



Report No.: RZA2010-1485-2



OET 65

TEST REPORT

Product Name	HUAWEI Ideos Tablet S7
Model	S7-104
FCC ID	QISS7-104
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.



GENERAL SUMMARY

Product Name	HUAWEI Ideos Tablet S7	Model	S7-104
FCC ID	QISS7-104		
Report No.	RZA2010-1485-2		
Client	Huawei Technologies Co., Ltd.		
Manufacturer	Huawei Technologies Co., Ltd.		
Reference Standard(s)	<p>IEEE Std C95.1, 1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz</p> <p>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</p> <p>KDB 248227 D01 SAR meas for 802 11 a b g v01r02: SAR Measurement Procedures for 802.11a/b/g Transmitters</p> <p>KDB 616217 D03 SAR Supp Note and Netbook Laptop v01: SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers - supplement to KDB 616217.</p> <p>KDB 447498 D01 Mobile Portable RF Exposure v04: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies</p>		
Conclusion	<p>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.</p> <p>General Judgment: Pass</p> <p style="text-align: right;">(Stamp) Date of issue: September 28th 2010</p>		
Comment	The test result only responds to the measured sample.		

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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.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

1.2. Testing Laboratory

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1.3. Applicant Information

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1.4. Manufacturer Information

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1.5. Information of EUT

General Information

Device Type :	Portable Device		
Exposure Category:	Uncontrolled Environment / General Population		
Product Name:	HUAWEI Ideos Tablet S7		
IMEI:	354522040003100		
Hardware Version:	HIDS70IA Ver.C		
Software Version:	S7V100R001C01B01C		
Antenna Type:	Internal Antenna		
Device Operating Configurations :			
Supporting Mode(s):	GSM 850/1900; (tested) WCDMA Band II/V; (tested) WIFI; (tested) BT;		
Device Class:	B		
Test Modulation:	(GSM)GMSK; (WCDMA) QPSK		
GPRS multislots class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS multislots class(12):	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
HSDPA UE Category:	8		
HSUPA UE Category:	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)	
Operating Frequency Range(s):	Band	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

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Auxiliary Equipment Details

AE1:Battery

Model: HB5A4P2
Manufacturer: Huawei Technologies Co., Ltd.
SN: YGCA605HI12319275

Equipment Under Test (EUT) is HUAWEI Ideos Tablet S7. SAR is tested for the EUT respectively for GSM 850, GSM 1900, WCDMA Band II, WCDMA Band V and 802.11b in this report. SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels. The EUT has a GSM/WCDMA antenna which is used for Tx/Rx, and the other is BT/WIFI antenna which can be used for Tx/Rx.

The sample undergoing test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. The Maximum SAR_{1g} Values and Power of Each Tested Band

Maximum SAR Values

Band	Channel	Position	SAR _{1g} (W/kg)
GSM 850	251	Left side	0.557
GSM 1900	810	Back side	1.100
WCDMA Band II	9538	Back side	0.975
WCDMA Band V	4183	Left side	0.688
802.11b	6	Back side	1.010

The Maximum Power

Band		Max Conducted Power (dBm)	Max Average Power (dBm)
GSM 850	GPRS,3 time-slots	30.56	26.30
	EGPRS, 3 time-slots	30.72	26.46
GSM 1900	GPRS,4 time-slots	26.52	23.51
	EGPRS, 4 time-slots	26.51	23.50
WCDMA Band II		22.62	/
WCDMA Band V		22.62	/
802.11b		13.83	/

1.7. Test Date

The test is performed from September 24, 2010 to September 28, 2010.

2. Operational Conditions during Test

2.1. General Description of Test Procedures

Connection to the EUT is established via air interface with E5515C, and the EUT is set to maximum output power by E5515C. 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.

Since the EUT only has the data transfer function, but does not have the voice transfer function, the tests in the band of GSM 850 and GSM 1900 are performed in the mode of GPRS and EGPRS, The tests in the band of WCDMA Band II and WCDMA Band V are performed in the mode of WCDMA, HSDPA and HSUPA.

