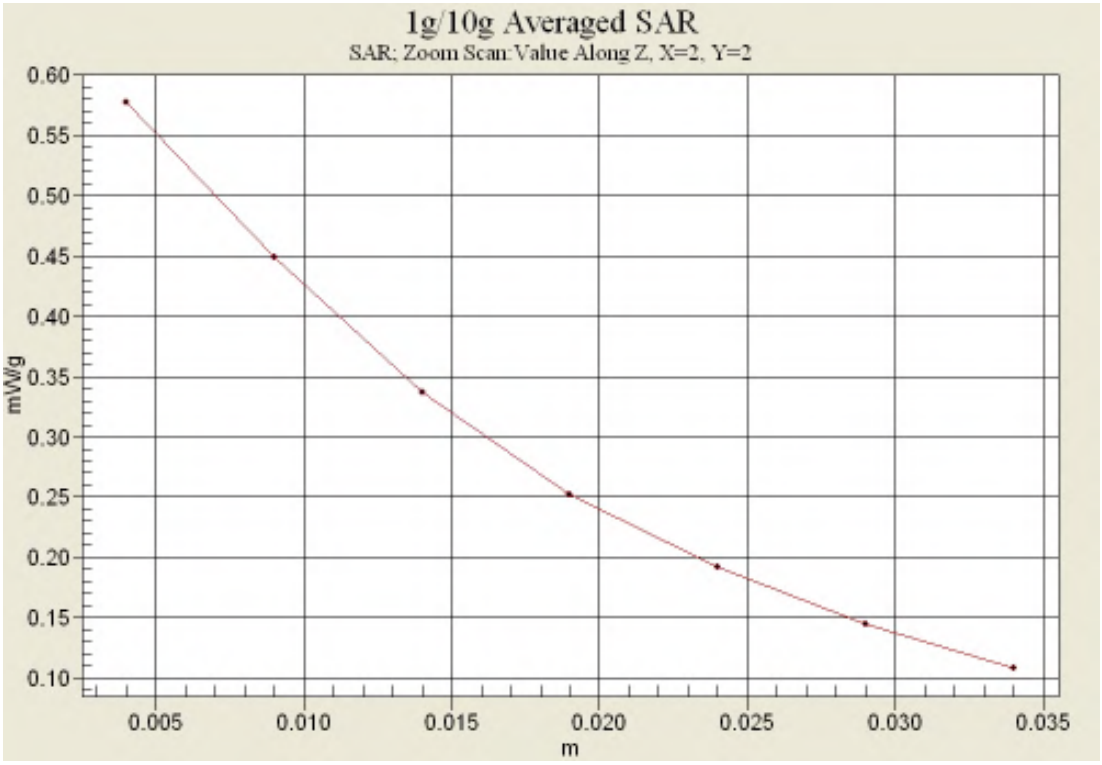
GSM850_Left Touch_CH190/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.559 mW/g

GSM850_Left Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.38 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.725 W/kg
SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.366 mW/g
Maximum value of SAR (measured) = 0.560 mW/g



0 dB = 0.560mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_Left Tilt_CH190.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

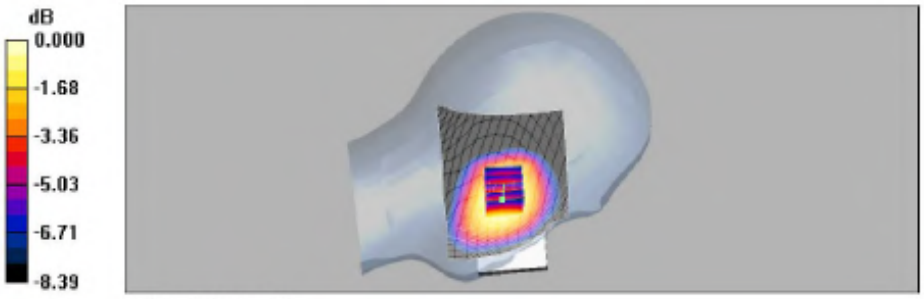
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: GSM850_Left Tilt

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.911 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.4, 6.4, 6.4); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_Left Tilt_CH190/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.339 mW/g

GSM850_Left Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.6 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 0.385 W/kg
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.238 mW/g
Maximum value of SAR (measured) = 0.329 mW/g



0 dB = 0.329mW/g

GSM 850 Body SAR Test

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_Rear_CH190.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

