SAR TEST REPORT

Equipment Under Test	:	GSM & WCDMA Phone with Bluetooth and WLAN
Model No.	:	LG-E455f
Applicant	:	LG Electronics MobileComm U.S.A., Inc.
Address of Applicant	:	1000 Sylvan Avenue Englewood Cliffs, NJ 07632
FCC ID	:	ZNFE455F
Device Category	:	Portable Device
Exposure Category	:	General Population/Uncontrolled Exposure
Date of Receipt	:	2013-01-03
Date of Test(s)	:	2013-02-07 ~ 2013-02-10
Date of Issue	:	2013-02-15

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**		**2013-02-15**
Approved by	**:**	**Denny Ham**		**2013-02-15**

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1. General Information

1.1 Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
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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 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	2013-02-05	Initial issue
01	2013-02-12	Revision 01
02	2013-02-15	Revision 02

1.4 Description of EUT(s)

EUT Type	: GSM & WCDMA Phone with Bluetooth and WLAN
Model	: LG-E455f
Serial Number	: 204KPRW100262
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 ㎒ ~ 848.8 ㎒ (GSM850) 1850.2 ㎒ ~ 1909.8 ㎒ (PCS1900) 826.4 ㎒ ~ 846.6 ㎒ (WCDMA V) 2412 ㎒ ~ 2462 ㎒ (WLAN) 2402 ㎒ ~ 2480 ㎒ (Bluetooth)
Battery Type	: 3.8V d.c. (Lithum-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	0.479	0.839	1.06
	GSM/GPRS/EDGE Rx Only 1900	0.477	0.464	0.628
	WCDMA V	0.388	0.942	0.942
DTS	2.45 ㎓ WLAN	0.305	0.111	0.111
DSS	Bluetooth	N/A		
Simultaneous SAR per KDB 690783 D01v01r02		**0.784**	**1.053**	**1.171**

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**	**33.70**		**30.70**	
	Nominal	33.20		30.20	
GPRS (GMSK, 1 Tx slot)	**Maximum**	**33.70**		**30.70**	
	Nominal	33.20		30.20	
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**	**28.70**		**25.70**	
	Nominal	28.20		25.20	
Average power for Production					
Mode	Nominal & Maximum	WCDMA V			
RMC 12.2K	**Maximum**	**23.70**			
	Nominal	23.20			
Average power for Production					
Mode	Nominal & Maximum	a	b	g	n
2.45 GHz WLAN	**Maximum**		**15.00**	**10.00**	**9.00**
	Nominal		14.00	9.00	8.00
Bluetooth	**Maximum**	**5.50**	**2.50**	**2.50**	
	Nominal	5.00	2.00	2.00	

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 and WCDMA 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.

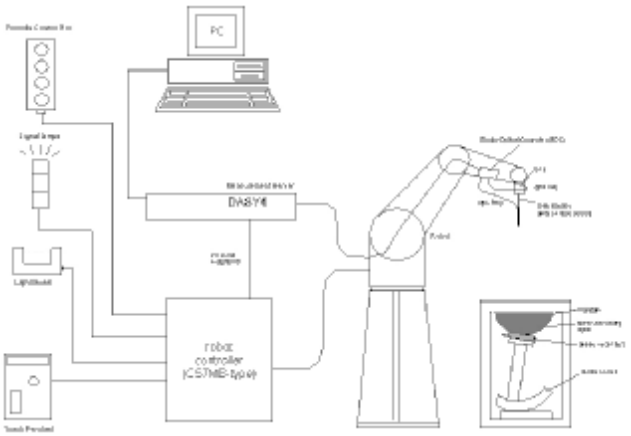


Fig a. The microwave circuit arrangement used for SAR system verification

• 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 Version 4.7(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 MHz to 2.5 GHz In brain simulating tissue (accuracy ± 8 %)
Frequency	:	10 MHz to >6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)
Directivity	:	±0.2 dB in brain tissue (rotation around probe axis) ±0.4 dB in brain tissue (rotation normal to probe axis)
Dynamic Range	:	5 µW/g to >100 mW/g; Linearity: ±0.2 dB
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 GHz 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.

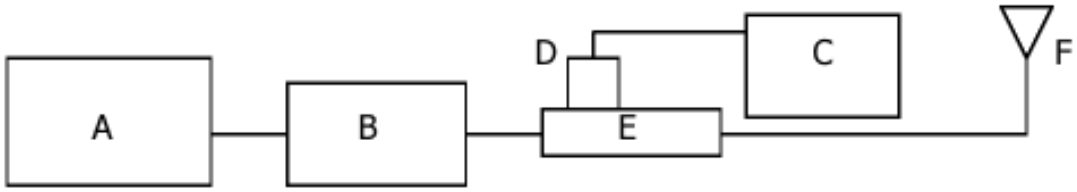


Fig b. The microwave circuit arrangement used for SAR system verification

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
D2450V2 S/N: 734	1782	2450 ㎒ Body	50.2 W/kg	4.89 W/kg	**48.90 W/kg**	**-2.59**	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**	-
	Body	Measured, 02/10/2013	51.7	1.98	21.6
		Recommended Limits	52.7	1.95	21.0 ~ 23.0
		Deviation(%)	**-1.90**	**1.54**	-

The composition of the brain & 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
2450	02/10/2013	1782	2450	Body	51.7	1.98	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 ㎑ 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	33.49	33.48	31.00	29.54	28.69
	190	836.6	33.49	33.49	31.02	29.54	28.70
	251	848.8	33.53	33.53	31.08	29.56	28.69
PCS 1900 Band	512	1850.2	30.57	30.57	27.69	26.60	25.61
	661	1880.0	30.62	30.62	27.71	26.62	25.63
	810	1909.8	30.53	30.52	27.57	26.48	25.48
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	24.46	24.45	24.98	25.28	**25.68**
	190	836.6	24.46	24.46	25.00	25.28	**25.69**
	251	848.8	24.50	24.50	25.06	25.30	**25.68**
PCS 1900 Band	512	1850.2	21.54	21.54	21.67	22.34	**22.60**
	661	1880.0	21.59	21.59	21.69	22.36	**22.62**
	810	1909.8	21.50	21.49	21.55	22.22	**22.47**

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.

WCDMA V

Band	Mode	Channel		Frequency (MHz)	Conducted Power (dBm)
WCDMA V (RMC)	RMC	4132		826.4	23.64
	RMC	4183		836.6	23.66
	RMC	4233		846.6	23.55
WCDMA V (HSDPA Active)	Sub-test 1	4132		826.4	23.59
		4183		836.6	23.54
		4233		846.6	23.50
	Sub-test 2	4132		826.4	22.65
		4183		836.6	22.53
		4233		846.6	22.54
	Sub-test 3	4132		826.4	22.19
		4183		836.6	22.06
		4233		846.6	22.09
	Sub-test 4	4132		826.4	22.18
		4183		836.6	22.04
		4233		846.6	22.07
		βc	βd	△ACK, △NACK, △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	21.41
		4183		836.6	21.33
		4233		846.6	21.30
	Sub-test 2	4132		826.4	20.60
		4183		836.6	20.57
		4233		846.6	20.57
	Sub-test 3	4132		826.4	21.05
		4183		836.6	20.94
		4233		846.6	20.93
	Sub-test 4	4132		826.4	21.56
		4183		836.6	21.50
		4233		846.6	21.47
	Sub-test 5	4132		826.4	21.82
		4183		836.6	21.78
		4233		846.6	21.77
		βc	βd	△ACK, △NACK, △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 (㎒)	GFSK (dB m)	PI/4DQPSK	8DPSK (dB m)
Low	2402	4.70	1.50	1.54
Middle	2441	4.90	1.82	1.85
High	2480	**5.10**	2.03	2.08

WLAN

802.11b Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(dB m)
2412	1	1	13.96
		2	13.72
		5.5	13.70
		11	13.77
2437	6	1	14.25
		2	14.23
		5.5	14.03
		11	13.85
2462	11	1	**14.65**
		2	14.40
		5.5	14.60
		11	14.05

802.11g Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(dB m)
2412	1	6	9.49
		9	9.48
		12	9.40
		18	9.17
		24	8.88
		36	8.67
		48	8.37
		54	8.23
2437	6	6	9.63
		9	9.60
		12	8.57
		18	9.31
		24	8.63
		36	8.77
		48	8.50
		54	7.94
2462	11	6	9.03
		9	8.88
		12	9.01
		18	8.56
		24	8.38
		36	8.06
		48	7.75
		54	7.62

802.11n_HT20 Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(dB m)
2412	1	MCS0	8.64
		MCS1	8.43
		MCS2	8.32
		MCS3	8.04
		MCS4	7.67
		MCS5	7.41
		MCS6	7.25
		MCS7	7.17
2437	6	MCS0	8.86
		MCS1	8.57
		MCS2	8.50
		MCS3	8.21
		MCS4	7.85
		MCS5	7.57
		MCS6	7.47
		MCS7	7.33
2462	11	MCS0	8.05
		MCS1	7.83
		MCS2	7.63
		MCS3	7.40
		MCS4	7.05
		MCS5	6.77
		MCS6	6.67
		MCS7	6.53
802.11n_HT40 Mode		Rated	Measured Power
Frequency (㎒)	Channel No.	(Mbps)	(dB m)
2422	1	MCS0	7.71
		MCS1	7.50
		MCS2	7.20
		MCS3	6.88
		MCS4	6.44
		MCS5	6.03
		MCS6	5.95
		MCS7	5.85
2437	6	MCS0	8.10
		MCS1	7.25
		MCS2	6.93
		MCS3	6.65
		MCS4	6.18
		MCS5	5.75
		MCS6	5.61
		MCS7	6.02
2452	11	MCS0	7.65
		MCS1	7.20
		MCS2	6.80
		MCS3	6.50
		MCS4	7.01
		MCS5	5.66
		MCS6	5.52
		MCS7	5.43

3.4 SAR Test Exclusions Applied

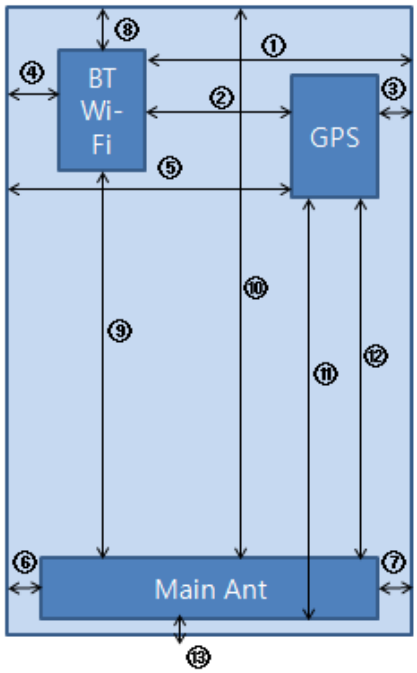
Per FCC KDB 447498 D01v05, the SAR exclusion threshold for distances < 50 ㎜ is defined by the following equation:

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

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

Bluetooth SAR was not required: (3.24/5 * √2.480 = 1.02 < 3.0)

<The Distance information of Antenna to Edges of EUT>



NO.	거리 (mm)
1	44.68
2	20.8
3	2.83
4	3.19
5	37.94
6	1.6
7	1.6
8	2.73
9	92.4
10	105.98
11	93.85
12	83.5
13	1.6

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 (㎒)	Channel							
GSM	Right Touch	836.6	190	33.49	33.70	-0.057	0.325	1.050	0.341	1.6
	Right Tilt	836.6	190	33.49	33.70	-0.027	0.227	1.050	0.238	
	Left Touch	836.6	190	33.49	33.70	0.193	0.333	1.050	0.350	
	Left Tilt	836.6	190	33.49	33.70	-0.016	0.191	1.050	0.201	
GPRS 4 Tx	Right Touch	836.6	190	28.70	28.70	-0.023	0.463	1.000	0.463	
	Right Tilt	836.6	190	28.70	28.70	-0.023	0.355	1.000	0.355	
	Left Touch	836.6	190	28.70	28.70	-0.046	0.479	1.000	0.479	
	Left Tilt	836.6	190	28.70	28.70	-0.040	0.320	1.000	0.320	

