SAR TEST REPORT

Equipment Under Test	:	Cellular/PCS GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Model No.	:	LG-P690 (Additional model name : P690/LGP690)
Applicant	:	LG Electronics Inc.
Address of Applicant	:	60-39, Gasan-dong, Gumchon-gu, Seoul, 153-023, Korea
FCC ID	:	BEJP690
Device Category	:	Portable Device
Exposure Category	:	General Population/Uncontrolled Exposure
Date of Receipt	:	2011-04-28
Date of Test(s)	:	2011-05-02 ~ 2011-05-09
Date of Issue	:	2011-05-19
Max. SAR	:	1.10 W/kg (GSM850), 0.699 W/kg (PCS1900) 0.679 W/kg (WLAN)

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	:	**Fred Jeong**	**2011-05-19**
Approved by	:	**Charles Kim**	**2011-05-19**

Contents

APPENDIX

A. DASY4 SAR Report
B. Uncertainty Analysis
C. Calibration certificate

1. General Information

1.1 Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, 435-040, Korea
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371
Homepage : www.kr.sgs.com/ee

1.2 Details of Manufacturer

Manufacturer : LG Electronics Inc.
Address : 60-39, Gasan-dong, Gumchon-gu, Seoul, 153-023, Korea
Contact Person : Hyeon Kyun Kim
Phone No. : 82-2-2033-1113

1.3 Version of Report

Version Number	Date	Revision
00	2011-05-19	Initial issue

1.4 Description of EUT(s)

EUT Type	: Cellular/PCS GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Model	: LG-P690 (Additional model name : P690/LGP690)
Serial Number	: 012KPLC904872
Mode of Operation	: GSM850, PCS1900, WLAN, Bluetooth
Duty Cycle	: 8(GSM), 8(GPRS 1Tx Slot), 4(GPRS 2Tx Slot), 2.67(GPRS 3Tx Slot), 2(GPRS 4Tx Slot), 1(WLAN)
Body worn Accessory	: None
Tx Frequency Range	: 824.2 MHz ~ 848.8 MHz (GSM850) 1850.2 MHz ~ 1909.8 MHz (PCS1900) 2412 MHz ~ 2462 MHz (WLAN) 2402 MHz ~ 2480 MHz (Bluetooth)
Conducted Max Power	: 33.20 dBm(GSM850), 30.40 dBm(PCS1900), 15.39 dBm(WLAN), 4.60 dBm(Bluetooth)
Battery Type	: 3.7 V d.c. (Lithum-ion Battery)

1.5 Test Environment

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

1.6 Operation Configuration

The device in GSM was controlled by using a Communication tester (CMU 200). 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.

1.7 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 4 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 2.7 mm for an ET3DV6 probe type).

- 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.

The probe is calibrated at the center of the dipole sensors that is located 1 mm to 2.7 mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within –2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1 % for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with

relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1 g and 10 g peak evaluations are only available for the predefined cube 7x7x7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30 g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1 g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.8 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.

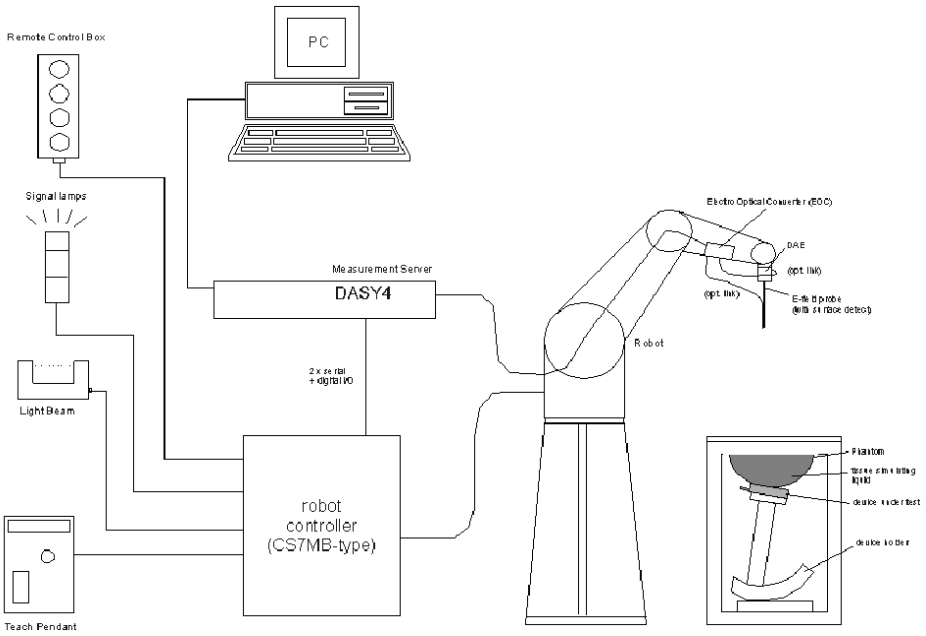


Fig a. The microwave circuit arrangement used for SAR system verification

• 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 or Windows XP.

• DASY4 software.

• Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.

• The SAM twin phantom enabling testing body usage.

• The device holder for flat phantom.

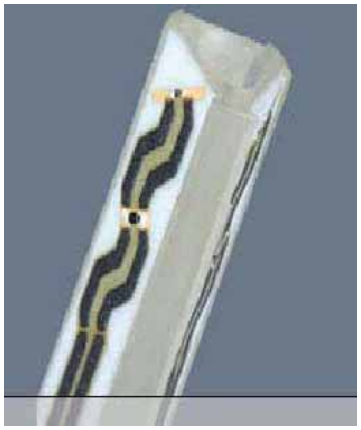
• Tissue simulating liquid mixed according to the given recipes.

• Validation dipole kits allowing to validate the proper functioning of the system.

1.9 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 D” 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 mm ± 0.1 mm

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

1.10 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 MHz, 1900 MHz and 2450 MHz. The tests for EUT were conducted within 24 hours after each validation. 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.

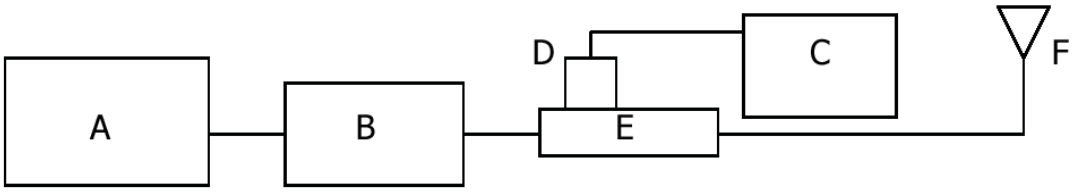


Fig b. The microwave circuit arrangement used for SAR system verification

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 777D/778D Dual directional coupling
F. Reference dipole Antenna

Photo of the dipole Antenna

System Validation Results

Validation Kit	Tissue	Target SAR 1 g from Calibration Certificate (1 W)	Measured SAR 1 g (1 W)	Deviation (%)	Date	Liquid Temp. (°C)
D835V2 S/N: 490	835 MHz Brain	9.62 W/kg	**9.16 W/kg**	**-4.78**	2011-05-02	22.3
D835V2 S/N: 490	835 MHz Body	9.84 W/kg	**9.92 W/kg**	**0.81**	2011-05-02	22.3
D1900V2 S/N: 5d033	1900 MHz Brain	39.4 W/kg	**40.8 W/kg**	**3.55**	2011-05-04	22.5
D1900V2 S/N: 5d033	1900 MHz Body	41.3 W/kg	**43.2 W/kg**	**4.60**	2011-05-04	22.5
D2450V2 S/N: 734	2450 MHz Brain	51.7 W/kg	**50.0 W/kg**	**-3.29**	2011-05-09	21.5
D2450V2 S/N: 734	2450 MHz Body	53.5 W/kg	**54.0 W/kg**	**0.93**	2011-05-09	21.5

Table 1. Results system validation

1.11 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Agilent Model 85070D Dielectric Probe (rates frequence band 200 MHz to 20 GHz) in conjunction with Agilent E5070B Network Analyzer(300 KHz - 3 GHz) by using a procedure detailed in Section V.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			Permittivity	Conductivity	Simulated Tissue Temp(℃)
835	Head	Measured, 2011-05-02	**43.5**	**0.90**	22.3
		Recommended Limits	41.5	0.90	21.0 ~ 23.0
		Deviation(%)	4.82	0.00	-
	Body	Measured, 2011-05-02	**57.0**	**0.95**	22.3
		Recommended Limits	55.2	0.97	21.0 ~ 23.0
		Deviation(%)	3.26	-2.06	-
1900	Head	Measured, 2011-05-04	**38.2**	**1.40**	22.5
		Recommended Limits	40.0	1.40	21.0 ~ 23.0
		Deviation(%)	-4.50	0.00	-
	Body	Measured, 2011-05-04	**51.7**	**1.56**	22.5
		Recommended Limits	53.3	1.52	21.0 ~ 23.0
		Deviation(%)	-3.00	2.63	-
2450	Head	Measured, 2011-05-09	**37.6**	**1.85**	22.5
		Recommended Limits	39.2	1.80	21.0 ~ 23.0
		Deviation(%)	-4.08	2.78	-
	Body	Measured, 2011-05-09	**50.2**	**1.99**	22.5
		Recommended Limits	52.7	1.95	21.0 ~ 23.0
		Deviation(%)	-4.74	2.05	-

The composition of the brain tissue simulating liquid

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

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

Salt: 99 $^{+}$% Pure Sodium Chloride Sugar: 98 $^{+}$% Pure Sucrose

Water: De-ionized, 16 MΩ^{+} resistivity HEC: Hydroxyethyl Cellulose

DGBE: 99 $^{+}$% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

1.12 Test Standards and Limits

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

frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

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

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

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

Table .4 RF exposure limits

2. Instruments List

Maunfacturer	Device	Type	Serial Number	Due date of Calibration
Stäubli	Robot	RX90BL	F03/5W05A1/A/01	N/A
Schmid& Partner Engineering AG	Dosimetric E-Field Probe	ET3DV6	1782	April 14, 2012
Schmid& Partner Engineering AG	835 MHz System Validation Dipole	D835V2	490	May 21, 2012
Schmid& Partner Engineering AG	1900 MHz System Validation Dipole	D1900V2	5d033	May 26, 2012
Schmid& Partner Engineering AG	2450 MHz System Validation Dipole	D2450V2	734	May 27, 2012
Schmid& Partner Engineering AG	Data acquisition Electronics	DAE3	567	January 27, 2012
Schmid& Partner Engineering AG	Software	DASY 4 V4.7	-	N/A
Schmid& Partner Engineering AG	Phantom	SAM Phantom V4.0	TP-1299 TP-1300	N/A
Agilent	Network Analyzer	E5070B	MY42100282	March 31, 2012
Agilent	Dielectric Probe Kit	85070D	2184	N/A
Agilent	Power Meter	E4419B	GB43311126	September 28, 2011
Agilent	Power Sensor	E9300H	MY41495307	October 01, 2011
			MY41495308	October 01, 2011
Agilent	Signal Generator	E4421B	MY43350132	September 28, 2011
Empower RF Systems	Power Amplifier	2001-BBS3Q7ECK	1032 D/C 0336	April 01, 2012
Agilent	Dual Directional Coupler	777D 778D	50128 50454	September 28, 2011
Microlab	LP Filter	LA-15N LA-30N	N/A	October 01, 2011
R&S	Mobile Test Unit	CMU 200	109495	September 29, 2011

3.Summary of Results

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.

RF Conducted Power

GSM

	Channel	Frequency(MHz)	Conducted Average Power(dBm)				
			GSM	GPRS			
				1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM 850 Band	128	824.2	33.20	33.20	30.70	28.70	27.80
	190	836.6	33.00	33.00	30.50	28.60	27.60
	251	848.8	32.80	32.80	30.40	28.40	27.40
PCS 1900 Band	512	1850.2	30.40	30.40	27.90	25.90	24.90
	661	1880.0	30.10	30.10	27.50	25.60	24.60
	810	1909.8	29.70	29.70	27.20	25.30	24.30

	Channel	Frequency(MHz)	Conducted Power(dBm)			
			EDGE			
			1 Tx Slot	2 Tx Slot	3 Tx Slot	4 Tx Slot
GSM 850 Band	128	824.2	27.40	25.40	23.40	22.40
	190	836.6	27.20	25.20	23.30	22.20
	251	848.8	27.10	25.10	23.10	22.10
PCS 1900 Band	512	1850.2	26.60	24.50	22.60	21.50
	661	1880.0	26.30	24.20	22.20	21.20
	810	1909.8	25.90	23.90	22.00	20.90

Bluetooth

Channel	Frequency (MHz)	GFSK (dBm)	8DPSK (dBm)
Low	2402	3.98	1.52
Middle	2441	4.6	1.76
High	2480	3.89	1.51

WLAN

802.11b Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dBm)
2412	1	1	15.36
		2	15.32
		5.5	15.29
		11	15.29
2437	6	1	15.39
		2	15.35
		5.5	15.26
		11	15.25
2462	11	1	15.36
		2	15.33
		5.5	15.28
		11	15.30

802.11g Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dBm)
2412	1	6	12.36
		9	12.27
		12	12.30
		18	12.33
		24	12.34
		36	12.28
		48	12.29
		54	12.26
2437	6	6	12.68
		9	12.56
		12	12.56
		18	12.63
		24	12.55
		36	12.61
		48	12.64
		54	12.64
2462	11	6	12.47
		9	12.45
		12	12.43
		18	12.43
		24	12.41
		36	12.42
		48	12.43
		54	12.45

802.11n Mode		Rated	Measured Power
Frequency (MHz)	Channel No.	(Mbps)	(dBm)
2412	1	MCS0	11.17
		MCS1	11.09
		MCS2	11.12
		MCS3	11.14
		MCS4	11.11
		MCS5	11.10
		MCS6	11.13
		MCS7	11.14
2437	6	MCS0	11.50
		MCS1	11.44
		MCS2	11.40
		MCS3	11.41
		MCS4	11.46
		MCS5	11.40
		MCS6	11.45
		MCS7	11.49
2462	11	MCS0	11.42
		MCS1	11.35
		MCS2	11.38
		MCS3	11.39
		MCS4	11.40
		MCS5	11.35
		MCS6	11.41
		MCS7	11.36

KDB 648474 D01 SAR Handsets Multi Xmiter and Ant v01r05 _Sept. 2008

Summary of SAR Evaluation Requirements for Cell Phone with Multiple Transmitters

These procedures were followed according to KDB 648474 document "SAR Handsets Multi Xmiter and Ant v01r05", September 2008. The procedures are applicable to phones with built-in unlicensed transmitters, such as 802.11 a/b/g and Bluetooth devices.

<Output Power Thresholds for Unlicensed Transmitters>

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this table.				

<SAR Evaluation Requirements for Cellphones with Multiple Transmitters>

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only ○ when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed ○ when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas ○ when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – ○ output ≤ 60/f: SAR not required ○ output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when ○ output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas ○ output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas ○ output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required ○ test SAR on highest output channel for each wireless mode and exposure condition ○ if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required ○ when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues ○ position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

<KDB 648474 Simultaneous SAR evaluation>

Mode (f)	P (dBm)	P (mW)	Stand-alone SAR
GSM 850	33.20	2089.30	Yes
PCS 1900	30.40	1096.48	Yes
WLAN	15.39	34.59	Yes
Bluetooth	4.60	2.88	No

⇨ Simultaneous and Stand-alone SAR for Bluetooth is not required.