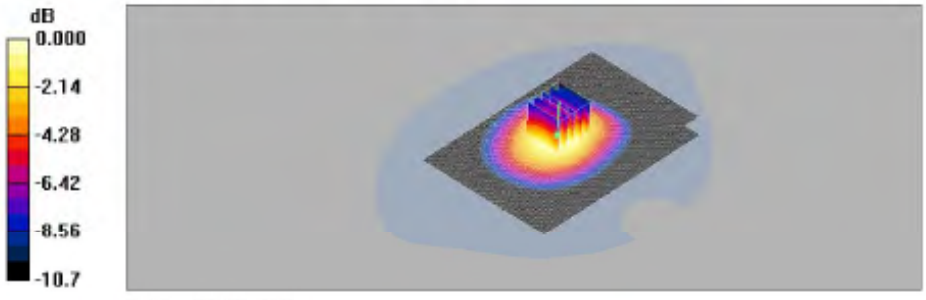
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: GSM850_Body

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.94 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

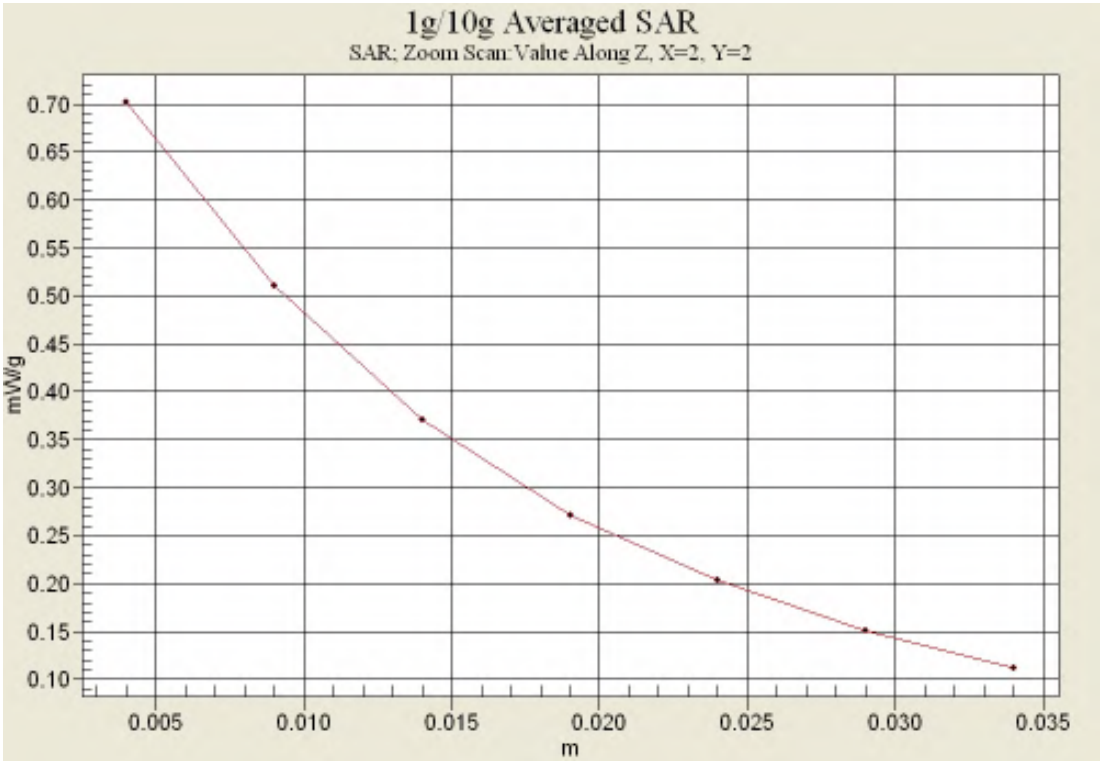
GSM850_Rear_CH190/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.707 mW/g

GSM850_Rear_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.2 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 0.917 W/kg
SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.462 mW/g
Maximum value of SAR (measured) = 0.707 mW/g



0 dB = 0.707mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

PCS1900 Head SAR Test

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Right Touch_CH661.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