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

GSM850 Body & Hotspot SAR

Test Mode	EUT Position	Slot	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	-	836.6	190	10	33.49	33.70	-0.022	Cube 0: 0.799 Cube 1: 0.593	1.050	0.839 0.623	1.6
GPRS	Front	4 Tx	836.6	190	10	28.70	28.70	-0.001	0.573	1.000	0.573	
	Rear	4 Tx	836.6	190	10	28.70	28.70	-0.071	1.06	1.000	1.06	
			842.2	128	10	28.69	28.70	0.005	1.04	1.002	1.04	
			848.8	251	10	28.69	28.70	-0.024	1.05	1.002	1.05	
	Left	4 Tx	836.6	190	10	28.70	28.70	-0.004	0.756	1.000	0.756	
	Right	4 Tx	836.6	190	10	28.70	28.70	-0.046	0.594	1.000	0.594	
	Bottom	4 Tx	836.6	190	10	28.70	28.70	0.032	0.149	1.000	0.149	
	Rear	4 Tx	836.6	190	10	28.70	28.70	0.085	0.946	1.000	0.946	

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 (㎒)	Channel							
GSM	Right Touch	1880.0	661	30.62	30.70	-0.053	0.410	1.019	0.418	1.6
	Right Tilt	1880.0	661	30.62	30.70	0.007	0.184	1.019	0.187	
	Left Touch	1880.0	661	30.62	30.70	-0.100	0.312	1.019	0.318	
	Left Tilt	1880.0	661	30.62	30.70	0.017	0.175	1.019	0.178	
GPRS 4 Tx	Right Touch	1880.0	661	25.63	25.70	-0.034	0.469	1.016	0.477	
	Right Tilt	1880.0	661	25.63	25.70	0.026	0.213	1.016	0.216	
	Left Touch	1880.0	661	25.63	25.70	-0.082	0.341	1.016	0.346	
	Left Tilt	1880.0	661	25.63	25.70	-0.090	0.201	1.016	0.204	

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

PCS1900 Body & Hotspot SAR

Test Mode	EUT Position	Slot	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	10	30.62	30.70	-0.135	0.455	1.019	0.464	1.6
GPRS	Front	4 Tx	1880.0	661	10	25.63	25.70	0.042	0.579	1.016	0.588	
	Rear	4 Tx	1880.0	661	10	25.63	25.70	-0.003	0.618	1.016	0.628	
	Left	4 Tx	1880.0	661	10	25.63	25.70	0.020	0.126	1.016	0.128	
	Right	4 Tx	1880.0	661	10	25.63	25.70	-0.088	0.240	1.016	0.244	
	Bottom	4 Tx	1880.0	661	10	25.63	25.70	0.011	0.270	1.016	0.274	

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

WCDMA FDD V 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							
Right Ear	Cheek	836.4	4182	23.66	23.70	-0.045	0.365	1.009	0.368	1.6
	Tilt	836.4	4182	23.66	23.70	-0.017	0.278	1.009	0.281	
Left Ear	Cheek	836.4	4182	23.66	23.70	-0.191	0.385	1.009	0.388	
	Tilt	836.4	4182	23.66	23.70	-0.020	0.222	1.009	0.224	

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

WCDMA FDD V Body& Hotspot 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								
RMC	Front	836.4	4182	10	23.66	23.70	-0.026	0.454	1.009	0.458	1.6
	Rear	836.4	4182	10	23.66	23.70	-0.035	Cube 0: 0.816	1.009	0.823	
								Cube 0: 0.577		0.582	
		826.4	4132	10	23.64	23.70	-0.021	Cube 0: 0.773	1.014	0.784	
								Cube 0: 0.554		0.562	
		846.6	4233	10	23.55	23.70	-0.033	Cube 0: 0.835	1.035	0.864	
								Cube 0: 0.576		0.596	
	Left	836.4	4182	10	23.66	23.70	-0.040	0.508	1.009	0.513	
	Right	836.4	4182	10	23.66	23.70	-0.006	0.470	1.009	0.474	
	Bottom	836.4	4182	10	23.66	23.70	-0.070	0.102	1.009	0.103	
	Rear	846.6	4233	10	23.55	23.70	-0.005	0.910	1.035	0.942	

WLAN Head SAR

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

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 (㎒)	Channel							
Right Ear	Cheek	1	2462	11	14.65	15.00	-0.086	0.161	1.084	0.175	1.6
	Tilt	1	2462	11	14.65	15.00	-0.041	0.127	1.084	0.138	
Left Ear	Cheek	1	2462	11	14.65	15.00	-0.152	0.281	1.084	0.305	
	Tilt	1	2462	11	14.65	15.00	-0.020	0.199	1.084	0.216	

WLAN Body & Hotspot SAR

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

Test Mode	EUT Position	Data Rate	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								
WLAN	Front	1	2462	11	10	14.65	15.00	-0.089	0.044	1.084	0.048	1.6
	Rear	1	2462	11	10	14.65	15.00	-0.031	0.102	1.084	0.111	
	Right	1	2462	11	10	14.65	15.00	-0.021	0.058	1.084	0.063	
	Top	1	2462	11	10	14.65	15.00	0.082	0.075	1.084	0.081	

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.

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 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	5.50	10	0.074

<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	G5M850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
Head	Right Touch	0.341	0.175	0.516
	Right Tilt	0.238	0.138	0.376
	Left Touch	0.350	0.305	0.655
	Left Tilt	0.201	0.216	0.417
	Configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.418	0.175	0.593
	Right Tilt	0.187	0.138	0.325
	Left Touch	0.318	0.305	0.623
	Left Tilt	0.178	0.216	0.394
	Configuration	GPRS850 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.463	0.175	0.638
	Right Tilt	0.355	0.138	0.493
	Left Touch	0.479	0.305	**0.784**
	Left Tilt	0.320	0.216	0.536
	Configuration	GPRS1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.477	0.175	0.652
	Right Tilt	0.216	0.138	0.354
	Left Touch	0.346	0.305	0.651
	Left Tilt	0.204	0.216	0.420
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Right Touch	0.368	0.175	0.543
	Right Tilt	0.281	0.138	0.419
	Left Touch	0.388	0.305	0.693
	Left Tilt	0.224	0.216	0.440

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	0.839	0.111	0.950
	configuration	GSM1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Rear	0.464	0.111	0.575
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Rear	0.942	0.111	**1.053**

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	0.839	0.074	0.913
	configuration	GSM1900 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Rear	0.464	0.074	0.538
	configuration	WCDMA V SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Rear	0.942	0.074	1.016

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	0.573	0.048	0.621
	Rear	1.06	0.111	**1.171**
	Left	0.756	-	0.756
	Right	0.594	0.063	0.657
	Bottom	0.149	-	0.149
	Top	-	0.081	0.081
	configuration	GPRS1900 SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Front	0.588	0.048	0.636
	Rear	0.628	0.111	0.739
	Left	0.128	-	0.128
	Right	0.244	0.063	0.307
	Bottom	0.274	-	0.274
	Top	-	0.081	0.081
	configuration	WCDMA V SAR(W/kg)	WLAN SAR (W/kg)	∑SAR (W/kg)
	Front	0.458	0.048	0.506
	Rear	0.942	0.111	1.053
	Left	0.513	-	0.513
	Right	0.474	0.063	0.537
	Bottom	0.103	-	0.103
	Top	-	0.081	0.081

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	0.573	0.074	0.647
	Rear	1.06	0.074	1.134
	Left	0.756	-	0.756
	Right	0.594	0.074	0.668
	Bottom	0.149	-	0.149
	Top	-	0.074	0.074
	configuration	GPRS1900 SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Front	0.588	0.074	0.662
	Rear	0.628	0.074	0.702
	Left	0.128	-	0.128
	Right	0.244	0.074	0.318
	Bottom	0.274	-	0.274
	Top	-	0.074	0.074
	configuration	WCDMA V SAR(W/kg)	Bluetooth SAR (W/kg)	∑SAR (W/kg)
	Front	0.458	0.074	0.532
	Rear	0.942	0.074	1.016
	Left	0.513	-	0.513
	Right	0.474	0.074	0.548
	Bottom	0.103	-	0.103
	Top	-	0.074	0.074

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 ㎝ from edge are not required to be evaluated for SAR ("-").

3.7 Repeated SAR Measurement

Test Mode	EUT Position	Traffic Channel		Distance (㎜)	Measured 1 g SAR (W/kg)	1st Repeated 1 g SAR (W/kg)	Deviation (%)
		Frequency (㎒)	Channel				
GPRS	Rear(4Tx)	836.6	190	10	1.06	0.946	-9.90
WCDMA	Rear	846.6	4233	10	0.835	0.910	8.98

<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 ℃

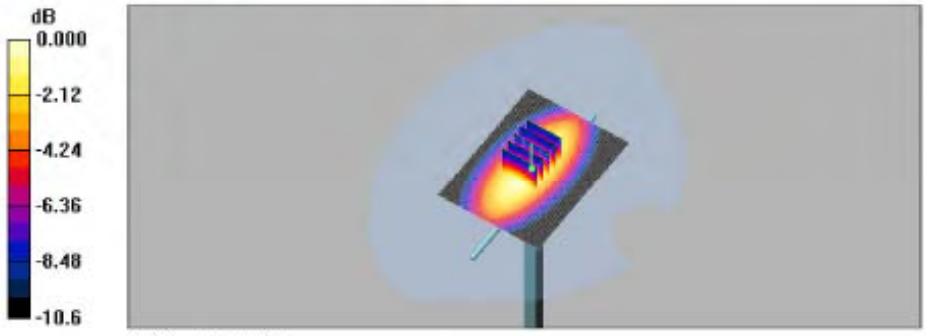
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Verification 835 MHz_Head

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

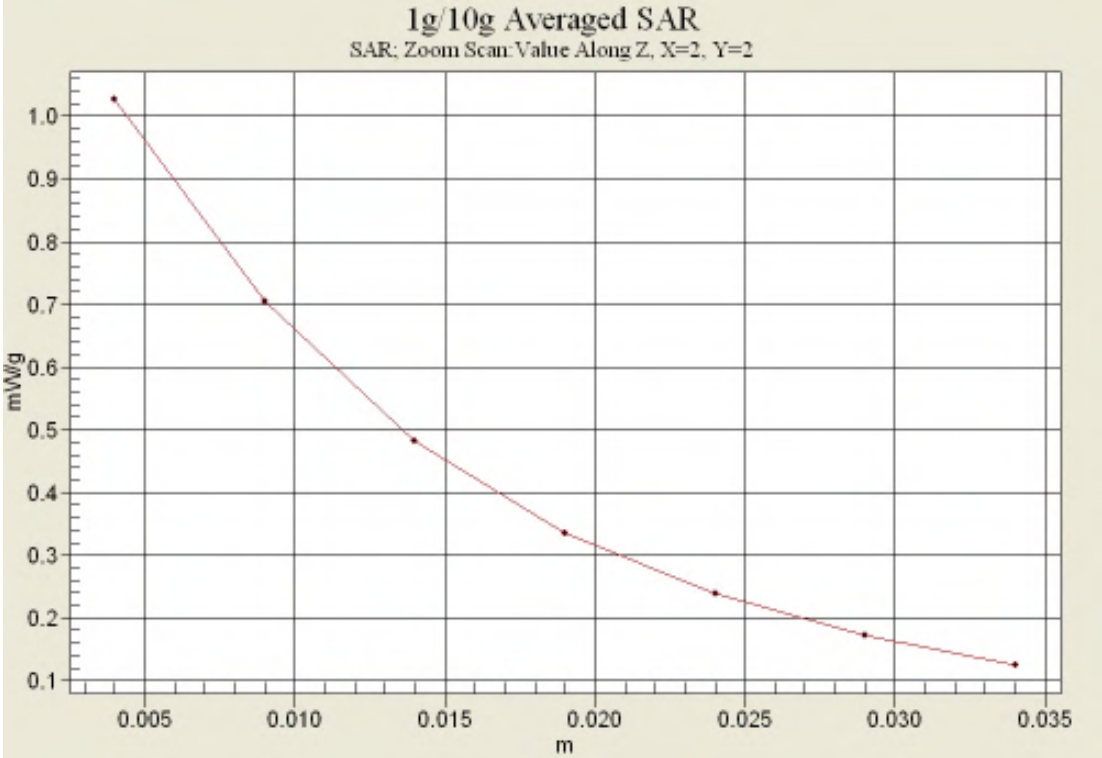
Verification 835 MHz_Head/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