<Simultaneous Transmission Summation for Held to Ear Voice Call with Hotspot Active Scenario>

Simultaneous TX	configuration	850 GSM SAR (W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Head SAR	Right Cheek	0.477	0.251	0.728
	Right Tilt	0.286	0.141	0.427
	Left Cheek	0.455	0.679	1.134
	Left Tilt	0.293	0.246	0.539
Simultaneous TX	configuration	1900 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Head SAR	Right Cheek	0.456	0.251	0.707
	Right Tilt	0.181	0.141	0.322
	Left Cheek	0.566	0.679	1.245
	Left Tilt	0.154	0.246	0.400

<Simultaneous Transmission Summation for 2G/3G Hotspot Data and WIFI Hotspot Active Scenario>

Simultaneous TX	configuration	850 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	1.100	0.137	1.237
	Front	0.558	0.122	0.680
	Left	0.388	-	0.388
	Right	0.404	0.122	0.526
	Bottom	0.092	-	0.092
	Top	-	0.019	0.019
Simultaneous TX	configuration	1900 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.699	0.137	0.836
	Front	0.519	0.122	0.641
	Left	0.164	-	0.164
	Right	0.125	0.122	0.247
	Bottom	0.281	-	0.281
	Top	-	0.019	0.019

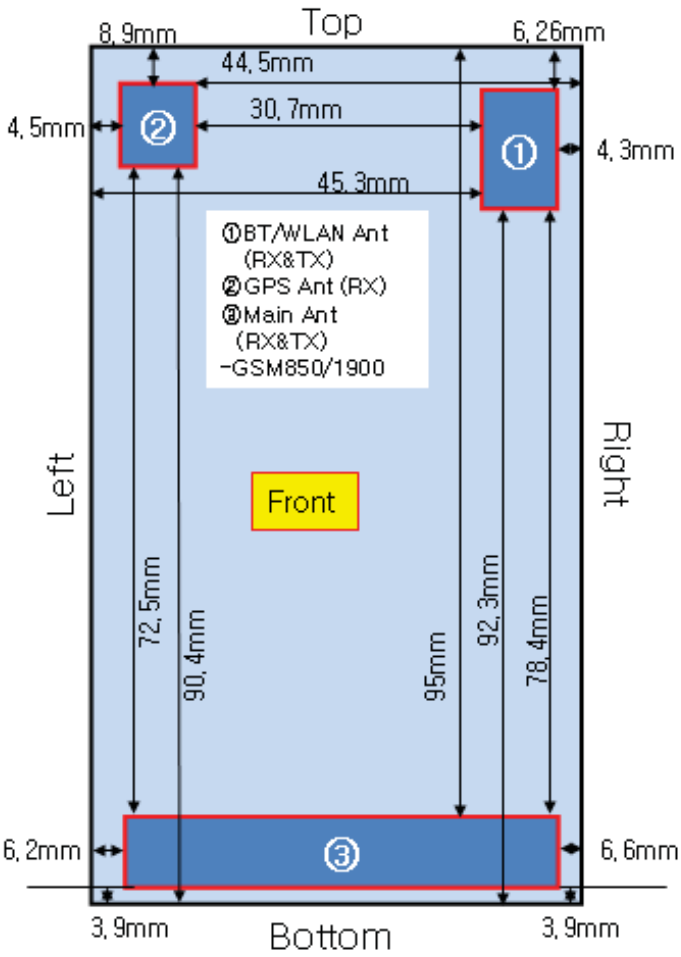
** The above tables represent the worst-case simultaneous transmission scenarios possible with this device.

Note : "-" SAR results shown in the table are zero for summation purposes. SAR was not required to be measured due to exclusions mentioned in Section “3.4 SAR Test Configuration”.

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.

SAR Test Configuration

Mode	Front	Back	Left	Right	Bottom	Top
GPRS 850	O	O	O	O	O	X
GPRS 1900	O	O	O	O	O	X
WLAN	O	O	X	O	X	O



Ambient Temperature (°C)	22.3
Liquid Temperature (°C)	22.3
Date	2011-05-02

GSM850 Head SAR

Head	EUT Position	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
		Frequency (MHz)	Channel			
Left Ear	Cheek	836.6	190	-0.071	0.455	1.6
	Tilt	836.6	190	-0.100	0.293	
Right Ear	Cheek	836.6	190	0.157	**0.477**	
	Tilt	836.6	190	-0.094	0.286	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.

Ambient Temperature (°C)	22.3
Liquid Temperature (°C)	22.3
Date	2011-05-02

GSM850 Body Hotspot SAR

Test Mode	EUT Position	Slot	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel			
GPRS	Front	2 Tx	836.6	190	0.065	0.558	1.6
	Back	2 Tx	824.2	128	-0.027	1.00	
	Back	2 Tx	836.6	190	0.009	1.04	
	Back	2 Tx	848.8	251	0.022	0.943	
	Left	2 Tx	836.6	190	-0.053	0.388	
	Right	2 Tx	836.6	190	-0.016	0.404	
	Bottom	2 Tx	836.6	190	-0.074	0.092	
	Back	1 Tx	824.2	128	-0.082	1.03	
	Back	1 Tx	836.6	190	0.030	0.805	
	Back	1 Tx	848.8	251	-0.017	0.984	
	Back	3 Tx	824.2	128	-0.040	**1.10**	
	Back	3 Tx	836.6	190	-0.020	0.856	
	Back	3 Tx	848.8	251	0.016	1.04	
	Back	4 Tx	824.2	128	-0.097	1.09	
	Back	4 Tx	836.6	190	0.141	0.908	
	Back	4 Tx	848.8	251	0.054	1.02	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.
6. The distance from EUT to flat phantom for testing Body SAR is 10 mm.
7. Top was not tested since the antenna distance to edge was greater than 2.5 cm per KDB941225 D06.

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	22.5
Date	2011-05-04

PCS1900 Head SAR

Head	EUT Position	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
		Frequency (MHz)	Channel			
Left Ear	Cheek	1880.0	661	-0.008	**0.566**	1.6
	Tilt	1880.0	661	0.100	0.154	
Right Ear	Cheek	1880.0	661	-0.050	0.456	
	Tilt	1880.0	661	-0.090	0.181	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	22.5
Date	2011-05-04

PCS1900 Body Hotspot SAR

Test Mode	EUT Position	Slot	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel			
GPRS	Front	2 Tx	1880.0	661	-0.099	0.519	1.6
	Back	2 Tx	1880.0	661	-0.028	0.665	
	Left	2 Tx	1880.0	661	-0.080	0.164	
	Right	2 Tx	1880.0	661	0.089	0.125	
	Bottom	2 Tx	1880.0	661	-0.062	0.281	
	Back	1 Tx	1880.0	661	-0.020	0.610	
	Back	3 Tx	1880.0	661	-0.060	0.659	
	Back	4 Tx	1880.0	661	-0.135	**0.699**	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.
6. The distance from EUT to flat phantom for testing Body SAR is 10 mm.
7. Top was not tested since the antenna distance to edge was greater than 2.5 cm per KDB941225 D06.

Ambient Temperature (°C)	21.5
Liquid Temperature (°C)	21.5
Date	2011-05-09

WLAN Head SAR

Head	Test Mode	EUT Position	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel			
Left Ear	11b	Cheek	2412	1	-0.049	0.500	1.6
	11b	Cheek	2437	6	-0.055	0.560	
	11b	Cheek	2462	11	-0.165	**0.679**	
	11b	Tilt	2437	6	-0.174	0.246	
Right Ear	11b	Cheek	2437	6	-0.163	0.251	
	11b	Tilt	2437	6	0.155	0.141	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.
6. WLAN could be used for data transmission during voice communication at the same time.
7. KDB 248227 <SAR Measurement Procedures for 802.11 a/b/g Transmitters>
   - Channel 1, 6 and 11 were tested by the definition of “default test channels”.
   - Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other mode were not tested since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
8. WLAN transmission was verified using a spectrum analyzer.

Ambient Temperature (°C)	21.5
Liquid Temperature (°C)	21.5
Date	2011-05-09

WLAN Body Hotspot SAR

Body	Test Mode	EUT Position	Traffic Channel		Power Drift(dB)	1 g SAR (W/kg)	1 g SAR Limits (W/kg)
			Frequency (MHz)	Channel			
Body	11b	Front	2437	6	0.017	0.122	1.6
	11b	Back	2412	1	0.031	0.098	
	11b	Back	2437	6	-0.002	0.132	
	11b	Back	2462	11	-0.176	**0.137**	
	11b	Right	2437	6	-0.065	0.122	
	11b	Top	2437	6	0.078	0.019	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
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. Liquid tissue depth was at least 15 cm.
5. Justification for reduced test configuration : Per FCC/OET Bulletin 65 Supplement C [July 2001], if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channel is optional for such test configurations.
6. The distance from EUT to flat phantom for testing Body SAR is 10 mm.
7. KDB 248227 <SAR Measurement Procedures for 802.11 a/b/g Transmitters>
   - Channel 1, 6 and 11 were tested by the definition of “default test channels”.
   - Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other mode were not tested since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11b mode.
8. WLAN transmission was verified using a spectrum analyzer.
9. Right and Bottom was not tested since the antenna distance to edge was greater than 2.5 cm per KDB941225 D06.

Appendix

List

Appendix A	DASY4 Report (Plots of the SAR Measurements)	- 835 MHz, 1900 MHz, 2450 MHz Validation 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 MHz Validation Test_Head

Date: 2011-05-02

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

Input Power : 250 mW

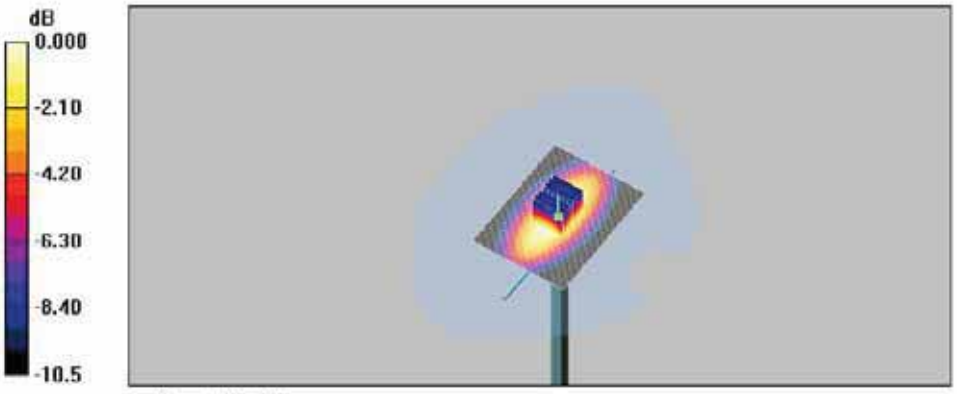
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Vaildation 835 MHz_Head

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.896 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

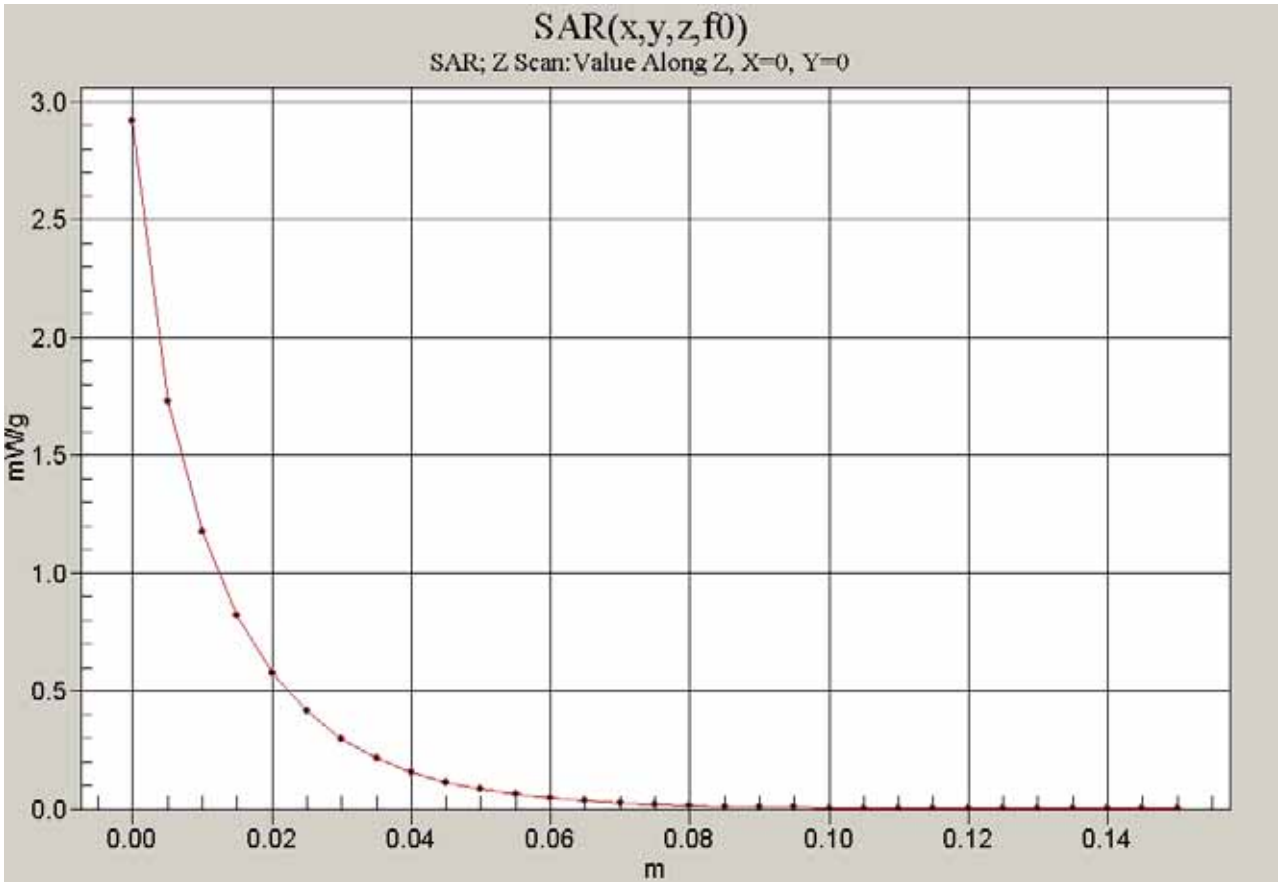
Validation 835 MHz_Head/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.47 mW/g

Validation 835 MHz_Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.4 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 3.41 W/kg
SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.49 mW/g
Maximum value of SAR (measured) = 2.48 mW/g



0 dB = 2.48mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

835 MHz Validation Test_Body

Date: 2011-05-02

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

Input Power : 250 mW

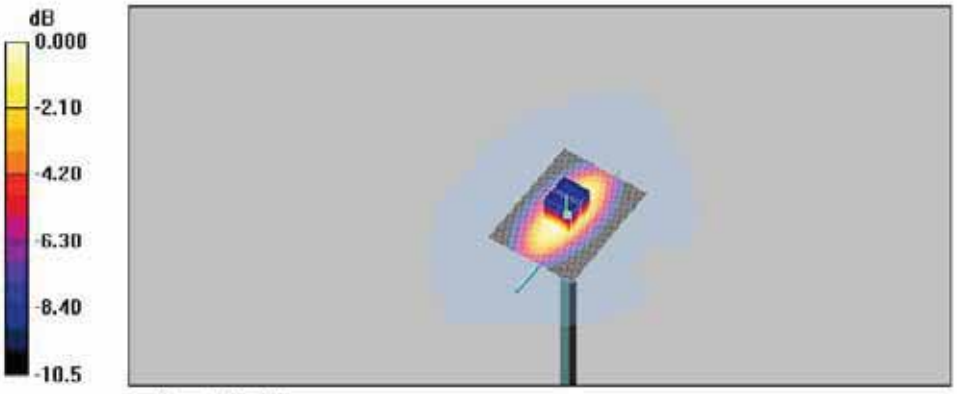
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:490
Program Name: Vaildation 835 MHz_Body

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.952 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