2.2. GSM Test Configuration

For the body SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. The EUT is commanded to operate at maximum transmitting power by E5515C. Using E5515C the power lever is set to "5" in SAR of GSM 850, set to "0" in SAR of GSM 1900. Since the EUT only has the data transfer function, but does not have the speech transfer function. The tests in the band of GSM 850 and GSM 1900 are only performed in the mode of GPRS and EGPRS. 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 timeslot 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 timeslot 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:

Output power of reductions:

GSM 850

GPRS (GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

EGPRS (8PSK):

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Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

EGPRS (GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

GSM 1900

GPRS (GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

EGPRS (8PSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

EGPRS (GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3
3	4.8
4	6.0

2.3. WCDMA Test Configuration

As the SAR body tests for WCDMA Band II and WCDMA band V, we established the radio link through call processing. The maximum output power were verified on high, middle and low channels for each test band according to 3GPP TS 34.121 with the following configuration:

- 1) 12.2kbps RMC, 64,144,384 kbps RMC with TPC set to all "1's"
- 2) Test loop Mode 1

For the output power, the configurations for the DPCCH and DPDCH₁ are as followed (EUT do not support the DPDCH_{2-n})

Table 1: The configurations for the DPCCH and DPDCH₁

	Channel Bit Rate(kbps)	Channel Symbol Rate(kcps)	Spreading Factor	Spreading Code Number	Bits/Slot
DPCCH	15	15	256	0	10
DPDCH ₁	15	15	256	64	10
	30	30	128	32	20
	60	60	64	16	40
	120	120	32	8	80
	240	240	16	4	160
	480	480	8	2	320
	960	960	4	1	640

SAR is tested with 12.2kps RMC and not required for other spreading codes (64,144, and 384 kbps RMC) and multiple DPDCH_n, because the maximum output power for each of these other configurations<0.25dB higher than 12.2kbps RMC and the multiple DPDCH_n is not applicable for the EUT.

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

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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(β_c, β_d), and HS-DPCCH power offset parameters(Δ_{ACK} , Δ_{NACK} , Δ_{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: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

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, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{hs} = 30/15$) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{hs} = 24/15$) with $\beta_{hs} = 24/15 * \beta_c$.

Note3: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 β_c/β_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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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

2.5. HSUPA Test Configuration

Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA.⁴⁰

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests.⁴¹ The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of 3 G device.

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Table 5: Sub-Test 5 Setup for Release 6 HSUPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽⁴⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-

DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the

signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the

signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Table 6: HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI (ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	11484	5.76
	4	4	10		20000	2.00
7 (No DPDCH)	4	8	2	2 SF2 & 2 SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.

UE Categories 1 to 6 supports QPSK only. UE Category 7 supports QPSK and 16QAM. (TS25.306-7.3.0)

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2.6. WIFI Test Configuration

For the 802.11b/g SAR body 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.

802.11b/g operating modes are tested independently according to the service requirements in each frequency band. 802.11b modes are tested on channels 1, 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”.

Table 7: “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 11 to 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”

2.7. Position of Module in Portable Devices

According to KDB 447498 D01 Mobile Portable RF Exposure v04 SAR is required for both back and edge with the most conservative exposure conditions, the EUT is tested at the following 5 test positions:

- Test Position 1: The backside of the EUT towards and directed tightly to touch the bottom of the flat phantom. (ANNEX I Picture 6)

- Test Position 2: The bottom side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 7)

SAR is required for GSM/WCDMA antenna, since it is the most conservative exposure conditions of the edge. (Please see ANNEX I Picture 5)

SAR is not required for WiFi antenna; this is not the most conservative antenna - to - user distance at edge mode. According to KDB 447498 4) ii) (2) –SAR is required only the edge with the most conservative exposure conditions, No SAR (Please see ANNEX I Picture 5)

- Test Position 3: The left side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 8)

SAR is required for GSM/WCDMA antenna, since it is the most conservative exposure conditions of the edge. (Please see ANNEX I Picture 5)

SAR is required for WiFi antenna; since it is the most conservative exposure conditions of the edge. (Please see ANNEX I Picture 5)

- Test Position 4: The top side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 9)

SAR is not required for GSM/WCDMA antenna; this is not the most conservative antenna - to - user distance at edge mode. According to KDB 447498 4) ii) (2) –SAR is required only the edge with the most conservative exposure conditions, No SAR(Please see ANNEX I Picture 5)