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 ℃

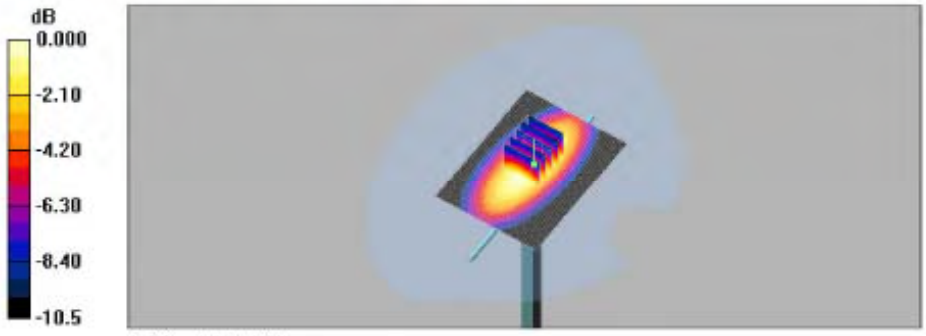
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Verification 835 MHz_Body

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

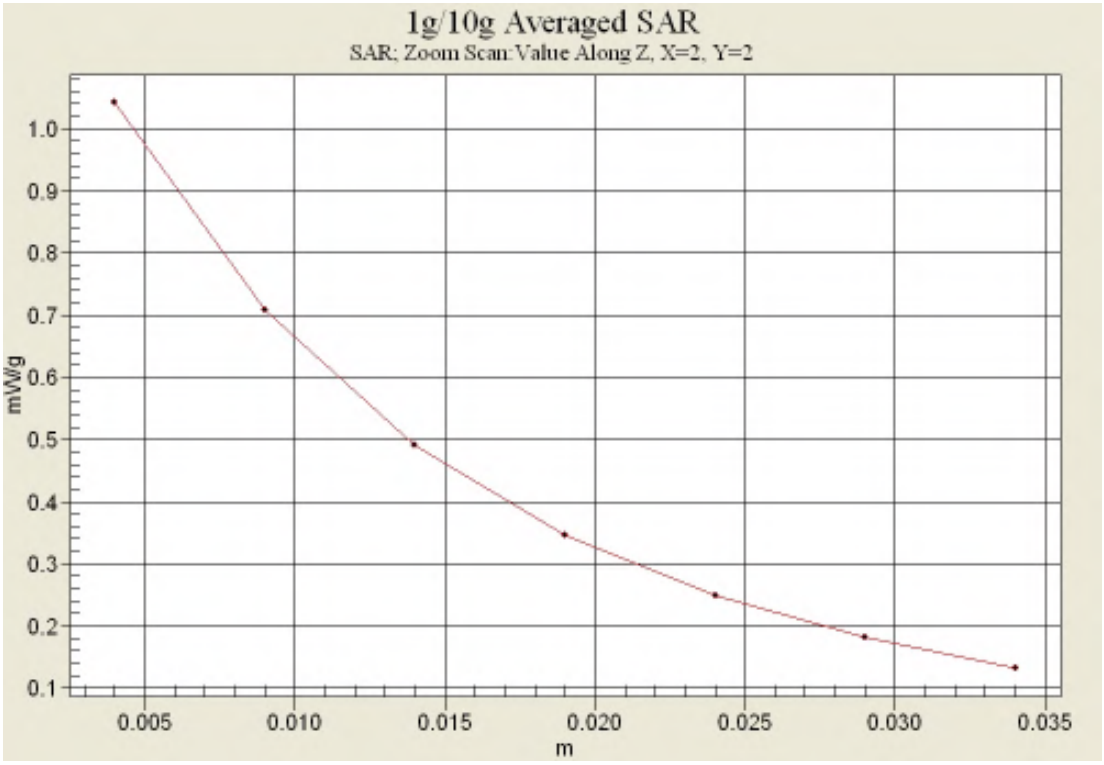
Verification 835 MHz_Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

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 ℃

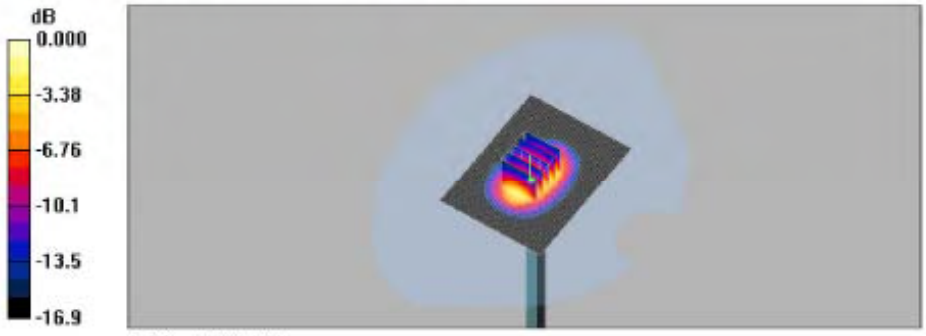
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Verification 1900 MHz_Head

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

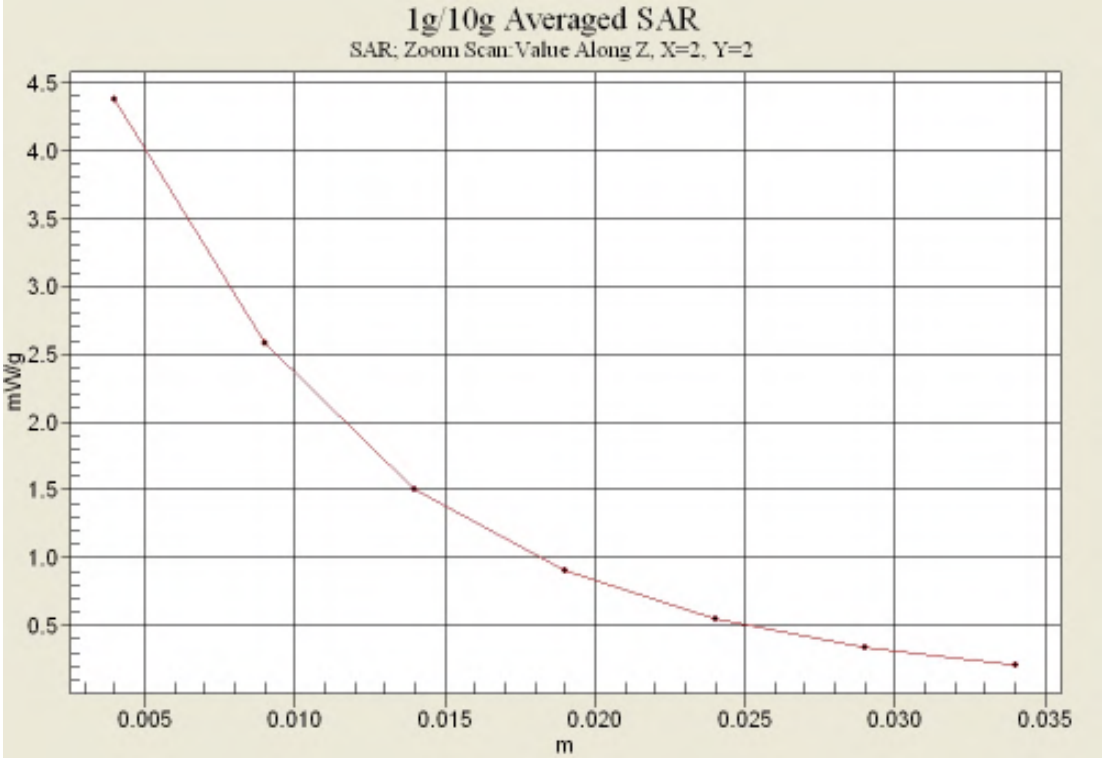
Verification 1900 MHz_Head/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.67 mW/g

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 ℃

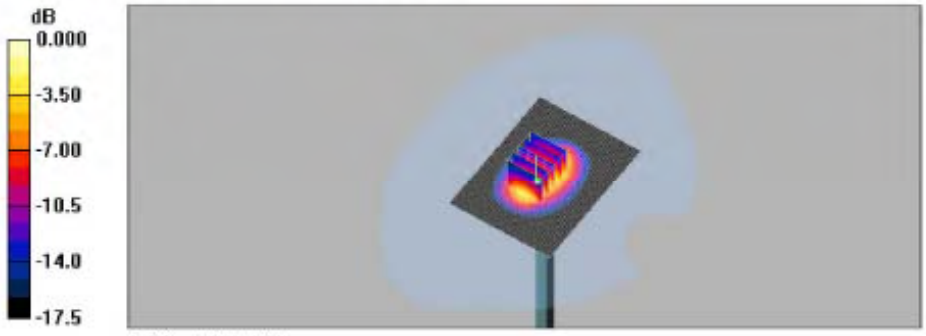
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Verification 1900 MHz_Body

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

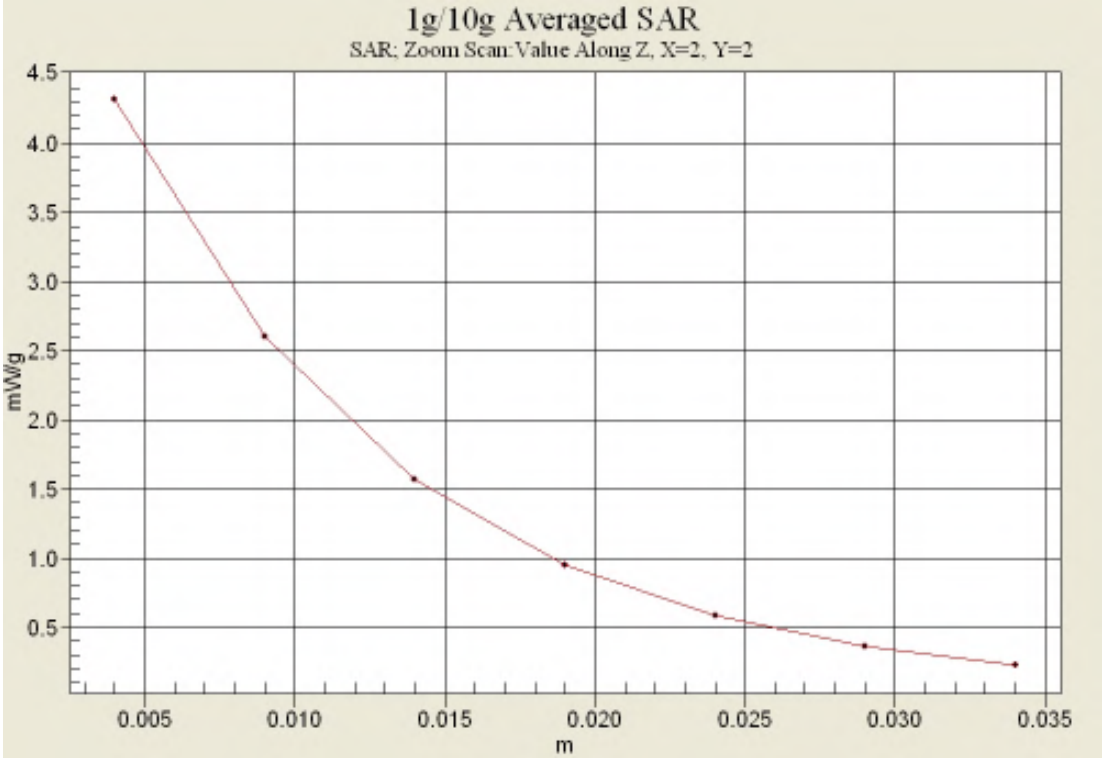
Verification 1900 MHz_Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.59 mW/g