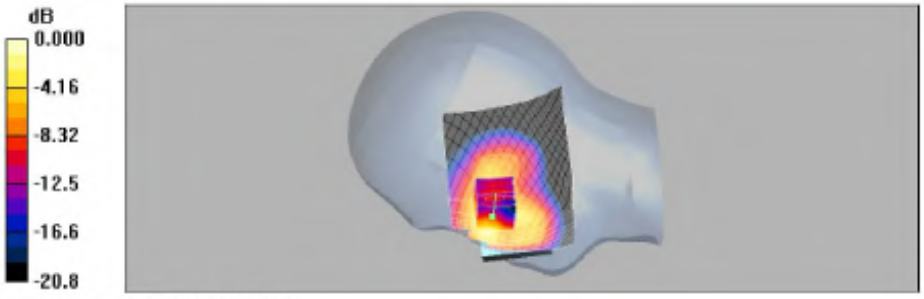
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Right Touch

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Right Touch_CH661/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.576 mW/g

PCS1900_Right Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.52 V/m; Power Drift = 0.195 dB
Peak SAR (extrapolated) = 0.787 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.298 mW/g
Maximum value of SAR (measured) = 0.560 mW/g



0 dB = 0.560mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Right Tilt_CH661.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

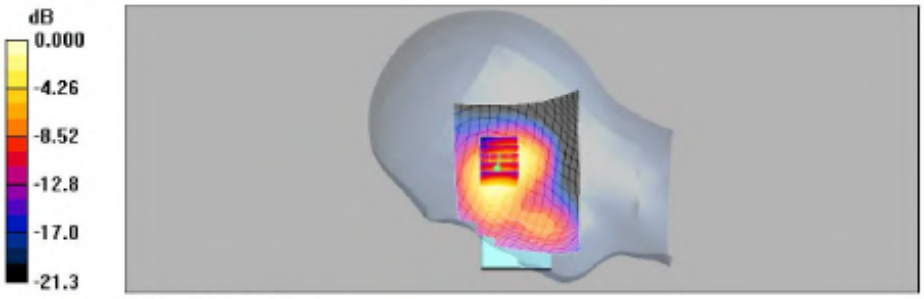
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Right Tilt

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Right Tilt_CH661/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.323 mW/g

PCS1900_Right Tilt_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.444 W/kg
SAR(1 g) = 0.285 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.307 mW/g



0 dB = 0.307mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Left Touch_CH661.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

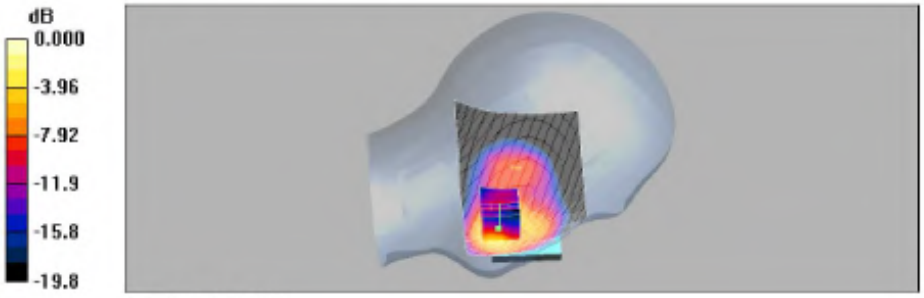
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Left Touch

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Left Touch_CH661/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.00 mW/g

PCS1900_Left Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.06 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.913 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Left Touch_CH512.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Left Touch

Communication System: PCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Left Section

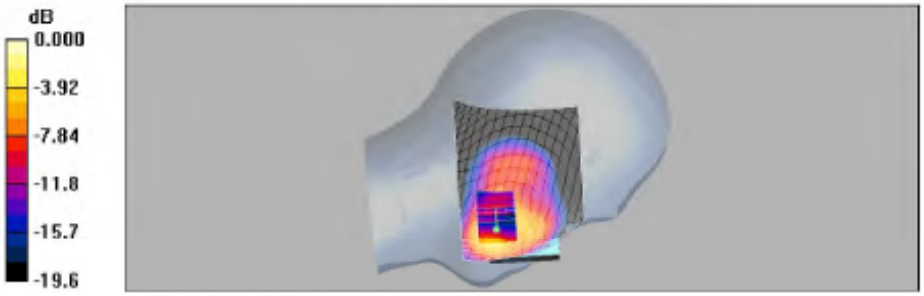
DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Left Touch_CH512/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.970 mW/g

PCS1900_Left Touch_CH512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.99 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.883 mW/g; SAR(10 g) = 0.478 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.991 mW/g



0 dB = 0.991mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Left Touch_CH810.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

