TESTING
No. L2264

OET 65

TEST REPORT

Product Name	HSDPA/UMTS dual band / GSM four bands mobile phone
Model	Brandy Lite A
Marketing Name	one touch 908A
FCC ID	RAD169
Client	TCT Mobile Limited

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Product Name	HSDPA/UMTS dual band / GSM four bands mobile phone	**Model**	Brandy Lite A
FCC ID	RAD169		
Report No.	RZA1108-1315SAR		
Client	TCT Mobile Limited		
Manufacturer	TCT Mobile Limited		
Reference Standard(s)	**IEEE Std C95.1, 1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz. **IEEE Std 1528™-2003:** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. **SUPPLEMENT C Edition 01-01 to OET BULLETIN 65 Edition 97-01 June 2001 including DA 02-1438, published June 2002:** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions. **KDB 941225 D06 Hot Spot SAR v01** SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities		
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 7 of this test report are below limits specified in the relevant standards. General Judgment: **Pass** (Stamp) **Date of issue: August 4th, 2011**		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中 **Revised by** 凌敏宝 **Performed by** 张先金

Director SAR Manager SAR Engineer

TABLE OF CONTENT

1. General Information

1.1. Notes of the Test Report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

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If the electrical report is inconsistent with the printed one, it should be subject to the latter.

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1.4. Manufacturer Information

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Postal Code:	201203
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1.5. Information of EUT

General Information

Device Type :	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
Product Name:	HSDPA/UMTS dual band / GSM four bands mobile phone		
Brand:	ALCATEL		
IMEI:	012633000043228		
Hardware Version:	Lot0		
Software Version:	V63A		
Antenna Type:	Internal Antenna		
Device Operating Configurations :			
Supporting Mode(s):	GSM 850/GSM 1900/WCDMA Band II/ WCDMA Band V; (tested) WiFi; (tested) GSM 900/GSM 1800; Bluetooth;		
Test Modulation:	(GSM)GMSK; (WCDMA)QPSK		
Device Class:	B		
HSDPA UE Category:	8		
GPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS Multislot Class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
Operating Frequency Range(s):	Mode	Tx (MHz)	Rx (MHz)
	GSM 850	824.2 ~ 848.8	869.2 ~ 893.8
	GSM 1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8
	WCDMA Band II	1852.4 ~ 1907.6	1932.4 ~ 1987.6
	WCDMA Band V	826.4 ~ 846.6	871.4 ~ 891.6
Power Class:	GSM 850: 4, tested with power level 5		
	GSM 1900: 1, tested with power level 0		
	WCDMA Band II: 3, tested with power control all up bits		
	WCDMA Band V: 3, tested with power control all up bits		
Test Channel: (Low - Middle - High)	128 - 190 - 251	(GSM 850)	(tested)
	512 - 661 - 810	(GSM 1900)	(tested)
	9262 - 9400 - 9538	(WCDMA Band II)	(tested)
	4132 - 4183 - 4233	(WCDMA Band V)	(tested)
	1 - 6 - 11	(WiFi)	(tested)

Auxiliary Equipment Details

AE:Battery

Model: /

Manufacturer: BYD

S/N: CAB31P0000C1

Equipment Under Test (EUT) is a model of HSDPA/UMTS dual band / GSM four bands mobile phone. The device has an internal antenna for GSM/WCDMA Tx/Rx, and the other is BT/WiFi antenna that can be used for Tx/Rx. It has Personal Wireless Routers (hot spots) function. The detail about Mobile phone and Lithium Battery is in chapter 1.5 in this report. SAR is tested for GSM 850, GSM 1900, WCDMA Band II, WCDMA Band V and WiFi.

This is a variant report. The initial report number is RZA1105-0800SAR. These two reports have the same model and FCC ID. This report is tested the worst position of the initial report, other SAR values are duplicated from the initial report. The detailed product change description please refer to the ANNEX K.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. The Maximum SAR_{1g} Values of each tested band

Head Configuration(Initial Data)

Mode	Channel	Position	SAR_{1g} (W/kg)
GSM 850	High/251	Right, Cheek	**0.786**
GSM 1900	Low/512	Left, Cheek	**0.496**
WCDMA Band II	Low/9262	Left, Cheek	**0.957**
WCDMA Band V	High/4233	Right, Cheek	**0.864**
WiFi	Middle/6	Right, Cheek	**0.363**

Body Worn Configuration(Initial Data)

Mode	Channel	Separation distance	SAR_{1g} (W/kg)
4-slots GPRS 850	High/251	15mm	**0.751**
4-slots GPRS 1900	Low/512	15mm	**0.458**

WCDMA Band II	Low/9262	15mm	**0.544**
WCDMA Band V	Middle/4183	15mm	**0.741**
WiFi	Middle/6	15mm	**0.094**

Hot spot Mode(Initial Data)

Mode	Channel	Separation distance	SAR_{1g} (W/kg)
4-slots GPRS 850	Low/128	10mm	**1.030**
4-slots GPRS 1900	Low/512	10mm	**0.736**
WCDMA Band II	Low/9262	10mm	**0.965**
WCDMA Band V	Middle/4183	10mm	**0.918**
WiFi	Low/1	10mm	**0.173**

Hot spot Mode(Variant Data)

Mode	Channel	Separation distance	SAR_{1g} (W/kg)
4-TXslots GPRS 850	Low/128	10mm	**0.901**

1.7. The Maximum Conducted Power of each tested band

Initial Data

Band		Max Burst Conducted Power (dBm)	Max Average Power (dBm)
GSM 850	GSM	**32.79**	**23.76**
	GPRS, 4-TXslots	**28.28**	**25.27**
	EGPRS, 4-TXslots	**28.30**	**25.29**
GSM 1900	GSM	**29.36**	**20.33**
	GPRS, 4-TXslots	**25.62**	**22.61**
	EGPRS, 4-TXslots	**25.64**	**22.63**

Initial Data

Mode	Maximum Conducted Power (dBm)
WCDMA Band II	**22.48**
WCDMA Band V	**23.11**

Variant Data

Band		Max Burst Conducted Power (dBm)	Max Average Power (dBm)
GSM 850	GSM	**32.78**	**23.75**
	GPRS, 4-TXslots	**28.27**	**25.26**
	EGPRS, 4-TXslots	**28.28**	**25.27**
GSM 1900	GSM	**29.27**	**20.24**
	GPRS, 4-TXslots	**25.53**	**22.52**
	EGPRS, 4-TXslots	**25.56**	**22.55**

Variant Data

Mode	Maximum Conducted Power (dBm)
WCDMA Band II	**22.33**
WCDMA Band V	**23.02**

Note: The detail Power refer to Table 11 and Table 13 (Power Measurement Results).

1.8. Test Date

The test is performed from May 21, 2011 to June 1, 2011 and August 3, 2011.

2. Operational Conditions during Test

2.1. General Description of Test Procedures

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radiofrequency Channel Number (ARFCN) is allocated to 128, 190 and 251 in the case of GSM 850, to 512, 661 and 810 in the case of GSM 1900, to 9262, 9400 and 9538 in the case of WCDMA Band II, to 4132, 4183 and 4233 in the case of WCDMA Band V. The EUT is commanded to operate at maximum transmitting power.

Connection to the EUT is established via air interface with E5515C, and the EUT is set to maximum output power by E5515C. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

2.2. GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using E5515C the power lever is set to “5” in SAR of GSM 850, set to “0” in SAR of GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5; the EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Table 1: The allowed power reduction in the multi-slot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power,(dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

2.3. WCDMA Test Configuration

2.3.1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channel according to the procedures described in section 5.2 of 3GPP TS 34. 121, using the appropriate RMC or AMR with TPC(transmit power control) set to all “1’s” for WCDMA/HSDPA. Results for all applicable physical channel configuration (DPCCH, $DPDCH_n$ and spreading codes, HSDPA) should be tabulated in the SAR report. All configuration that are not supported by the DUT or can not be measured due to technical or equipment limitations should be clearly identified.

2.3.2. Head SAR Measurements

SAR for head exposure configurations in voice mode is measured using a 12.2kbps RMC with TPC bits configured to all “1’s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2kbps AMR is less than 1/4 dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2kbps AMR with a 3.4 kbps SRB(Signaling radio bearer) using the exposure configuration that results in the highest SAR in 12.2kbps RMC for that RF channel.

2.3.3. Body SAR Measurements

SAR for body exposure configurations in voice and data modes is measured using 12.2kbps RMC with TPC bits configured to all “1’s”. SAR for other spreading codes and multiple $DPDCH_n$, when supported by the DUT, are not required when the maximum average output of each RF channel, for each spreading code and $DPDCH_n$ configuration, are less than 1/4 dB higher than those measured in 12.2kbps RMC. Otherwise, SAR is measured on the maximum output channel with an applicable RMC configuration for the corresponding spreading code or $DPDCH_n$ using the exposure configuration that results in the highest SAR with 12.2 kbps RMC. When more than 2 $DPDCH_n$ are supported by the DUT, it may be necessary to configure additional $DPDCH_n$ for a DUT using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

2.4. HSDPA Test Configuration

SAR for body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average output of each RF channel with HSDPA active is at least 1/4 dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc,βd), and HS-DPCCH power offset

parameters(△ACK, △NACK, △CQI)should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Table 2: Subtests for UMTS Release 5 HSDPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1: $\triangle_{ACK}$, $\triangle_{NACK}$ and $\triangle_{CQI}$= 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c$=30/15 ⇔ β_{hs}=30/15*β_c

Note2:For the HS-DPCCH power mask requirement test in clause 5.2C,5.7A,and the Error Vector Magnitude(EVM) with HS-DPCCH test in clause 5.13.1.A,and HSDPA EVM with phase discontinuity in clause 5.13.1AA, $\triangle_{ACK}$ and $\triangle_{NACK}$= 8 (A_{hs}=30/15) with β_{hs}=30/15*β_c,and $\triangle_{CQI}$= 7 (A_{hs}=24/15) with β_{hs}=24/15*β_c.

Note3: CM=1 forβ_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4:For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to β_c=11/15 and β_d=15/15.

Table 3: Settings of required H-Set 1 QPSK in HSDPA mode

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	534
Inter-TTI Distance	TTI's	3
Number of HARQ Processes	Processes	2
Information Bit Payload (N_{INF})	Bits	3202
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	4800
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	9600
Coding Rate	/	0.67
Number of Physical Channel Codes	Codes	5
Modulation	/	QPSK

Table 4: HSDPA UE category

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum Transport Bits/HS-DSCH	Total Channel
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

Table 5: UE maximum output powers with HS-DPCCH (Release 5 Only)

Ratio of β_c to β_d for all values of β_{hs}	Power Class 3		Power Class 4	
	Power (dBm)	Tolerance (dB)	Power (dBm)	Tolerance (dB)
$1/15 \le \beta_c/\beta_d \le 12/15$	+24	+1/-3	+21	+2/-2
$13/15 \le \beta_c/\beta_d \le 15/8$	+23	+2/-3	+20	+3/-2
$15/7 \le \beta_c/\beta_d \le 15/0$	+22	+3/-3	+19	+4/-2

2.5. WIFI Test Configuration

For the 802.11b/g SAR tests, a communication link is set up with the test mode software for WIFI mode test. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 1, 6 and 11 respectively in the case of 2450 MHz. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

802.11b/g operating modes are tested independently according to the service requirements in each frequency band.802.11b/g modes are tested on channels1,6,11;however,if output power reduction is necessary for channels 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels must be tested instead.

SAR is not required for 802.11g channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels. When the maximum average output channel in each frequency band is not included in the “default test channels”, the maximum channel should be tested instead of an adjacent “default test channels”, these are referred to as the “required test channels” and are illustrated in Table 6.

Table 6: “Default Test Channels”

Mode	GHz	Channel	Turbo Channel	“Default Test Channels”			
				15.247		UNII	
				802.11b	802.11g		
802.11b/g	2.412	1#		√	*		
	2.437	6	6	√	*		
	2.462	11#		√	*		

Note: #=when output power is reduced for channel 1 and /or 11to meet restricted band requirements the highest out put channels closet to each of these channels should be tested.

√= “default test channels”

* =possible 802.11g channels with maximum average output 0.25dB>=the “default test channels”

2.6. Test Positions

2.6.1. Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

2.6.2. Body Worn Configuration

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. The distance between the device and the phantom was kept 15mm.

Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. The distance between the device and the phantom was kept 10mm of wireless routers.

3. SAR Measurements System Configuration

3.1. SAR Measurement Set-up

The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric 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 electronic (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.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY4 measurement server.
- The DASY4 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003
- DASY4 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System validation dipoles allowing to validate the proper functioning of the system.

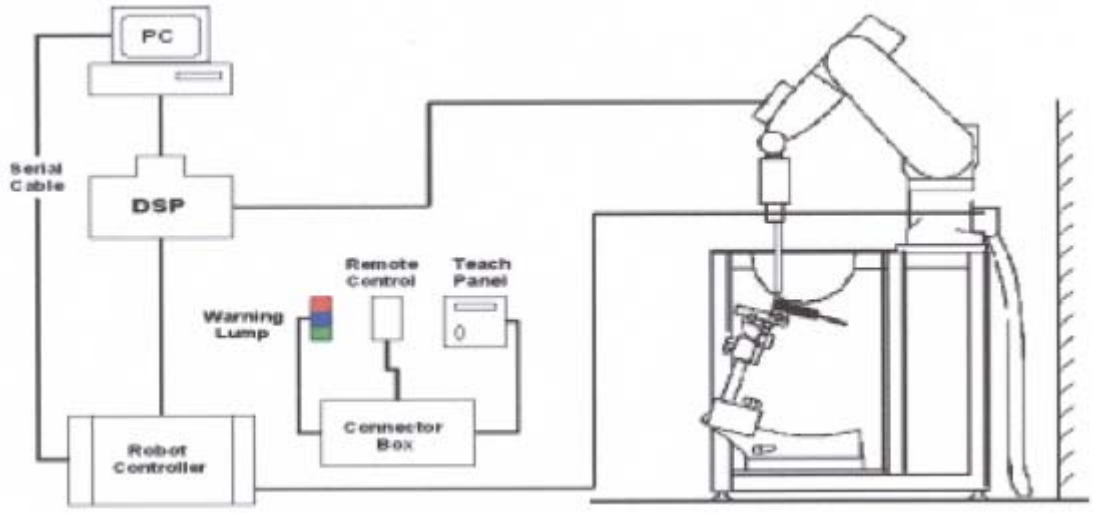

Figure 1 SAR Lab Test Measurement Set-up

3.2. DASY4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

3.2.1. EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

Figure 2.EX3DV4 E-field Probe

Figure 3. EX3DV4 E-field probe

3.2.2. E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.
E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.
Or

$$SAR = \frac{|E|^2 \sigma}{\rho}$$

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m3).

3.3. Other Test Equipment

3.3.1. Device Holder for Transmitters

The DASY device holder is designed to cope with the die rent positions given in the standard.
It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the inference of the clamp on the test results could thus be lowered.

Figure 4 Device Holder

3.3.2. Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden Figure. 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±0.1 mm
Filling Volume	Approx. 20 liters
Dimensions	810 x 1000 x 500 mm (H x L x W)
	Aailable Special

Figure 5 Generic Twin Phantom

3.4. Scanning Procedure

The DASY4 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

- The “surface check” measurement tests the optical surface detection system of the DASY4 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- Area Scan

  The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid

spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.
After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

- Zoom Scan
  Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

- Spatial Peak Detection
  The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The DASY4 system allows evaluations that combine measured data and robot positions, such as:
  • maximum search
  • extrapolation
  • boundary correction
  • peak search for averaged SAR
  During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.
  Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.
- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

3.5. Data Storage and Evaluation

3.5.1. Data Storage

The DASY4 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.5.2. Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	Dcp_i
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	
	- Density	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY4 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot c f / d c p_i$$

With V_i = compensated signal of channel i (i = x, y, z)

U_i = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)^2] for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \ .) / (\quad \cdot 1000)$$

with $\boldsymbol{SAR}$ = local specific absorption rate in mW/g

$\boldsymbol{E_{tot}}$ = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \quad \text{or} \quad \boldsymbol{P_{pwe} = H_{tot}^2 \cdot 37.7}$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

$\boldsymbol{E_{tot}}$ = total electric field strength in V/m

$\boldsymbol{H_{tot}}$ = total magnetic field strength in A/m

3.6. System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured every day using the dielectric probe kit and the network analyzer. A system check measurement was made following the determination of the dielectric parameters of the simulates, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system check results (dielectric parameters and SAR values) are given in the table 13 and table 14.

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).

System check is performed regularly on all frequency bands where tests are performed with the DASY4 system.