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 ℃

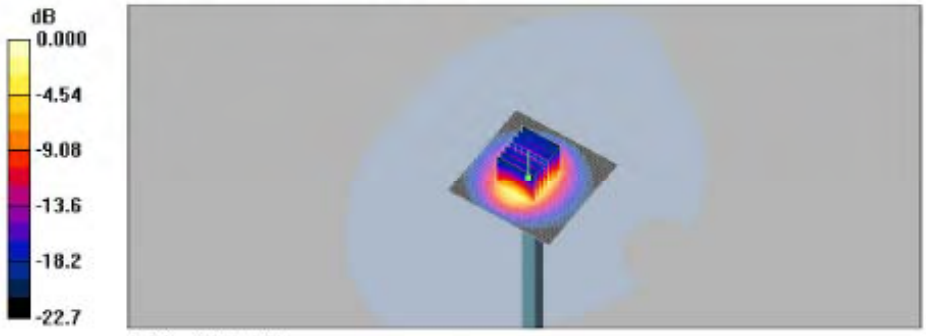
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 734
Program Name: Verification 2450 MHz_Head

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

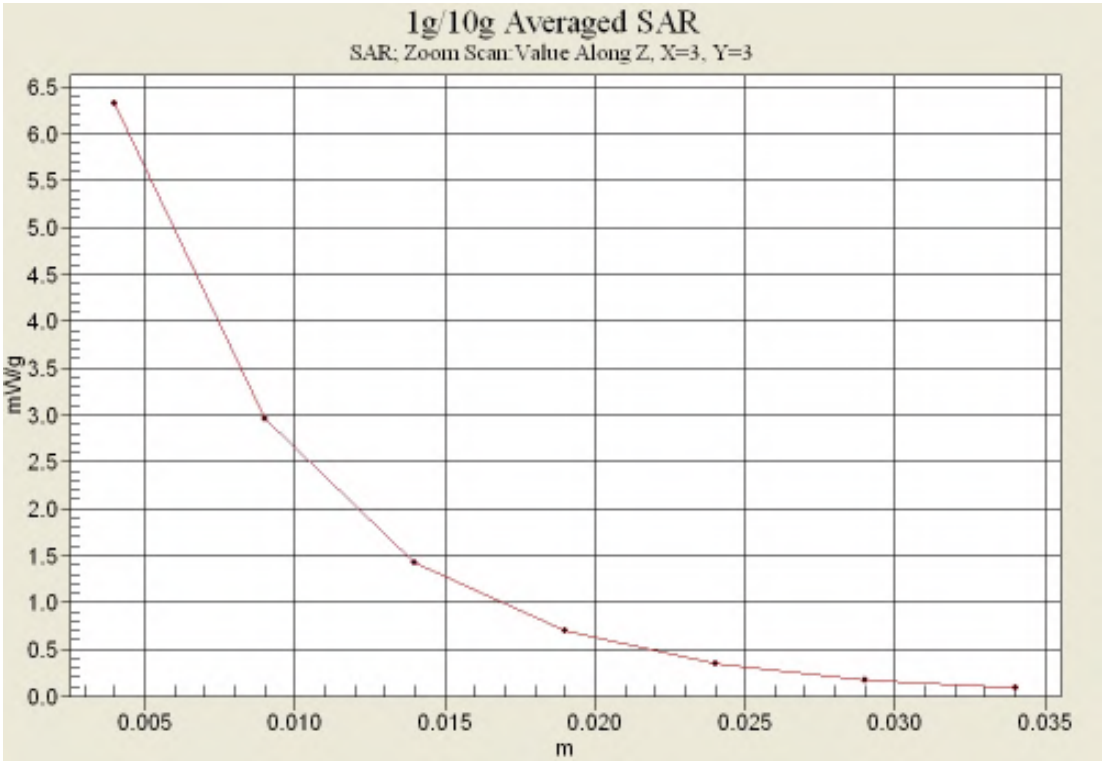
Verification 2450 MHz_Head/Area Scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 6.41 mW/g

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

2450 ㎒ Verification Test_Body

Date: 2013-02-10

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

Input Power : 100 mW

Ambient Temp : 23.1 ℃ Tissue Temp : 21.6 ℃

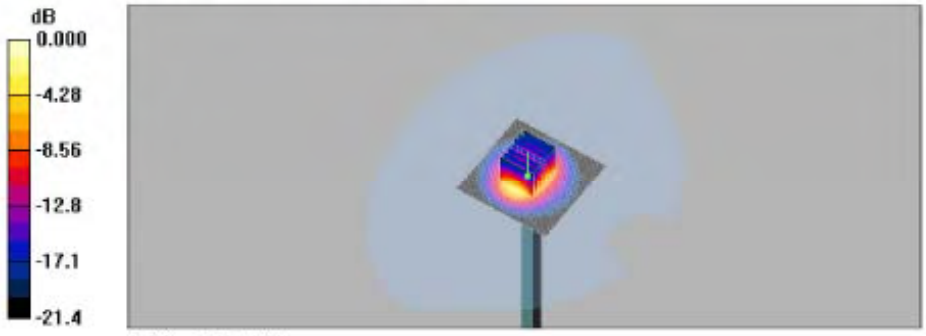
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 734
Program Name: Verification 2450 MHz_Body

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); 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

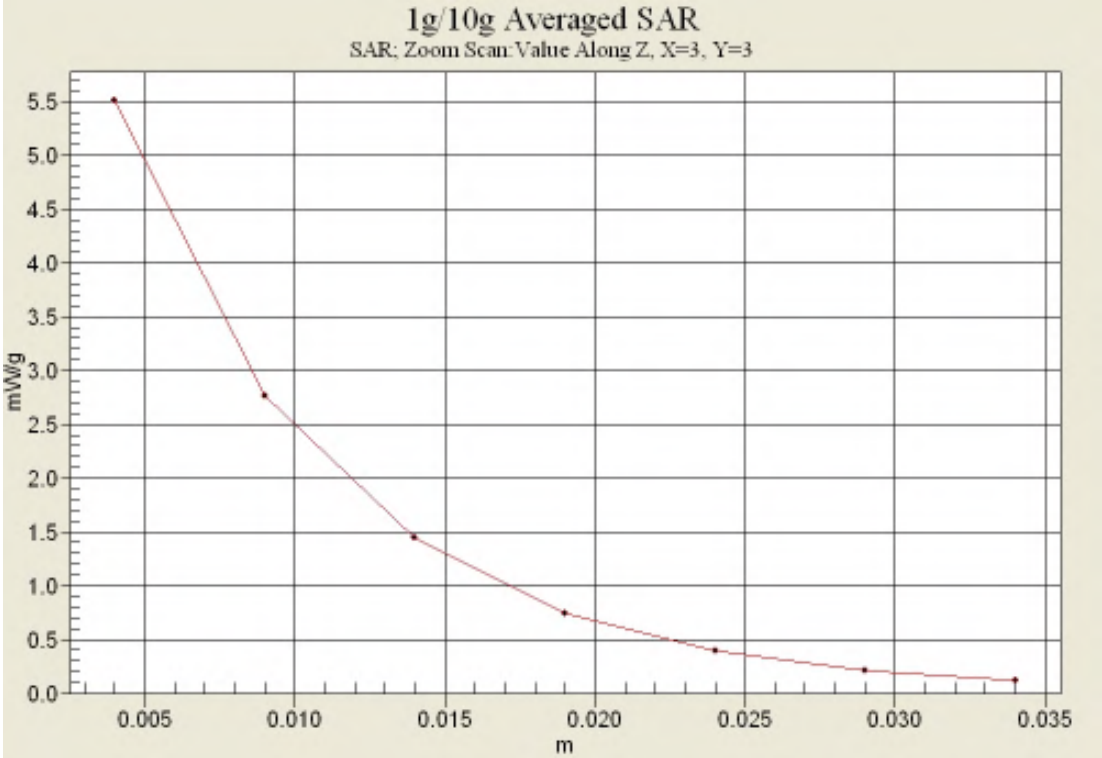
Verification 2450 MHz_Body/Area Scan (81x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 5.67 mW/g

Verification 2450 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.9 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 10.4 W/kg
SAR(1 g) = 4.89 mW/g; SAR(10 g) = 2.28 mW/g
Maximum value of SAR (measured) = 5.51 mW/g



0 dB = 5.51mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=3, Y=3
mW/g
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 ℃

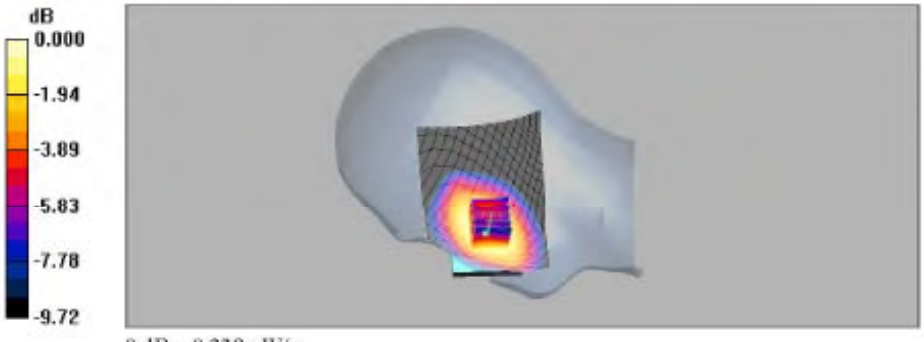
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GSM850_Right Touch

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) = 0.354 mW/g

GSM850_Right Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.01 V/m; Power Drift = -0.057 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.338 mW/g



0 dB = 0.338mW/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 ℃

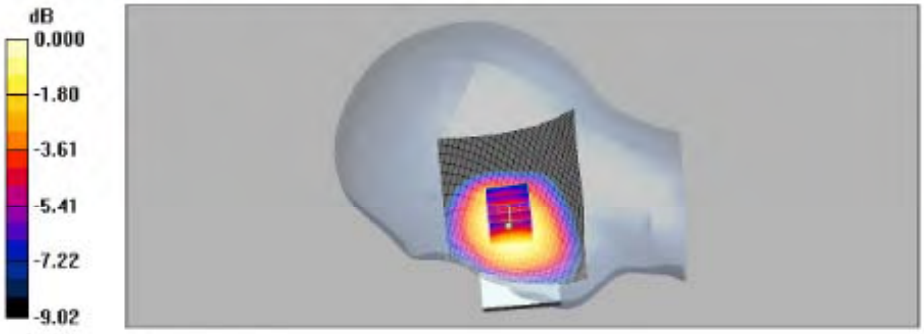
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GSM850_Right Tilt

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) = 0.243 mW/g

GSM850_Right Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.227 mW/g; SAR(10 g) = 0.175 mW/g
Maximum value of SAR (measured) = 0.236 mW/g