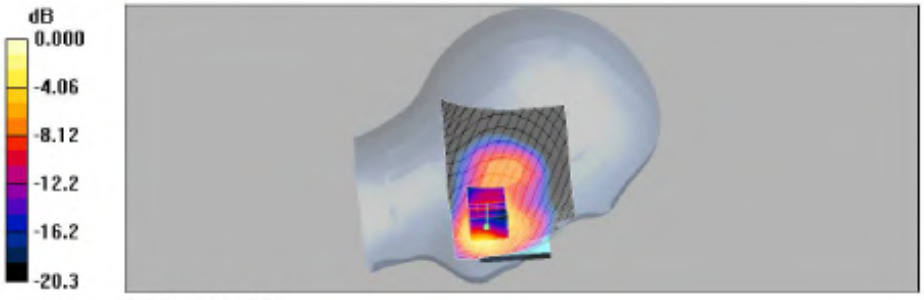
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Left Touch

Communication System: PCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.44 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

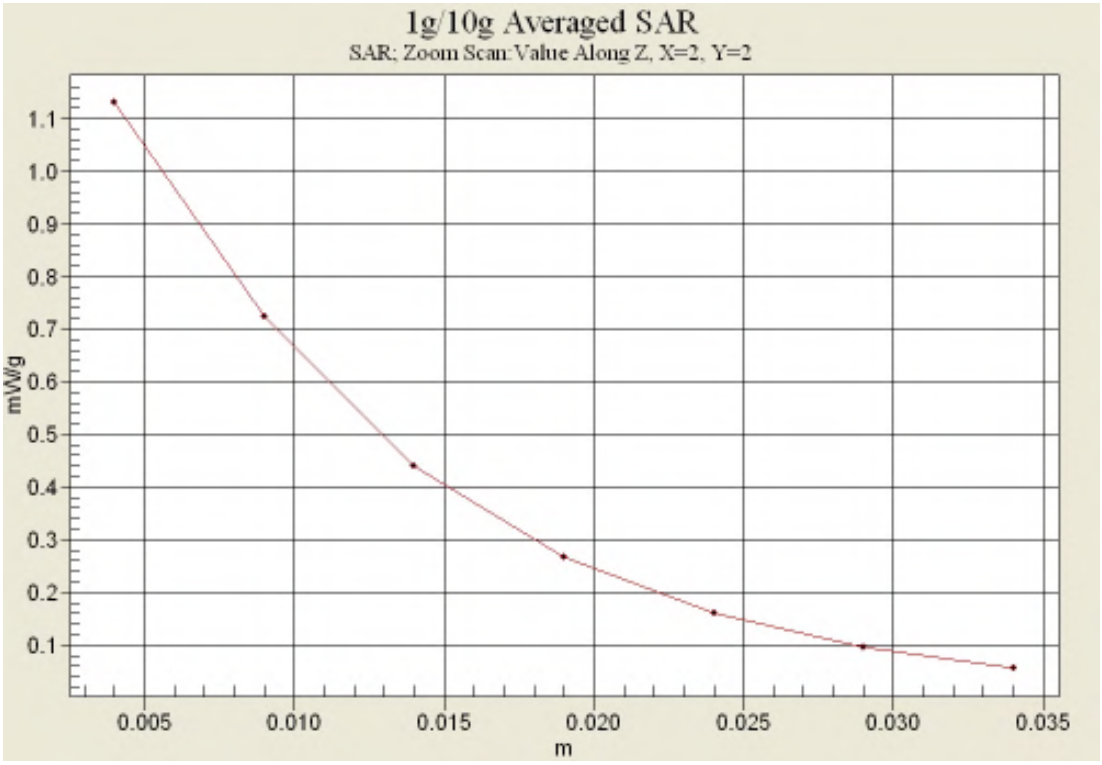
PCS1900_Left Touch_CH810/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

PCS1900_Left Touch_CH810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.60 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.558 mW/g
Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Left Tilt_CH661.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

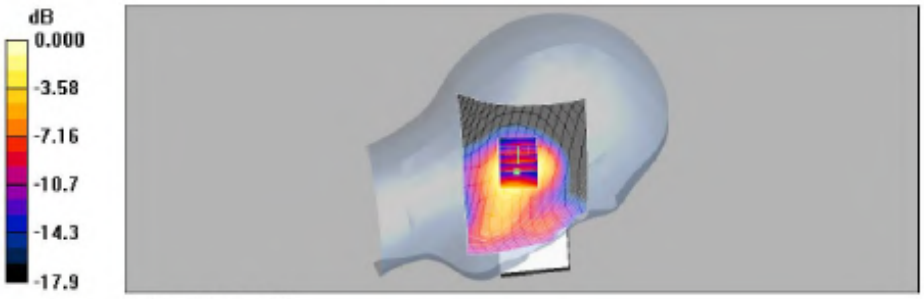
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242004
Program Name: PCS1900_Left Tilt