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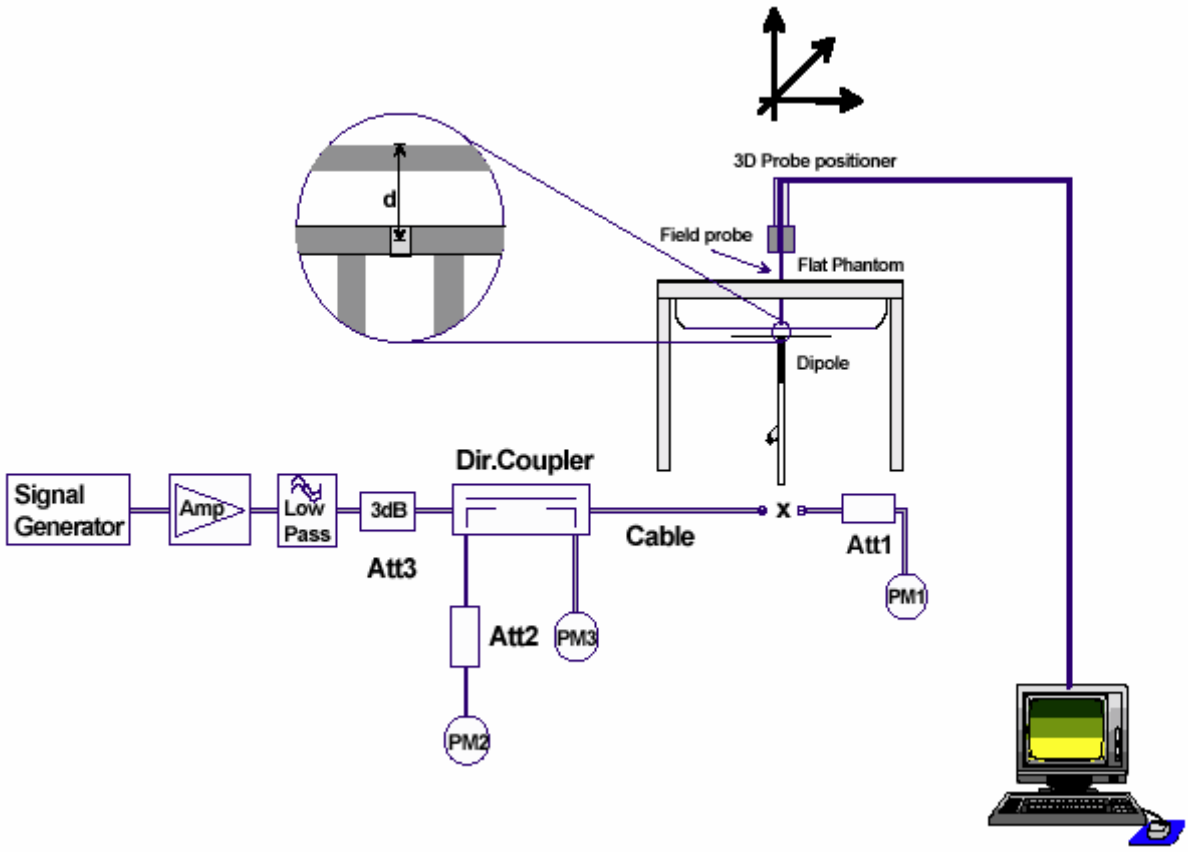


Figure 6 System Check Set-up

3.7. Equivalent Tissues

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case. The table 7 and table 8 show the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

Table 7: Composition of the Head Tissue Equivalent Matter

MIXTURE%	FREQUENCY(Brain) 835MHz
Water	41.45
Sugar	56
Salt	1.45
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz ε=41.5 σ=0.9

MIXTURE%	FREQUENCY(Brain) 1900MHz
Water	55.242
Glycol monobutyl	44.452
Salt	0.306
Dielectric Parameters Target Value	f=1900MHz ε=40.0 σ=1.40

MIXTURE%	FREQUENCY(Brain) 2450MHz
Water	62.7
Glycol	36.8
Salt	0.5
Dielectric Parameters Target Value	f=2450MHz ε=39.20 σ=1.80

Table 8: Composition of the Body Tissue Equivalent Matter

MIXTURE%	FREQUENCY(Body) 835MHz
Water	52.5
Sugar	45
Salt	1.4
Preventol	0.1
Cellulose	1.0
Dielectric Parameters Target Value	f=835MHz ε=55.2 σ=0.97

MIXTURE%	FREQUENCY (Body) 1900MHz
Water	69.91
Glycol monobutyl	29.96
Salt	0.13
Dielectric Parameters Target Value	f=1900MHz ε=53.3 σ=1.52

MIXTURE%	FREQUENCY(Body) 2450MHz
Water	73.2
Glycol	26.7
Salt	0.1
Dielectric Parameters Target Value	f=2450MHz ε=52.70 σ=1.95

4. Laboratory Environment

Table 9: The Ambient Conditions during Test

Temperature	Min. = 20°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

5. Characteristics of the Test

5.1. Applicable Limit Regulations

IEEE Std C95.1, 1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz.

5.2. Applicable Measurement Standards

IEEE Std 1528™-2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

SUPPLEMENT C Edition 01-01 to OET BULLETIN 65 Edition 97-01 June 2001 including DA 02-1438, published June 2002: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions.

KDB 941225 D06 Hot Spot SAR v01 SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

6. Conducted Output Power Measurement

6.1. Summary

The DUT is tested using an E5515C communications tester as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted power. Conducted output power was measured using an integrated RF connector and attached RF cable. This result contains conducted output power for the EUT.

6.2. Conducted Power Results

Table 10: Conducted Power Measurement Results (Initial Data)

GSM 850		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GSM	Results	32.79	32.77	32.71	-9.03dB	23.76	23.74	23.68
GPRS (GMSK)	1TXslot	32.81	32.77	32.74	-9.03dB	23.78	23.74	23.71
	2TXslots	30.91	30.85	30.86	-6.02dB	24.89	24.83	24.84
	3TXslots	29.35	29.31	29.31	-4.26dB	25.09	25.05	25.05
	4TXslots	28.28	28.27	28.26	-3.01dB	**25.27**	**25.26**	**25.25**
EGPRS (GMSK)	1TXslot	32.77	32.79	32.71	-9.03dB	23.74	23.76	23.68
	2TXslots	30.91	30.89	30.84	-6.02dB	24.89	24.87	24.82
	3TXslots	29.35	29.34	29.3	-4.26dB	25.09	25.08	25.04
	4TXslots	28.3	28.29	28.24	-3.01dB	**25.29**	**25.28**	**25.23**
GSM 1900		**Burst Conducted Power(dBm)**				**Average power(dBm)**		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM	Results	29.13	29.36	29.28	-9.03dB	20.1	20.33	20.25
GPRS (GMSK)	1TXslot	29.18	29.35	29.28	-9.03dB	20.15	20.32	20.25
	2TXslots	27.97	28.11	28.05	-6.02dB	21.95	22.09	22.03
	3TXslots	26.55	26.63	26.54	-4.26dB	22.29	22.37	22.28
	4TXslots	25.52	25.62	25.52	-3.01dB	**22.51**	**22.61**	**22.51**
EGPRS (GMSK)	1TXslot	29.11	29.35	29.25	-9.03dB	20.08	20.32	20.22
	2TXslots	27.9	28.12	28.01	-6.02dB	21.88	22.1	21.99
	3TXslots	26.49	26.65	26.51	-4.26dB	22.23	22.39	22.25
	4TXslots	25.47	25.64	25.49	-3.01dB	**22.46**	**22.63**	**22.48**

Table 11: Conducted Power Measurement Results (Variant Data)

GSM 850		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GSM	Results	32.78	32.67	32.58	-9.03dB	23.75	23.64	23.55
GPRS (GMSK)	1TXslot	32.75	32.66	32.53	-9.03dB	23.72	23.63	23.5
	2TXslots	30.79	30.7	30.6	-6.02dB	24.77	24.68	24.58
	3TXslots	29.31	29.26	29.16	-4.26dB	25.05	25	24.9
	4TXslots	28.27	28.2	28.14	-3.01dB	**25.26**	**25.19**	**25.13**
EGPRS (GMSK)	1TXslot	32.75	32.73	32.67	-9.03dB	23.72	23.7	23.64
	2TXslots	30.88	30.78	30.61	-6.02dB	24.86	24.76	24.59
	3TXslots	29.34	29.31	29.27	-4.26dB	25.08	25.05	25.01
	4TXslots	28.28	28.25	28.19	-3.01dB	**25.27**	**25.24**	**25.18**
GSM 1900		**Burst Conducted Power(dBm)**				**Average power(dBm)**		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GSM	Results	29.11	29.27	29.22	-9.03dB	20.08	20.24	20.19
GPRS (GMSK)	1TXslot	29.15	29.29	29.2	-9.03dB	20.12	20.26	20.17
	2TXslots	27.91	28.08	27.99	-6.02dB	21.89	22.06	21.97
	3TXslots	26.51	26.59	26.52	-4.26dB	22.25	22.33	22.26
	4TXslots	25.48	25.53	25.49	-3.01dB	**22.47**	**22.52**	**22.48**
EGPRS (GMSK)	1TXslot	29.14	29.27	29.17	-9.03dB	20.11	20.24	20.14
	2TXslots	27.85	28.11	27.95	-6.02dB	21.83	22.09	21.93
	3TXslots	26.44	26.57	26.43	-4.26dB	22.18	22.31	22.17
	4TXslots	25.45	25.56	25.44	-3.01dB	**22.44**	**22.55**	**22.43**

Note:

1) Division Factors

To average the power, the division factor is as follows:

1 TX- slot = 1 transmit time slot out of 8 time slots

=> conducted power divided by (8/1) => -9.03 dB

2) TX- slots = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

3) TX- slots = 3 transmit time slots out of 8 time slots

=> conducted power divided by (8/3) => -4.26 dB

4) TX- slots = 4 transmit time slots out of 8 time slots

=> conducted power divided by (8/4) => -3.01 dB

2) Average power numbers

The maximum power numbers are marks in bold.

Table 12: Conducted Power Measurement Results (Initial Data)

WCDMA Band II	Conducted Power (dBm)		
	Channel 9262	Channel 9400	Channel 9538
12.2kbps RMC	21.6	22.48	22.22
64kbps RMC	21.54	22.45	22.19
144kbps RMC	21.59	22.43	22.17
384kbps RMC	21.56	22.43	22.16
WCDMA Band II HSDPA	**Conducted Power (dBm)**		
	Channel 9262	Channel 9400	Channel 9538
Sub - Test 1	21.56	22.4	22.15
Sub - Test 2	21.49	22.32	22.08
Sub - Test 3	21.14	21.97	21.69
Sub - Test 4	21.1	21.91	21.67
WCDMA Band V	**Conducted Power (dBm)**		
	Channel 4132	Channel 4183	Channel 4233
12.2kbps RMC	23.1	22.97	23.08
64kbps RMC	23.1	22.92	23.08
144kbps RMC	23.11	22.94	23.1
384kbps RMC	23.09	22.98	23
WCDMA Band V HSDPA	**Conducted Power (dBm)**		
	Channel 4132	Channel 4183	Channel 4233
Sub - Test 1	22.95	22.82	22.91
Sub - Test 2	22.79	22.64	22.83
Sub - Test 3	22.25	22.15	22.33
Sub - Test 4	22.22	22.14	22.27

Table 13: Conducted Power Measurement Results (Variant Data)

WCDMA Band II	Conducted Power (dBm)		
	Channel 9262	Channel 9400	Channel 9538
12.2kbps RMC	21.4	22.33	22.25
64kbps RMC	21.35	22.29	22.23
144kbps RMC	21.39	22.31	22.24
384kbps RMC	21.33	22.27	22.22
WCDMA Band II HSDPA	**Conducted Power (dBm)**		
	Channel 9262	Channel 9400	Channel 9538
Sub - Test 1	21.3	22.26	22.15
Sub - Test 2	21.23	22.21	22.12
Sub - Test 3	21.81	21.89	21.75
Sub - Test 4	21.78	21.87	21.72

WCDMA Band V	Conducted Power (dBm)		
	Channel 4132	Channel 4183	Channel 4233
12.2kbps RMC	22.87	23.02	22.84
64kbps RMC	22.85	22.99	22.81
144kbps RMC	22.84	22.97	22.82
384kbps RMC	22.86	23.01	22.83
WCDMA Band V HSDPA	**Conducted Power (dBm)**		
	Channel 4132	Channel 4183	Channel 4233
Sub - Test 1	22.81	22.87	22.81
Sub - Test 2	22.77	22.81	22.79
Sub - Test 3	22.27	22.29	22.26
Sub - Test 4	22.23	22.24	22.25

7. Test Results

7.1. Dielectric Performance

Table 14: Dielectric Performance of Head Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp ℃
		ε_r	σ(s/m)	
835MHz (head)	Target value ± 5% window	41.50 39.43 — 43.58	0.90 0.86 — 0.95	/
	Measurement value 2011-5-22	41.76	0.90	21.7
1900MHz (head)	Target value ±5% window	40.00 38.00 — 42.00	1.40 1.33 — 1.47	/
	Measurement value 2011-5-24	39.89	1.45	21.8
2450MHz (head)	Target value ±5% window	39.20 37.24 — 41.16	1.80 1.71 — 1.89	/
	Measurement value 2011-6-1	39.10	1.81	21.8

Table 15: Dielectric Performance of Body Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp ℃
		ε_r	σ(s/m)	
835MHz (body)	Target value ±5% window	55.20 52.44 — 57.96	0.97 0.92 — 1.02	/
	Measurement value 2011-5-21	56.25	0.99	21.7
	Measurement value 2011-8-3	55.39	1.00	21.6
1900MHz (body)	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2011-5-23	51.98	1.56	21.8
2450MHz (body)	Target value ±5% window	52.70 50.07 — 55.34	1.95 1.85 — 2.05	/
	Measurement value 2011-6-1	51.19	1.94	21.9

7.2. System Check Results

Table 16: System Check for Head Tissue Simulating Liquid

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp
		10g	1g	ε_r	σ(s/m)	℃
835MHz	Recommended result ±10% window	1.56 1.40 — 1.72	2.39 2.15 — 2.63	41.2	0.89	/
	Measurement value 2011-5-22	1.58	2.40	41.76	0.90	21.7
1900MHz	Recommended result ±10% window	5.22 4.70 — 5.74	10 9.00 — 11.00	39.5	1.44	/
	Measurement value 2011-5-24	5.30	10.33	39.89	1.45	21.8
2450 MHz	Recommended result ±10% window	6.24 5.62 — 6.86	13.3 11.97—14.63	38.7	1.77	/
	Measurement value 2011-6-1	6.52	14.06	39.10	1.81	21.8

Note: 1. The graph results see ANNEX B.

2. Recommended Values used derive from the calibration certificate and 250 mW is used as feeding power to the calibrated dipole.

Table 17: System Check for Body Tissue Simulating Liquid

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp
		10g	1g	ε_r	σ(s/m)	℃
835MHz	Recommended result ±10% window	1.63 1.47 — 1.79	2.49 2.24 — 2.74	54.6	0.98	/
	Measurement value 2011-5-21	1.64	2.54	56.25	0.99	21.7
	Measurement value 2011-8-3	1.61	2.52	55.39	1.00	21.6
1900 MHz	Recommended result ±10% window	5.52 4.97 — 6.07	10.3 9.27 — 11.33	53.5	1.54	/
	Measurement value 2011-5-23	5.36	10.20	51.98	1.56	21.8
2450 MHz	Recommended result ±10% window	5.97 5.37 — 6.57	13 11.7—14.3	51.8	2.01	/
	Measurement value 2011-6-1	6.48	14.01	51.19	1.94	21.9

Note: 1. The graph results see ANNEX B.

2. Target Values used derive from the calibration certificate and 250 mW is used as feeding power to the Calibrated dipole.

7.3. Summary of Measurement Results

7.3.1. GSM 850 (GPRS/EGPRS)

Table 18: SAR Values [GSM 850 (GPRS/EGPRS)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	±0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test Position of Head					
Left hand, Touch Cheek	Middle/190	0.500	0.688	-0.094	Figure 13
Left hand, Tilt 15 Degree	Middle/190	0.235	0.310	-0.011	Figure 14
Right hand, Touch Cheek	High/251	0.585	0.786	-0.017	Figure 15
	Middle/190	0.541	0.729	-0.087	Figure 16
	Low/128	0.558	0.746	-0.030	Figure 17
Right hand, Tilt 15 Degree	Middle/190	0.247	0.328	-0.019	Figure 18
Test position of Body (Distance 15mm)					
Towards Ground (GSM)	Middle/190	0.359	0.513	0.073	Figure 19
Towards Ground (2TXslots)	Middle/190	0.465	0.638	-0.011	Figure 20
Towards Ground (3TXslots)	Middle/190	0.490	0.673	-0.063	Figure 21
Towards Ground (4TXslots)	High/251	0.534	0.751	-0.034	Figure 22
	Middle/190	0.511	0.702	-0.016	Figure 23
	Low/128	0.515(max.cube)	0.716(max.cube)	0.010	Figure 24
Towards Phantom(4TXslots)	Middle/190	0.439	0.594	-0.023	Figure 25
Worst Case Position of Body with Earphone (Distance 15mm)					
Towards Ground (GSM)	High/251	0.436	0.602	-0.077	Figure 26

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.