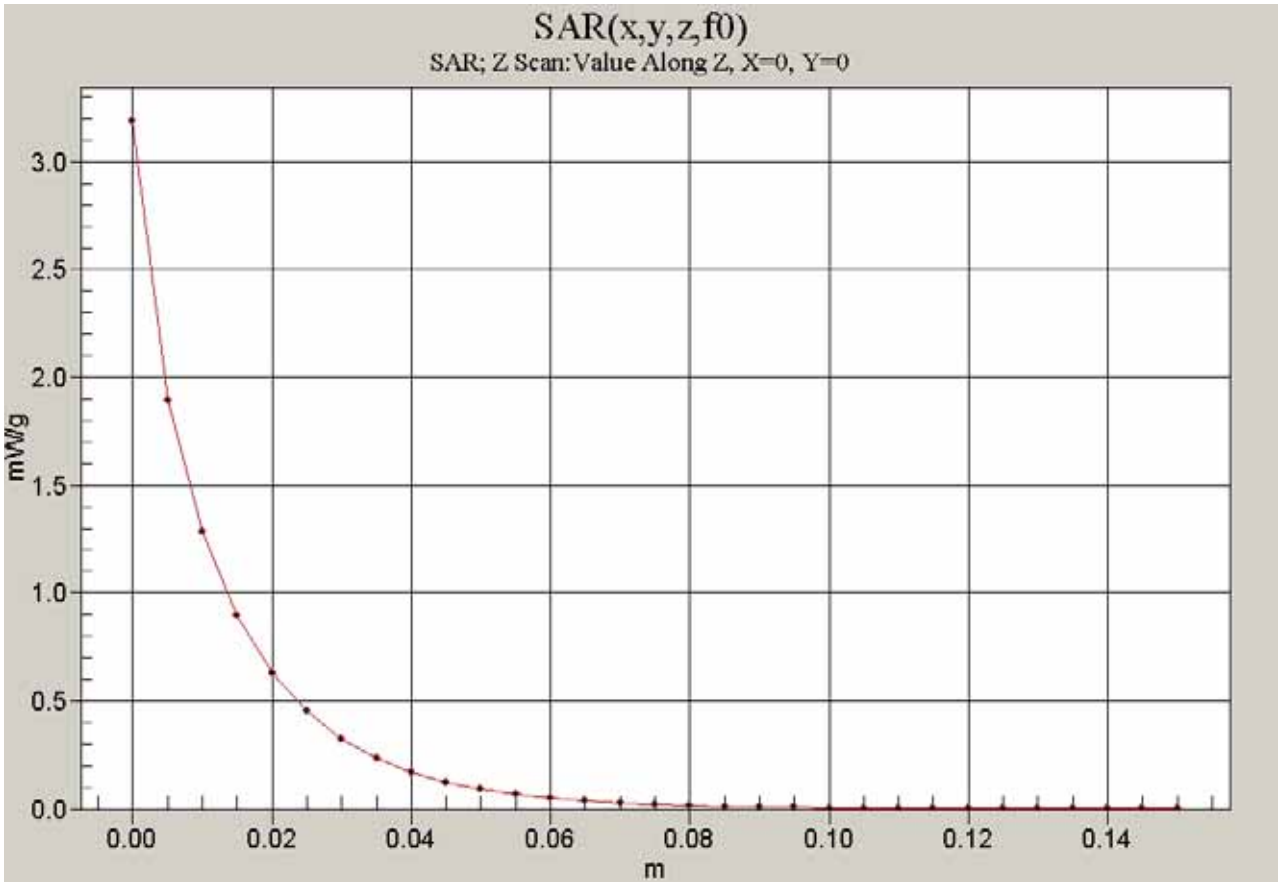
Validation 835 MHz_Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.68 mW/g

Validation 835 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.3 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 3.63 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.68 mW/g



0 dB = 2.68mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

1900 MHz Validation Test_Head

Date: 2011-05-04

Test Laboratory: SGS Testing Korea
File Name: Validation 1900 MHz_Head.da4

Input Power : 250 mW

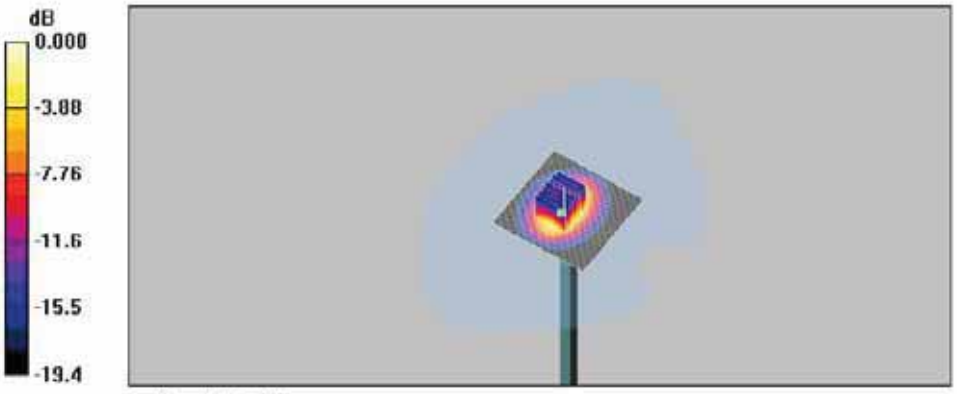
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Validation 1900 MHz

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.95, 4.95, 4.95); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

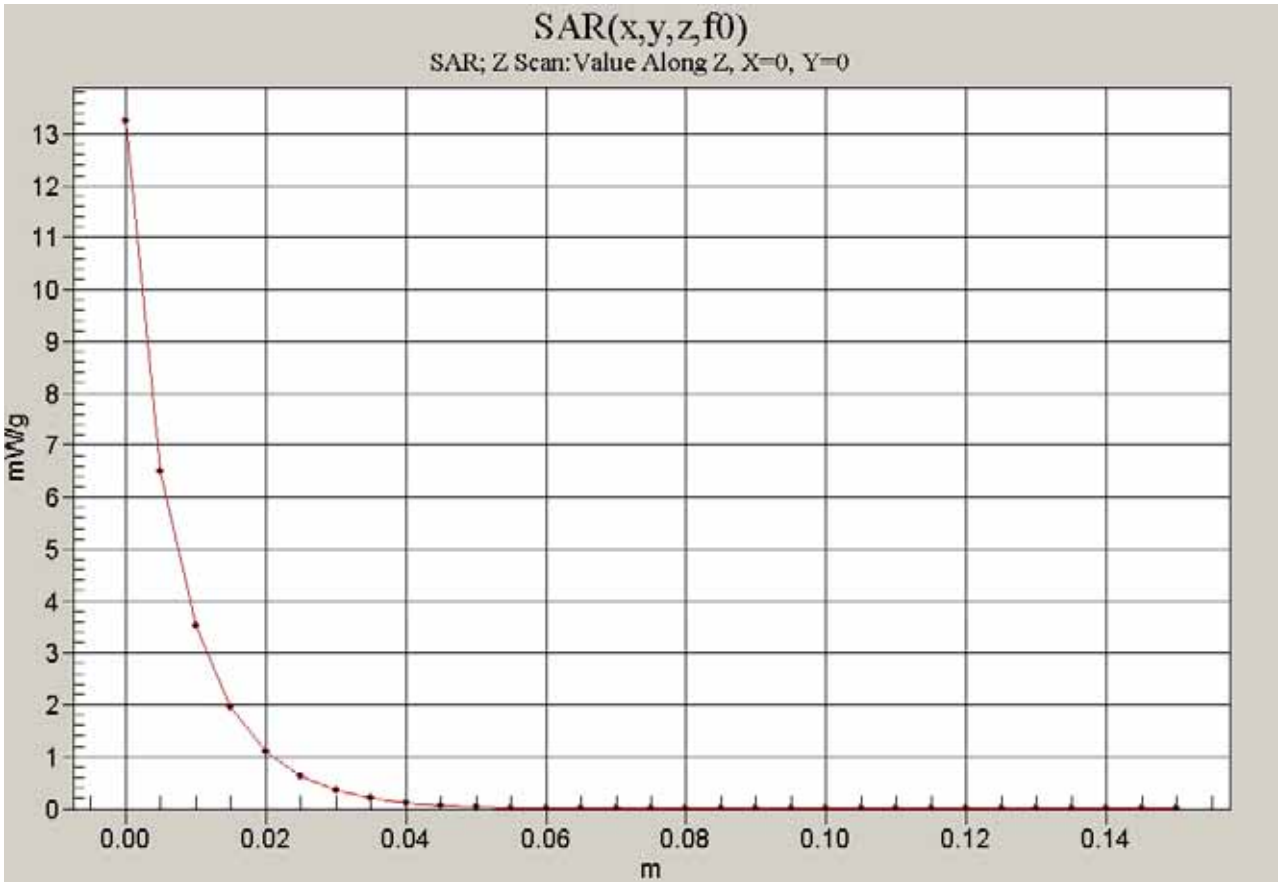
Validation 1900 MHz_Head/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.0 mW/g

Validation 1900 MHz_Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.4 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 18.1 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 11.7 mW/g



0 dB = 11.7mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

1900 MHz Validation Test_Body

Date: 2011-05-04

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

Input Power : 250 mW

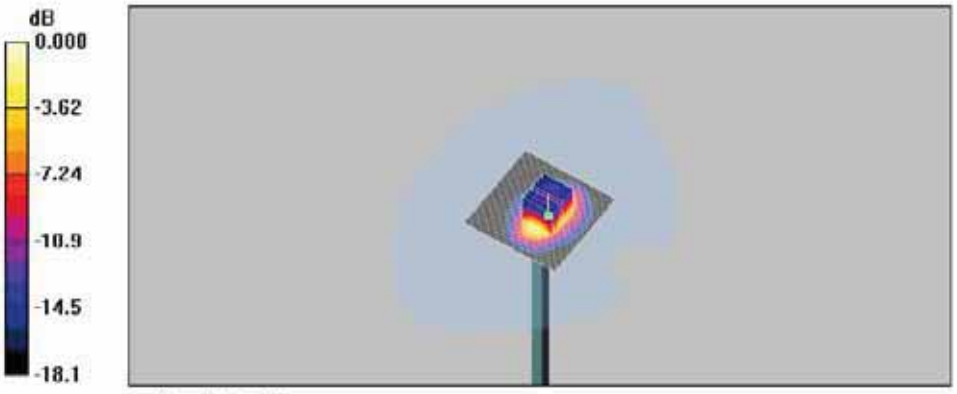
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d033
Program Name: Validation 1900 MHz

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

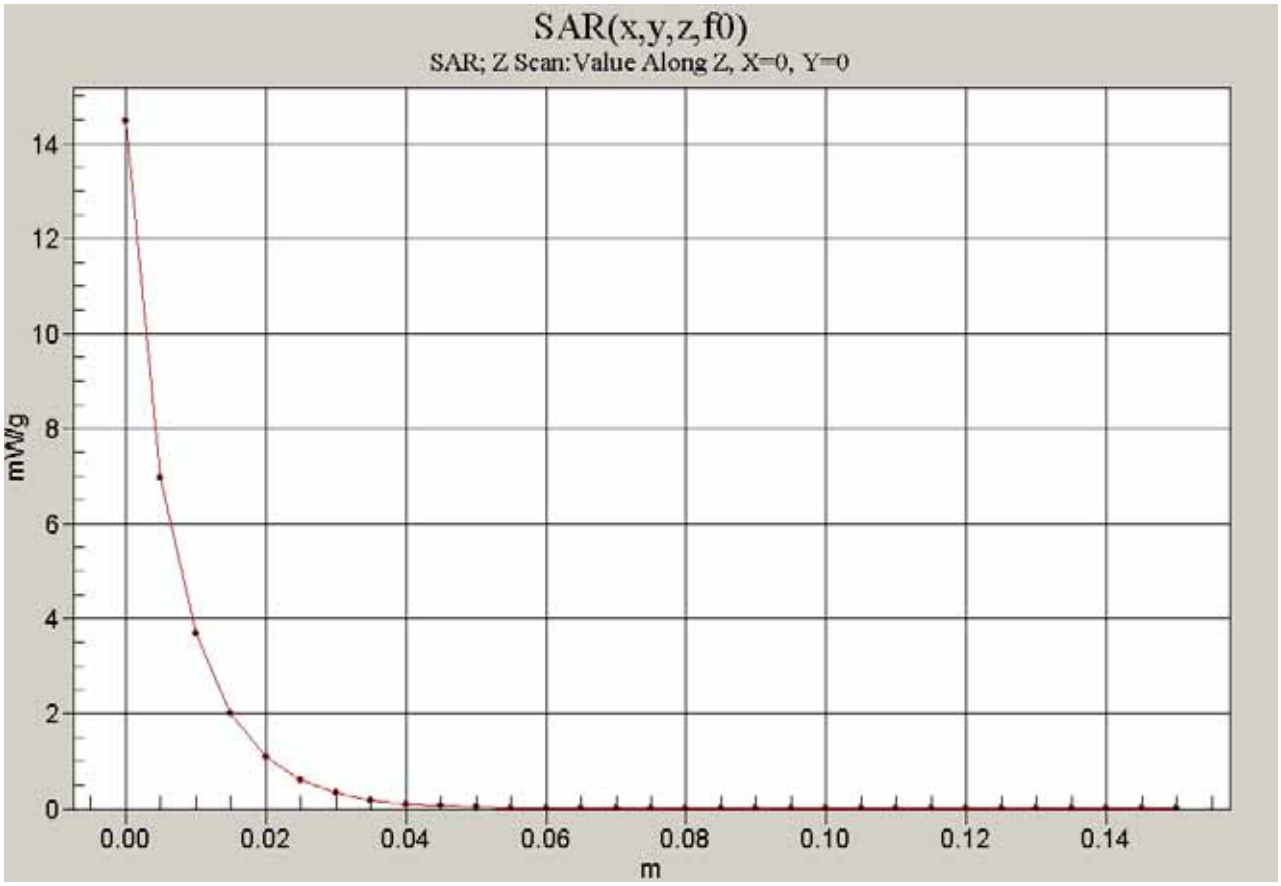
Validation 1900 MHz_Body/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.9 mW/g

Validation 1900 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 77.0 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.61 mW/g
Maximum value of SAR (measured) = 12.2 mW/g



0 dB = 12.2mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
14
12
10
8
6
4
2
0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

2450 MHz Validation Test_Head

Date: 2011-05-09

Test Laboratory: SGS Testing Korea
File Name: Validation 2450 MHz_Head.da4

Input Power : 250 mW

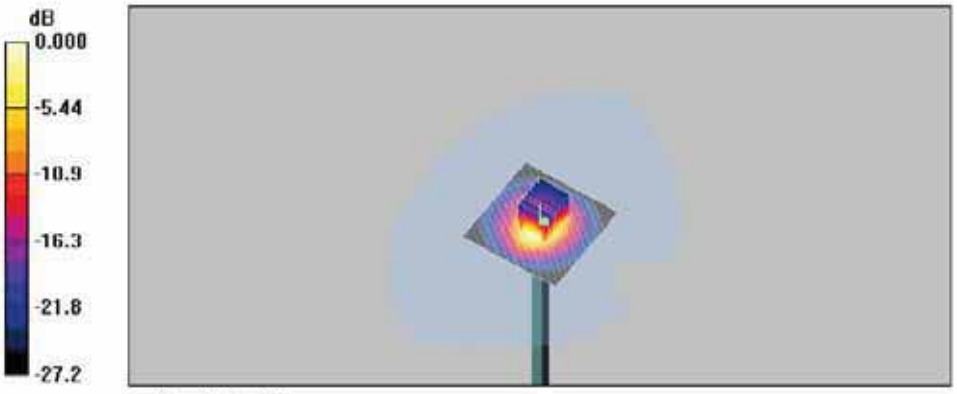
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:734
Program Name: Validation 2450 MHz_Head