0 dB = 0.236mW/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 ℃

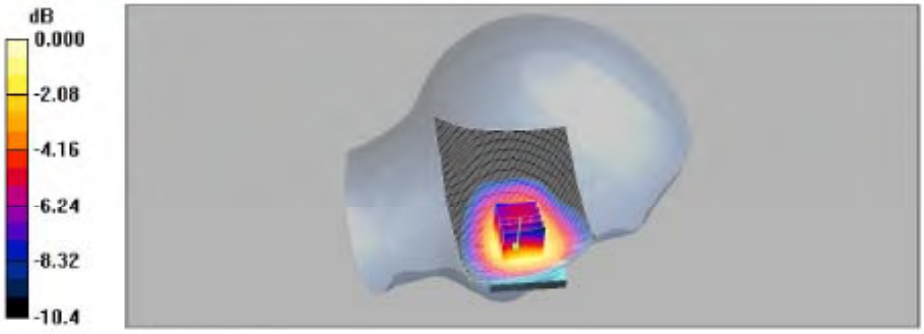
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GSM850_Left Touch

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) = 0.360 mW/g

GSM850_Left Touch_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.02 V/m; Power Drift = 0.193 dB
Peak SAR (extrapolated) = 0.414 W/kg
SAR(1 g) = 0.333 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.349 mW/g



0 dB = 0.349mW/g

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 ℃

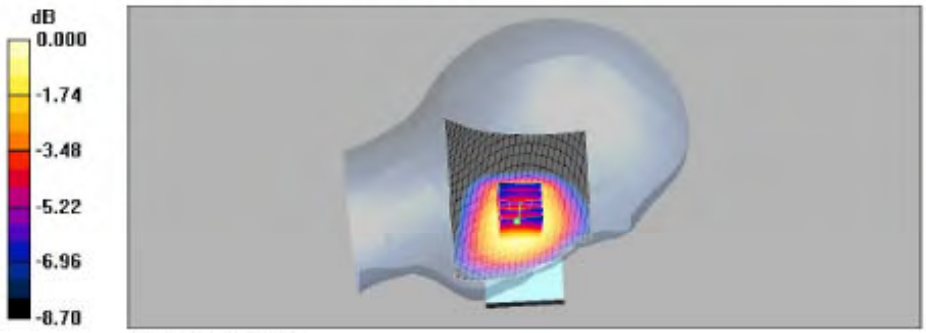
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GSM850_Left Tilt

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) = 0.204 mW/g

GSM850_Left Tilt_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.77 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.146 mW/g
Maximum value of SAR (measured) = 0.201 mW/g



0 dB = 0.201mW/g

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Right Touch_CH190_4TX.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

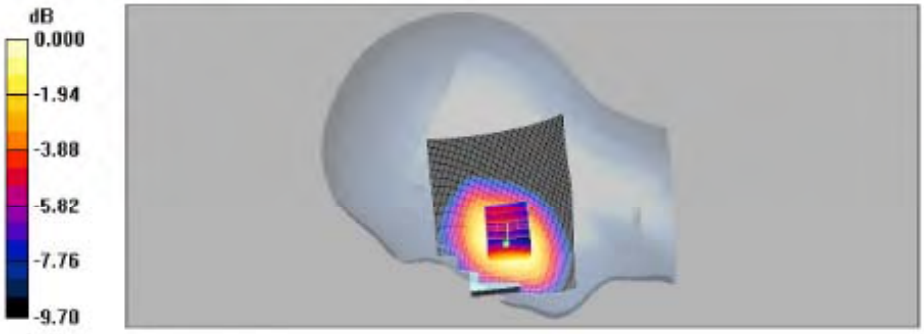
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Right Touch

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Right Touch_CH190_4TX/Area Scan (71x101x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.501 mW/g

GPRS850_Right Touch_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.55 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.582 W/kg
SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.350 mW/g
Maximum value of SAR (measured) = 0.487 mW/g



0 dB = 0.487mW/g

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Right Tilt_CH190_4TX.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

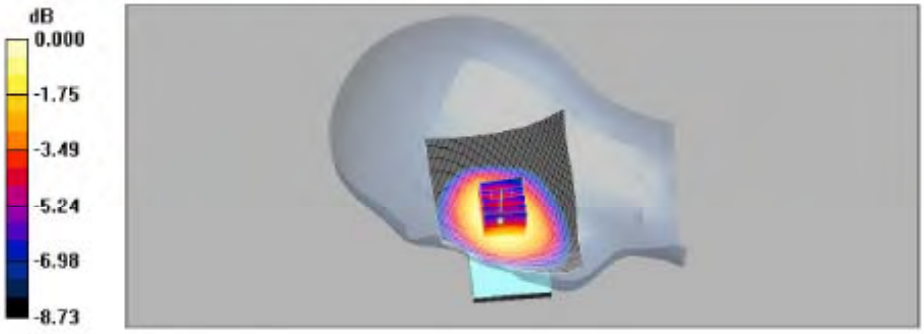
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Right Tilt

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Right Tilt_CH190_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.373 mW/g

GPRS850_Right Tilt_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.416 W/kg
SAR(1 g) = 0.355 mW/g; SAR(10 g) = 0.274 mW/g
Maximum value of SAR (measured) = 0.371 mW/g



0 dB = 0.371mW/g

Date: 2013-02-07

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Left Touch_CH190_4TX.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

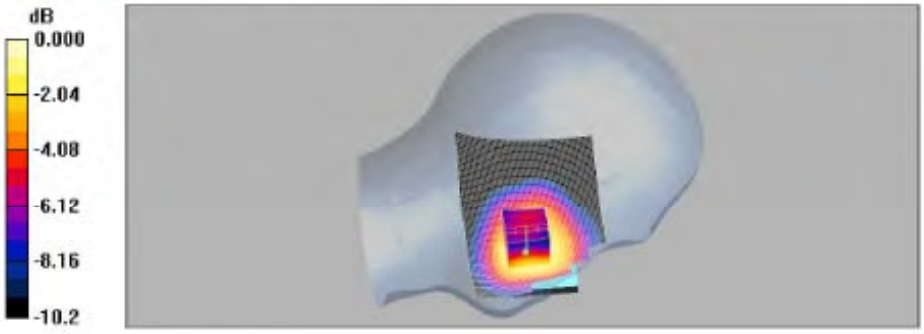
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Left Touch

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

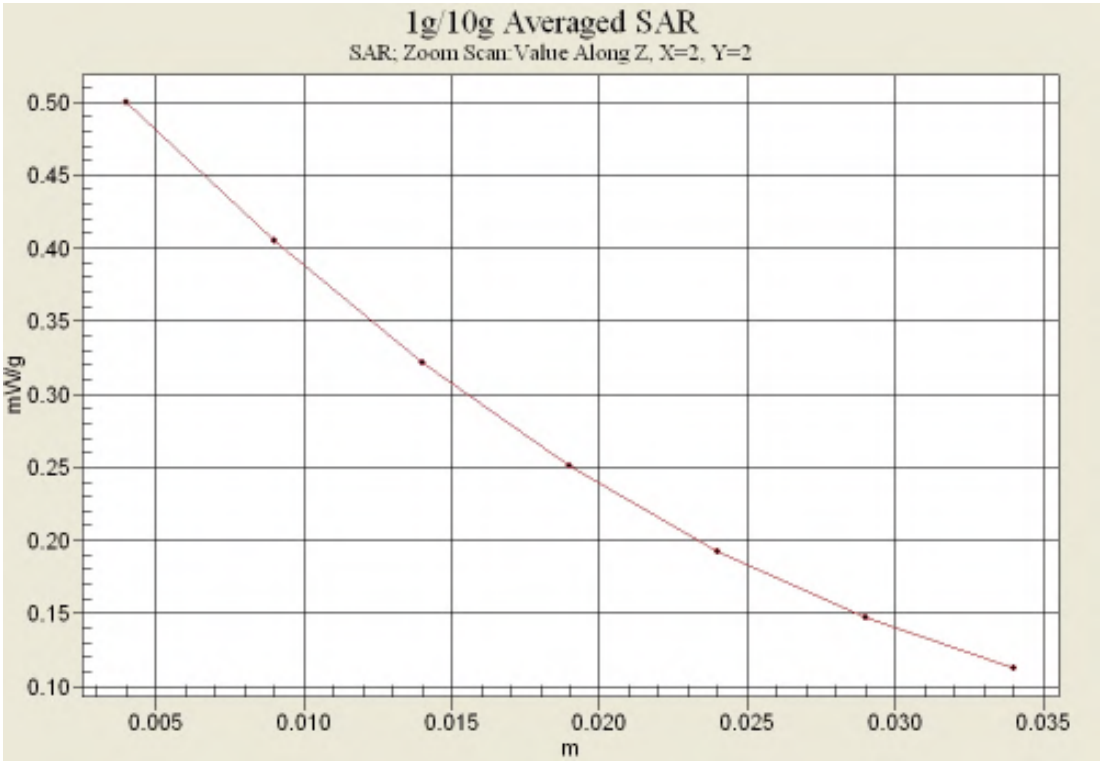
GPRS850_Left Touch_CH190_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.506 mW/g

GPRS850_Left Touch_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.56 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.596 W/kg
SAR(1 g) = 0.479 mW/g; SAR(10 g) = 0.359 mW/g
Maximum value of SAR (measured) = 0.500 mW/g



0 dB = 0.500mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
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: GPRS850_Left Tilt_CH190_4TX.da4

Ambient Temp : 23.8 ℃ Tissue Temp : 22.9 ℃

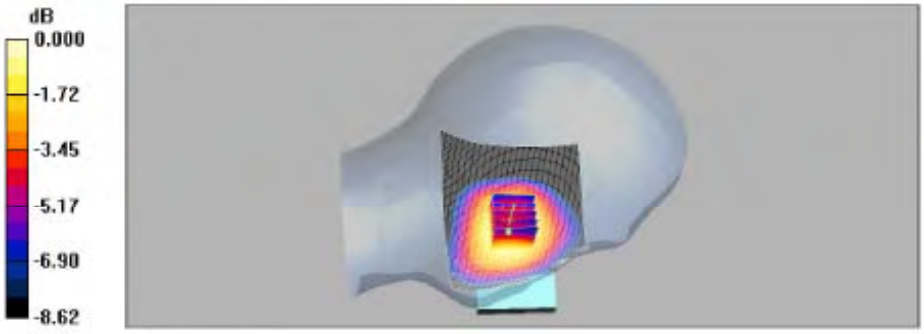
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Left Tilt

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Left Tilt_CH190_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.335 mW/g

GPRS850_Left Tilt_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 0.378 W/kg
SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.335 mW/g



0 dB = 0.335mW/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-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GSM850_Body

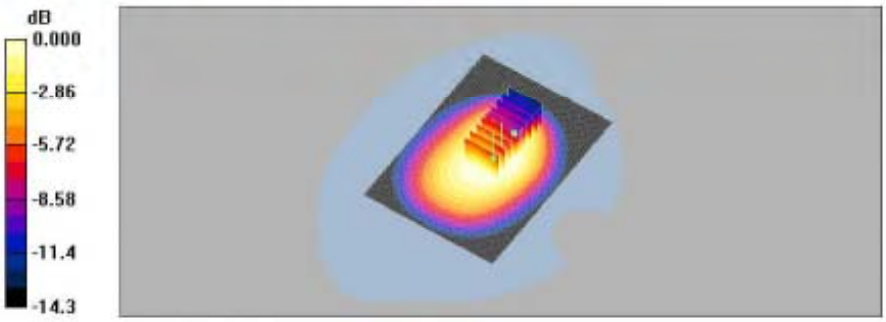
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.94 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.861 mW/g

GSM850_Rear_CH190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.799 mW/g; SAR(10 g) = 0.583 mW/g
Maximum value of SAR (measured) = 0.841 mW/g

GSM850_Rear_CH190/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 0.964 W/kg
SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.381 mW/g
Maximum value of SAR (measured) = 0.723 mW/g



0 dB = 0.723mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Front_CH190_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