3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

4. When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

5. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.

6. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 19: SAR Values [GSM 850(wireless routers incorporated in device)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground(4TXslots)	High/251	0.710(max.cube)	0.984(max.cube)	-0.052	Figure 27
	Middle/190	0.716	1.020	-0.065	Figure 28
	Low/128	0.697(max.cube)	1.030(max.cube)	-0.064	Figure 29
Towards Phantom (4TXslots)	Middle/190	0.567	0.768	0.003	Figure 30
Left Edge(4TXslots)	Middle/190	0.317	0.461	-0.006	Figure 31
Right Edge(4TXslots)	Middle/190	0.381	0.549	-0.033	Figure 32
Top Edge(4TXslots)	N/A	N/A	N/A	N/A	N/A
Bottom Edge(4TXslots)	Middle/190	0.078	0.146	-0.039	Figure 33
Worst Case Position of Body with EGPRS (GMSK, Distance 10mm)					
Towards Ground(4TXslots)	Low/128	0.734(max.cube)	1.010(max.cube)	-0.018	Figure 34

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm(see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top Edge is excluded from hotspot mode SAR evaluation.
4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.
5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

7.3.2. GSM 1900 (GPRS/EGPRS)

Table 20: SAR Values [GSM 1900(GPRS/EGPRS)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test Position of Head					
Left hand, Touch cheek	High/810	0.252	0.427	0.171	Figure 35
	Middle/661	0.245	0.416	0.024	Figure 36
	Low/512	0.294	0.496	-0.044	Figure 37
Left hand, Tilt 15 Degree	Middle/661	0.111	0.176	-0.058	Figure 38
Right hand, Touch cheek	Middle/661	0.240(max.cube)	0.375(max.cube)	-0.062	Figure 39
Right hand, Tilt 15 Degree	Middle/661	0.115	0.184	-0.006	Figure 40
Test position of Body (Distance 15mm)					
Towards Ground (GSM)	Middle/661	0.137	0.233	-0.046	Figure 41
Towards Ground (2TXslots)	Middle/661	0.198	0.335	-0.034	Figure 42
Towards Ground (3TXslots)	Middle/661	0.213	0.358	-0.022	Figure 43
Towards Ground (4TXslots)	High/810	0.229	0.390	0.003	Figure 44
	Middle/661	0.228	0.387	0.030	Figure 45
	Low/512	0.270	0.458	-0.044	Figure 46
Towards Phantom (4TXslots)	Middle/661	0.168(max.cube)	0.297(max.cube)	-0.116	Figure 47
Worst Case Position of Body with Earphone (Distance 15mm)					
Towards Ground (GSM)	Low/512	0.128	0.215	0.015	Figure 48

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.

3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

4. When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

5. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.

6. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 21: SAR Values [GSM 1900(wireless routers incorporated in device)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground (4TXslots)	High/810	0.365	0.643	-0.026	Figure 49
	Middle/661	0.358	0.630	-0.045	Figure 50
	Low/512	0.422	0.736	0.036	Figure 51
Towards Phantom (4TXslots)	Middle/661	0.255	0.453	-0.087	Figure 52
Left Edge(4TXslots)	Middle/661	0.124	0.217	-0.053	Figure 53
Right Edge(4TXslots)	Middle/661	0.096	0.173	-0.042	Figure 54
Top Edge(4TXslots)	N/A	N/A	N/A	N/A	N/A
Bottom Edge(4TXslots)	Middle/661	0.192	0.342	-0.114	Figure 55
Worst Case Position of Body with EGPRS(GMSK, Distance 10mm)					
Towards Ground (4TXslots)	Low/512	0.421	0.736	0.015	Figure 56

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm(see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top Edge is excluded from hotspot mode SAR evaluation..
4. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

7.3.3. WCDMA Band II (WCDMA/HSDPA)

Table 22: SAR Values [WCDMA Band II (WCDMA/HSDPA)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test Position of Head					
Left Hand, Touch Cheek	High/9538	0.535	0.901	0.000	Figure 57
	Middle/9400	0.535	0.909	0.063	Figure 58
	Low/9262	0.571	0.957	0.073	Figure 59
Left Hand, Tilt 15 Degree	Middle/9400	0.252	0.396	-0.124	Figure 60
Right Hand, Touch Cheek	High/9538	0.492(max.cube)	0.780(max.cube)	-0.079	Figure 61
	Middle/9400	0.554(max.cube)	0.877(max.cube)	-0.034	Figure 62
	Low/9262	0.573(max.cube)	0.892(max.cube)	0.025	Figure 63
Right Hand, Tilt 15 Degree	Middle/9400	0.236	0.375	0.033	Figure 64
Test Position of Body (Distance 15mm)					
Towards Ground	High/9538	0.296	0.502	0.045	Figure 65
	Middle/9400	0.298	0.509	-0.024	Figure 66
	Low/9262	0.320	0.544	-0.055	Figure 67
Towards Phantom	Middle/9400	0.221(max.cube)	0.383(max.cube)	0.058	Figure 68
Worst Case Position of Body with Earphone (Distance 15mm)					
Towards Ground	Low/9262	0.241	0.402	0.080	Figure 69

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.

3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.

5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 23: SAR Values [WCDMA Band II (wireless routers incorporated in device)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground	High/9538	0.536	0.938	0.046	Figure 70
	Middle/9400	0.547	0.955	0.048	Figure 71
	Low/9262	0.554	0.965	0.058	Figure 72
Towards Phantom	Middle/9400	0.345(max.cube)	0.612(max.cube)	0.056	Figure 73
Left Edge	Middle/9400	0.164	0.286	0.025	Figure 74
Right Edge	Middle/9400	0.125	0.214	0.030	Figure 75
Top Edge	N/A	N/A	N/A	N/A	N/A
Bottom Edge	Middle/9400	0.233	0.411	0.070	Figure 76
Worst Case Position of Body with HSDPA (Distance 10mm)					
Towards Ground	Low/9262	0.364	0.637	0.150	Figure 77

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm(see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top Edge is excluded from hotspot mode SAR evaluation.
4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.
5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

7.3.4. WCDMA Band V (WCDMA/HSDPA)

Table 24: SAR Values [WCDMA Band V (WCDMA/HSDPA)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test Position of Head					
Left Hand, Touch Cheek	Middle/4183	0.456	0.620	-0.030	Figure 78
Left Hand, Tilt 15 Degree	Middle/4183	0.265	0.350	0.047	Figure 79
Right Hand, Touch Cheek	High/4233	0.639	0.864	0.089	Figure 80
	Middle/4183	0.642	0.863	-0.106	Figure 81
	Low/4132	0.580	0.779	-0.014	Figure 82
Right Hand, Tilt 15 Degree	Middle/4183	0.301	0.398	0.015	Figure 83
Test Position of Body (Distance 15mm)					
Towards Ground	High/4233	0.476	0.657	-0.022	Figure 84
	Middle/4183	0.537	0.741	0.084	Figure 85
	Low/4132	0.448	0.616	-0.026	Figure 86
Towards Phantom	Middle/4183	0.417	0.566	-0.020	Figure 87
Worst Case Position of Body with Earphone (Distance 15mm)					
Towards Ground	Middle/4183	0.521	0.711	-0.004	Figure 88

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.
4. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 25: SAR Values [WCDMA Band V (wireless routers incorporated in device)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	±0.21	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground	High/4233	0.510(max.cube)	0.795(max.cube)	0.044	Figure 89
	Middle/4183	0.660(max.cube)	0.918(max.cube)	-0.015	Figure 90
	Low/4132	0.562(max.cube)	0.781(max.cube)	0.027	Figure 91
Towards Phantom	Middle/4183	0.578	0.780	-0.015	Figure 92
Left Edge	Middle/4183	0.301	0.438	0.014	Figure 93
Right Edge	Middle/4183	0.347	0.497	0.001	Figure 94
Top Edge	N/A	N/A	N/A	N/A	N/A
Bottom Edge	Middle/4183	0.061	0.112	-0.083	Figure 95
Worst Case Position of Body with HSDPA (Distance 10mm)					
Towards Ground	Middle/4183	0.498	0.689	-0.009	Figure 96

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. WWAN antenna is located at bottom edge; antenna-to-top edge distance is more than 2.5 cm(see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top Edge is excluded from hotspot mode SAR evaluation.
4. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.
5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 26: SAR Values [GSM 850(wireless routers incorporated in device)] (Variant Data)

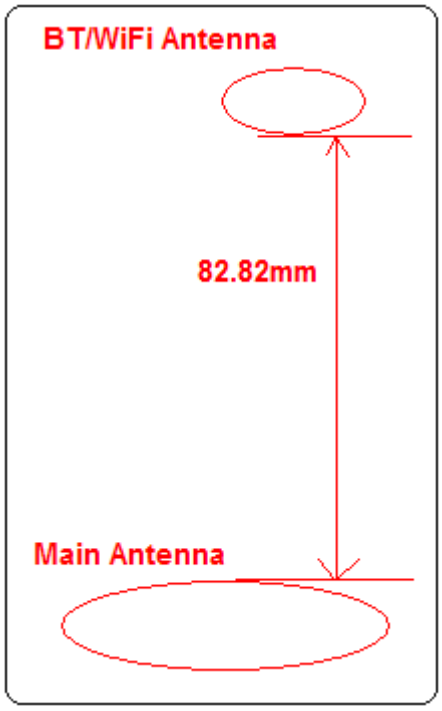
Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	±0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground(4TXslots)	Low/128	0.654(max.cube)	0.901(max.cube)	-0.092	Figure 115

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above.
4. The SAR is tested at the worst position of the initial report; report number is RZA1105-0800SAR.

7.3.5. Bluetooth/WiFi Function

The distance between BT/WIFI antenna and GSM/WCDMA antenna is ＞5cm. The location of the antennas inside mobile phone is shown in Annex I:



The output power of BT antenna is as following(Initial Data):

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
GFSK(dBm)	6.14	7.33	8.41
EDR2M-4_DQPSK(dBm)	6.73	8.15	8.91
EDR3M-8DPSK(dBm)	4.39	5.79	6.70

The output power of WIFI antenna is as following(Initial Data):

Mode	Channel	Data rate (Mbps)	AV Power (dBm)
802.11b	1	1	15.62
		2	15.69
		5.5	15.29
		11	14.80
	6	1	15.55
		2	15.70
		5.5	15.37
		11	14.87
	11	1	16.10
		2	16.23
		5.5	15.82

		11	15.95
802.11g	1	6	13.19
		9	12.91
		12	12.73
		18	12.22
		24	11.82
		36	11.10
		48	10.60
		54	10.39
	6	6	13.40
		9	13.11
		12	12.88
		18	12.36
		24	11.90
		36	11.30
		48	10.57
		54	10.38
	11	6	13.92
		9	13.38
		12	13.23
		18	12.80
		24	12.33
		36	11.61
		48	11.03
		54	10.90
802.11n HT20	1	MCS0	13.22
		MCS1	12.56
		MCS2	11.90
		MCS3	11.68
		MCS4	10.97
		MCS5	10.31
		MCS6	10.10
		MCS7	9.92
	6	MCS0	13.11
		MCS1	12.63
		MCS2	12.00
		MCS3	11.63
		MCS4	10.90
		MCS5	10.45
		MCS6	10.27
		MCS7	9.98
	11	MCS0	13.40
		MCS1	12.91

		MCS2	12.40
		MCS3	12.06
		MCS4	11.35
		MCS5	10.86
		MCS6	10.50
		MCS7	10.39

Note: 1. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.

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.				

Stand-alone SAR

According to the output power measurement result and the distance between BT/WIFI antenna and GSM/WCDMA antenna we can draw the conclusion that:

stand-alone SAR are not required for BT, because the output power of BT transmitter is ≤ $2P_{Ref}$=13.8dBm and its antenna is ＞5cm from GSM/WCDMA antenna.

stand-alone SAR are required for WIFI, because the output power of WIFI transmitter is ≥ $2P_{Ref}$=13.8dBm and its antenna is ＞5cm from other antenna.

Table 27: SAR Values (802.11b) (Initial Data)

Limit of SAR (W/kg)		10 g Average	1g Average	Power Drift (dB)	Graph Results
		2.0	1.6	± 0.21	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1g Average		
Test position of Head					
Left hand, Touch cheek	Middle/6	0.083	0.165	-0.046	Figure 97
Left hand, Tilt 15 Degree	Middle/6	0.082	0.165	0.107	Figure 98
Right hand, Touch cheek	High/11	0.152	0.327	0.000	Figure 99
	Middle/6	0.168	0.363	0.050	Figure 100
	Low/1	0.150	0.321	0.156	Figure 101
Right hand, Tilt 15 Degree	Middle/6	0.122	0.260	0.115	Figure 102
Test position of Body (Distance 15mm)					
Towards Ground	High/11	0.047	0.088	0.121	Figure 103
	Middle/6	0.048	0.094	-0.141	Figure 104
	Low/1	0.045	0.083	0.056	Figure 105
Towards phantom	Middle/6	0.021	0.037	0.080	Figure 106
Worst case position of Body with Earphone(Distance 15mm)					
Towards Ground	Middle/6	0.019	0.035	-0.096	Figure 107

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.
4. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.
5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Table 28: SAR Values [802.11b (wireless routers incorporated in device)] (Initial Data)

Limit of SAR		10 g Average	1 g Average	Power	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Different Test Position	Channel	Measurement Result(W/kg)		Power Drift (dB)	
		10 g Average	1 g Average		
Test position of Body (Distance 10mm)					
Towards Ground	High/11	0.080	0.157	0.146	Figure 108
	Middle/6	0.081	0.155	0.066	Figure 109
	Low/1	0.091	0.173	0.182	Figure 110
Towards Phantom	Middle/6	0.033	0.061	-0.007	Figure 111
Left Edge	Middle/6	0.026	0.048	0.141	Figure 112
Right Edge	Middle/6	0.008	0.014	-0.142	Figure 113
Top Edge	Middle/6	0.036	0.069	-0.051	Figure 114
Bottom Edge	N/A	N/A	N/A	N/A	N/A

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Upper and lower frequencies were measured at the worst position.
3. WLAN antenna is located at Left edge; antenna-to-bottom edge distance is more than 2.5 cm(see ANNEX I). Based upon KDB941225 D06, when the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Bottom Edge is excluded from hotspot mode SAR evaluation.
4. KDB 248227-SAR is not required for 802.11g/n channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.
5. The SAR values are duplicated from the initial report, report number is RZA1105-0800SAR.

Simultaneous SAR

About BT and GSM/WCDMA Antenna, because GSM/WCDMA antenna is >5cm from BT Antenna, stand-alone SAR are not required for BT, so Simultaneous SAR are not required for GSM/WCDMA and BT Antenna.

About WIFI and GSM/WCDMA Antenna, because GSM/WCDMA antenna is >5cm from WIFI Antenna, Max ($SAR_{GSM/WCDMA}$+ SAR_{WIFI})= 0.892W/kg +0.363 W/kg =1.255 W/kg <1.6 W/kg, so Simultaneous SAR are not required for GSM/WCDMA and WIFI Antenna.

About BT and WiFi can't simultaneous transmit.