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.37, 4.37, 4.37); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

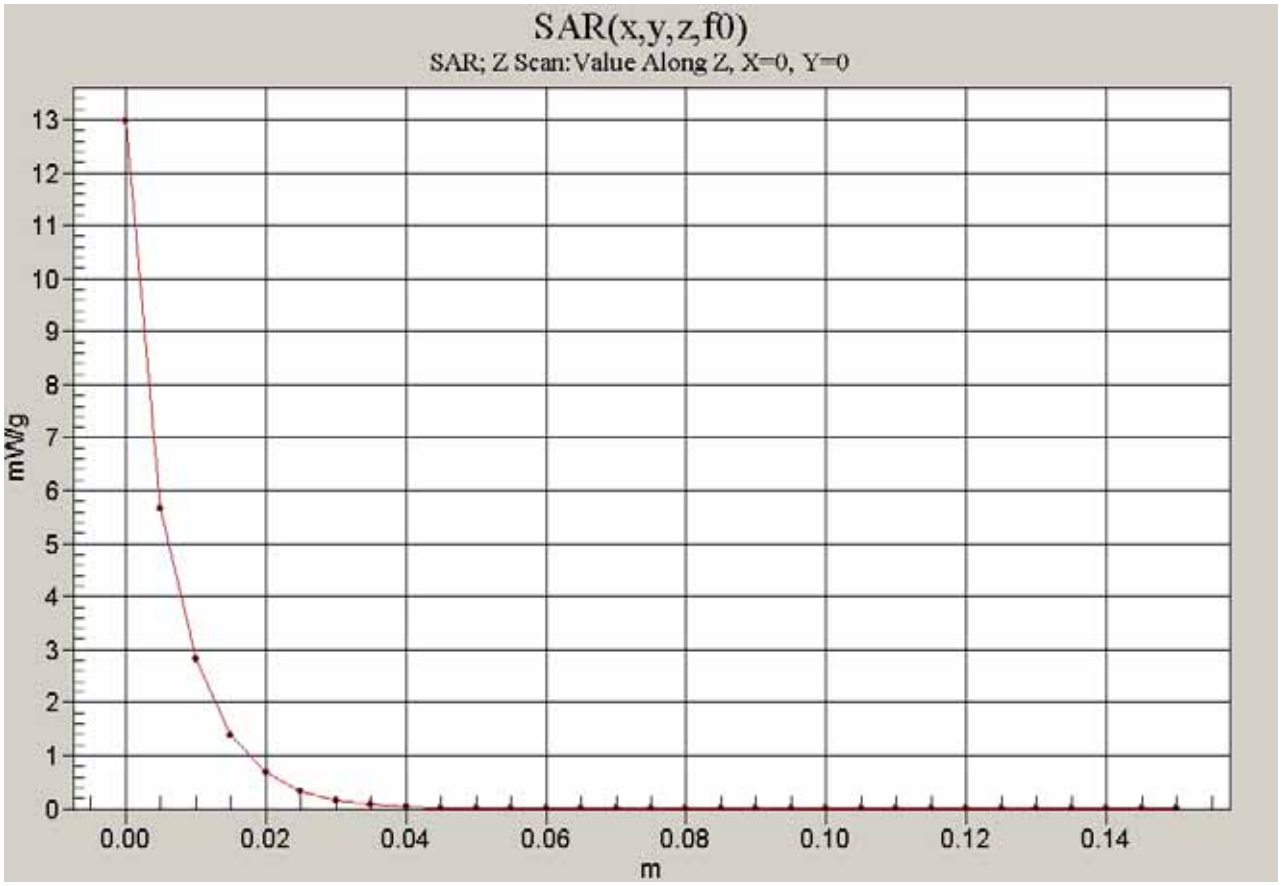
Validation 2450 MHz_Head/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.1 mW/g

Validation 2450 MHz_Head/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.5 V/m; Power Drift = -0.076 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 12.5 mW/g; SAR(10 g) = 5.35 mW/g
Maximum value of SAR (measured) = 14.0 mW/g



0 dB = 14.0mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

2450 MHz Validation Test_Body

Date: 2011-05-09

Test Laboratory: SGS Testing Korea
File Name: Validation 2450 MHz_Body.da4

Input Power : 250 mW

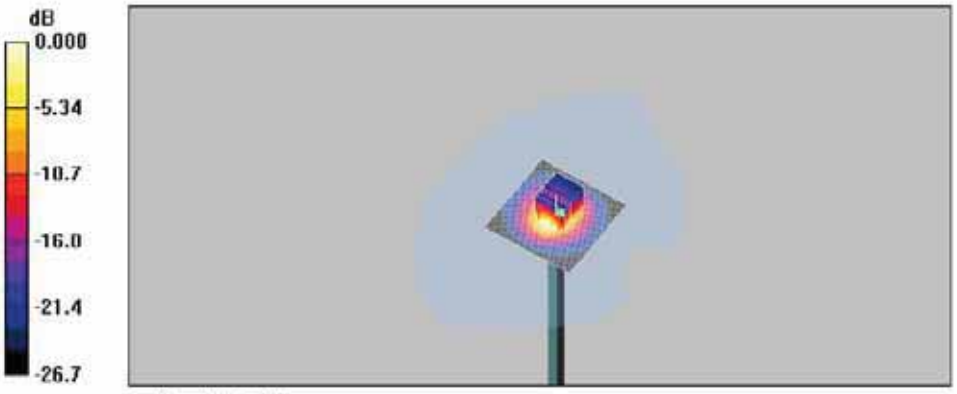
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:734
Program Name: Validation 2450 MHz_Body

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; ε_r = 50.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

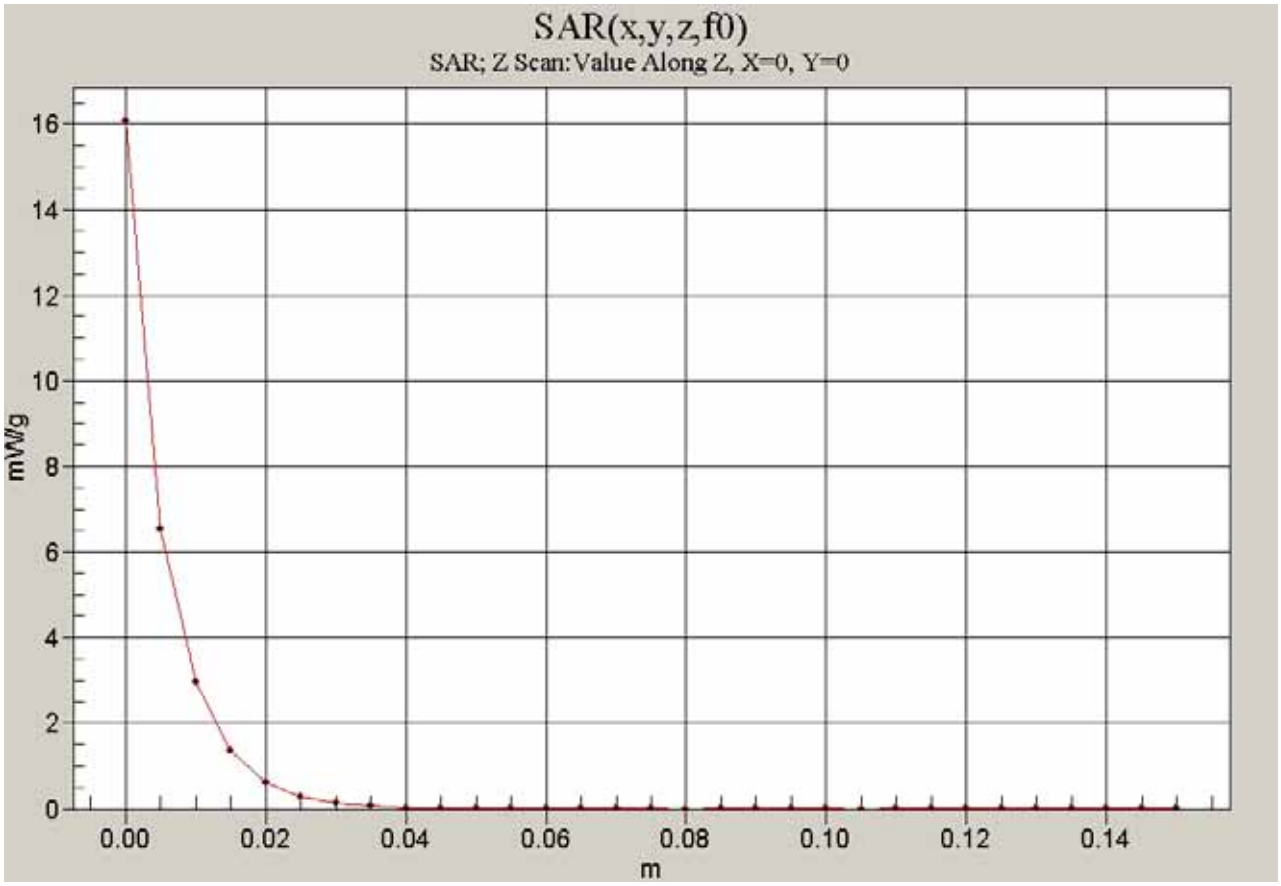
Validation 2450 MHz_Body/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.3 mW/g

Validation 2450 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.0 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 37.7 W/kg
SAR(1 g) = 13.5 mW/g; SAR(10 g) = 5.72 mW/g
Maximum value of SAR (measured) = 14.7 mW/g



0 dB = 14.7mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
16
14
12
10
8
6
4
2
0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

GSM 850 Head SAR Test

Date: 2011-05-02

Test Laboratory: SGS Testing Korea
File Name: GSM850_LE.da4

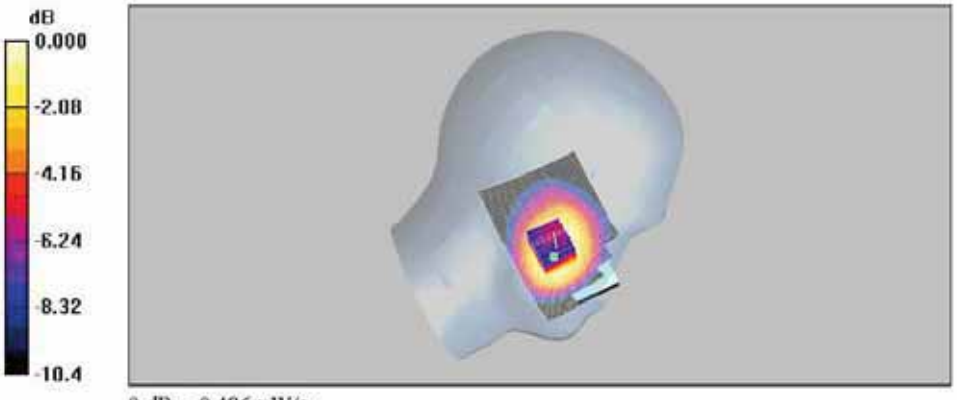
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Head

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.899 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_LE_Mid_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.497 mW/g

GSM850_LE_Mid_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.16 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 0.610 W/kg
SAR(1 g) = 0.455 mW/g; SAR(10 g) = 0.330 mW/g
Maximum value of SAR (measured) = 0.486 mW/g



0 dB = 0.486mW/g

Date: 2011-05-02

Test Laboratory: SGS Testing Korea
File Name: GSM850_LE.da4

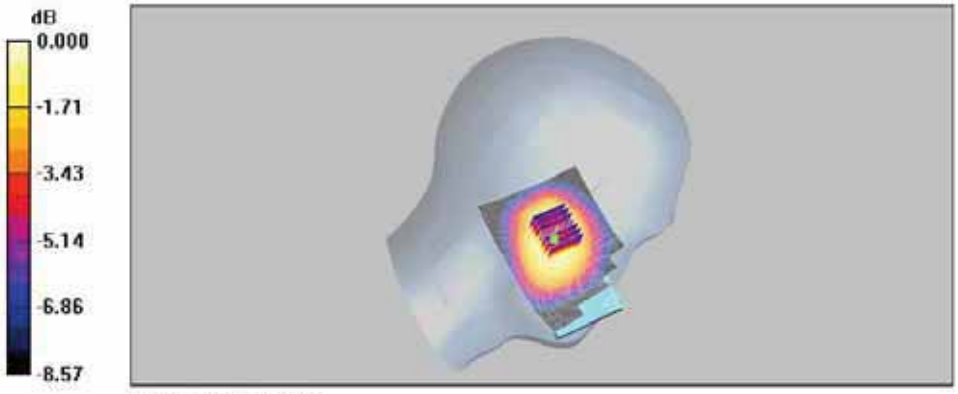
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Head

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.899 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_LE_Mid_Tilt/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.309 mW/g

GSM850_LE_Mid_Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 0.369 W/kg
SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.219 mW/g
Maximum value of SAR (measured) = 0.310 mW/g



0 dB = 0.310mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_RE.da4

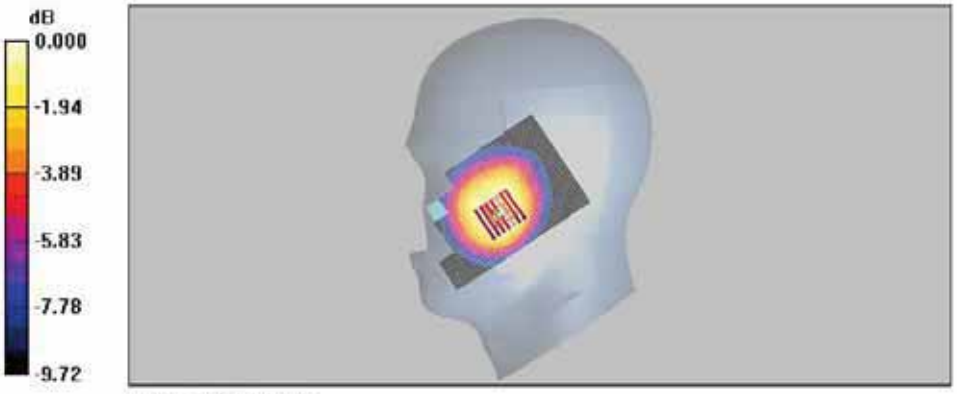
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Head

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.899 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