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Left Tilt_CH661/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.299 mW/g

PCS1900_Left Tilt_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 0.429 W/kg
SAR(1 g) = 0.280 mW/g; SAR(10 g) = 0.165 mW/g
Maximum value of SAR (measured) = 0.297 mW/g



0 dB = 0.297mW/g

PCS1900 Body SAR Test

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Rear_CH661.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

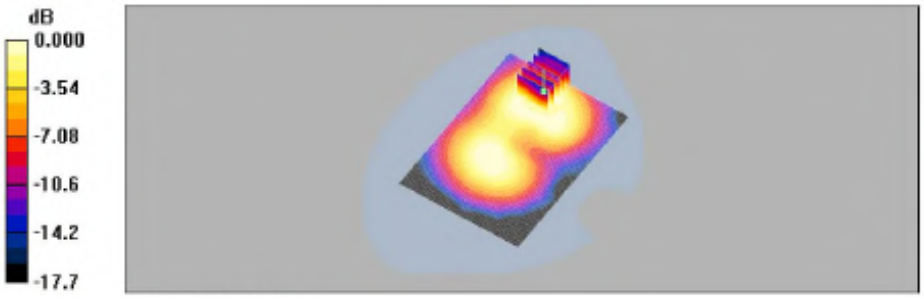
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

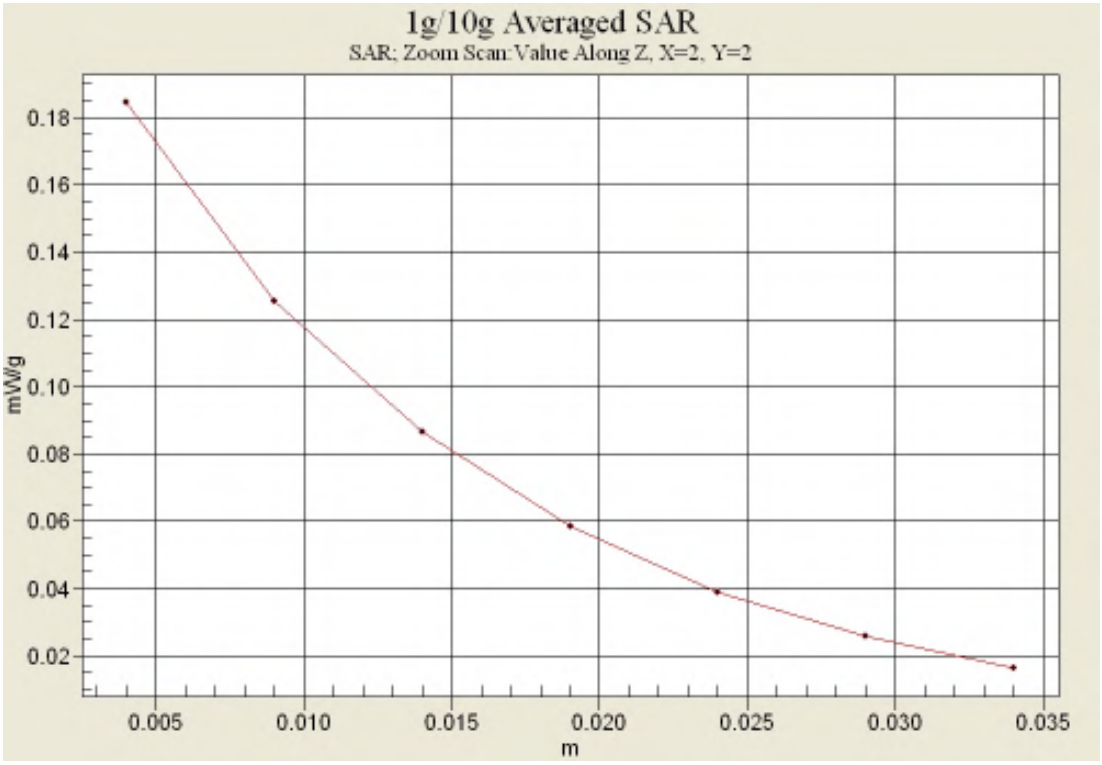
PCS1900_Rear_CH661/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.167 mW/g