8. Measurement Uncertainty

No.	source	Type	Uncertainty Value (%)	Probability Distribution	k	c_i	Standard ncertainty $u_i^{'}$ (%)	Degree of freedom V_{eff} or v_i
1	System repetivity	A	0.5	N	1	1	0.5	9
Measurement system								
2	-probe calibration	B	5.9	N	1	1	5.9	∞
3	-axial isotropy of the probe	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	1.9	∞
4	- Hemispherical isotropy of the probe	B	9.4	R	$\sqrt{3}$	$\sqrt{0.5}$	3.9	∞
6	-boundary effect	B	1.9	R	$\sqrt{3}$	1	1.1	∞
7	-probe linearity	B	4.7	R	$\sqrt{3}$	1	2.7	∞
8	- System detection limits	B	1.0	R	$\sqrt{3}$	1	0.6	∞
9	-readout Electronics	B	1.0	N	1	1	1.0	∞
10	-response time	B	0	R	$\sqrt{3}$	1	0	∞
11	-integration time	B	4.32	R	$\sqrt{3}$	1	2.5	∞
12	-noise	B	0	R	$\sqrt{3}$	1	0	∞
13	-RF Ambient Conditions	B	3	R	$\sqrt{3}$	1	1.73	∞
14	-Probe Positioner Mechanical Tolerance	B	0.4	R	$\sqrt{3}$	1	0.2	∞
15	-Probe Positioning with respect to Phantom Shell	B	2.9	R	$\sqrt{3}$	1	1.7	∞
16	-Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	$\sqrt{3}$	1	2.3	∞
Test sample Related								
17	-Test Sample Positioning	A	2.9	N	1	1	4.92	71
18	-Device Holder Uncertainty	A	4.1	N	1	1	4.1	5
19	-Output Power Variation - SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.9	∞
Physical parameter								
20	-phantom	B	4.0	R	$\sqrt{3}$	1	2.3	∞

21	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.64	1.8	∞
22	-liquid conductivity (measurement uncertainty)	B	0.77	N	1	0.64	0.493	9
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
24	-liquid permittivity (measurement uncertainty)	B	0.29	N	1	0.6	0.174	9
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					11.36	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N		k=2	22.72	

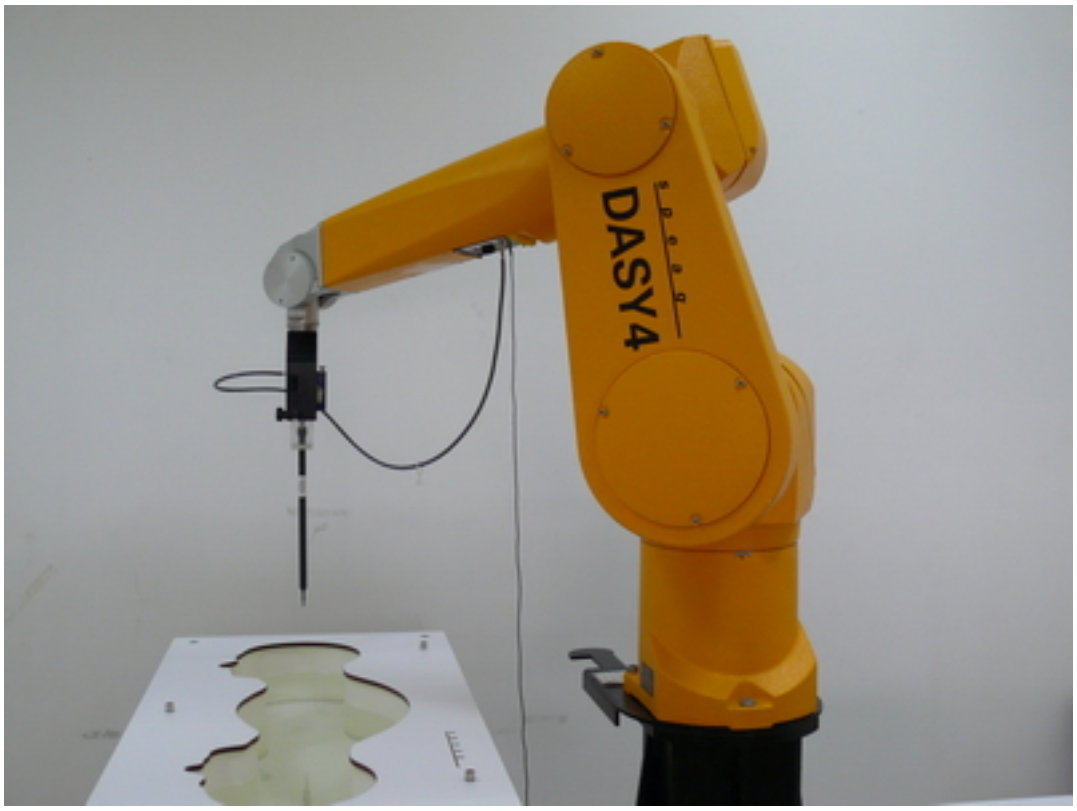
9. Main Test Instruments

Table 29: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 13, 2010	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 12, 2011	One year
04	Power sensor	Agilent N8481H	MY50350004	September 26, 2010	One year
05	Signal Generator	HP 8341B	2730A00804	September 13, 2010	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	BTS	E5515C	MY48360988	December 3, 2010	One year
08	E-field Probe	EX3DV4	3677	November 24, 2010	One year
09	DAE	DAE4	871	November 18, 2010	One year
10	Validation Kit 835MHz	D835V2	4d092	January 14, 2010	Two years
11	Validation Kit 1900MHz	D1900V2	5d018	June 15, 2010	Two years
12	Validation Kit 2450MHz	D2450V2	712	February 19, 2010	Two years

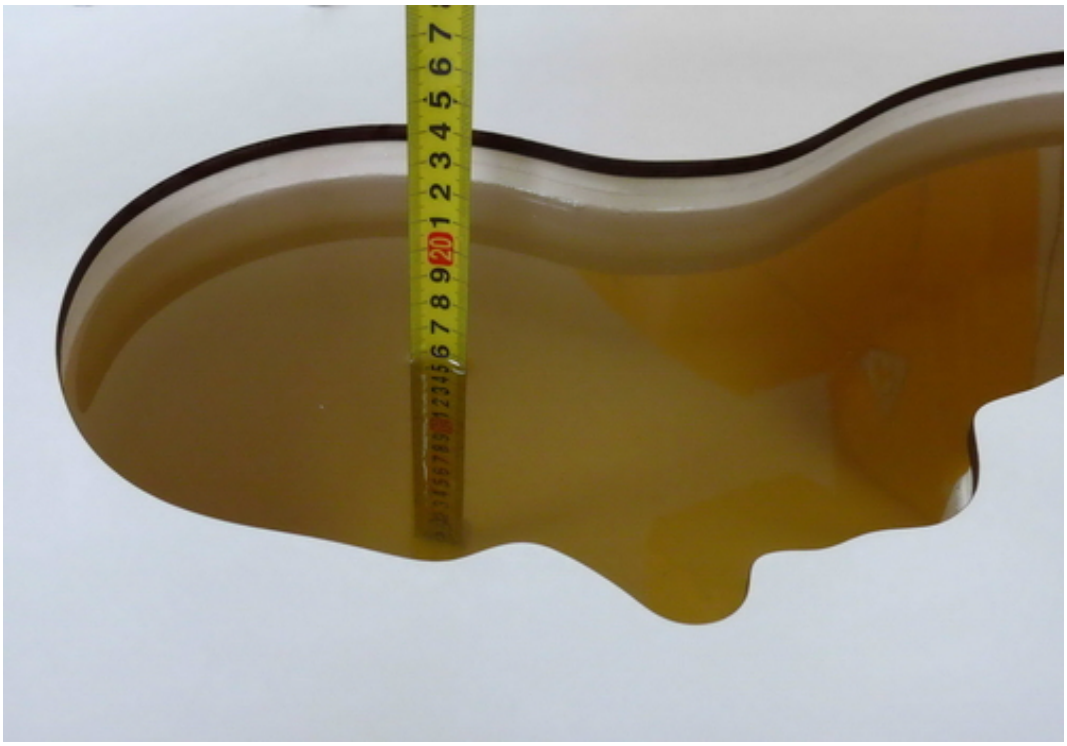
*******END OF REPORT BODY*******

ANNEX A: Test Layout

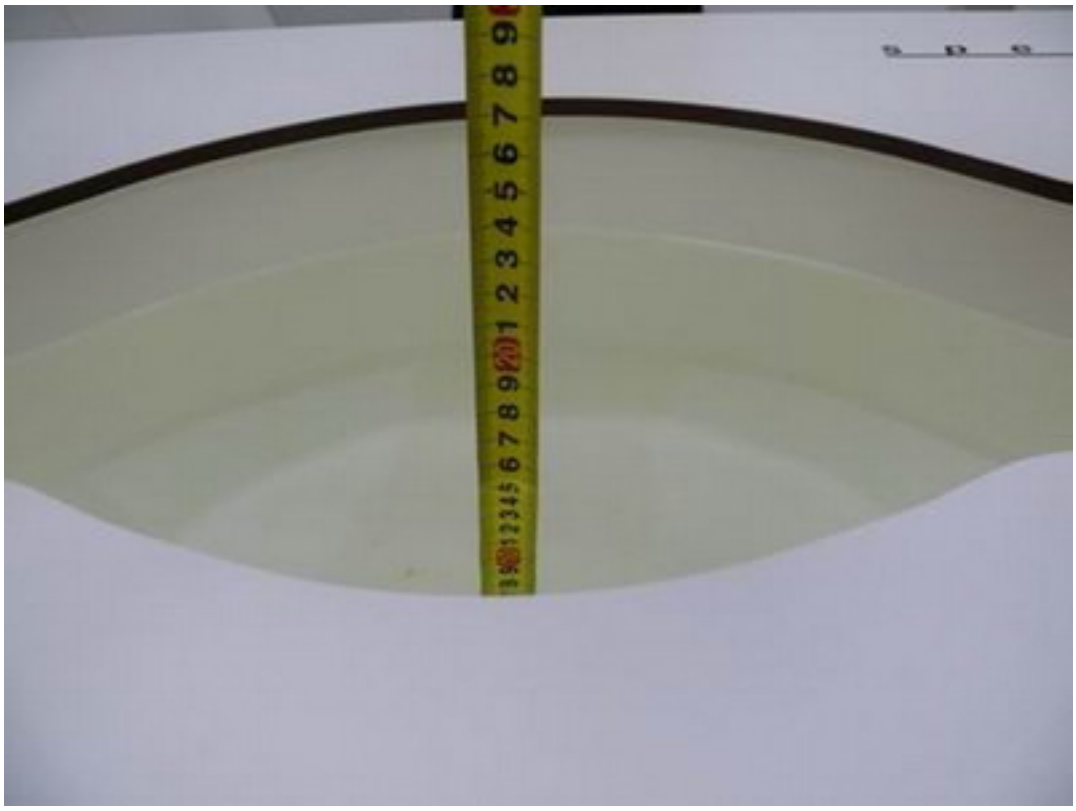


Picture 1: Specific Absorption Rate Test Layout

Picture 2: Liquid depth in the flat Phantom (835MHz, 15.4cm depth)

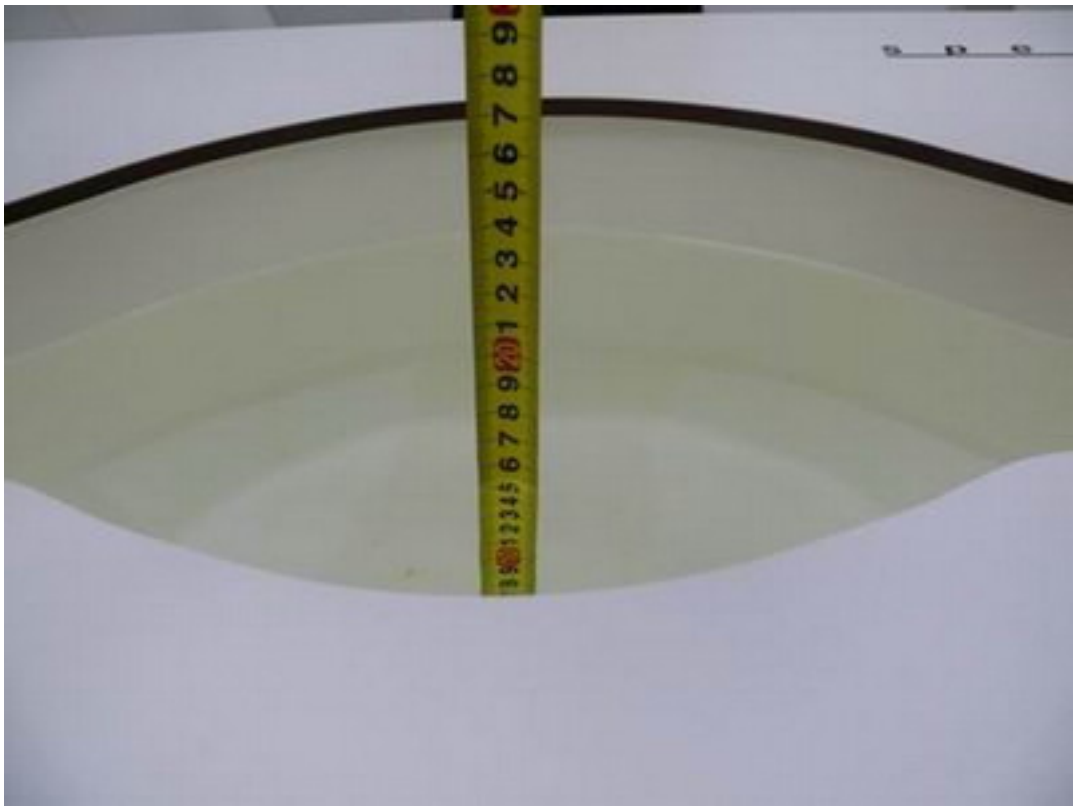


Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)



Picture 4: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)

Picture 5: liquid depth in the head Phantom (1900 MHz, 15.3cm depth)



Picture 6: Liquid depth in the flat Phantom (2450 MHz, 15.3cm depth)

Picture 7: Liquid depth in the head Phantom (2450 MHz, 15.4cm depth)

ANNEX B: System Check Results

System Performance Check at 835 MHz Head TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

Date/Time: 5/22/2011 6:45:13 PM

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.90 mho/m; ε_r = 41.76; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.7℃

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (101x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.56 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.1 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 3.54 W/kg

SAR(1 g) = 2.40 mW/g; SAR(10 g) = 1.58 mW/g

Maximum value of SAR (measured) = 2.63 mW/g

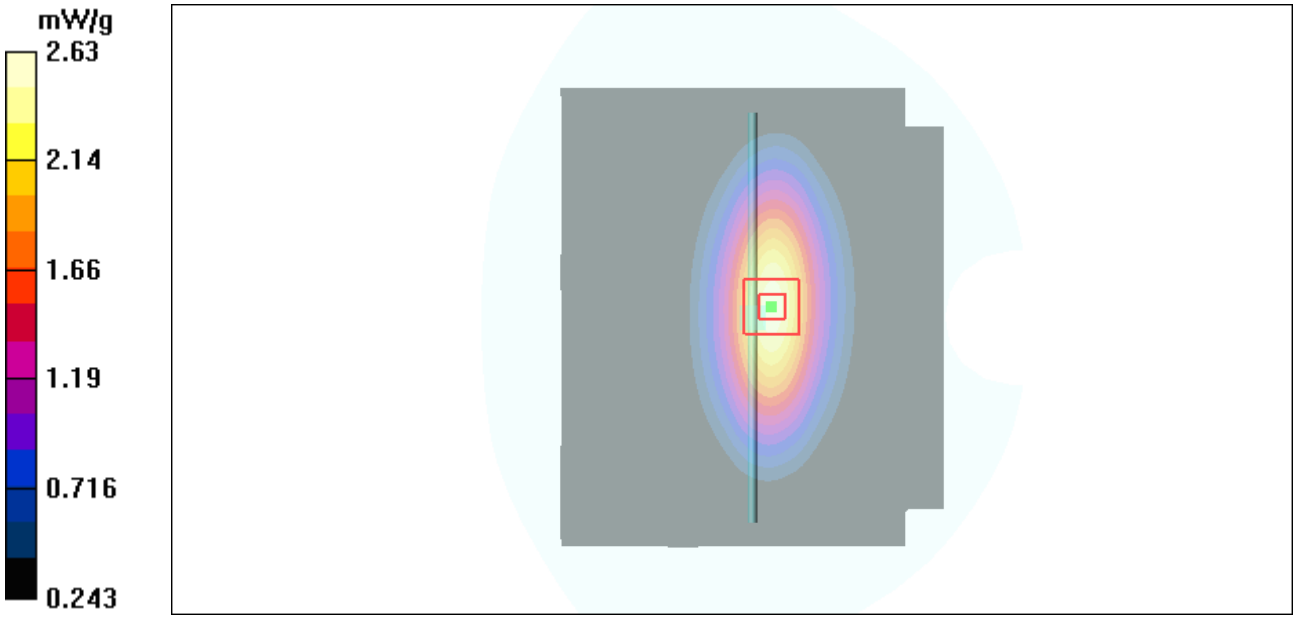


Figure 7 System Performance Check 835MHz 250mW

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

Date/Time: 5/21/2011 8:34:20 AM

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 56.25; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.7℃

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.72 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.9 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.54 mW/g; SAR(10 g) = 1.64 mW/g