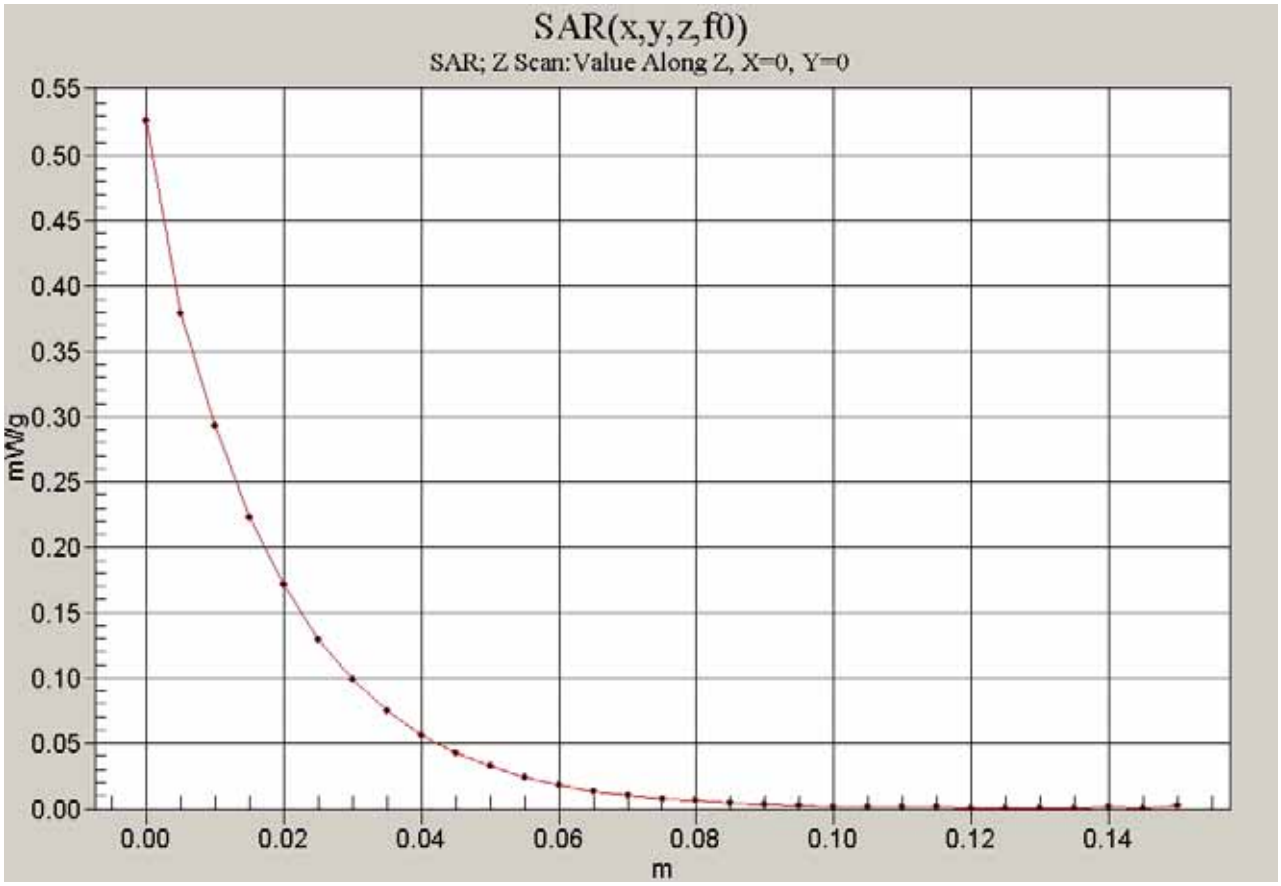
GSM850_RE_Mid_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.491 mW/g

GSM850_RE_Mid_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.48 V/m; Power Drift = 0.157 dB
Peak SAR (extrapolated) = 0.605 W/kg
SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.354 mW/g
Maximum value of SAR (measured) = 0.512 mW/g



0 dB = 0.512mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GSM850_RE.da4

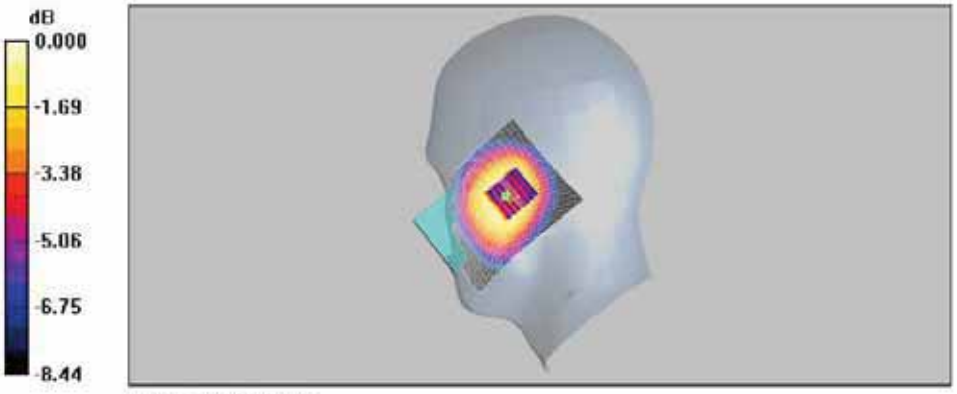
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Head

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.899 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.22, 6.22, 6.22); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GSM850_RE_Mid_Tilt/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.305 mW/g

GSM850_RE_Mid_Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = -0.094 dB
Peak SAR (extrapolated) = 0.359 W/kg
SAR(1 g) = 0.286 mW/g; SAR(10 g) = 0.216 mW/g
Maximum value of SAR (measured) = 0.300 mW/g



0 dB = 0.300mW/g

GSM850 Body SAR Test

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Front.da4

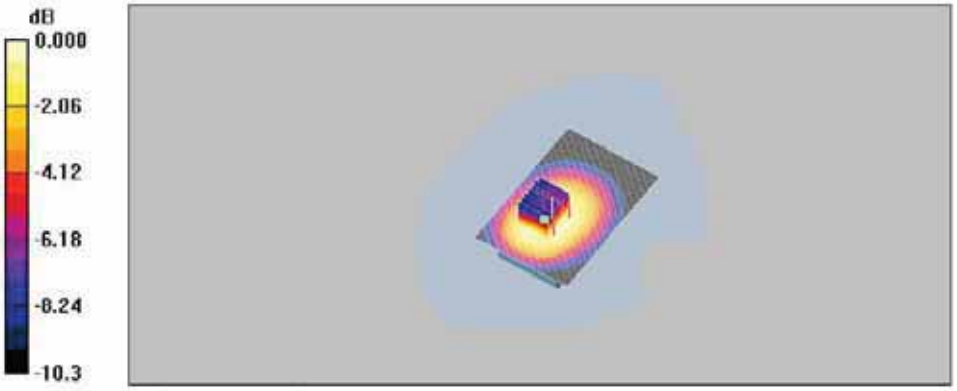
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Front_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.588 mW/g

GPRS850_Front_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.7 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 0.724 W/kg
SAR(1 g) = 0.558 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 0.592 mW/g



0 dB = 0.592mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Back.da4

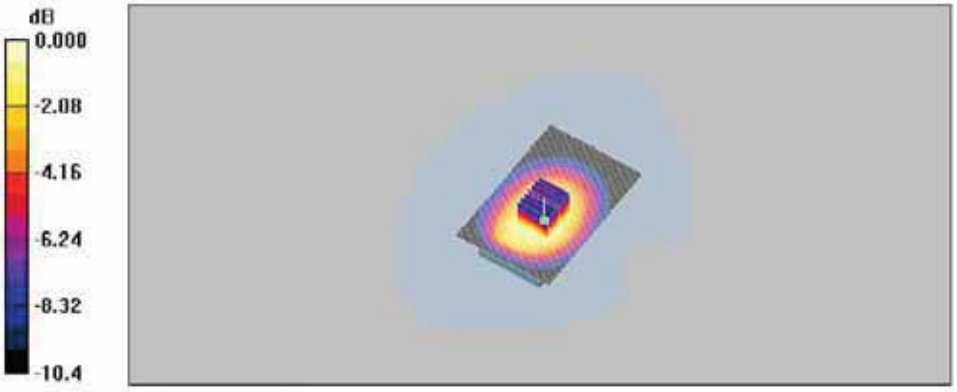
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.936 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Low_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 mW/g

GPRS850_Back_Low_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.1 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.714 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Back.da4

DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

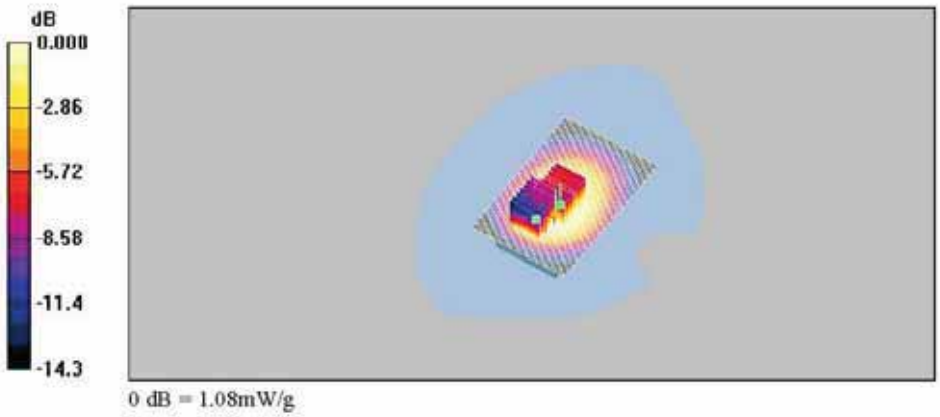
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.11 mW/g

GPRS850_Back_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.8 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.743 mW/g
Maximum value of SAR (measured) = 1.10 mW/g

GPRS850_Back_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.8 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.948 mW/g; SAR(10 g) = 0.622 mW/g
Maximum value of SAR (measured) = 1.08 mW/g



0 dB = 1.08mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Back.da4

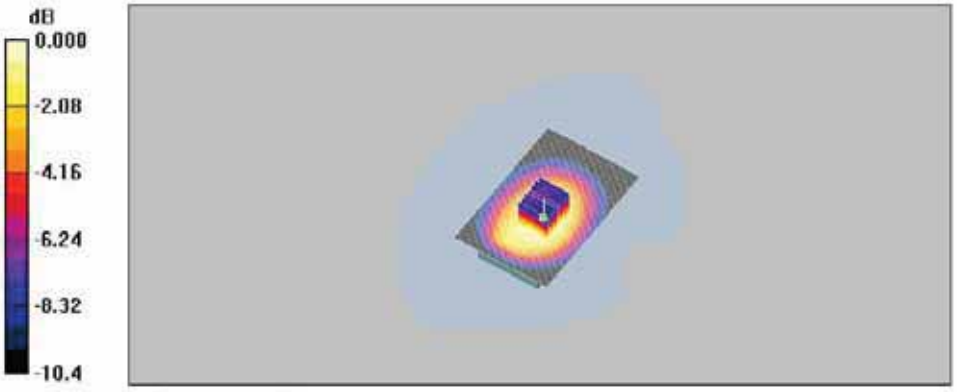
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium parameters used: f = 849 MHz; σ = 0.972 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_High_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.998 mW/g

GPRS850_Back_High_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.7 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.943 mW/g; SAR(10 g) = 0.668 mW/g
Maximum value of SAR (measured) = 1.00 mW/g



0 dB = 1.00mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Left.da4

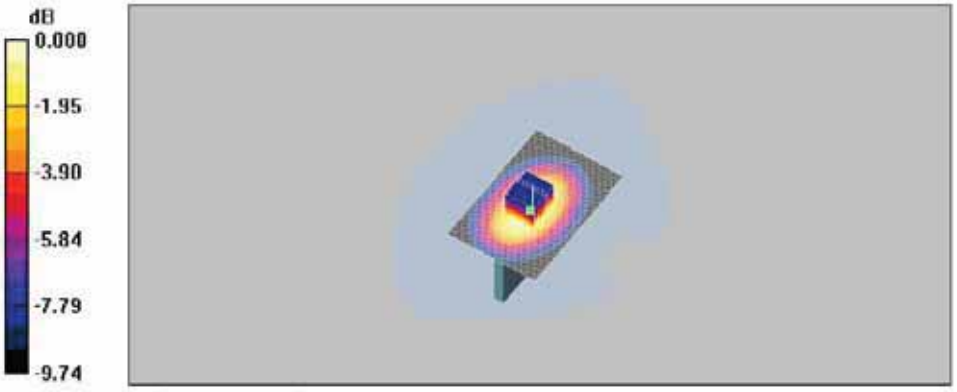
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Left_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.419 mW/g

GPRS850_Left_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.6 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.388 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.414 mW/g



0 dB = 0.414mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Right.da4

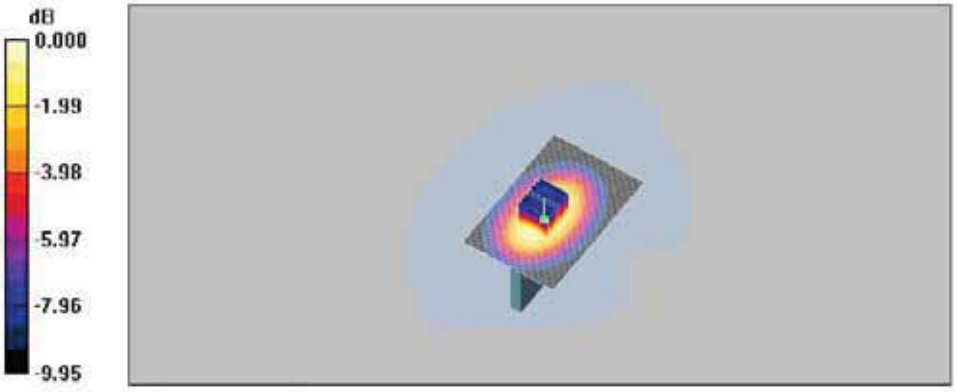
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Right_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.428 mW/g

GPRS850_Right_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.7 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.404 mW/g; SAR(10 g) = 0.275 mW/g
Maximum value of SAR (measured) = 0.435 mW/g



0 dB = 0.435mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_2Tx_Bottom.da4

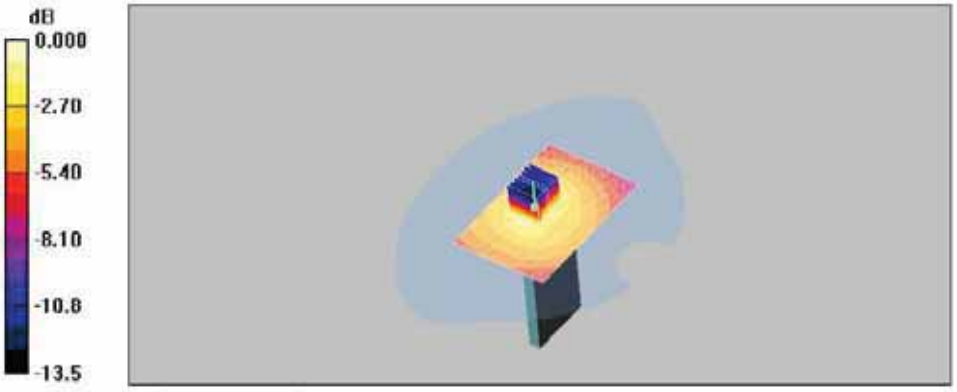
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Bottom_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.093 mW/g

GPRS850_Bottom_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.01 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.213 W/kg
SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.053 mW/g
Maximum value of SAR (measured) = 0.098 mW/g



0 dB = 0.098mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_1Tx_Back.da4

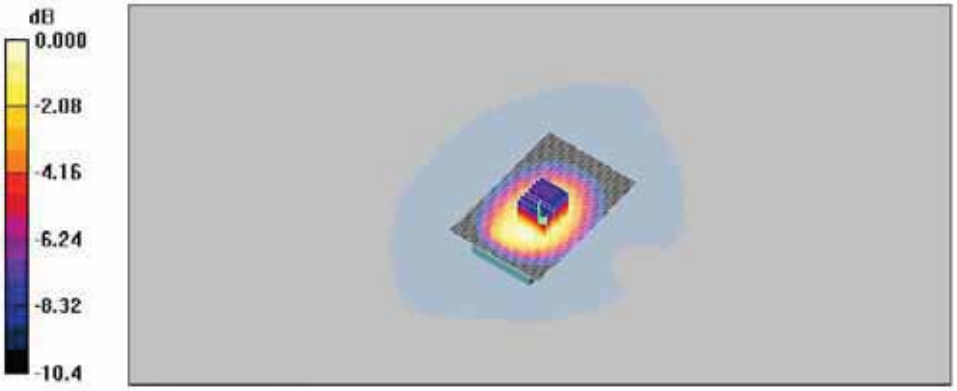
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.936 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Low_1cm_1Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.12 mW/g

GPRS850_Back_Low_1cm_1Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.0 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.736 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_1Tx_Back.da4