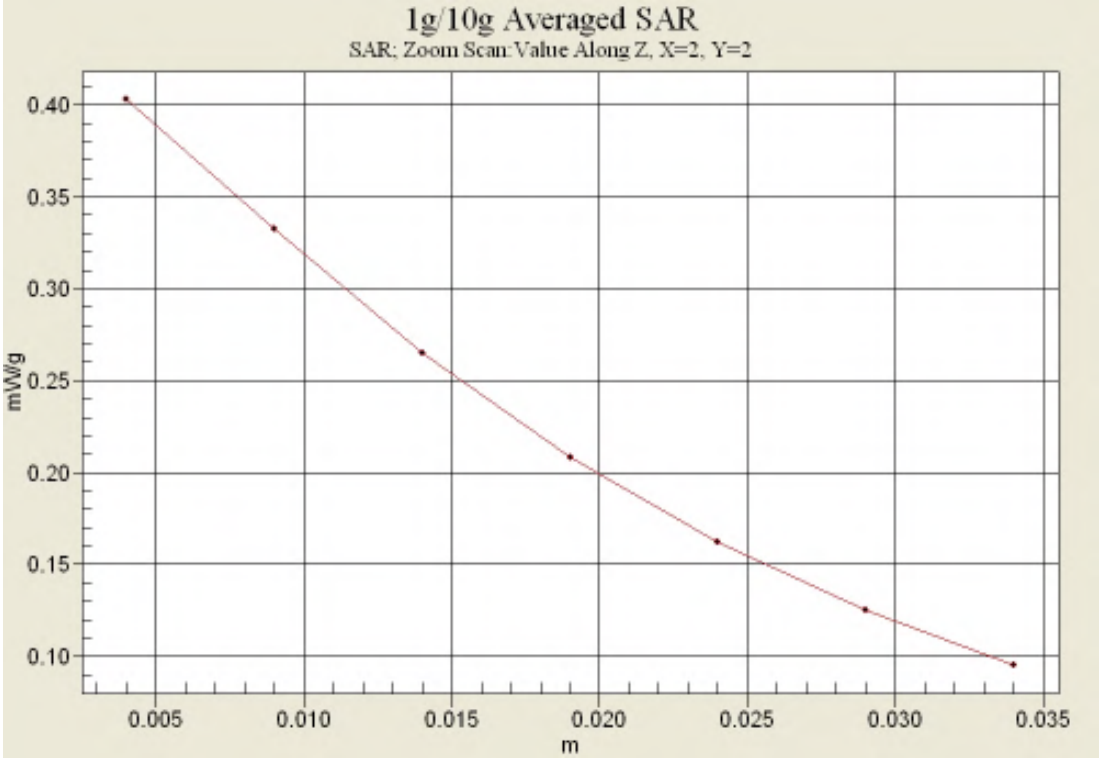
PCS1900_Rear_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.98 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 0.235 W/kg
SAR(1 g) = 0.146 mW/g; SAR(10 g) = 0.086 mW/g
Maximum value of SAR (measured) = 0.164 mW/g



0 dB = 0.164mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WLAN Head SAR Test

Date: 2013-02-10

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: WLAN_11b_Right Touch_1Mbps_CH1.da4

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

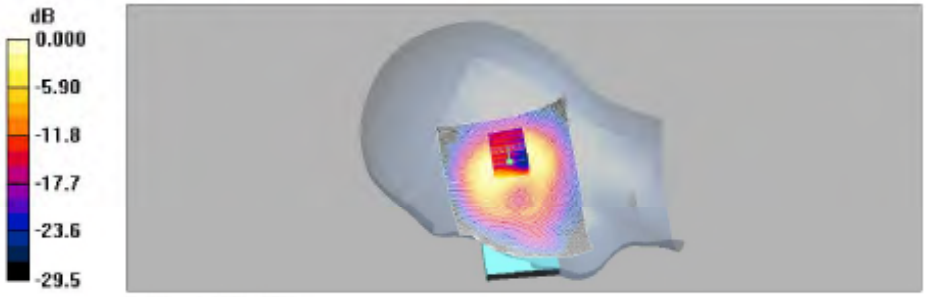
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: WLAN 11b_Head

Communication System: WLAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.74 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.48, 4.48, 4.48); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN 11b_Right Touch_1Mbps_CH1/Area Scan (111x151x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.398 mW/g

WLAN 11b_Right Touch_1Mbps_CH1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.6 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.734 W/kg
SAR(1 g) = 0.342 mW/g; SAR(10 g) = 0.164 mW/g
Maximum value of SAR (measured) = 0.385 mW/g