Maximum value of SAR (measured) = 2.72 mW/g

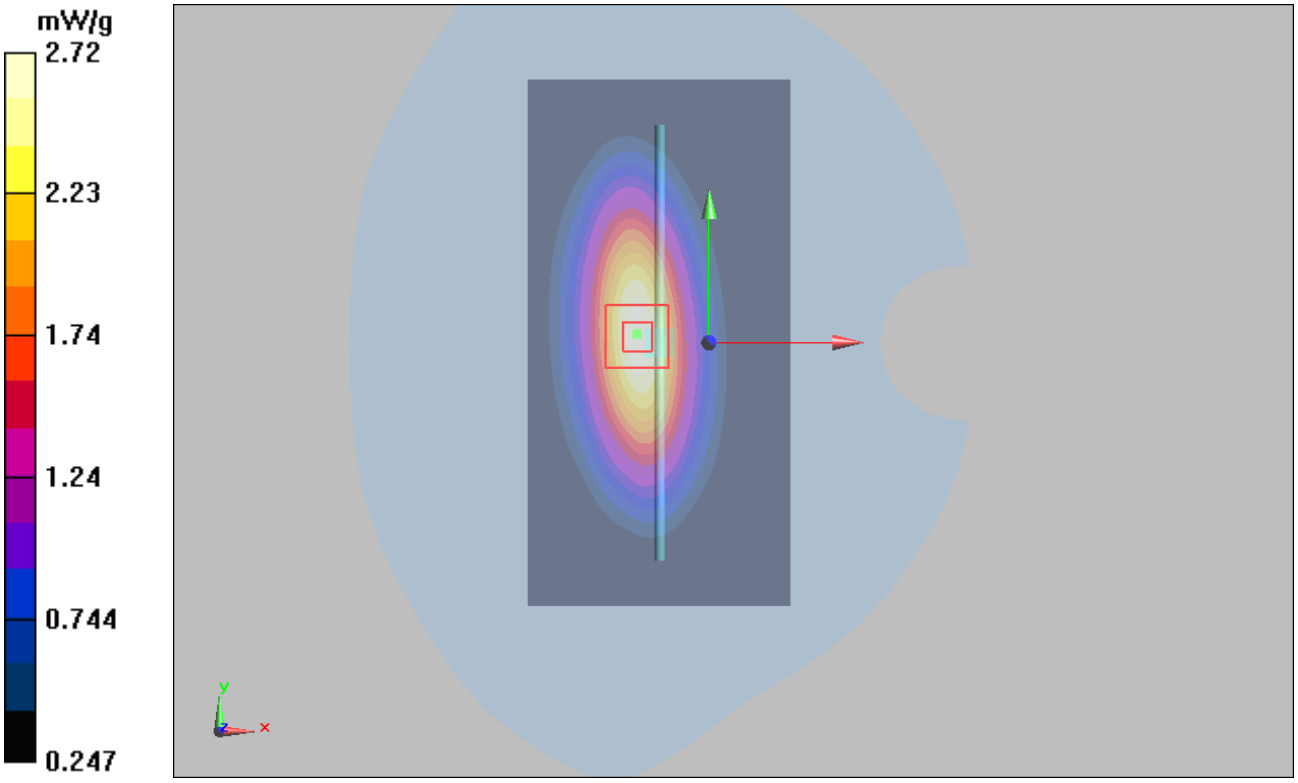


Figure 8-1 System Performance Check 835MHz 250mW

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d092

Date/Time: 8/3/2011 10:34:20 PM

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 1.00 mho/m; ε_r = 55.39; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.7℃

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.72 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.9 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.52 mW/g; SAR(10 g) = 1.61 mW/g

Maximum value of SAR (measured) = 2.70 mW/g

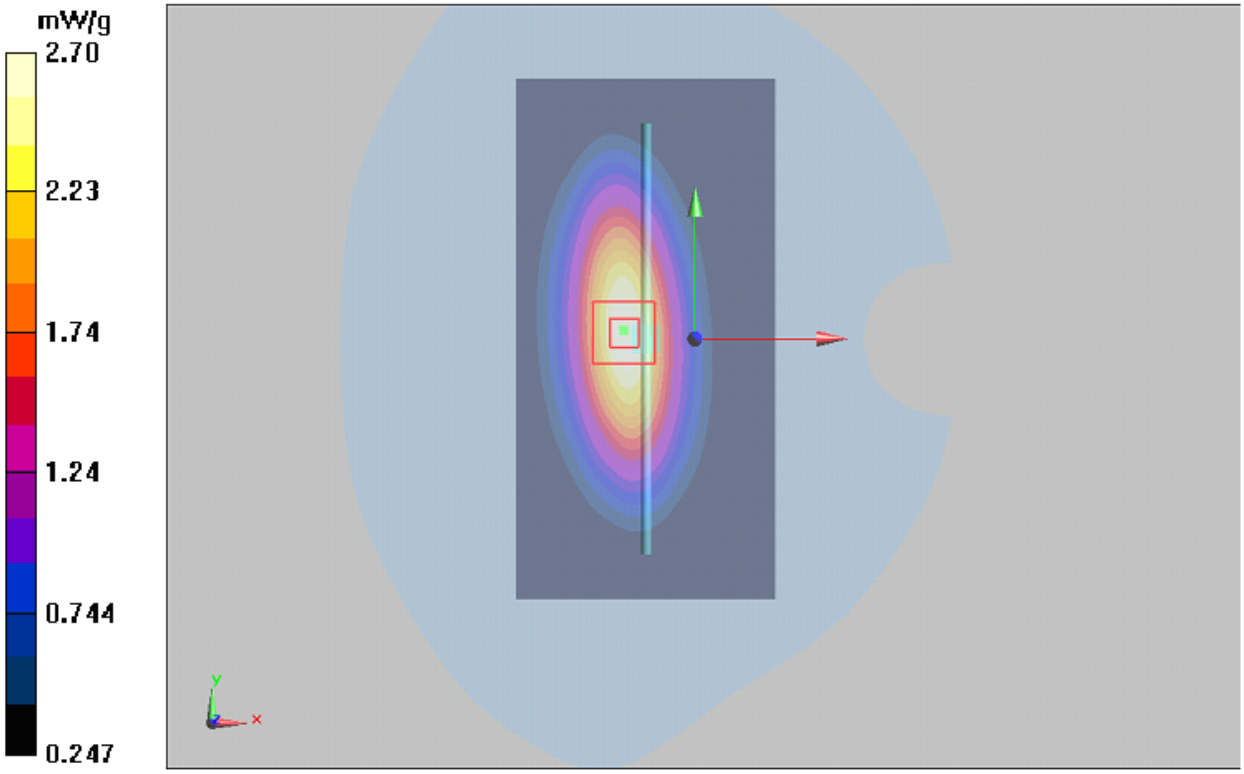


Figure 9-2 System Performance Check 835MHz 250mW

System Performance Check at 1900 MHz Head TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d018

Date/Time: 5/24/2011 2:01:34 PM

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.89; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.8℃

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.94, 7.94, 7.94); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.7 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.0 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 10.33 mW/g; SAR(10 g) = 5.30 mW/g

Maximum value of SAR (measured) = 11.53 mW/g

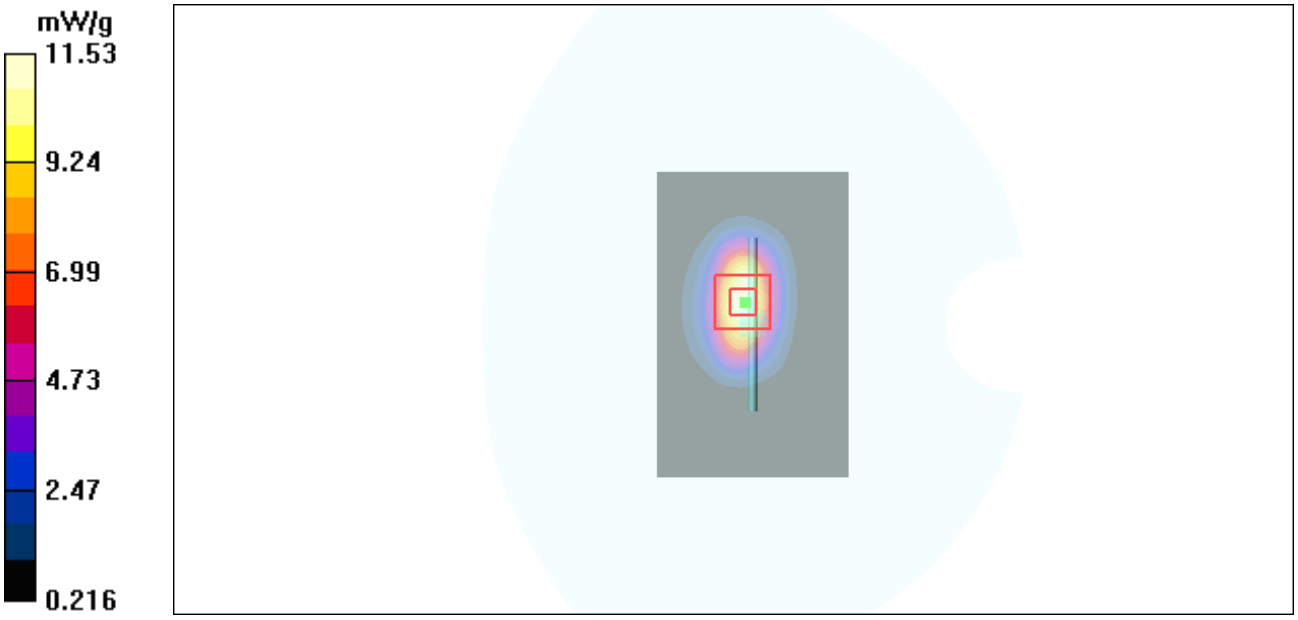


Figure 10 System Performance Check 1900MHz 250mW

System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d018

Date/Time: 5/23/2011 8:36:19 AM

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 51.98; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.8℃

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.9 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 80.8 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 10.20 mW/g; SAR(10 g) = 5.36 mW/g

Maximum value of SAR (measured) = 11.05 mW/g

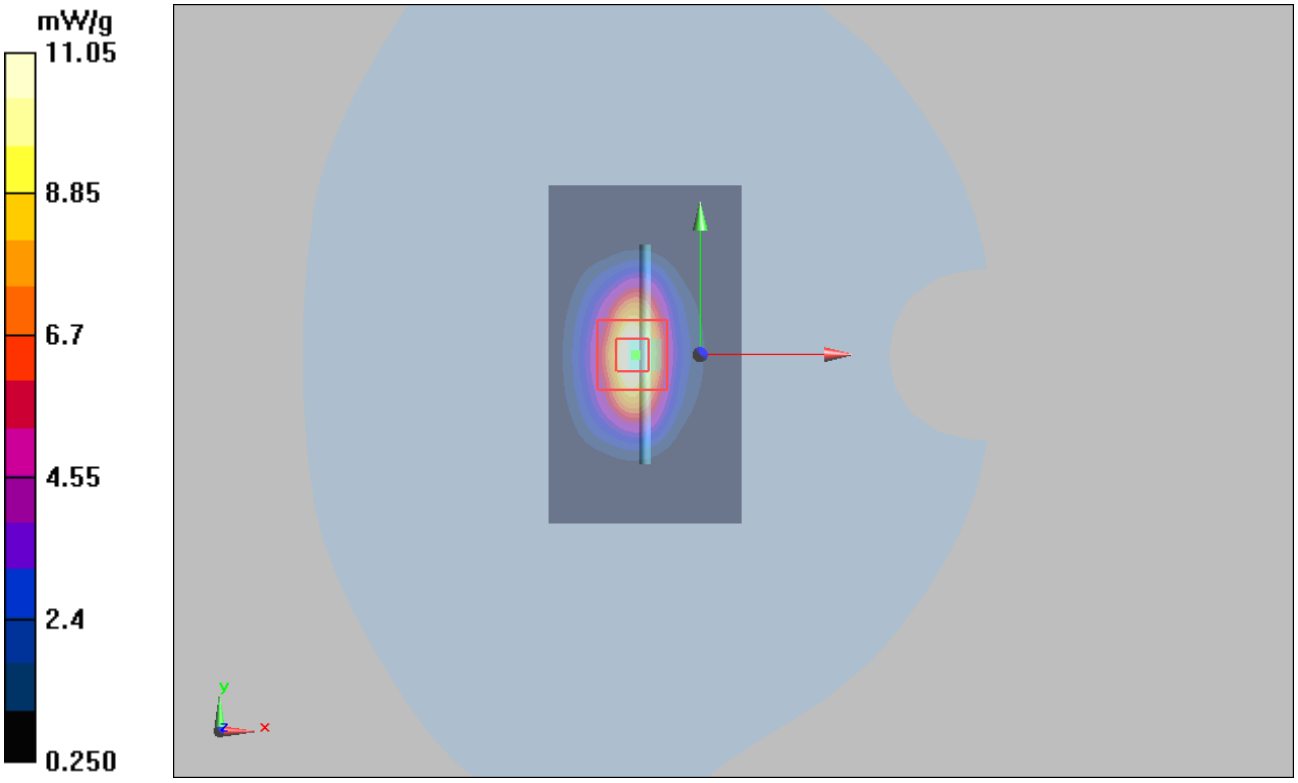


Figure 11 System Performance Check 1900MHz 250mW

System Performance Check at 2450 MHz Head TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712

Date/Time: 6/1/2011 4:51:36 PM

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.81 mho/m; ε_r = 39.10; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.8℃

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.32, 7.32, 7.32); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 21.4 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 67.0 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 28.0 W/kg

SAR(1 g) = 14.06 mW/g; SAR(10 g) = 6.52 mW/g

Maximum value of SAR (measured) = 15.68 mW/g

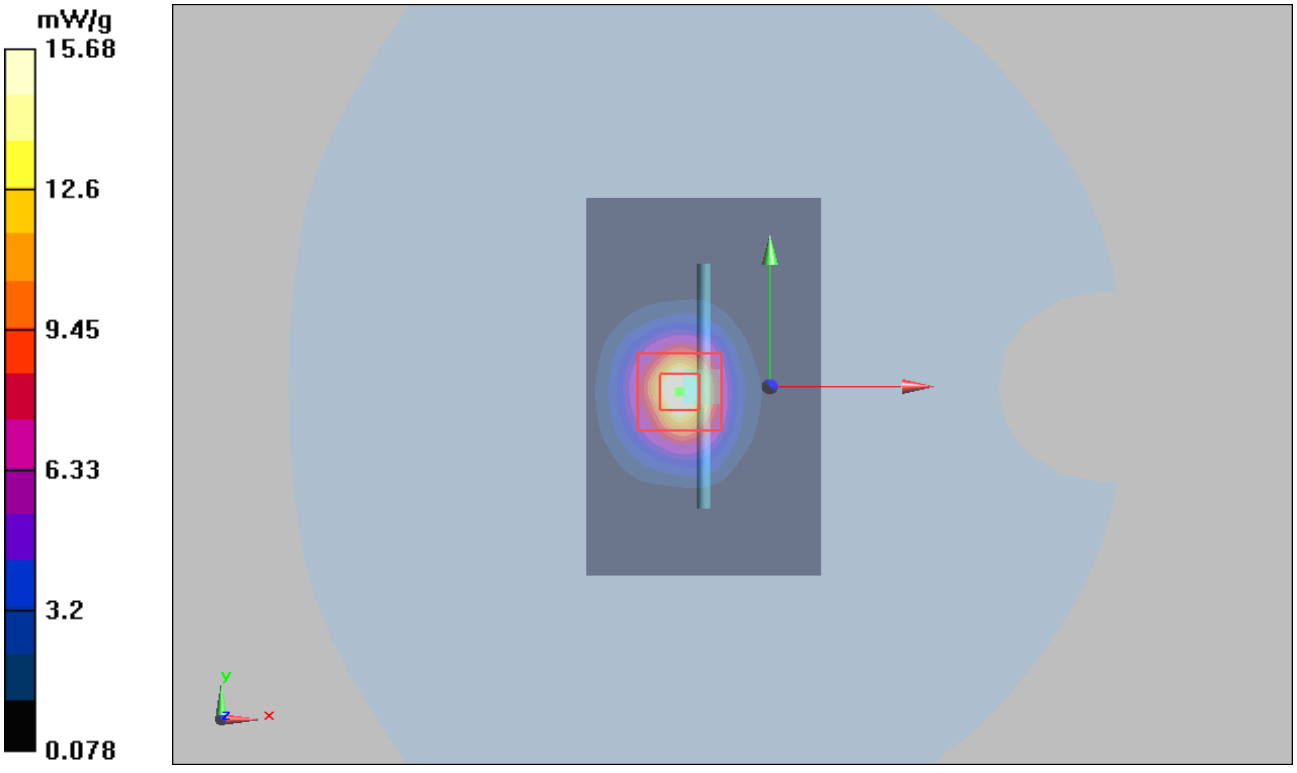


Figure 12 System Performance Check 2450MHz 250mW

System Performance Check at 2450 MHz Body TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712

Date/Time: 6/1/2011 3:36:36 PM

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 51.19; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.9℃

Phantom section: Flat Section

DASY4 Configuration:

Probe: EX3DV4 - SN3677; ConvF(7.46, 7.46, 7.46); Calibrated: 11/24/2010

Electronics: DAE4 Sn871; Calibrated: 11/18/2010

Phantom: SAM000 T01; Type: SAM V4.0; Serial: TP-1246

Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 21.5 mW/g

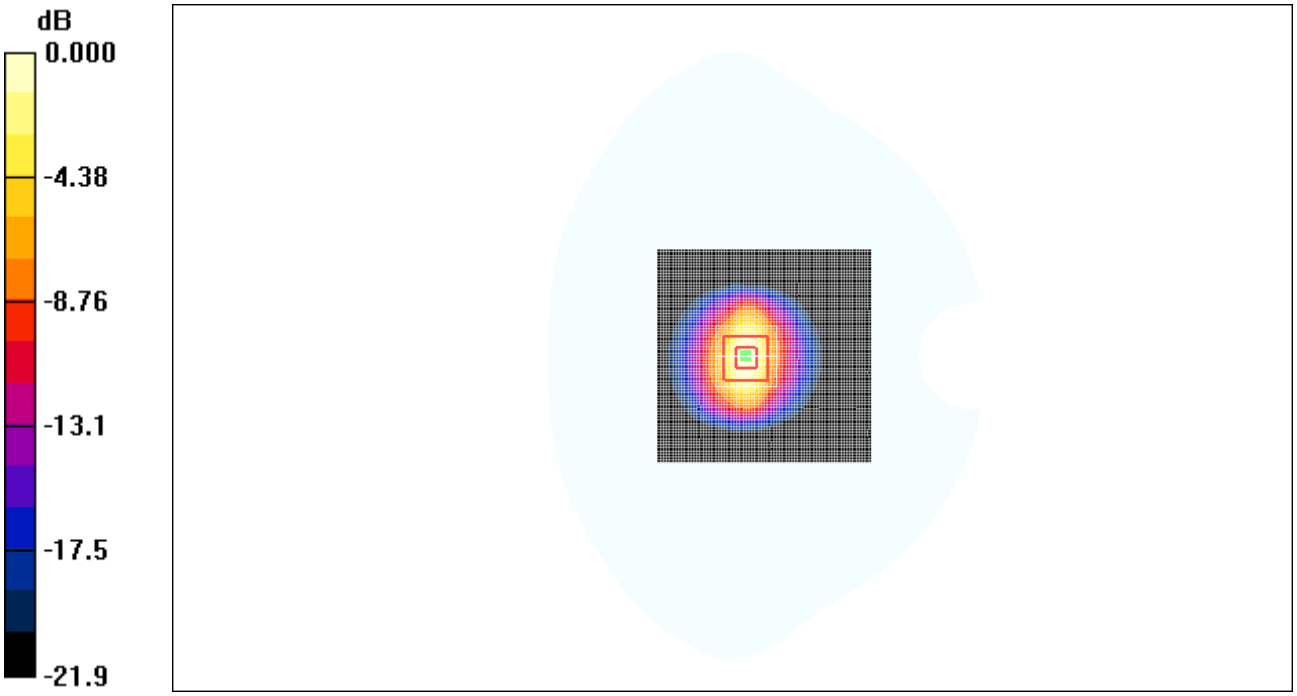
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 71.0 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 28.2 W/kg

SAR(1 g) = 14.01 mW/g; SAR(10 g) = 6.48 mW/g

Maximum value of SAR (measured) = 19.82 mW/g



0 dB = 19.82mW/g

Figure 13 System Performance Check 2450MHz 250mW

ANNEX C: Graph Results

GSM 850 Left Cheek Middle

Date/Time: 5/22/2011 9:00:27 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.905 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.728 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.91 V/m; Power Drift = -0.094 dB
Peak SAR (extrapolated) = 0.864 W/kg
SAR(1 g) = 0.688 mW/g; SAR(10 g) = 0.500 mW/g
Maximum value of SAR (measured) = 0.737 mW/g

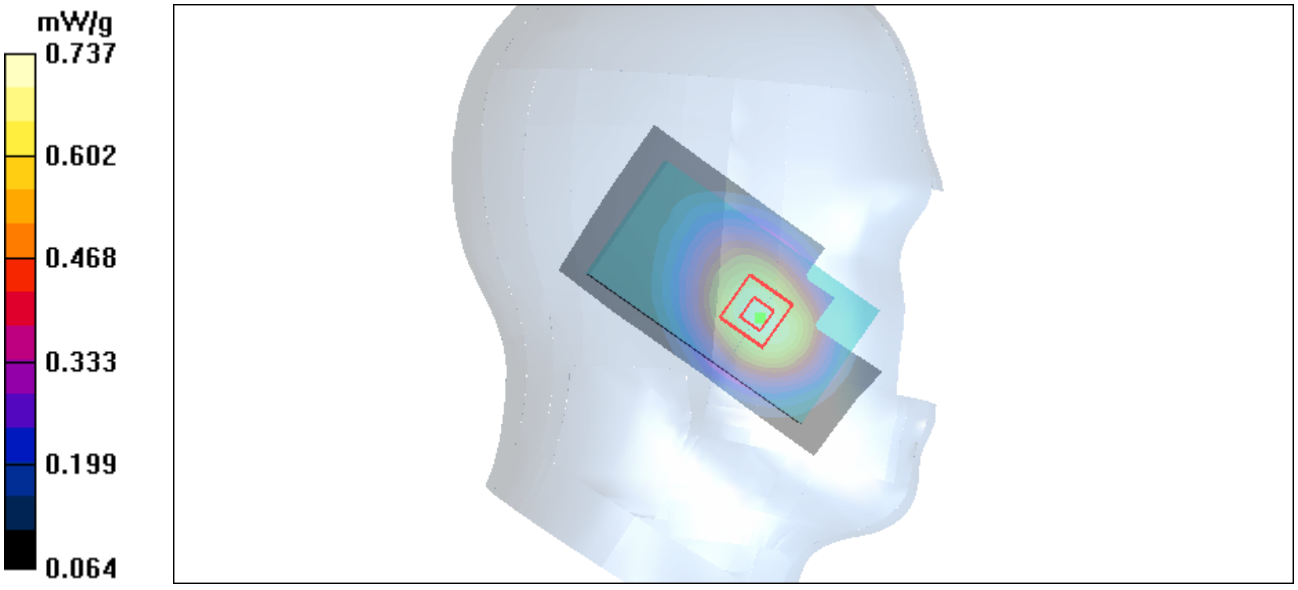


Figure 14 Left Hand Touch Cheek GSM 850 Channel 190

GSM 850 Left Tilt Middle

Date/Time: 5/22/2011 9:13:38 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.905 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Left Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.326 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.373 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.235 mW/g
Maximum value of SAR (measured) = 0.324 mW/g

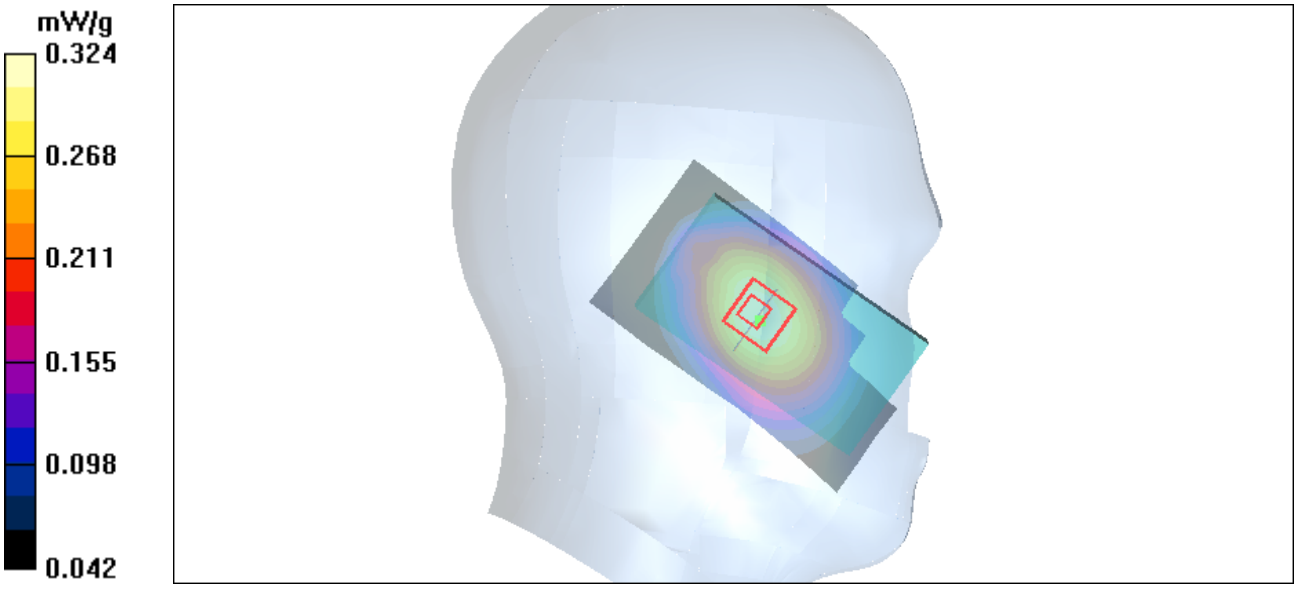


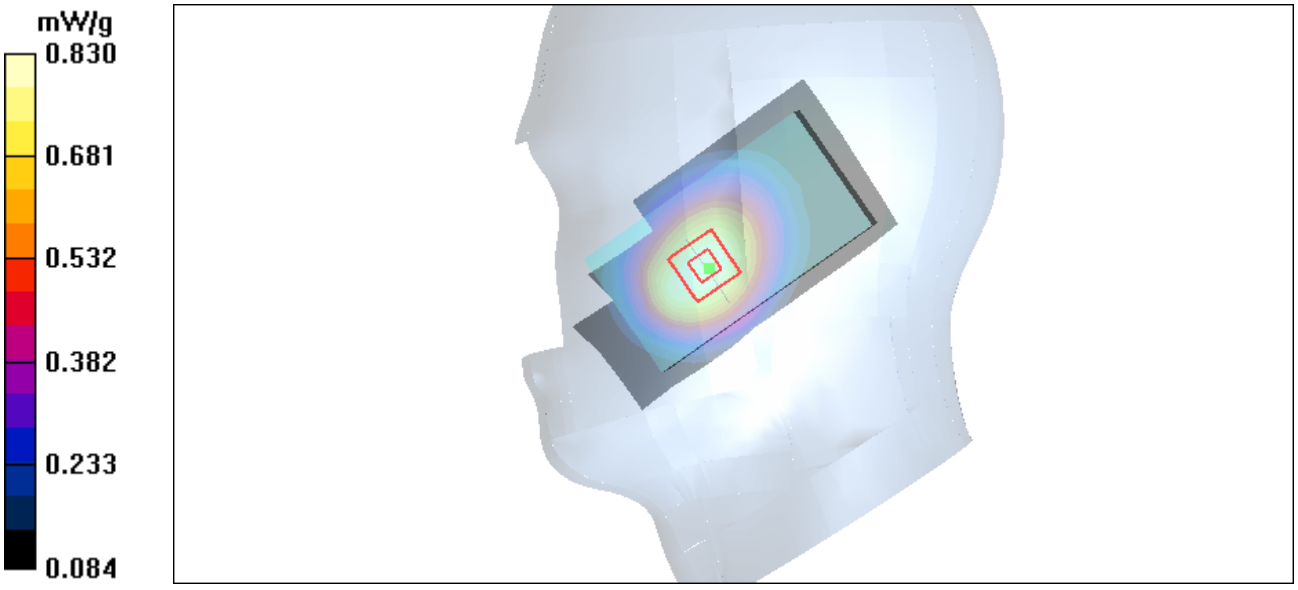
Figure 15 Left Hand Tilt 15° GSM 850 Channel 190

GSM 850 Right Cheek High

Date/Time: 5/22/2011 8:17:26 PM
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 0.915 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.849 mW/g

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.92 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.786 mW/g; SAR(10 g) = 0.585 mW/g
Maximum value of SAR (measured) = 0.830 mW/g



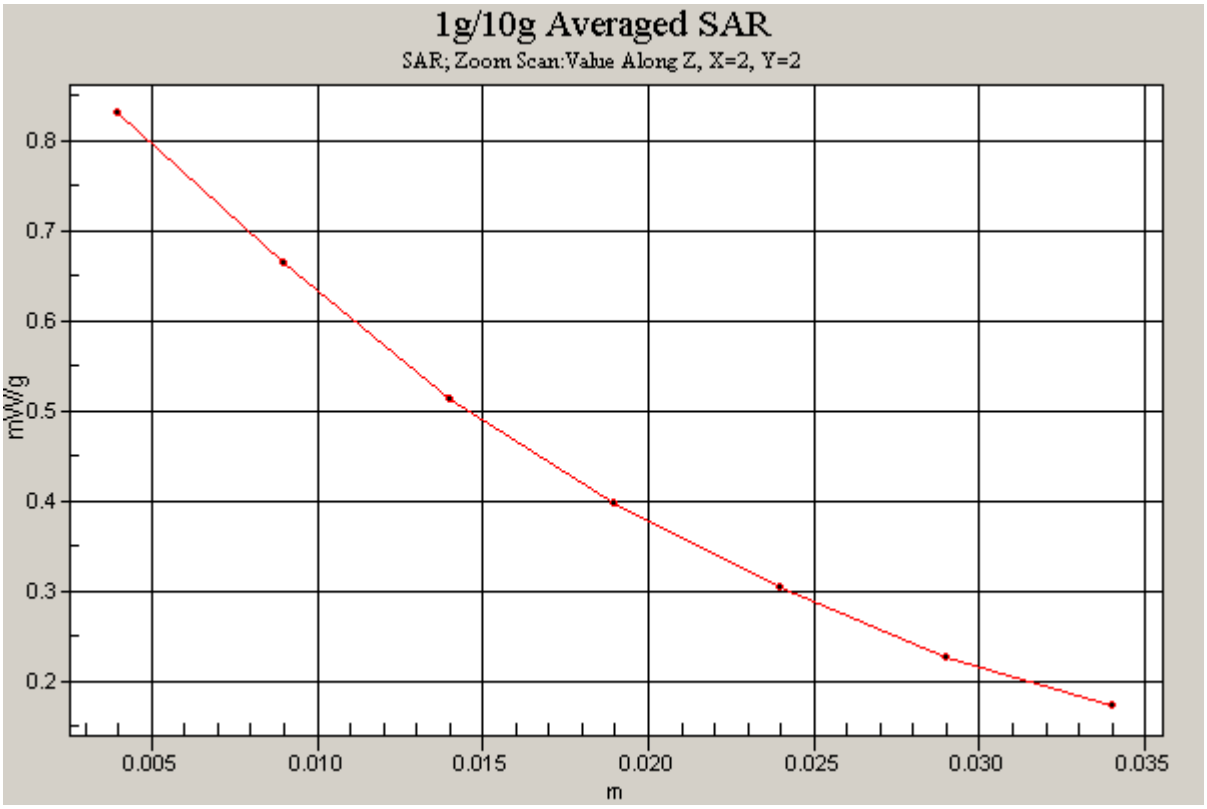


Figure 16 Right Hand Touch Cheek GSM 850 Channel 251

GSM 850 Right Cheek Middle

Date/Time: 5/22/2011 8:04:35 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.905 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.787 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.59 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 0.884 W/kg
SAR(1 g) = 0.729 mW/g; SAR(10 g) = 0.541 mW/g
Maximum value of SAR (measured) = 0.768 mW/g

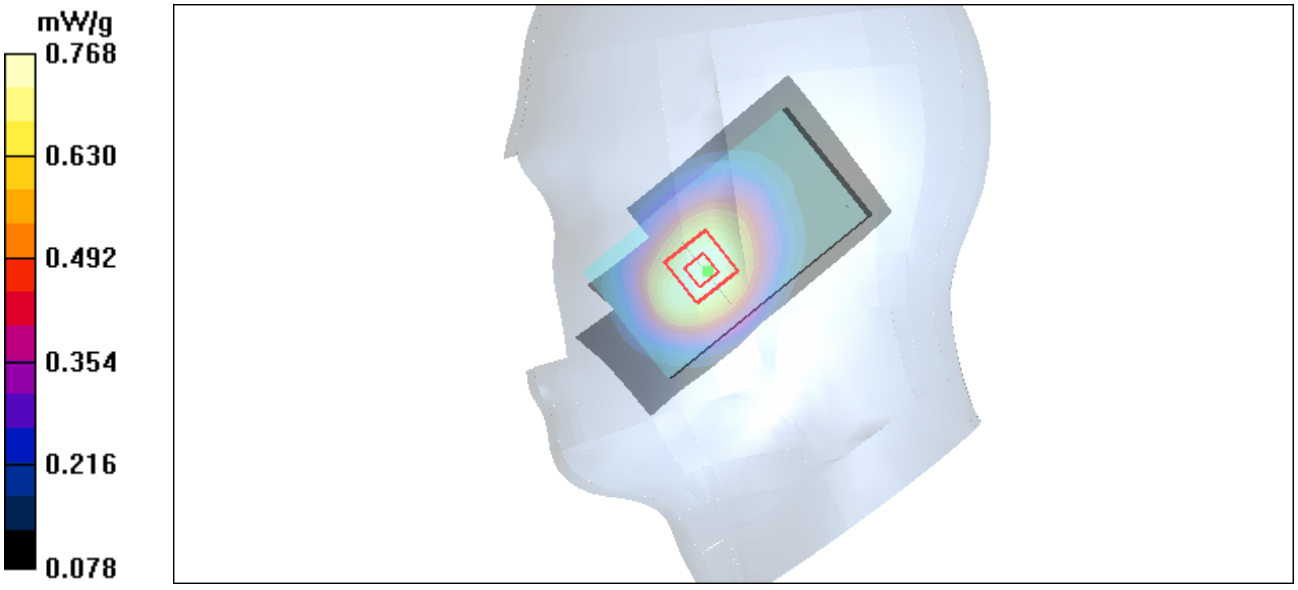


Figure 17 Right Hand Touch Cheek GSM 850 Channel 190

GSM 850 Right Cheek Low

Date/Time: 5/22/2011 8:31:35 PM
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.894 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.798 mW/g