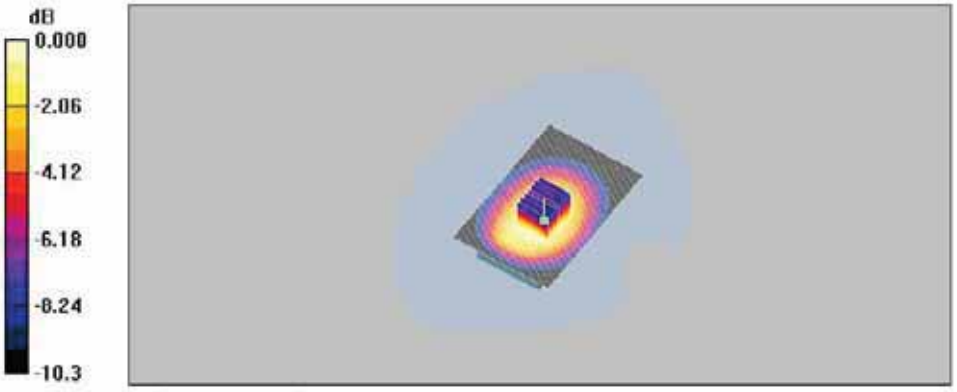
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Mid_1cm_1Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.854 mW/g

GPRS850_Back_Mid_1cm_1Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.7 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.805 mW/g; SAR(10 g) = 0.574 mW/g
Maximum value of SAR (measured) = 0.853 mW/g



0 dB = 0.853mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_1Tx_Back.da4

DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

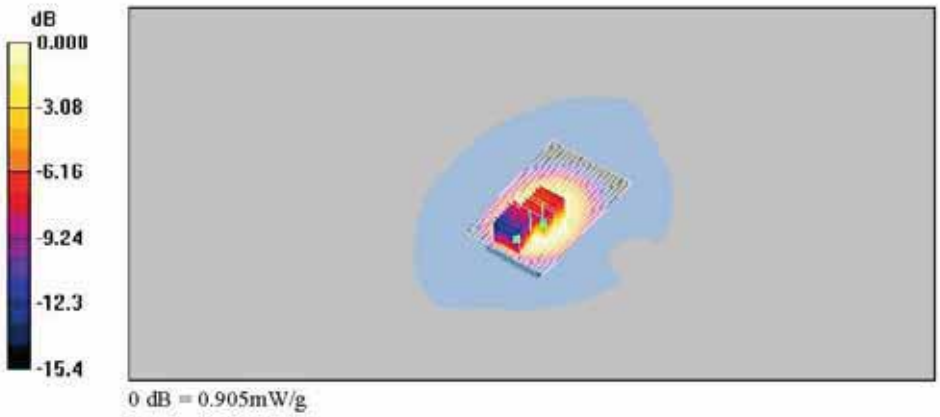
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8
Medium parameters used: f = 849 MHz; σ = 0.972 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_High_1cm_1Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.03 mW/g

GPRS850_Back_High_1cm_1Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.4 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.696 mW/g
Maximum value of SAR (measured) = 1.04 mW/g

GPRS850_Back_High_1cm_1Tx/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.4 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.782 mW/g; SAR(10 g) = 0.512 mW/g
Maximum value of SAR (measured) = 0.905 mW/g



0 dB = 0.905mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_3Tx_Back.da4

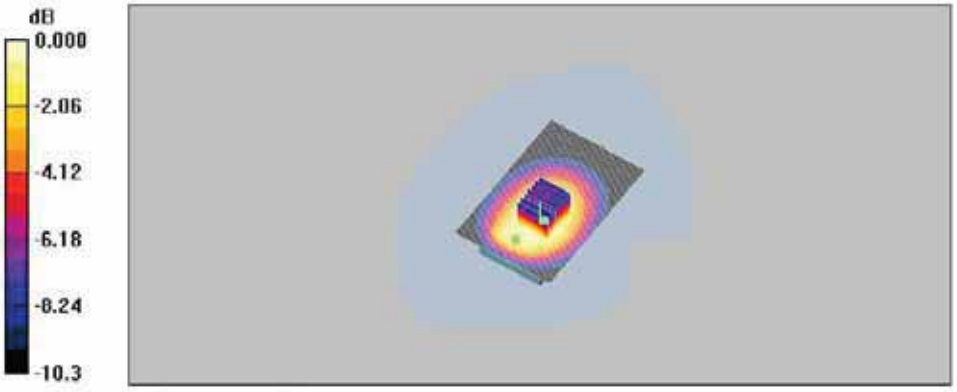
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:2.67
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.936 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

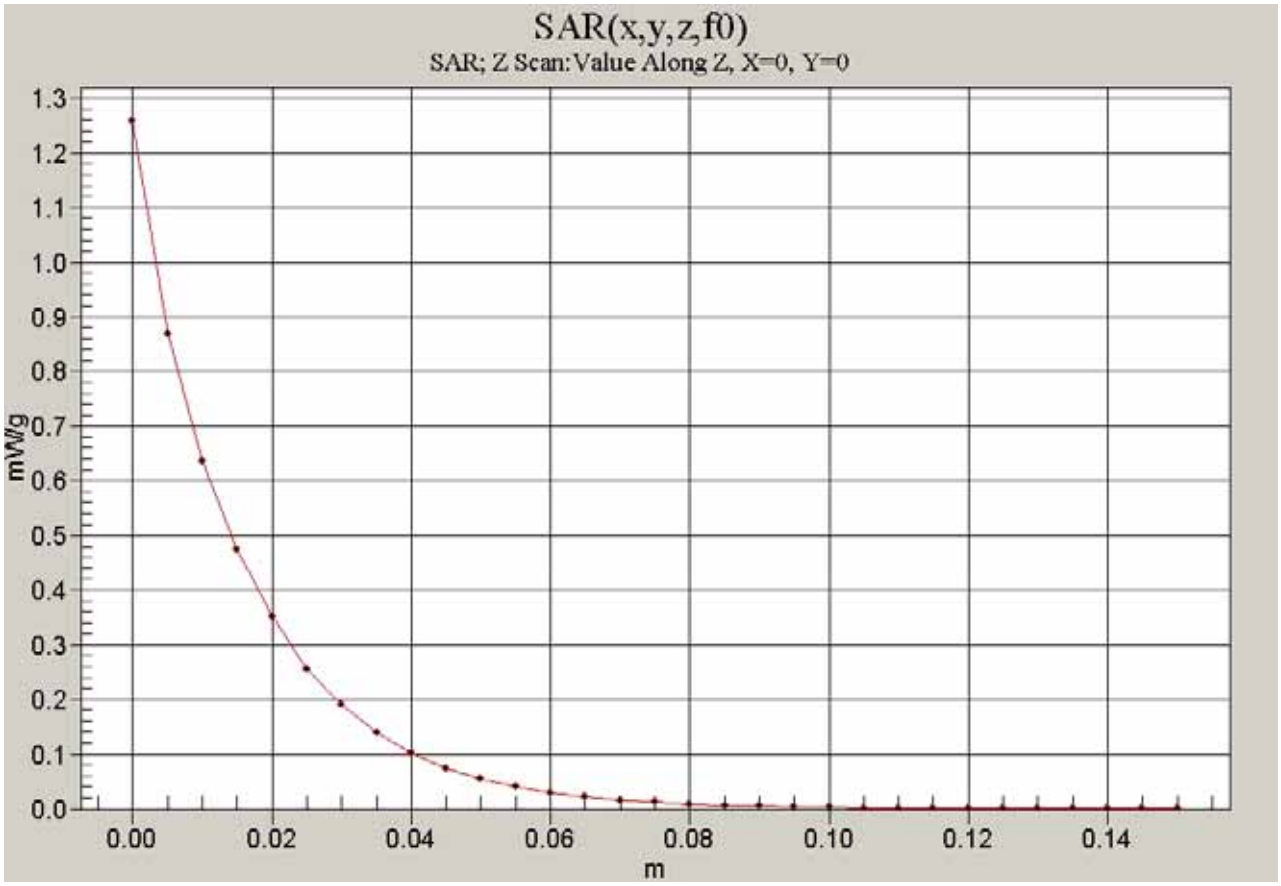
GPRS850_Back_Low_1cm_3Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.17 mW/g

GPRS850_Back_Low_1cm_3Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.7 V/m; Power Drift = -0.040 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.789 mW/g
Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.17mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_3Tx_Back.da4

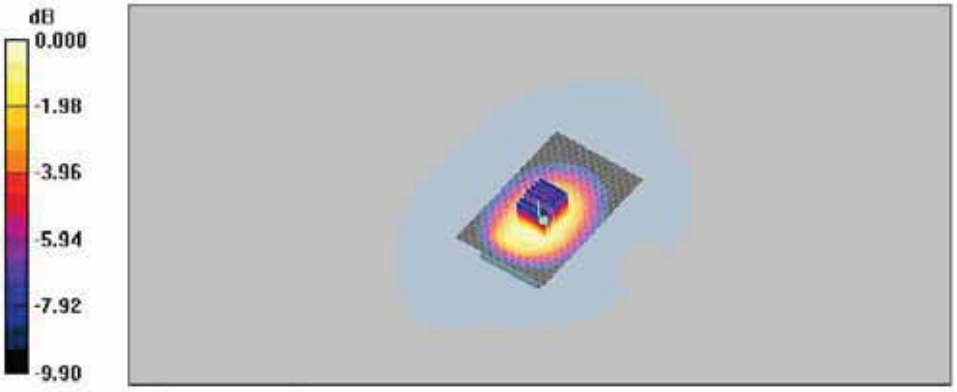
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2.67
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Mid_1cm_3Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.910 mW/g

GPRS850_Back_Mid_1cm_3Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.6 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.856 mW/g; SAR(10 g) = 0.610 mW/g
Maximum value of SAR (measured) = 0.905 mW/g



0 dB = 0.905mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_3Tx_Back.da4

DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

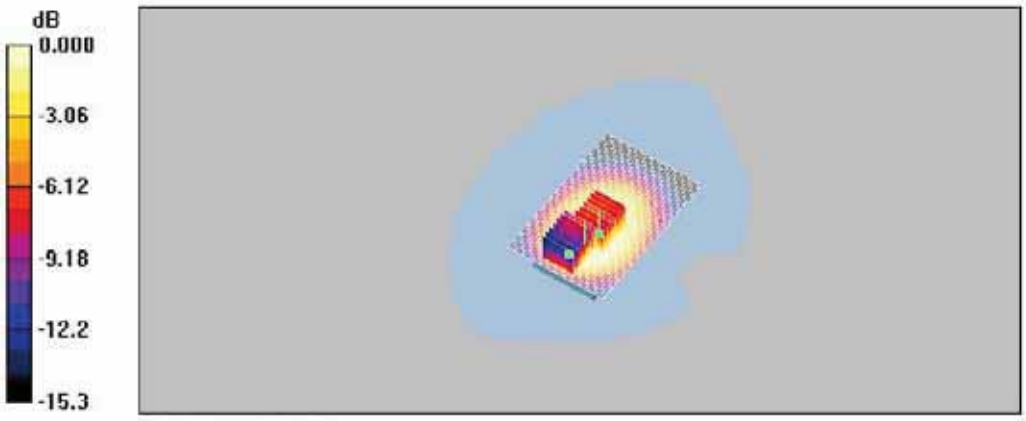
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium parameters used: f = 849 MHz; σ = 0.972 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_High_1cm_3Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g

GPRS850_Back_High_1cm_3Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.741 mW/g
Maximum value of SAR (measured) = 1.11 mW/g

GPRS850_Back_High_1cm_3Tx/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.837 mW/g; SAR(10 g) = 0.551 mW/g
Maximum value of SAR (measured) = 0.972 mW/g



0 dB = 0.972mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_4Tx_Back.da4

DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

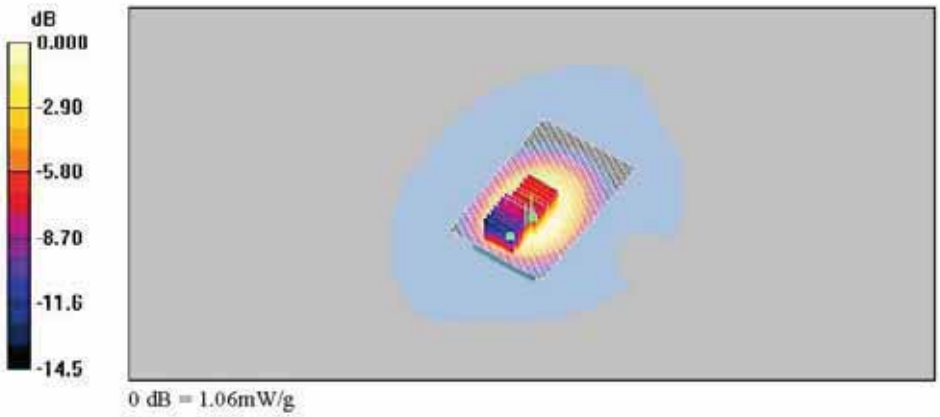
Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:2
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.936 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Low_1cm_4Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

GPRS850_Back_Low_1cm_4Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.0 V/m; Power Drift = -0.097 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.783 mW/g
Maximum value of SAR (measured) = 1.16 mW/g

GPRS850_Back_Low_1cm_4Tx/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.0 V/m; Power Drift = -0.097 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.927 mW/g; SAR(10 g) = 0.598 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_4Tx_Back.da4

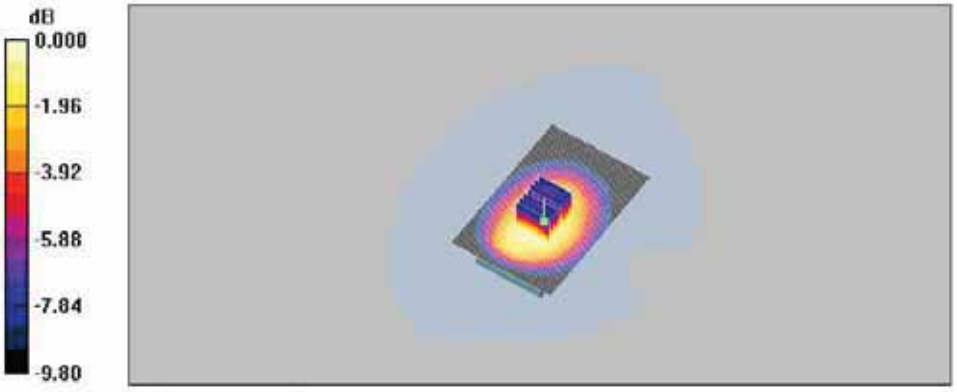
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:2
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.954 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_Mid_1cm_4Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.956 mW/g

GPRS850_Back_Mid_1cm_4Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.0 V/m; Power Drift = 0.141 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.908 mW/g; SAR(10 g) = 0.646 mW/g
Maximum value of SAR (measured) = 0.961 mW/g



0 dB = 0.961mW/g

Date: 2011-05-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS850_Body_1cm_4Tx_Back.da4

DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: GSM850_Body

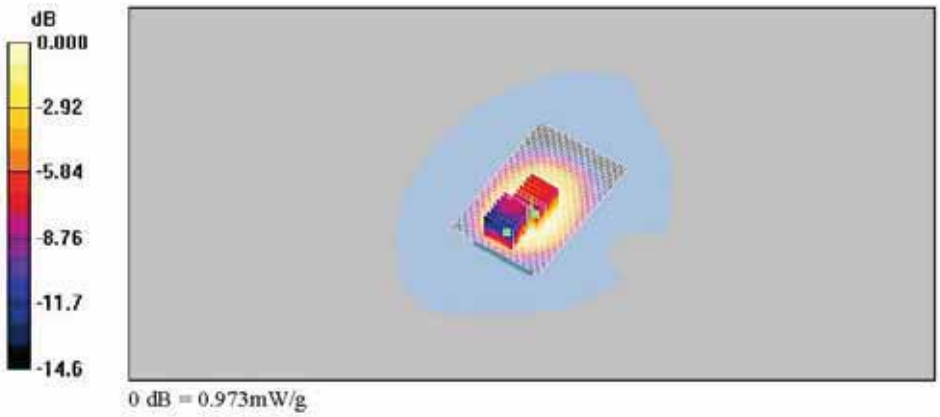
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:2
Medium parameters used: f = 849 MHz; σ = 0.972 mho/m; ε_r = 57; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(6.03, 6.03, 6.03); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP_900MHz; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