0 dB = 0.385mW/g

Date: 2013-02-10

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: WLAN_11b_Right Tilt_1Mbps_CH1.da4

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

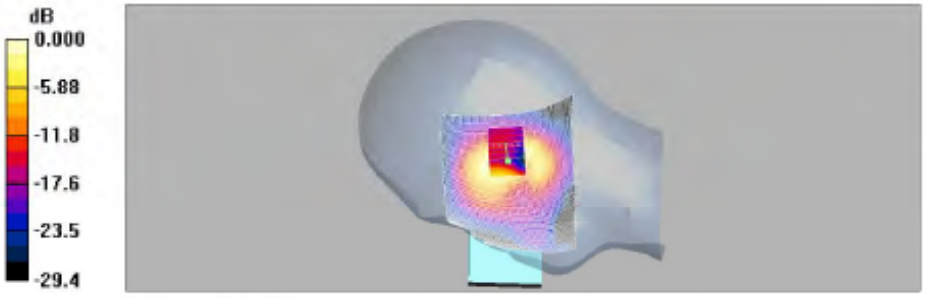
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: WLAN 11b_Head

Communication System: WLAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.74 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.48, 4.48, 4.48); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN 11b_Right Tilt_1Mbps_CH1/Area Scan (111x151x1): Measurement grid:
dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.379 mW/g

WLAN 11b_Right Tilt_1Mbps_CH1/Zoom Scan (7x7x7)/Cube 0: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.672 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.152 mW/g
Maximum value of SAR (measured) = 0.354 mW/g



0 dB = 0.354mW/g

Date: 2013-02-10

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: WLAN_11b_Left Touch_1Mbps_CH1.da4

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

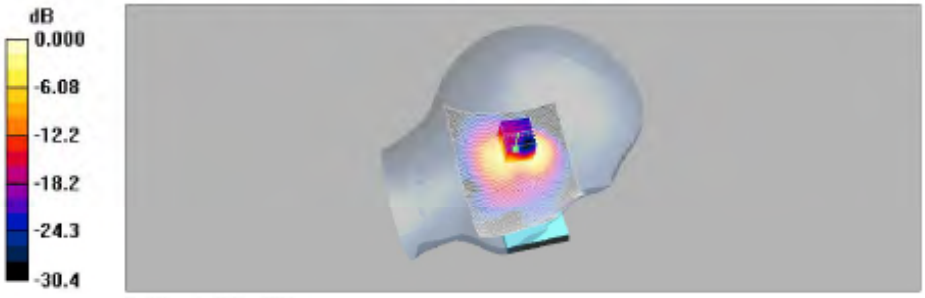
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: WLAN 11b_Head

Communication System: WLAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.74 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.48, 4.48, 4.48); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

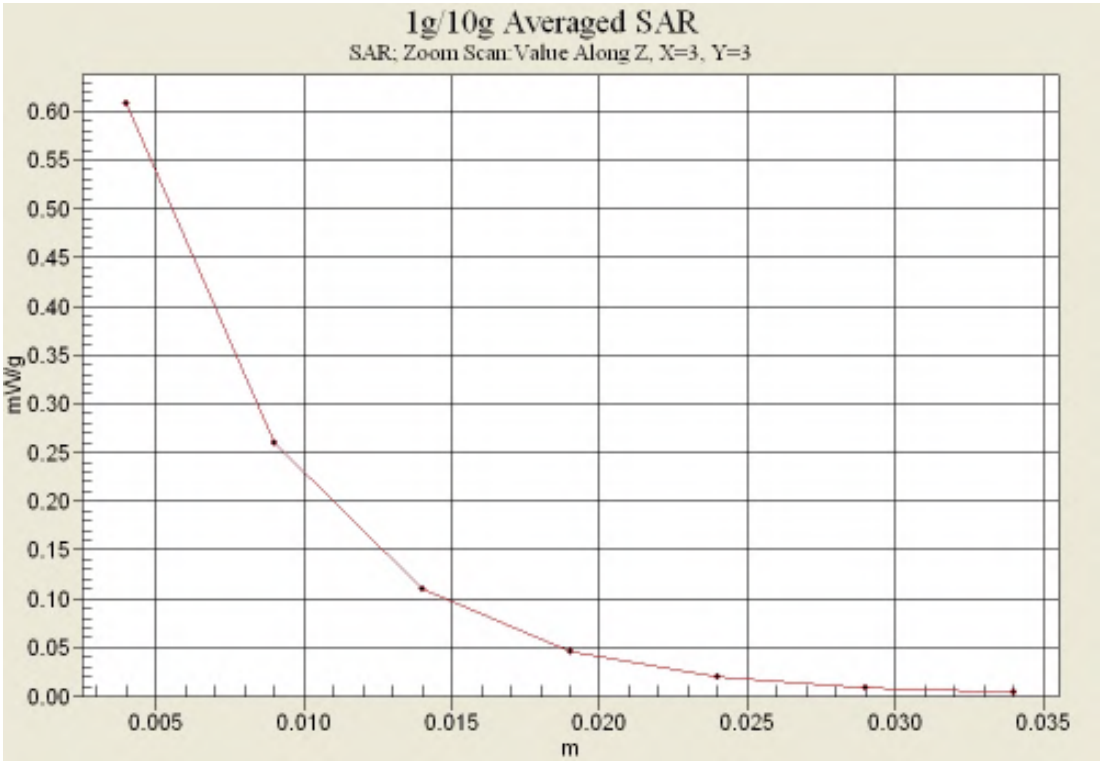
WLAN 11b_Left Touch_1Mbps_CH1/Area Scan (111x151x1): Measurement grid:
dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.616 mW/g