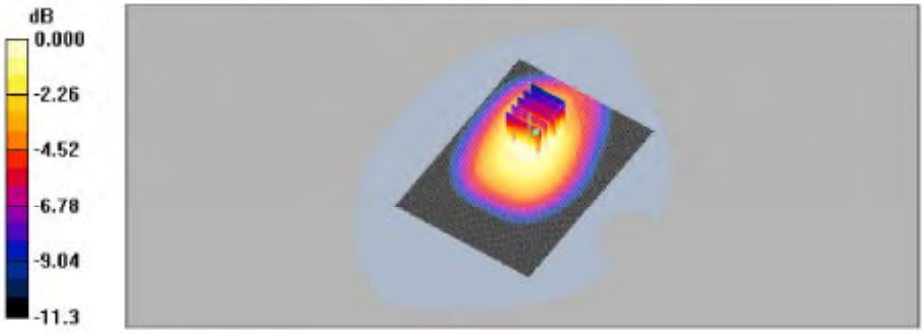
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Front_CH190_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.626 mW/g

GPRS850_Front_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 0.792 W/kg
SAR(1 g) = 0.573 mW/g; SAR(10 g) = 0.423 mW/g
Maximum value of SAR (measured) = 0.600 mW/g



0 dB = 0.600mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Rear_CH190_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

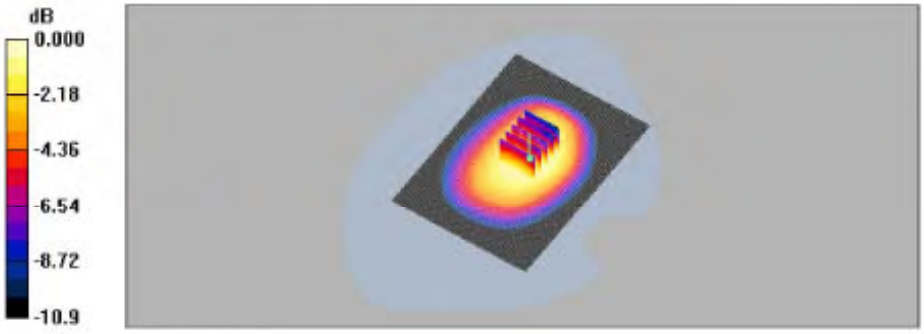
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

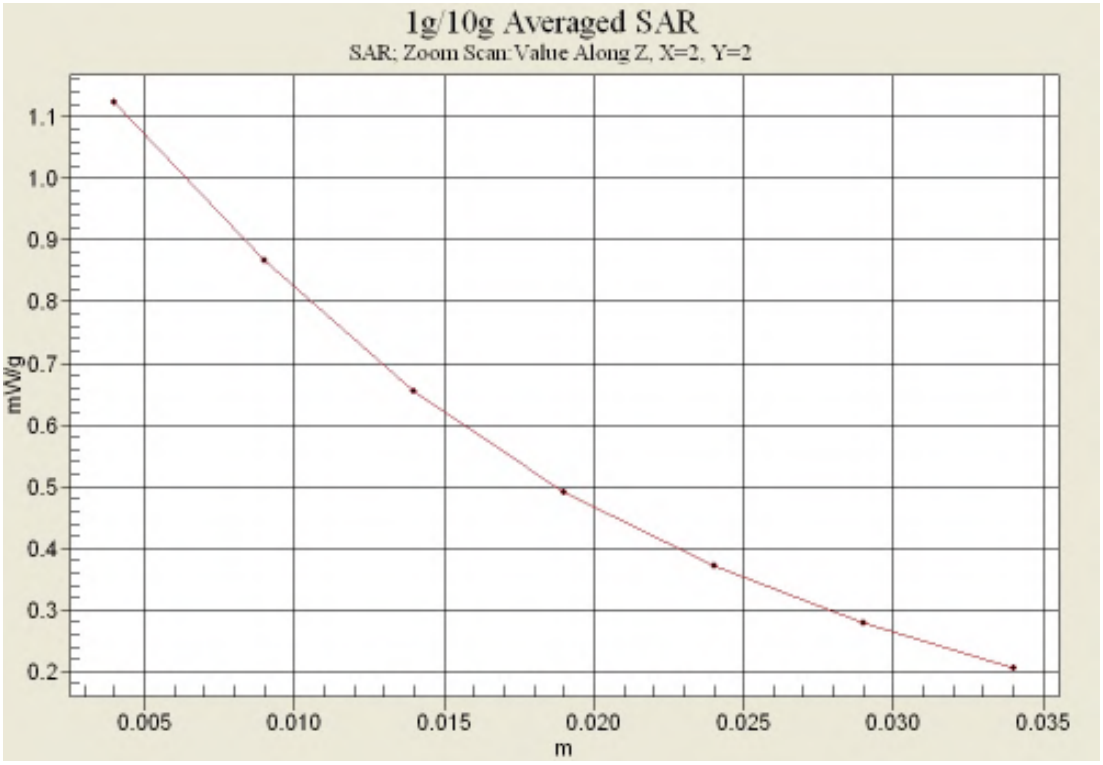
GPRS850_Rear_CH190_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.11 mW/g

GPRS850_Rear_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.7 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.776 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/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
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Rear_CH128_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

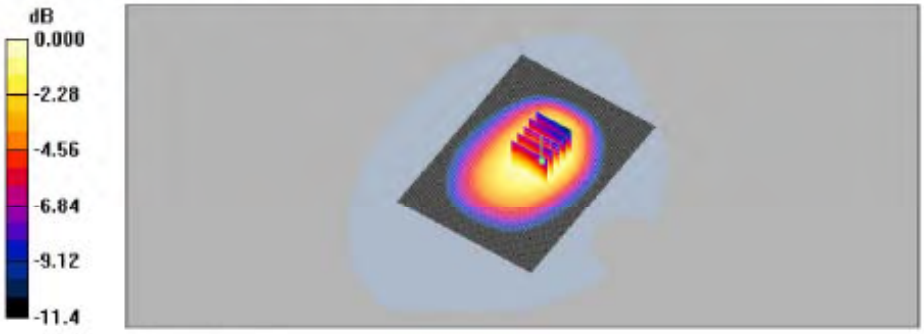
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 824.2 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 824.2 MHz; σ = 0.927 mho/m; ε_r = 52.9; 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

GPRS850_Rear_CH128_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g

GPRS850_Rear_CH128_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.3 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.756 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Rear_CH251_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

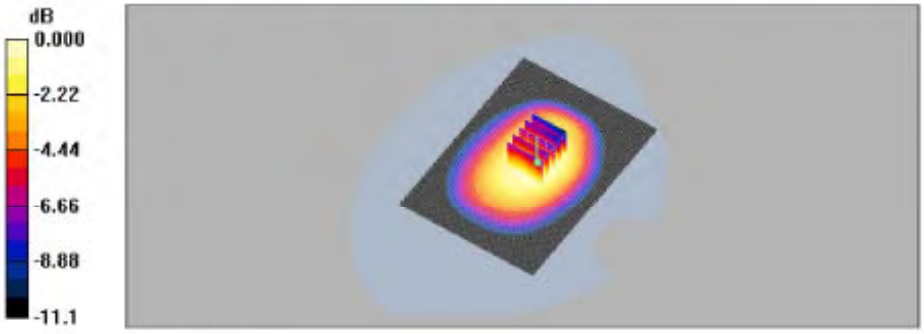
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 848.8 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 848.8 MHz; σ = 0.953 mho/m; ε_r = 52.6; 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

GPRS850_Rear_CH251_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.11 mW/g

GPRS850_Rear_CH251_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.0 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.770 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Left Edge_CH190_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

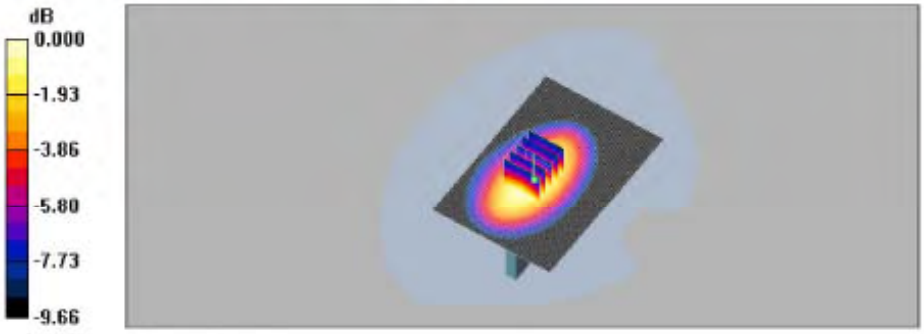
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Left Edge_CH190_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.824 mW/g

GPRS850_Left Edge_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.4 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.515 mW/g
Maximum value of SAR (measured) = 0.816 mW/g



0 dB = 0.816mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Right Edge_CH190_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

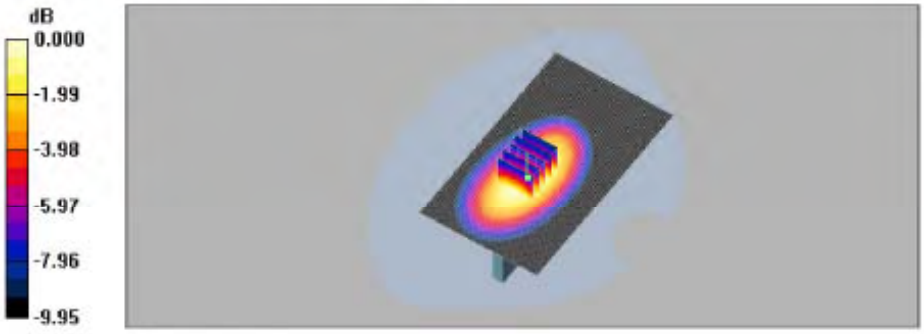
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Right Edge_CH190_4TX/Area Scan (71x121x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.632 mW/g

GPRS850_Right Edge_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.9 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.839 W/kg
SAR(1 g) = 0.594 mW/g; SAR(10 g) = 0.406 mW/g
Maximum value of SAR (measured) = 0.634 mW/g



0 dB = 0.634mW/g

Date: 2013-02-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Bottom_CH190_4TX.da4

Ambient Temp : 23.3 ℃ Tissue Temp : 22.5 ℃

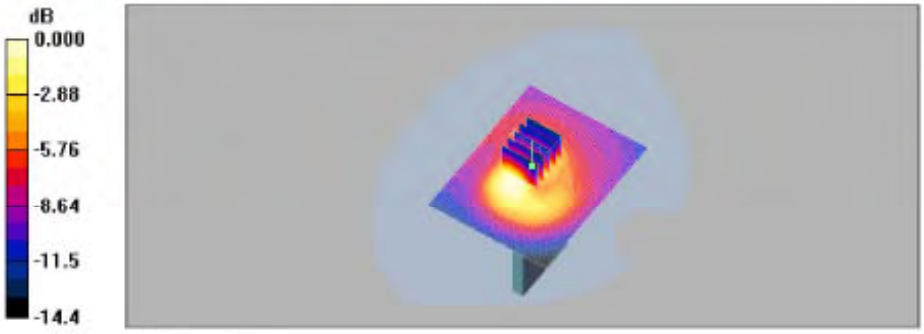
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS850_Body

Communication System: GPRS850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
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

GPRS850_Bottom_CH190_4TX/Area Scan (71x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.207 mW/g

GPRS850_Bottom_CH190_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.032 dB
Peak SAR (extrapolated) = 0.323 W/kg
SAR(1 g) = 0.149 mW/g; SAR(10 g) = 0.080 mW/g
Maximum value of SAR (measured) = 0.163 mW/g