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.81 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.885 W/kg
SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.558 mW/g
Maximum value of SAR (measured) = 0.776 mW/g

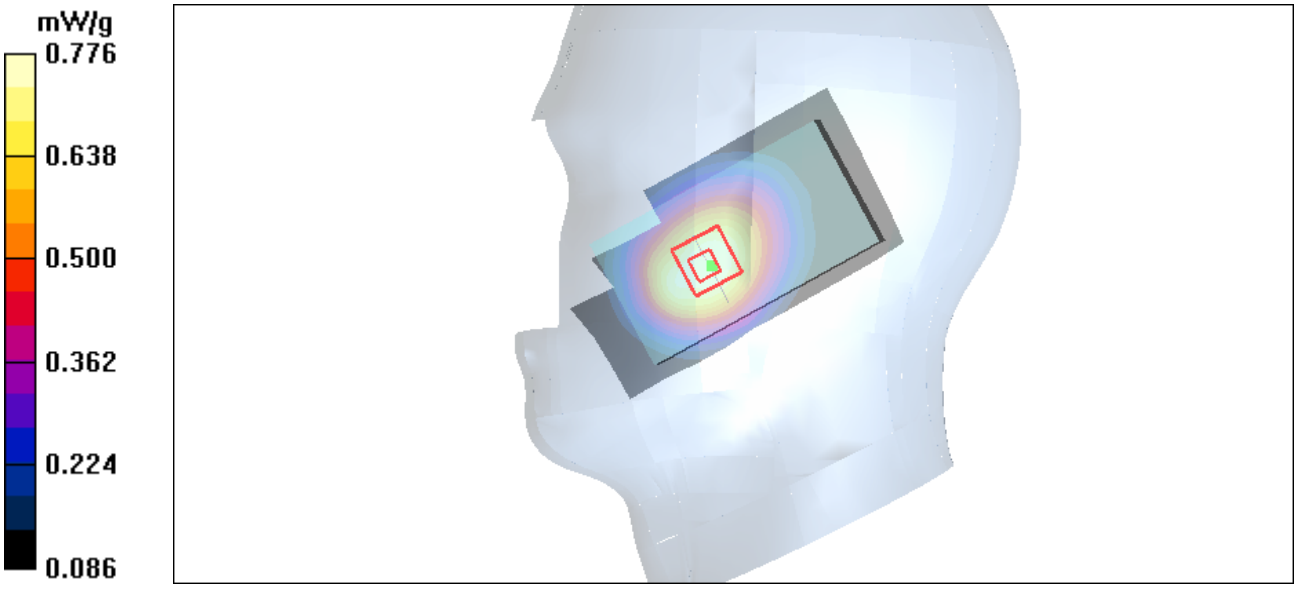


Figure 18 Right Hand Touch Cheek GSM 850 Channel 128

GSM 850 Right Tilt Middle

Date/Time: 5/22/2011 8:44:54 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.905 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Right Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(9.5, 9.5, 9.5); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.343 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.6 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.390 W/kg
SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.247 mW/g
Maximum value of SAR (measured) = 0.344 mW/g

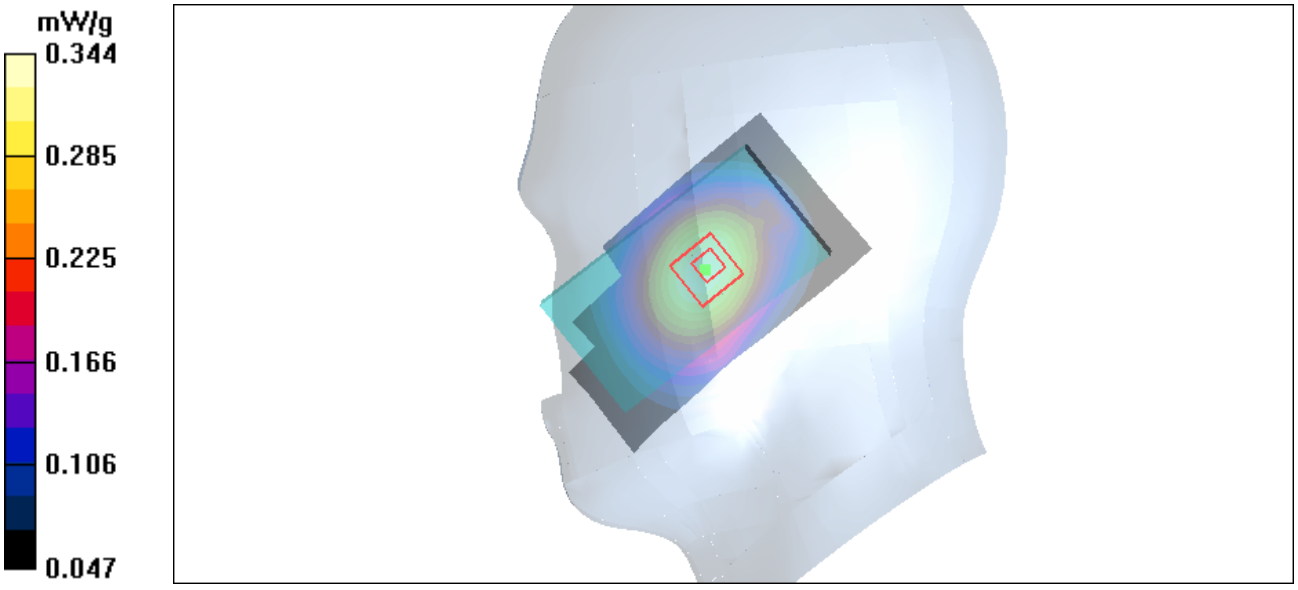


Figure 19 Right Hand Tilt 15° GSM 850 Channel 190

GSM 850 Towards Ground Middle

Date/Time: 5/21/2011 10:06:35 PM
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.996 mho/m; ε_r = 56.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Ground Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.516 mW/g

Towards Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.45 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.359 mW/g
Maximum value of SAR (measured) = 0.525 mW/g

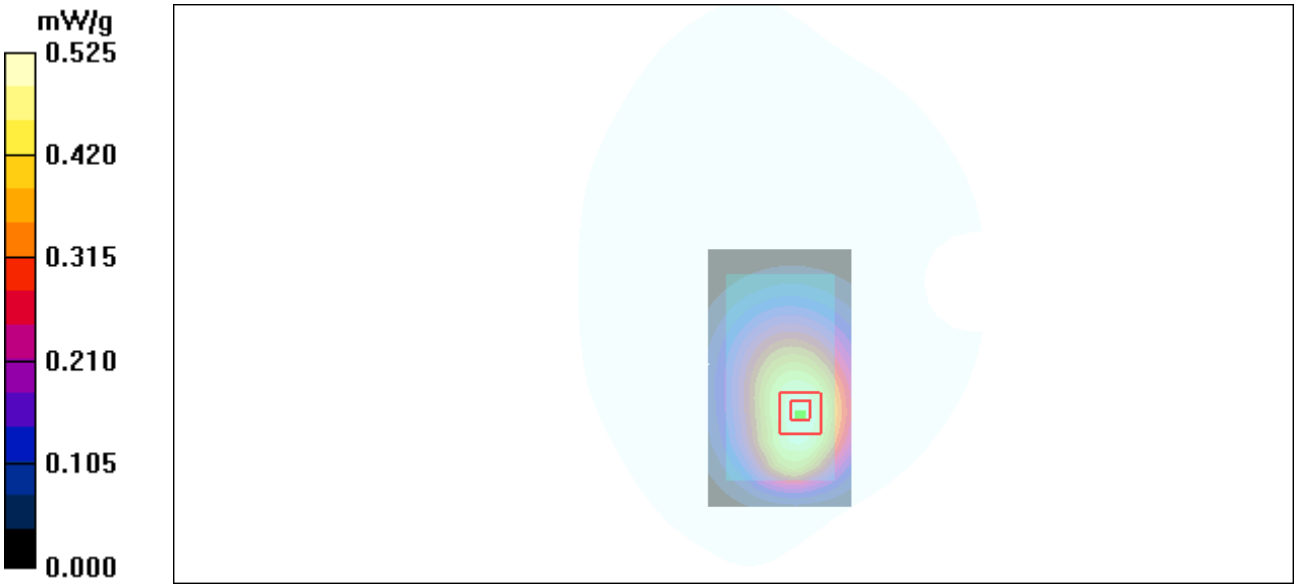


Figure 20 Body, Towards Ground, GSM 850 Channel 190

GSM 850 GPRS (2TXslots) Towards Ground Middle

Date/Time: 5/21/2011 8:56:40 PM
Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 837 MHz; σ = 0.996 mho/m; ε_r = 56.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.672 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.72 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.809 W/kg
SAR(1 g) = 0.638 mW/g; SAR(10 g) = 0.465 mW/g
Maximum value of SAR (measured) = 0.677 mW/g

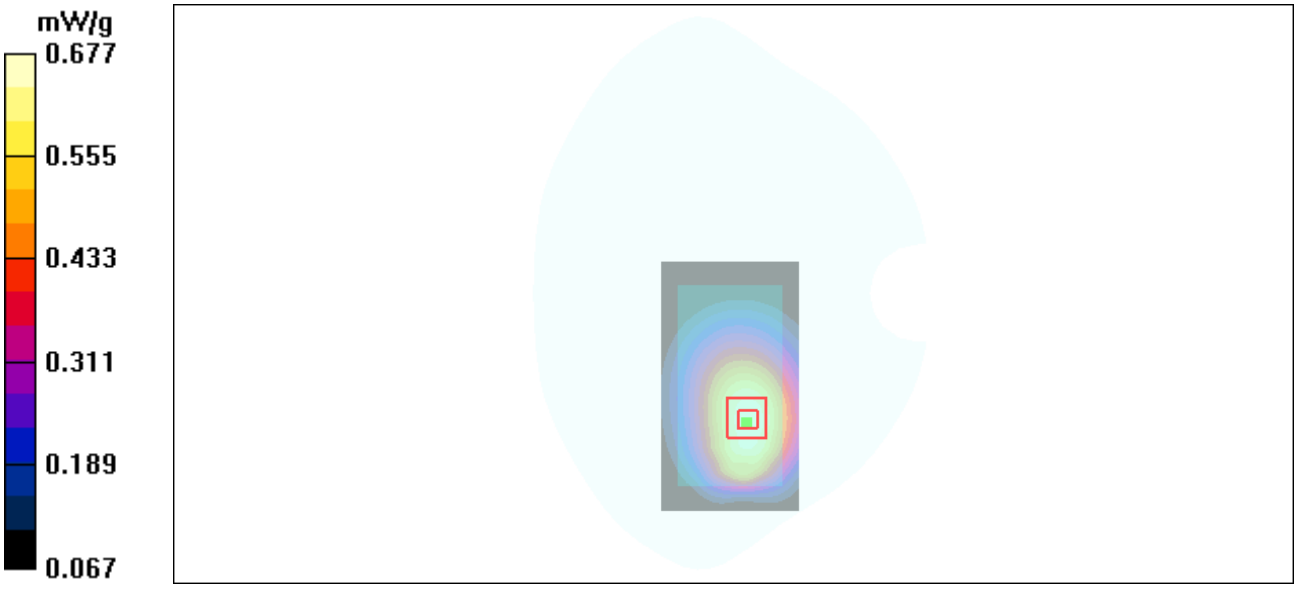


Figure 21 Body, Towards Ground, GSM 850 GPRS (2TXslots) Channel 190

GSM 850 GPRS (3TXslots) Towards Ground Middle

Date/Time: 5/21/2011 9:09:17 PM
Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz;Duty Cycle: 1:2.767
Medium parameters used: f = 837 MHz; σ = 0.996 mho/m; ε_r = 56.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.703 mW/g

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.0 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.858 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.490 mW/g
Maximum value of SAR (measured) = 0.714 mW/g

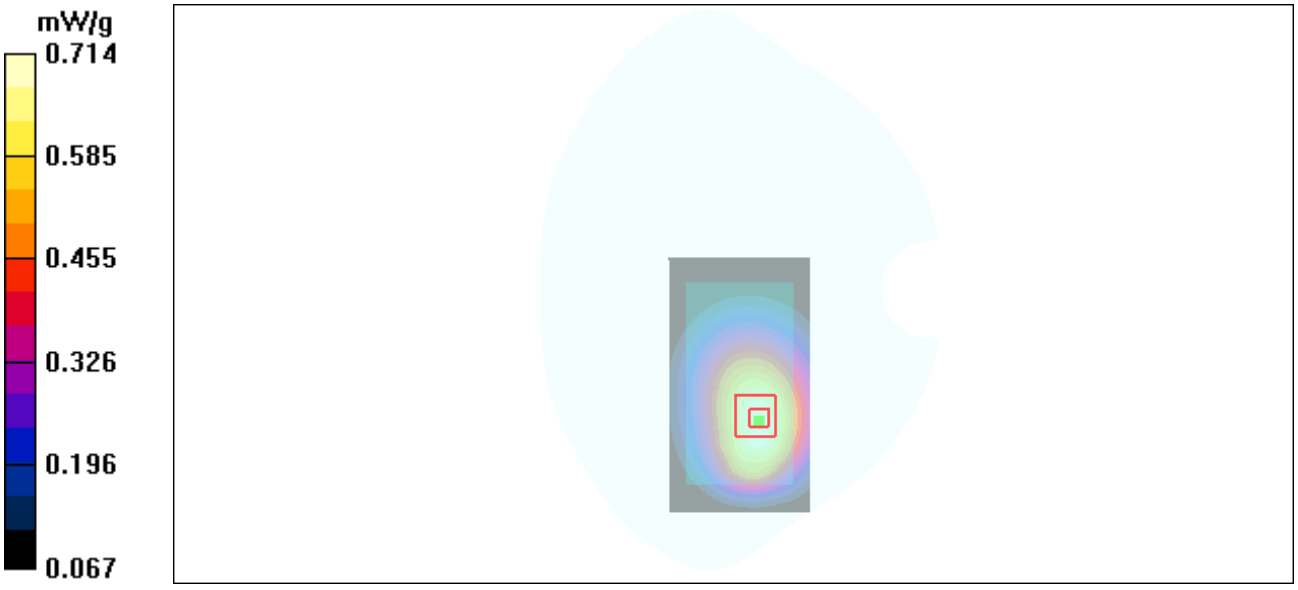


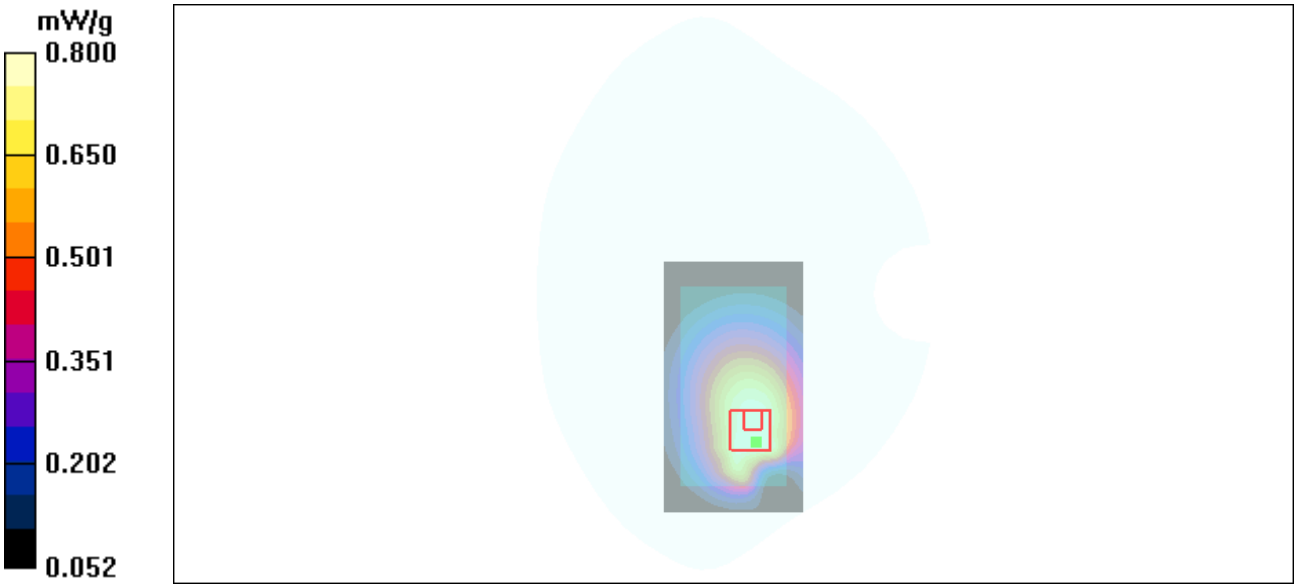
Figure 22 Body, Towards Ground, GSM 850 GPRS (3TXslots) Channel 190