WLAN 11b_Left Touch_1Mbps_CH1/Zoom Scan (7x7x7)/Cube 0: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.2 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.608 mW/g



0 dB = 0.608mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=3, Y=3
mW/g
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date: 2013-02-10

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: WLAN_11b_Left Tilt_1Mbps_CH1.da4

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

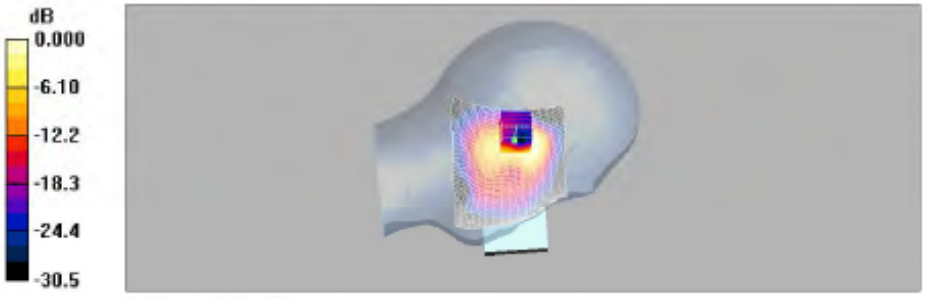
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: WLAN 11b_Head

Communication System: WLAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.74 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.48, 4.48, 4.48); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN 11b_Left Tilt_1Mbps_CH1/Area Scan (111x151x1): Measurement grid:
dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.552 mW/g

WLAN 11b_Left Tilt_1Mbps_CH1/Zoom Scan (7x7x7)/Cube 0: Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.157 mW/g
Maximum value of SAR (measured) = 0.510 mW/g



0 dB = 0.510mW/g

Repeated SAR Test

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_Left Touch_CH810_Repeated Test.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

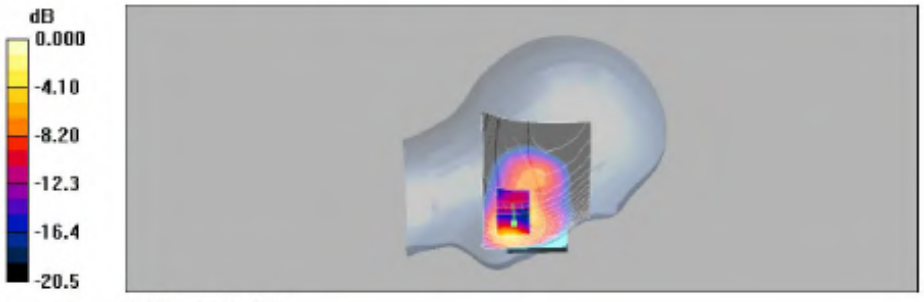
DUT: LG-C398; Type: Cellular/PCS GSM/GPRS Phone with Bluetooth and WLAN; Serial: 210KPQJ242084
Program Name: PCS1900_Left Touch

Communication System: PCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.44 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(5.12, 5.12, 5.12); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2013-01-25
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Left Touch_CH810_Repeated Test/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

PCS1900_Left Touch_CH810_Repeated Test/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.00 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.568 mW/g
Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.17mW/g