0 dB = 0.163mW/g

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 ℃

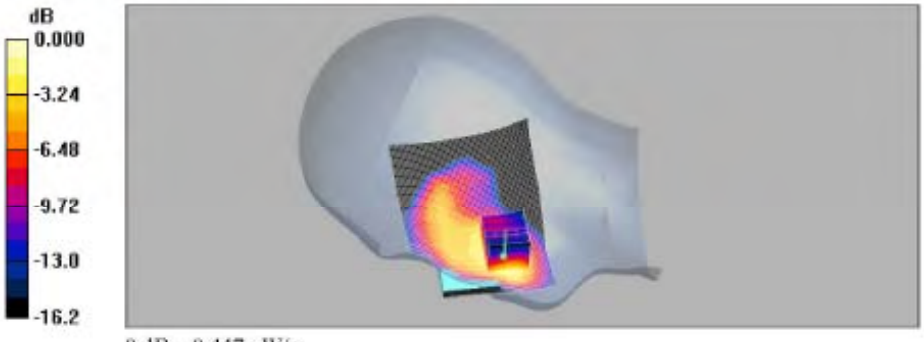
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: PCS1900_Right Touch

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) = 0.456 mW/g

PCS1900_Right Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.58 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.616 W/kg
SAR(1 g) = 0.410 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.447 mW/g



0 dB = 0.447mW/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 ℃

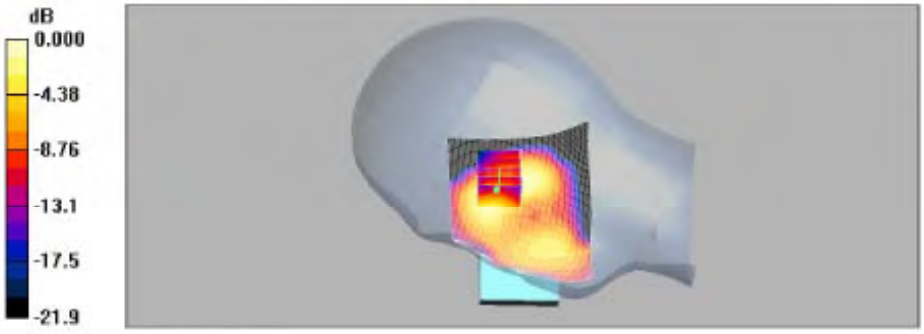
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: PCS1900_Right Tilt

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) = 0.228 mW/g

PCS1900_Right Tilt_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.0 V/m; Power Drift = 0.007 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.110 mW/g
Maximum value of SAR (measured) = 0.196 mW/g



0 dB = 0.196mW/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 ℃

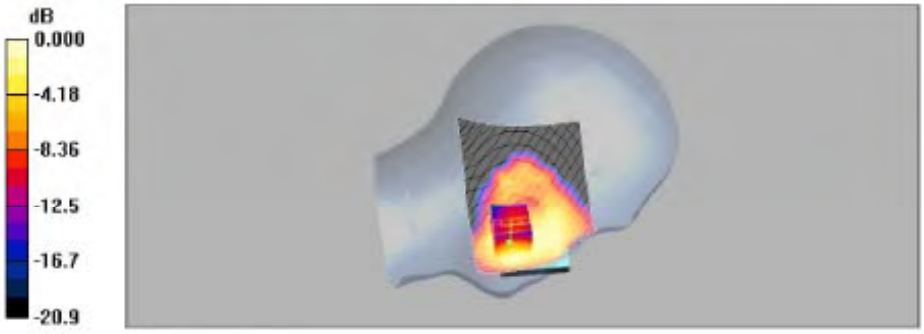
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: PCS1900_Left Touch

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) = 0.355 mW/g

PCS1900_Left Touch_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.93 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 0.462 W/kg
SAR(1 g) = 0.312 mW/g; SAR(10 g) = 0.199 mW/g
Maximum value of SAR (measured) = 0.330 mW/g



0 dB = 0.330mW/g

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 ℃

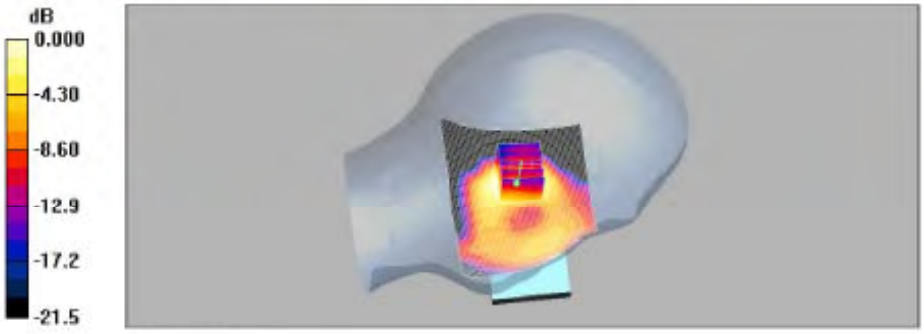
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: PCS1900_Left Tilt

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) = 0.211 mW/g

PCS1900_Left Tilt_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.175 mW/g; SAR(10 g) = 0.101 mW/g
Maximum value of SAR (measured) = 0.194 mW/g



0 dB = 0.194mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Right Touch_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

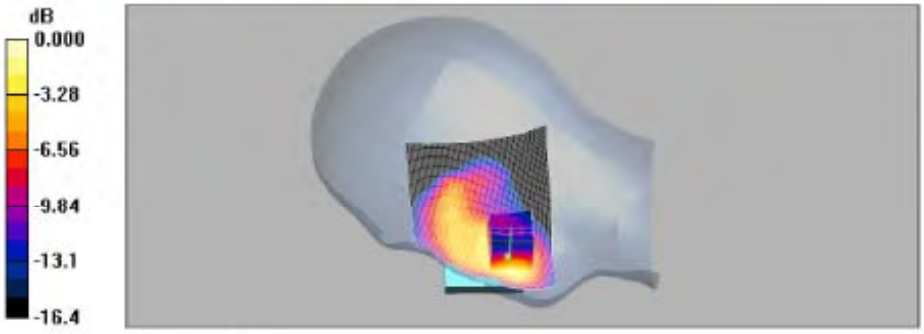
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Right Touch

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

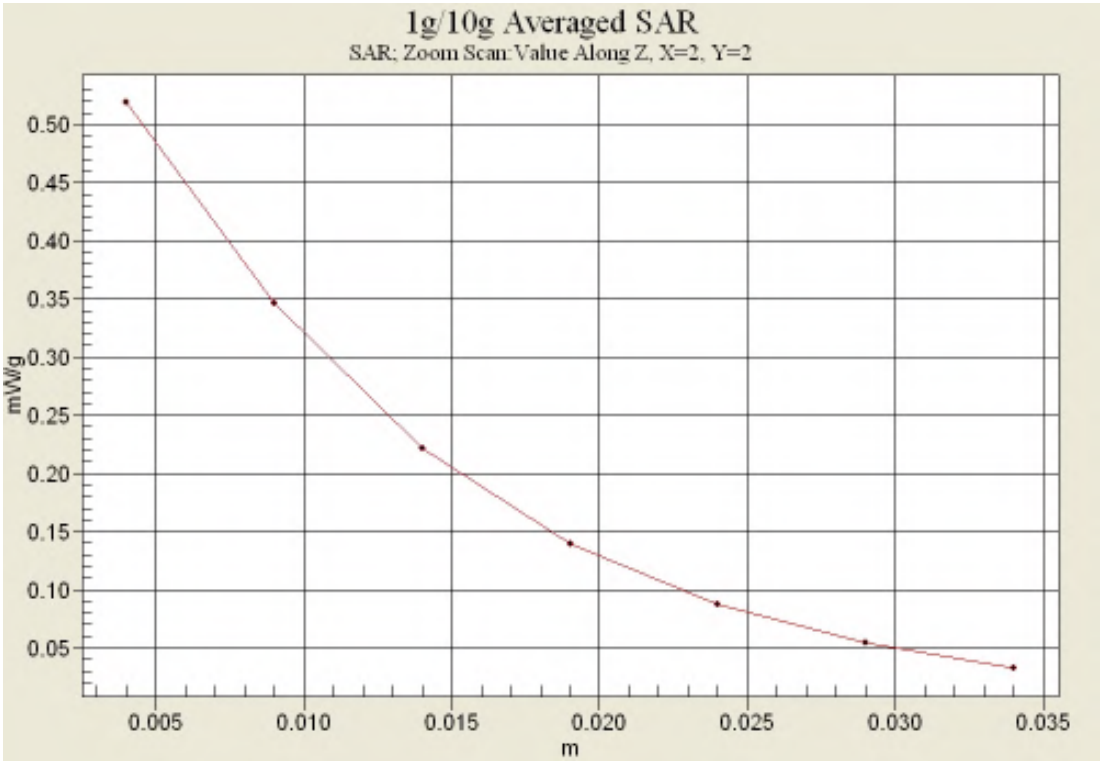
GPRS1900_Right Touch_CH661_4TX/Area Scan (71x101x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.523 mW/g

GPRS1900_Right Touch_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.57 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.696 W/kg
SAR(1 g) = 0.469 mW/g; SAR(10 g) = 0.285 mW/g
Maximum value of SAR (measured) = 0.519 mW/g



0 dB = 0.519mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
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: GPRS1900_Right Tilt_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

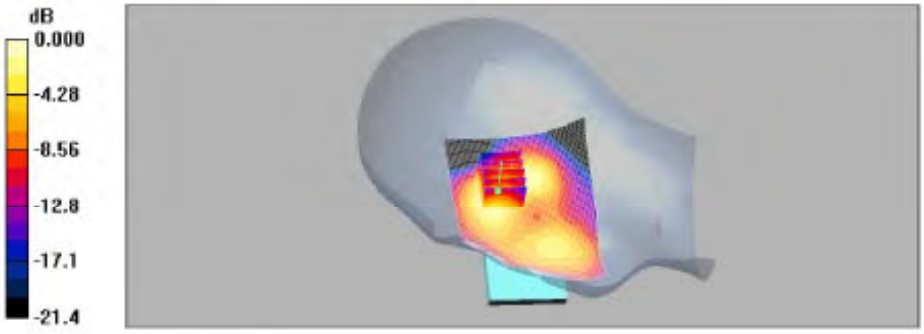
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Right Tilt

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Right Tilt_CH661_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.260 mW/g

GPRS1900_Right Tilt_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 0.321 W/kg
SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.129 mW/g
Maximum value of SAR (measured) = 0.225 mW/g



0 dB = 0.225mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Left Touch_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

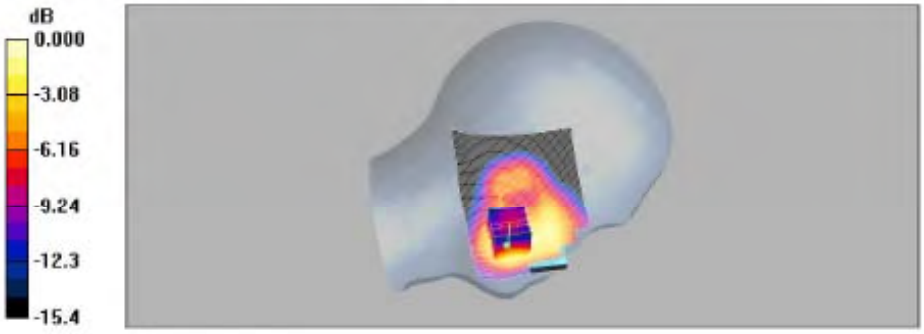
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Left Touch

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Left Touch_CH661_4TX/Area Scan (71x101x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.389 mW/g

GPRS1900_Left Touch_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.76 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.506 W/kg
SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.218 mW/g
Maximum value of SAR (measured) = 0.361 mW/g



0 dB = 0.361mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Left Tilt_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.3 ℃