GPRS850_Back_High_1cm_4Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

GPRS850_Back_High_1cm_4Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.1 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.732 mW/g
Maximum value of SAR (measured) = 1.08 mW/g

GPRS850_Back_High_1cm_4Tx/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.1 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.837 mW/g; SAR(10 g) = 0.540 mW/g
Maximum value of SAR (measured) = 0.973 mW/g



0 dB = 0.973mW/g

PCS1900 Head SAR Test

Date: 2011-05-04

Test Laboratory: SGS Testing Korea
File Name: PCS1900_LE.da4

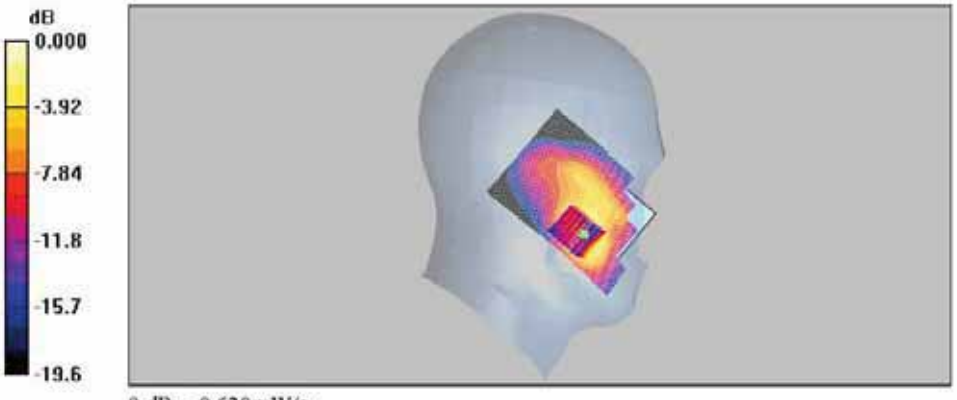
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Head

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.95, 4.95, 4.95); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

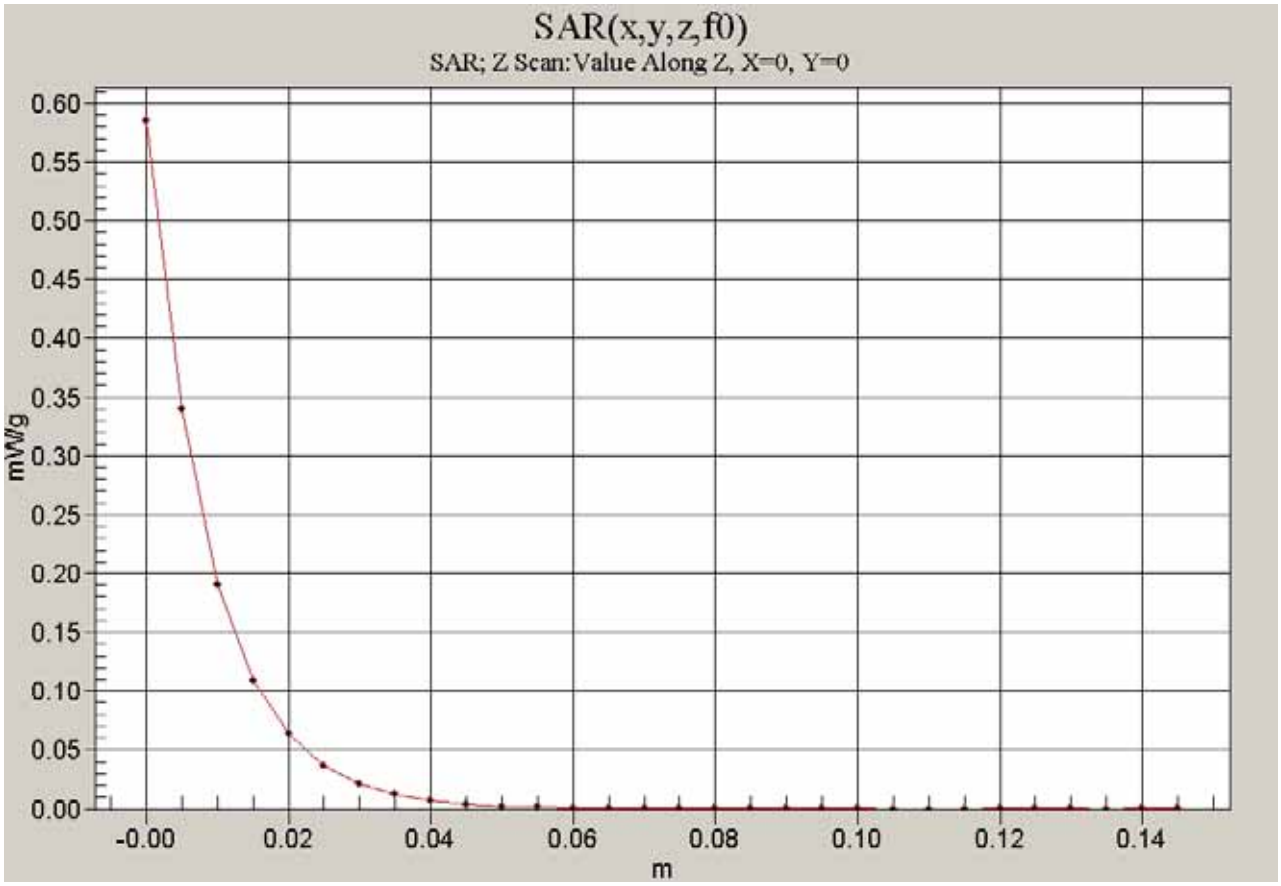
PCS1900_LE_Mid_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.593 mW/g

PCS1900_LE_Mid_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.66 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 0.934 W/kg
SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 0.630 mW/g



0 dB = 0.630mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
-0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

Date: 2011-05-04

Test Laboratory: SGS Testing Korea
File Name: PCS1900_LE.da4

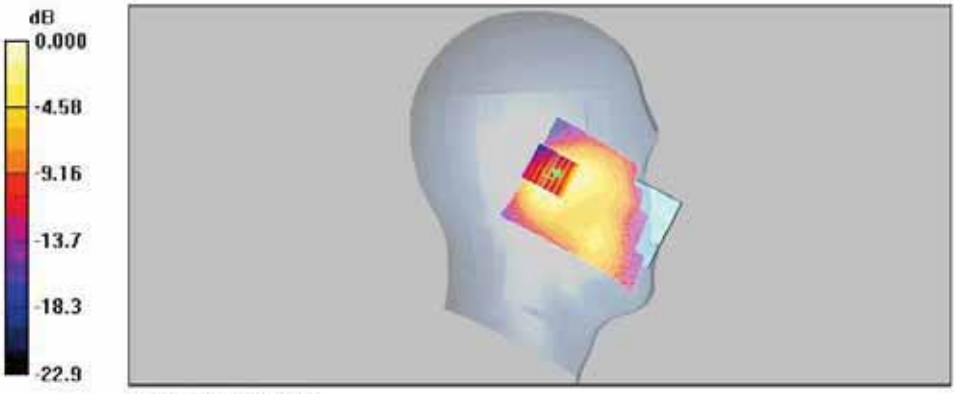
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Head

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.95, 4.95, 4.95); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_LE_Mid_Tilt/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.186 mW/g

PCS1900_LE_Mid_Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.53 V/m; Power Drift = 0.100 dB
Peak SAR (extrapolated) = 0.244 W/kg
SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.091 mW/g
Maximum value of SAR (measured) = 0.169 mW/g



0 dB = 0.169mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_RE.da4

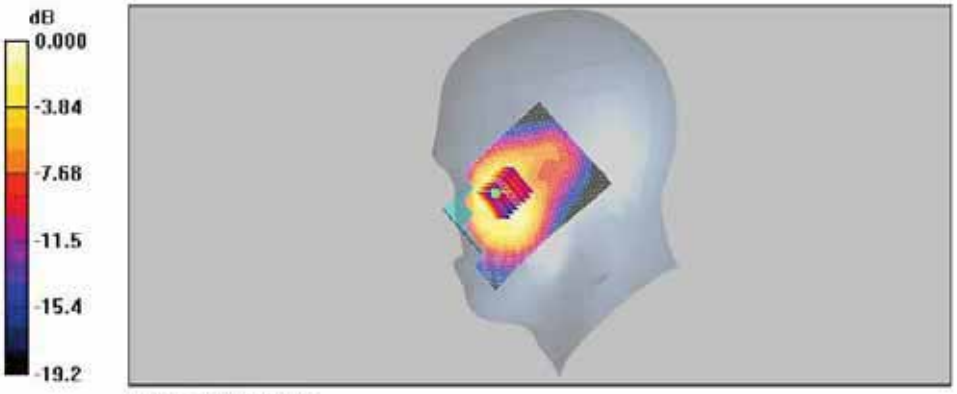
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Head

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.95, 4.95, 4.95); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_RE_Mid_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.488 mW/g

PCS1900_RE_Mid_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.40 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 0.727 W/kg
SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.496 mW/g



0 dB = 0.496mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: PCS1900_RE.da4

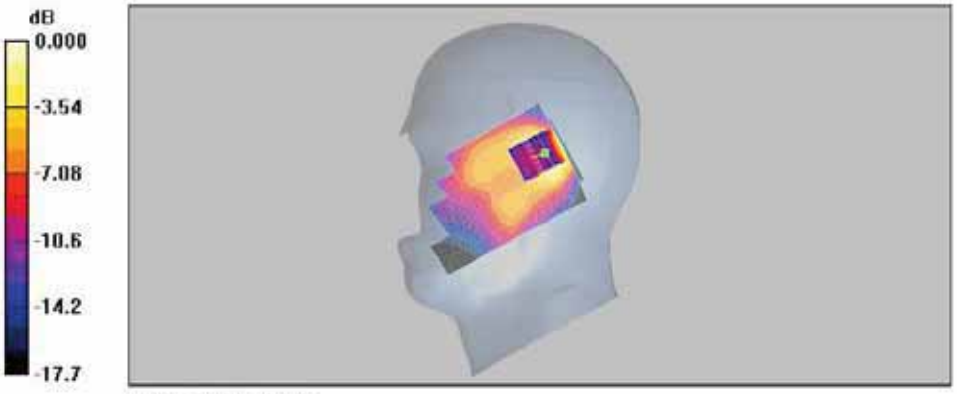
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Head

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium parameters used: f = 1880 MHz; σ = 1.4 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.95, 4.95, 4.95); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_RE_Mid_Tilt/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.206 mW/g

PCS1900_RE_Mid_Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.1 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.181 mW/g; SAR(10 g) = 0.104 mW/g
Maximum value of SAR (measured) = 0.201 mW/g



0 dB = 0.201mW/g

PCS1900 Body SAR Test

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_2Tx_Front.da4

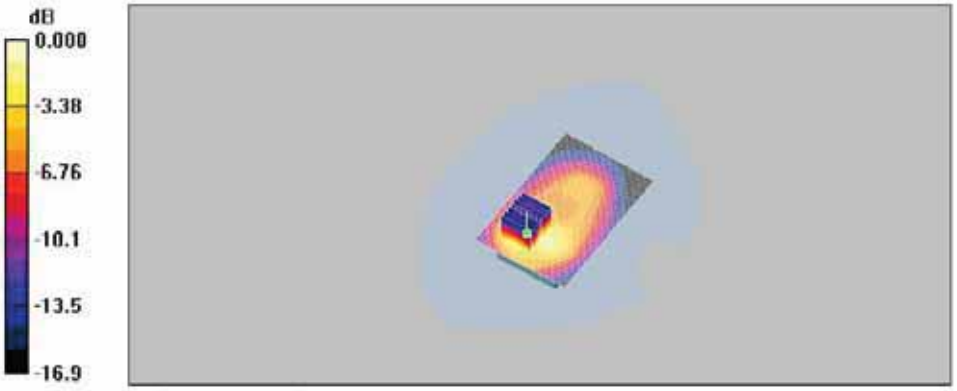
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Front_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.582 mW/g

PCS1900_Front_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 0.888 W/kg
SAR(1 g) = 0.519 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.569 mW/g



0 dB = 0.569mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_2Tx_Back.da4

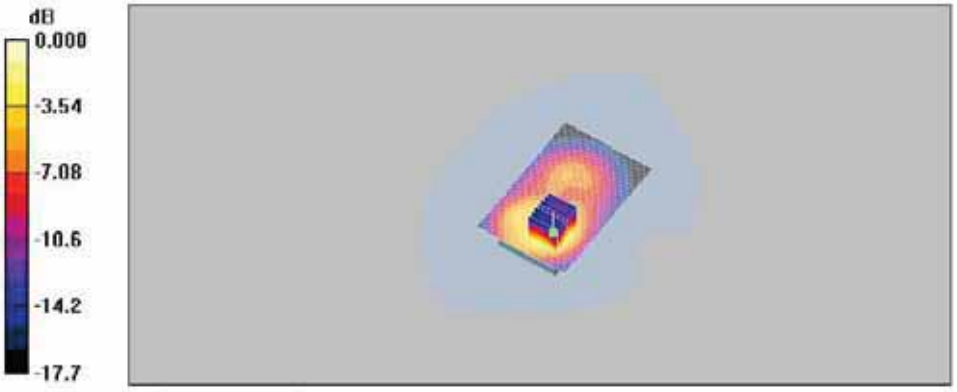
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Back_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.758 mW/g

PCS1900_Back_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.95 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.370 mW/g
Maximum value of SAR (measured) = 0.739 mW/g



0 dB = 0.739mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_2Tx_Left.da4

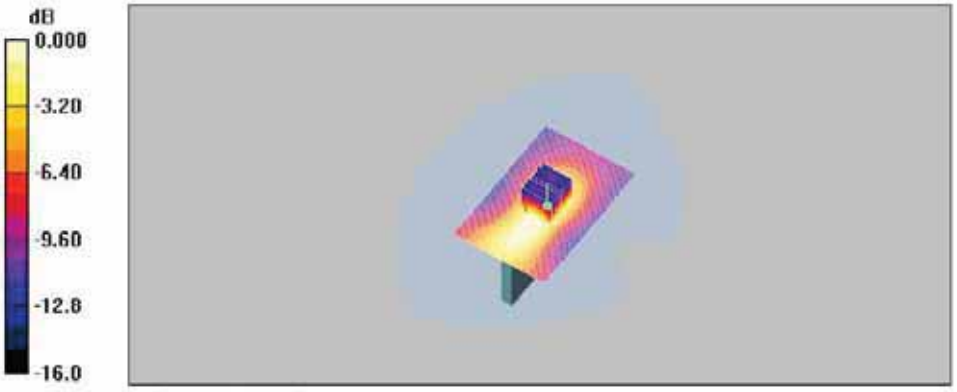
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Left_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.185 mW/g

PCS1900_Left_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 0.269 W/kg
SAR(1 g) = 0.164 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.179 mW/g



0 dB = 0.179mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_2Tx_Right.da4

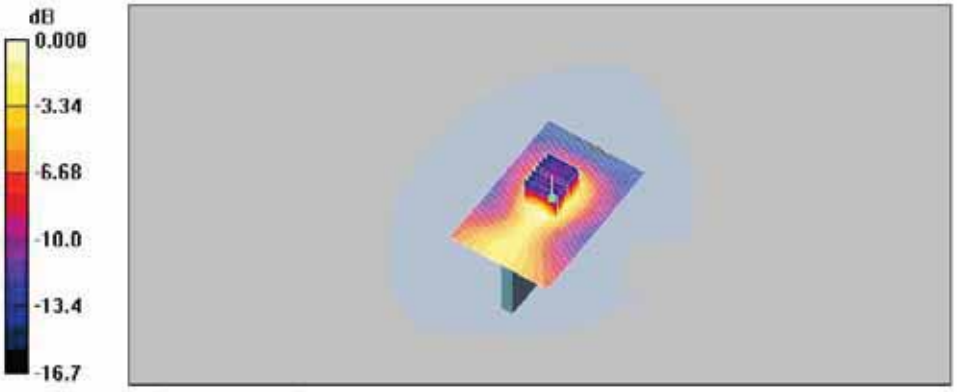
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Right_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.138 mW/g