GSM 850 GPRS (4TXslots) Towards Ground High

Date/Time: 5/21/2011 9:53:11 PM
Communication System: GSM850 + GPRS(4Up); Frequency: 848.8 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Ground High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.856 mW/g

Towards Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.964 W/kg
SAR(1 g) = 0.751 mW/g; SAR(10 g) = 0.534 mW/g
Maximum value of SAR (measured) = 0.800 mW/g



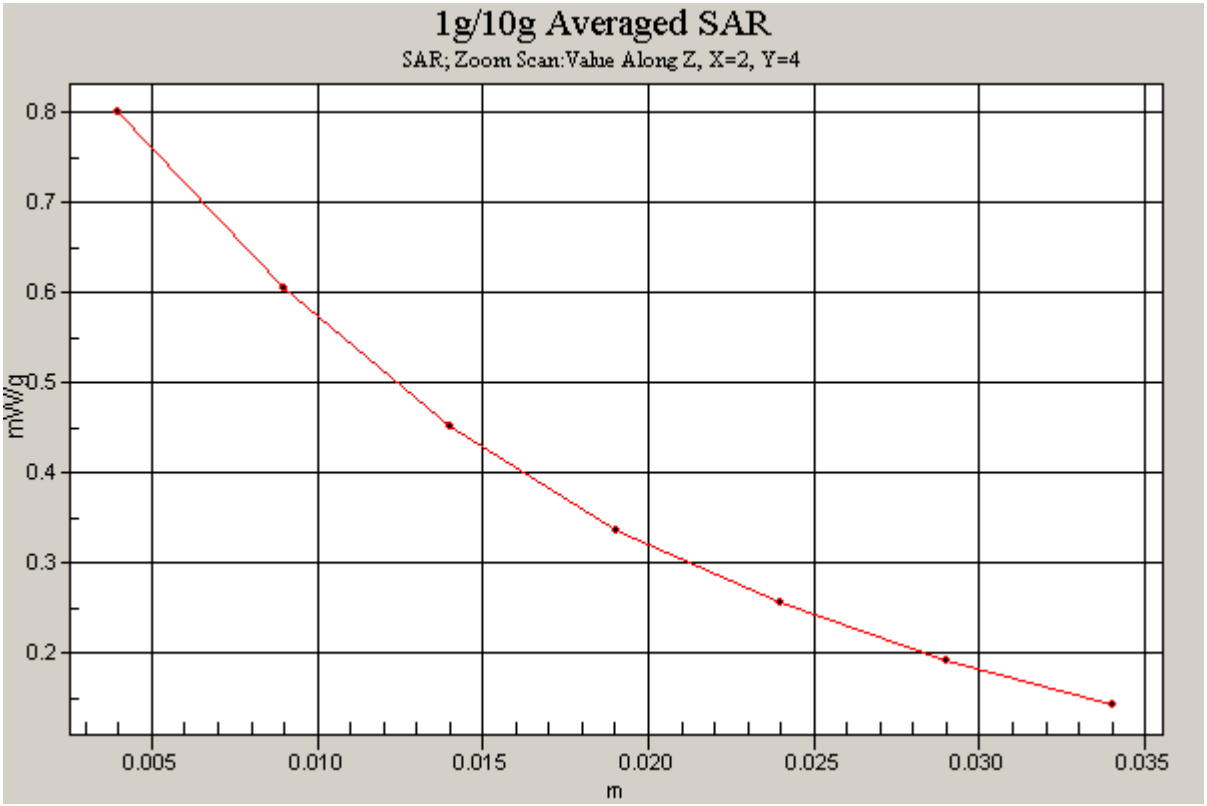


Figure 23 Body, Towards Ground, GSM 850 GPRS (4TXslots) Channel 251

GSM 850 GPRS (4TXslots) Towards Ground Middle

Date/Time: 5/21/2011 9:21:55 PM
Communication System: GSM850 + GPRS(4Up); Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 837 MHz; σ = 0.996 mho/m; ε_r = 56.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Ground Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.746 mW/g

Towards Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.511 mW/g
Maximum value of SAR (measured) = 0.744 mW/g

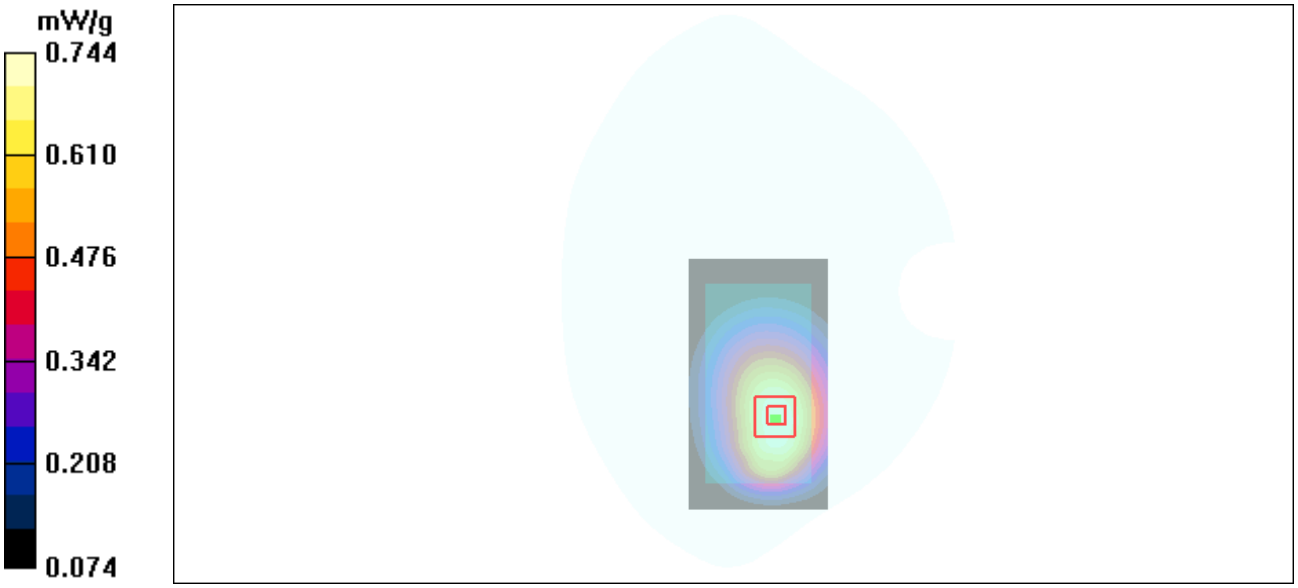


Figure 24 Body, Towards Ground, GSM 850 GPRS (4TXslots) Channel 190

GSM 850 GPRS (4TXslots) Towards Ground Low

Date/Time: 5/21/2011 9:35:27 PM
Communication System: GSM850 + GPRS(4Up); Frequency: 824.2 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.985 mho/m; ε_r = 56.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Ground Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.806 mW/g

Towards Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 0.917 W/kg
SAR(1 g) = 0.716 mW/g; SAR(10 g) = 0.515 mW/g
Maximum value of SAR (measured) = 0.754 mW/g
Towards Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.624 mW/g; SAR(10 g) = 0.427 mW/g
Maximum value of SAR (measured) = 0.704 mW/g

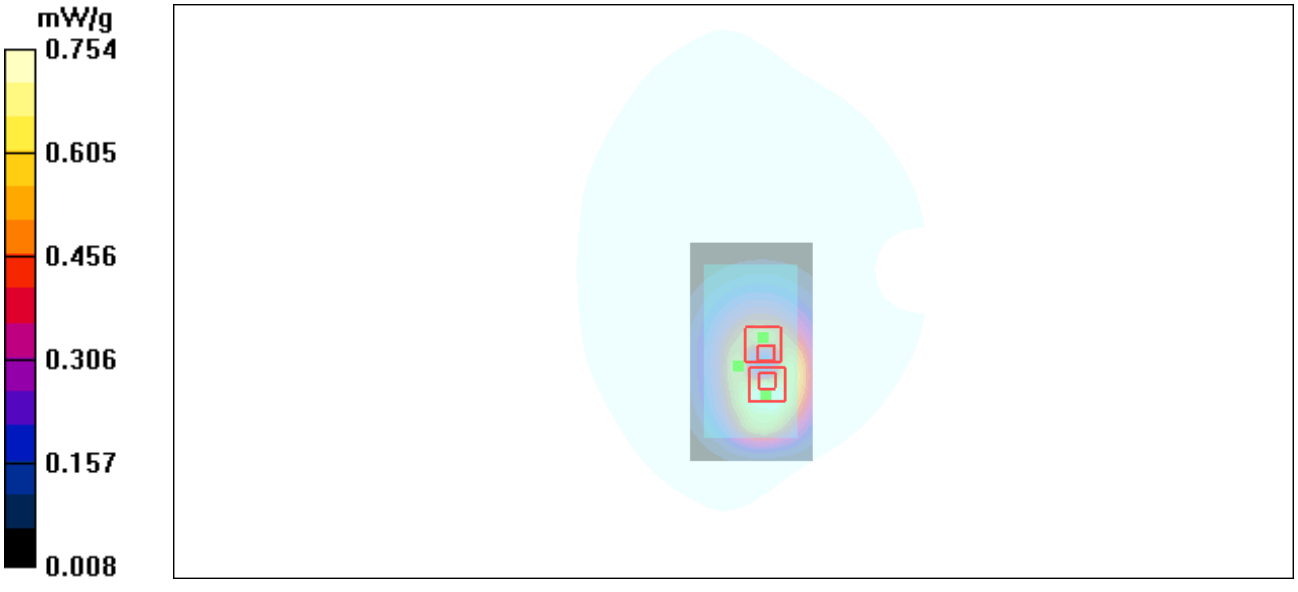


Figure 25 Body, Towards Ground, GSM 850 GPRS (4TXslots) Channel 128

GSM 850 GPRS (4TXslots) Towards Phantom Middle

Date/Time: 5/21/2011 10:22:15 PM
Communication System: GSM850 + GPRS(4Up); Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 837 MHz; σ = 0.996 mho/m; ε_r = 56.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.629 mW/g

Towards Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.27 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.742 W/kg
SAR(1 g) = 0.594 mW/g; SAR(10 g) = 0.439 mW/g
Maximum value of SAR (measured) = 0.629 mW/g

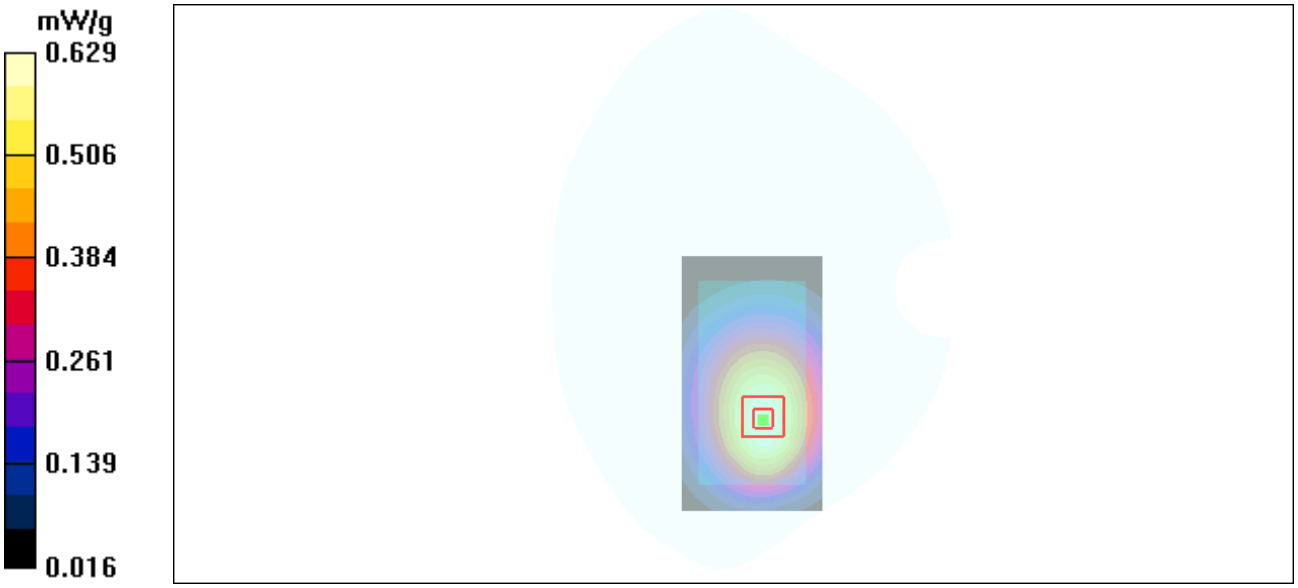


Figure 26 Body, Towards Phantom, GSM 850 GPRS (4TXslots) Channel 190

GSM 850 with Earphone Towards Ground High

Date/Time: 5/21/2011 9:54:09 AM
Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY4 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1246
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Towards Ground High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.635 mW/g

Towards Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.63 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.769 W/kg
SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.436 mW/g
Maximum value of SAR (measured) = 0.642 mW/g

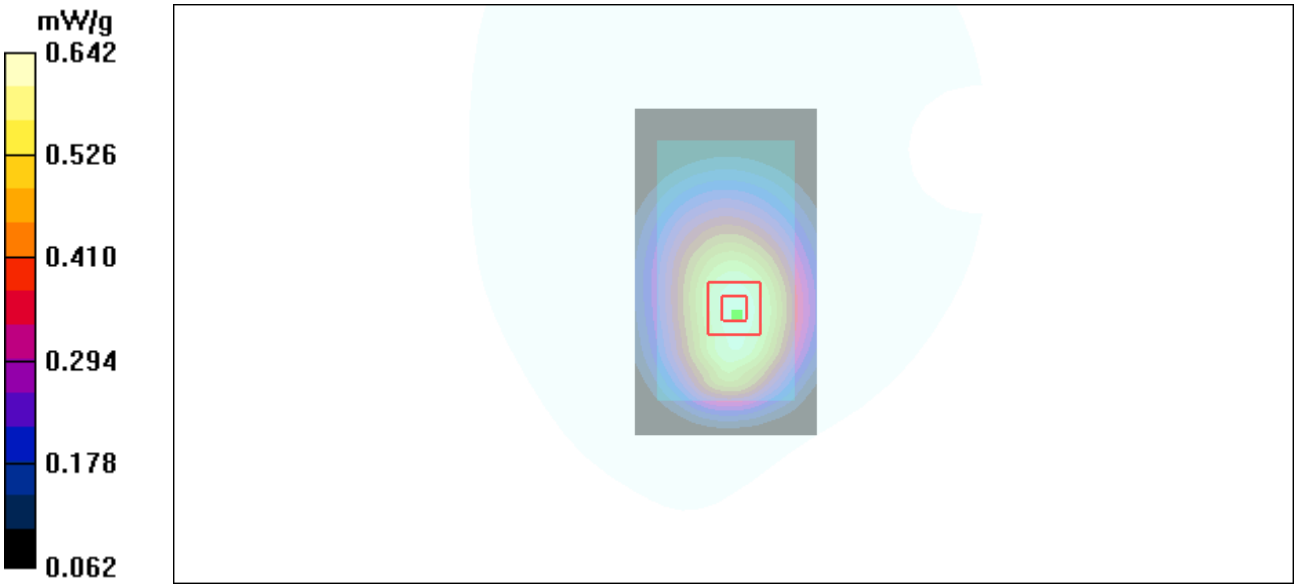


Figure 27 Body with Earphone, Towards Ground, GSM 850 Channel 251