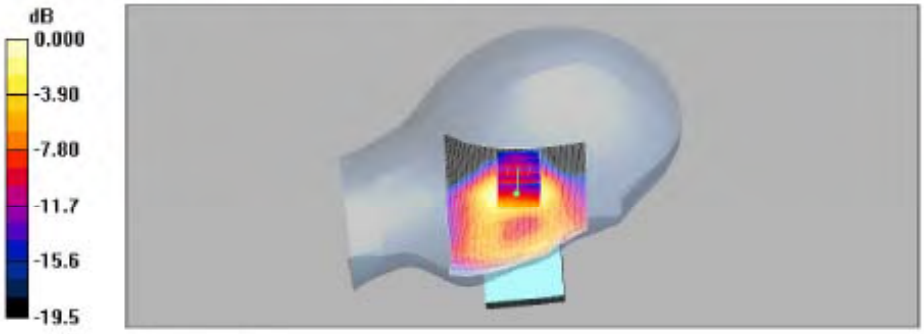
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Left Tilt

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Left Tilt_CH661_4TX/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.232 mW/g

GPRS1900_Left Tilt_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.303 W/kg
SAR(1 g) = 0.201 mW/g; SAR(10 g) = 0.118 mW/g
Maximum value of SAR (measured) = 0.222 mW/g



0 dB = 0.222mW/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 ℃

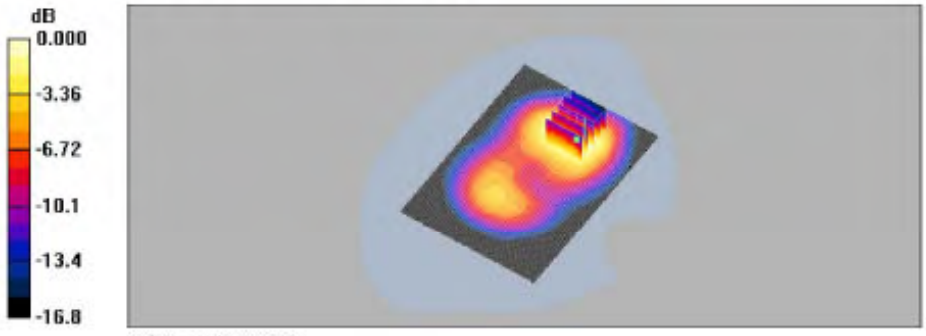
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: PCS1900_Body

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) = 0.500 mW/g

PCS1900_Rear_CH661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.19 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 0.793 W/kg
SAR(1 g) = 0.455 mW/g; SAR(10 g) = 0.282 mW/g
Maximum value of SAR (measured) = 0.497 mW/g



0 dB = 0.497mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Front_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

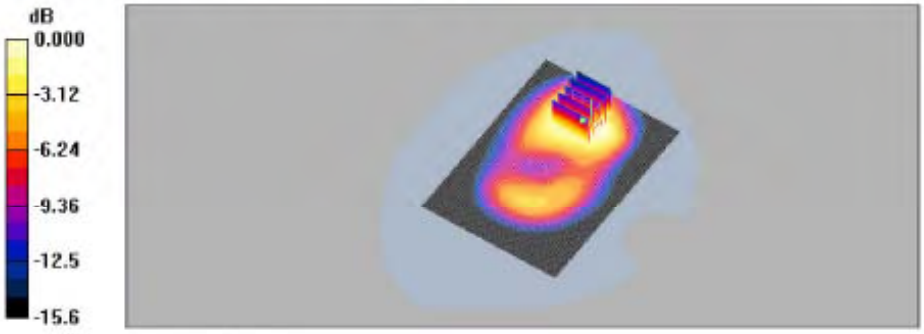
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Body

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Front_CH661_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.635 mW/g

GPRS1900_Front_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.19 V/m; Power Drift = 0.042 dB
Peak SAR (extrapolated) = 0.907 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.363 mW/g
Maximum value of SAR (measured) = 0.624 mW/g



0 dB = 0.624mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Rear_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

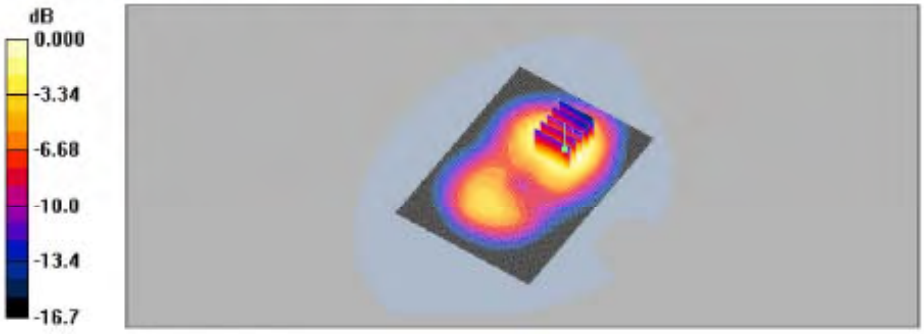
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Body

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

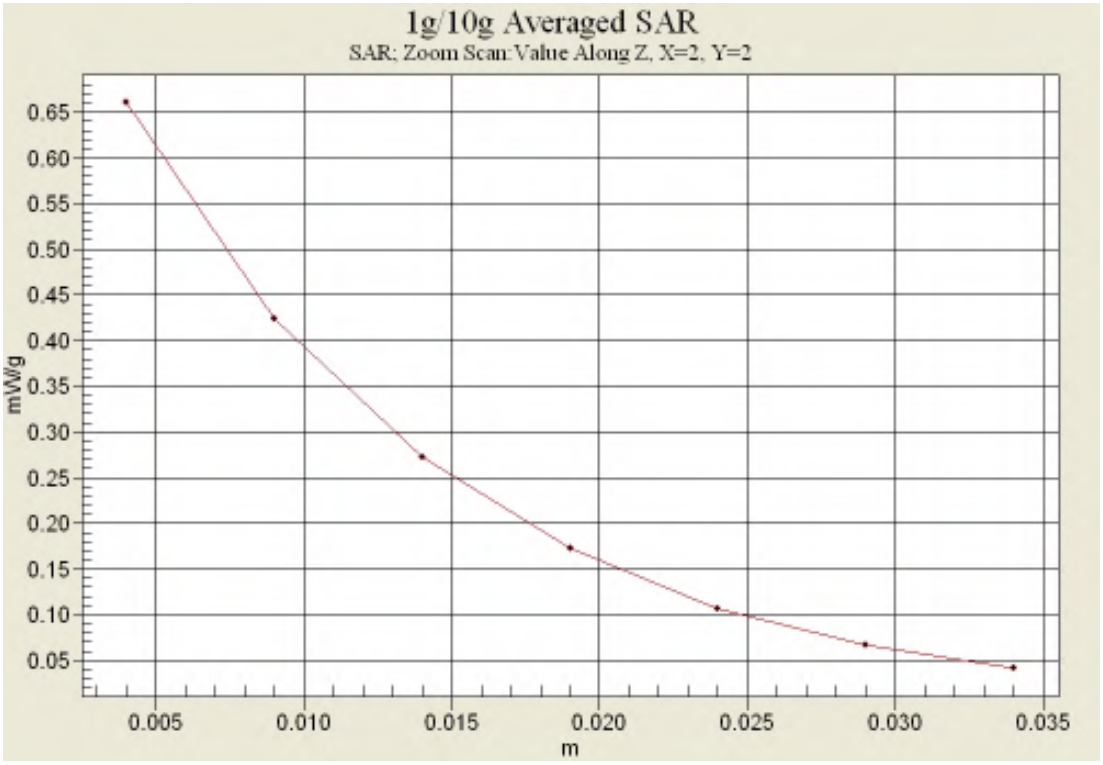
GPRS1900_Rear_CH661_4TX/Area Scan (81x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.700 mW/g

GPRS1900_Rear_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.90 V/m; Power Drift = -0.003 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.618 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.660 mW/g



0 dB = 0.660mW/g

Z-Scan


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=2
mW/g
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
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: GPRS1900_Left Edge_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

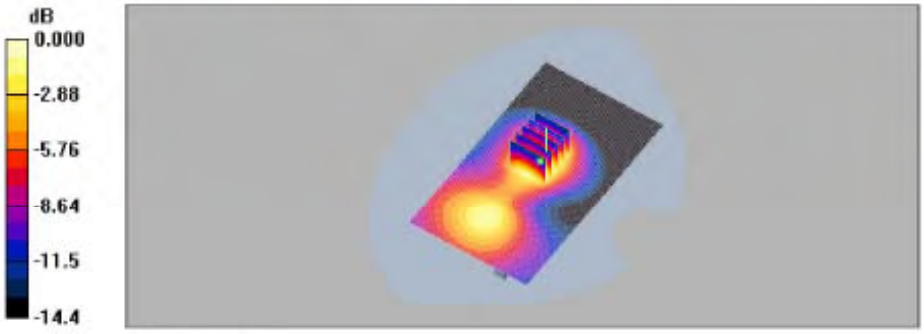
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Body

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Left Edge_CH661_4TX/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.137 mW/g

GPRS1900_Left Edge_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.11 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.077 mW/g
Maximum value of SAR (measured) = 0.132 mW/g



0 dB = 0.132mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Right Edge_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

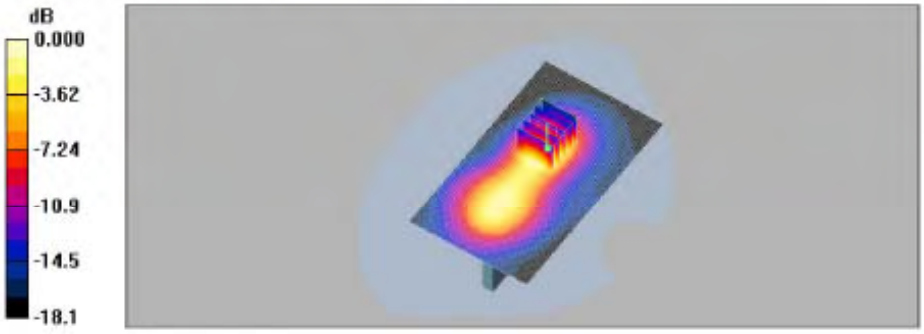
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Body

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Right Edge_CH661_4TX/Area Scan (71x121x1): Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.278 mW/g

GPRS1900_Right Edge_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.0 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.131 mW/g
Maximum value of SAR (measured) = 0.267 mW/g



0 dB = 0.267mW/g

Date: 2013-02-09

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Bottom_CH661_4TX.da4

Ambient Temp : 23.5 ℃ Tissue Temp : 22.1 ℃

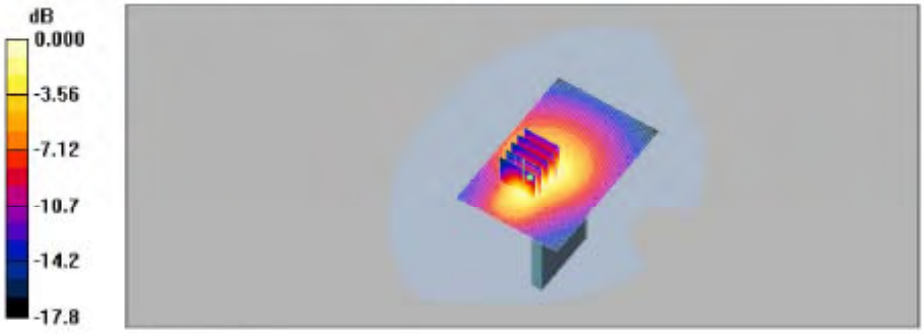
DUT: LG-E455f; Type: GSM & WCDMA Phone with Bluetooth and WLAN; Serial: 204KPRW100262
Program Name: GPRS1900_Body

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
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

GPRS1900_Bottom_CH661_4TX/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.274 mW/g

GPRS1900_Bottom_CH661_4TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 0.475 W/kg
SAR(1 g) = 0.270 mW/g; SAR(10 g) = 0.150 mW/g
Maximum value of SAR (measured) = 0.302 mW/g



0 dB = 0.302mW/g