PCS1900_Right_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.78 V/m; Power Drift = 0.089 dB
Peak SAR (extrapolated) = 0.204 W/kg
SAR(1 g) = 0.125 mW/g; SAR(10 g) = 0.074 mW/g
Maximum value of SAR (measured) = 0.137 mW/g



0 dB = 0.137mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_2Tx_Bottom.da4

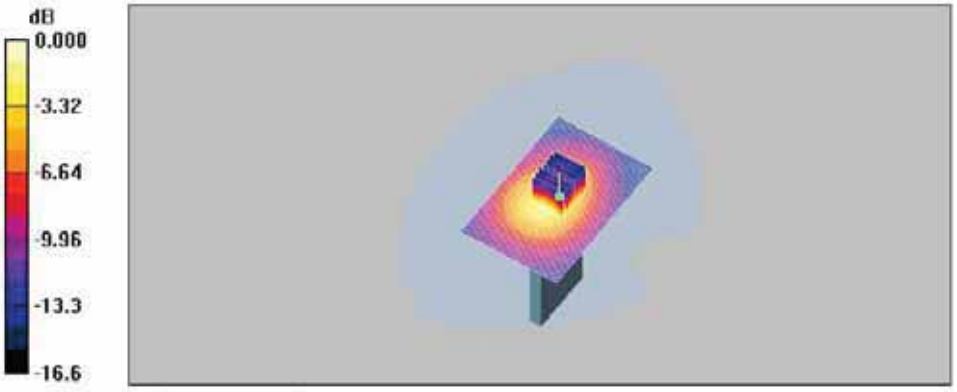
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Bottom_Mid_1cm_2Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.312 mW/g

PCS1900_Bottom_Mid_1cm_2Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.456 W/kg
SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.313 mW/g



0 dB = 0.313mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_1Tx_Back.da4

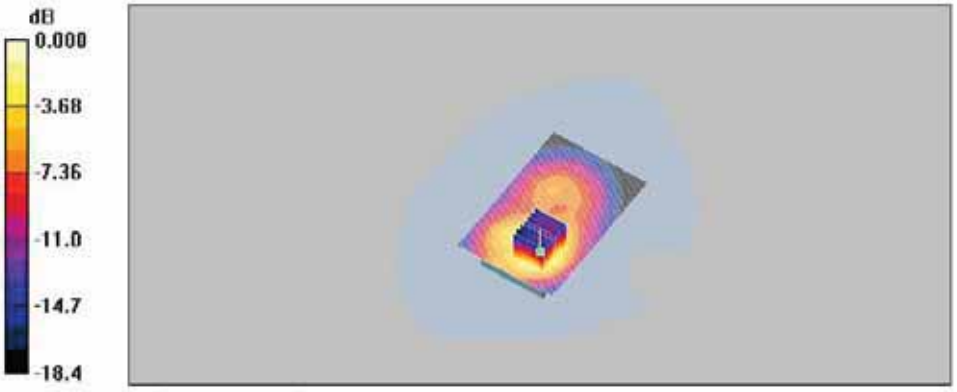
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Back_Mid_1cm_1Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.691 mW/g

PCS1900_Back_Mid_1cm_1Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.40 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.610 mW/g; SAR(10 g) = 0.337 mW/g
Maximum value of SAR (measured) = 0.671 mW/g



0 dB = 0.671mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_3Tx_Back.da4

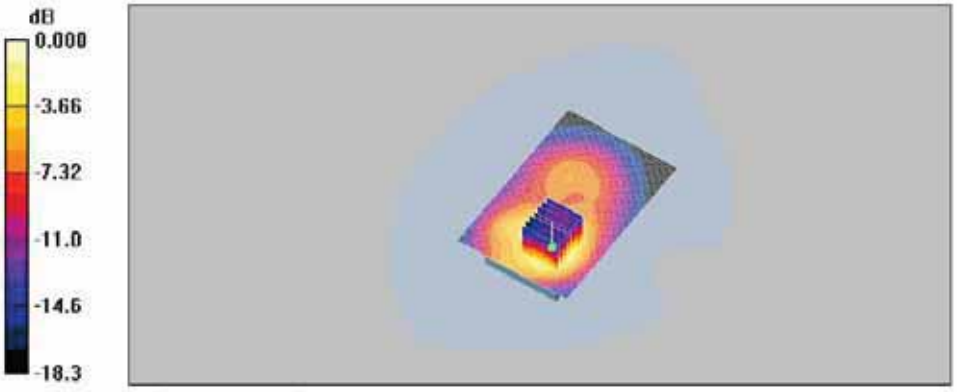
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

PCS1900_Back_Mid_1cm_3Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.757 mW/g

PCS1900_Back_Mid_1cm_3Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.85 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.366 mW/g
Maximum value of SAR (measured) = 0.732 mW/g



0 dB = 0.732mW/g

Date: 2011-05-04

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: GPRS1900_Body_1cm_4Tx_Back.da4

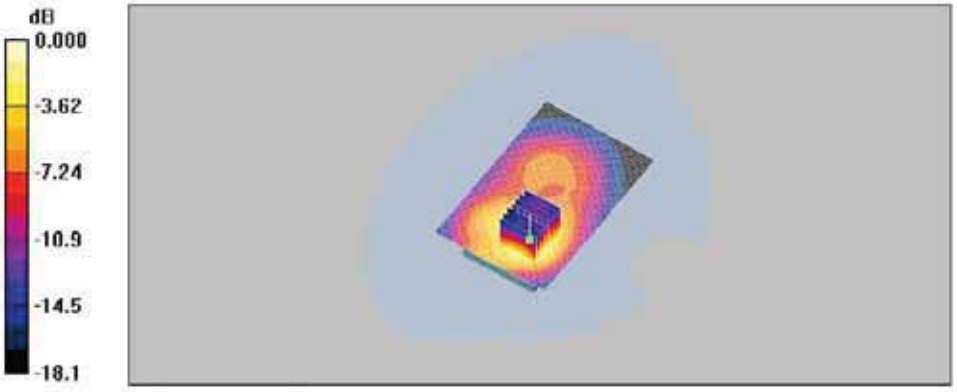
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: PCS1900_Body

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.34, 4.34, 4.34); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

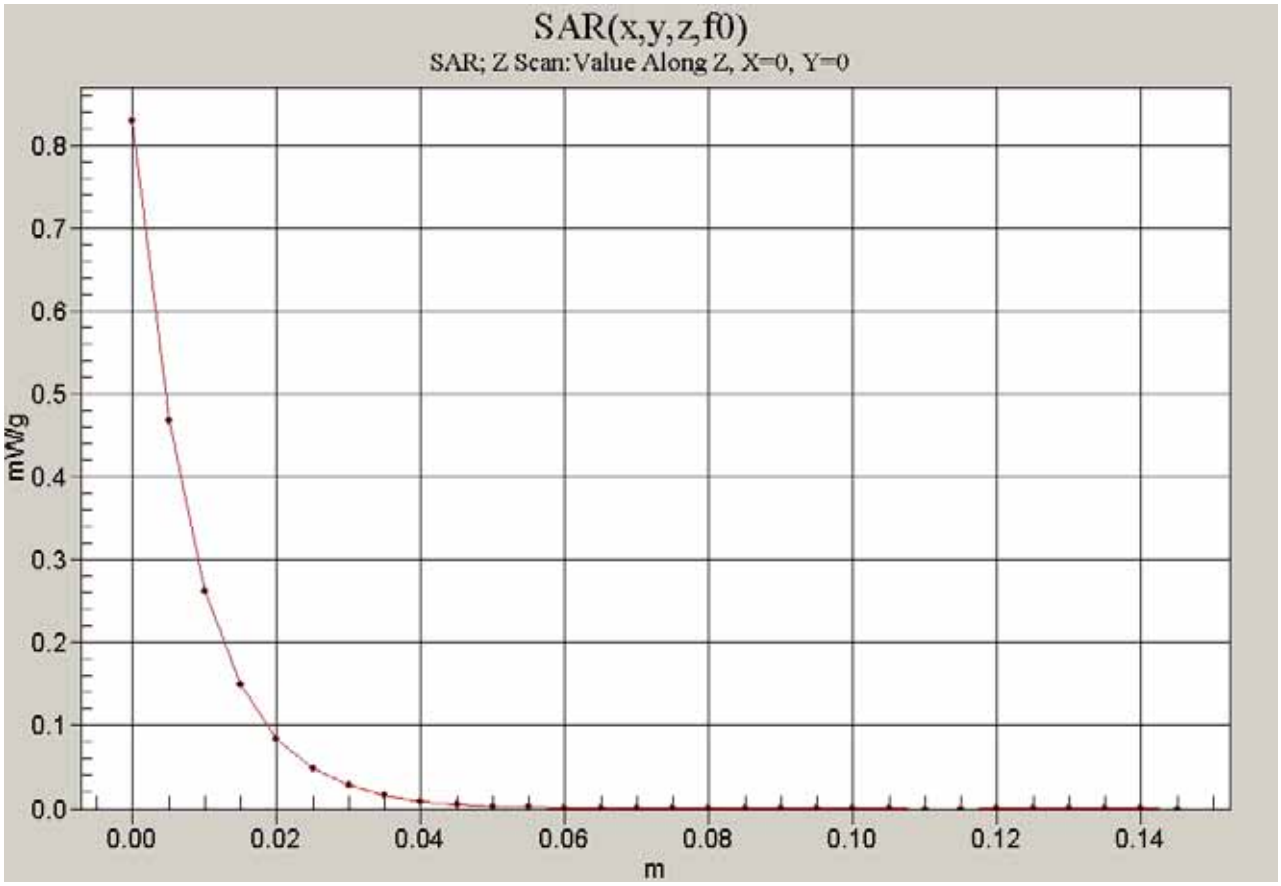
PCS1900_Back_Mid_1cm_4Tx/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.804 mW/g

PCS1900_Back_Mid_1cm_4Tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.778 mW/g



0 dB = 0.778mW/g

Z Scan


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
m

WLAN Head SAR Test

Date: 2011-05-09

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

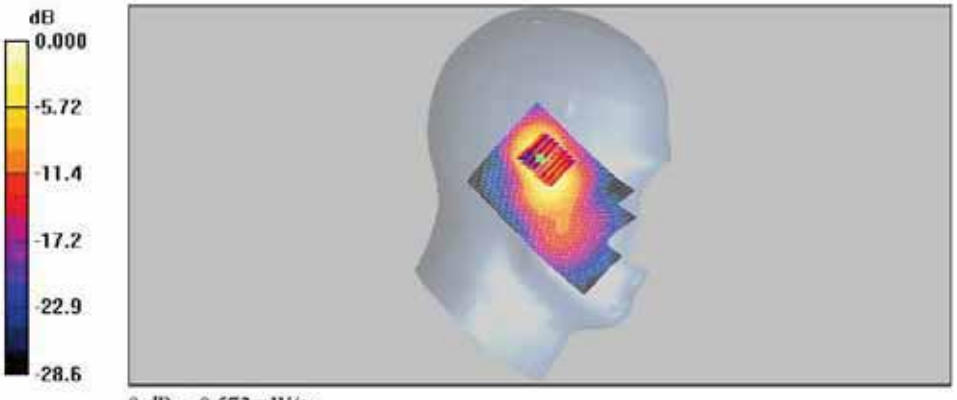
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: WLAN_Head

Communication System: WLAN; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.37, 4.37, 4.37); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_LE_Low_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.593 mW/g

WLAN_LE_Low_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.95 V/m; Power Drift = -0.049 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.235 mW/g
Maximum value of SAR (measured) = 0.573 mW/g



0 dB = 0.573mW/g

Date: 2011-05-09

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

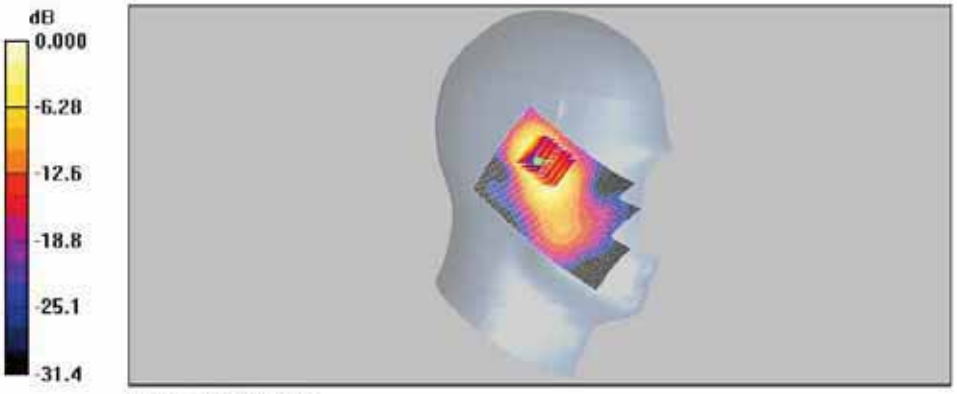
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: WLAN_Head

Communication System: WLAN; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2437 MHz; σ = 1.84 mho/m; ε_r = 37.7; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.37, 4.37, 4.37); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_LE_Mid_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.685 mW/g

WLAN_LE_Mid_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.57 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.560 mW/g; SAR(10 g) = 0.262 mW/g
Maximum value of SAR (measured) = 0.635 mW/g



0 dB = 0.635mW/g

Date: 2011-05-09

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

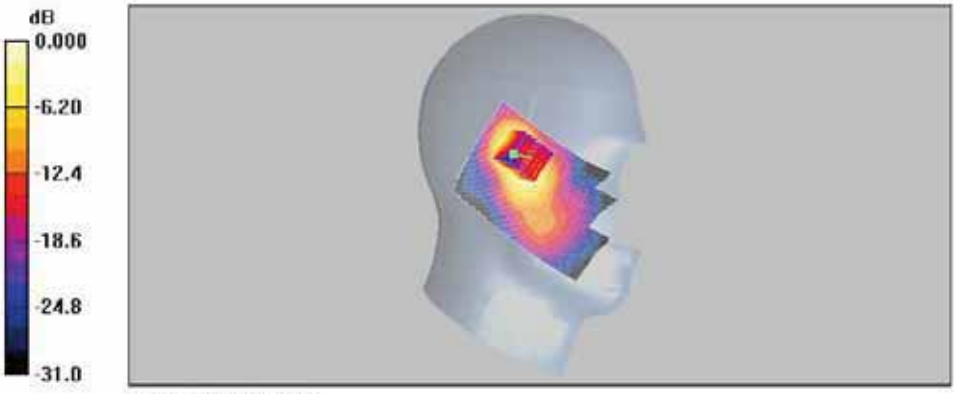
DUT: LG-P690; Type: Mobile Phone; Serial: 012KPLC904872
Program Name: WLAN_Head

Communication System: WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.87 mho/m; ε_r = 37.5; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1782; ConvF(4.37, 4.37, 4.37); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2011-01-27
- Phantom: SAM MIC #2000-93 with CRP; Type: SAM MIC #2000-93; Serial: TP-1299
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_LE_High_Cheek/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.834 mW/g

WLAN_LE_High_Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.02 V/m; Power Drift = -0.165 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.312 mW/g
Maximum value of SAR (measured) = 0.765 mW/g



0 dB = 0.765mW/g