SAR is required for WiFi antenna, since it is the most conservative exposure conditions of the edge. (Please see ANNEX I Picture 5)

- Test Position 5: The right side of the EUT towards the bottom of the flat phantom. (ANNEX I Picture 10)

SAR is not required for GSM/WCDMA antenna; this is not the most conservative antenna - to - user distance at edge mode. According to KDB 447498 4) ii) (2) –SAR is required only the edge with the most conservative exposure conditions, No SAR(Please see ANNEX I Picture 5)

SAR is not required for WiFi antenna; this is not the most conservative antenna - to - user distance at edge mode. According to KDB 447498 4) ii) (2) –SAR is required only the edge with the most conservative exposure conditions, No SAR(Please see ANNEX I Picture 5)

3. SAR Measurements System Configuration

3.1. SAR Measurement Set-up

The DASY5 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 DASY5 measurement server.
- The DASY5 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
- DASY5 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.

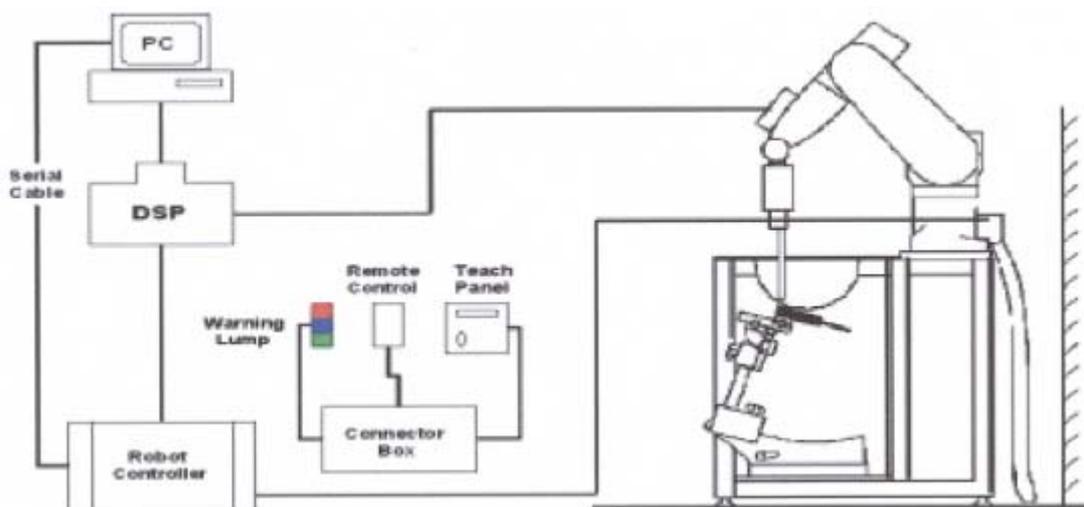


Figure 1. SAR Lab Test Measurement Set-up

3.2. DASY5 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 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/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 $\pm 10\%$. The spherical isotropy was evaluated and found to be better than $\pm 0.25\text{dB}$. 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 below 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.

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

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

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

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

3.3. Other Test Equipment

3.3.1. Device Holder for Transmitters

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.) It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4 and SAM v6.0 Phantoms.

Material: POM, Acrylic glass, Foam

3.3.2. Phantom

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (Oval Flat) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of wireless portable device usage as well as body mounted usage at the flat phantom region. A cover prevents 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 with the robot.

Filling Volume	Approx. 20 liters
Dimensions L x W)	810 x 1000 x 500 mm (H x Available
Special	



Figure 4.ELI4 Phantom

3.4. Scanning Procedure

The DASY5 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. $\pm 5\%$.
- The “surface check” measurement tests the optical surface detection system of the DASY5 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 $\pm 0.1\text{mm}$). 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 $\pm 30^\circ$.)
- 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 DASY5 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 DASY5 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 “.DA5”. 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 DASY5 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.

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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.

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

with SAR = local specific absorption rate in mW/g

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

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

ρ = equivalent tissue density in g/cm³

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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

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

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

3.6. System Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants 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 simulant, 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 12.

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

System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.

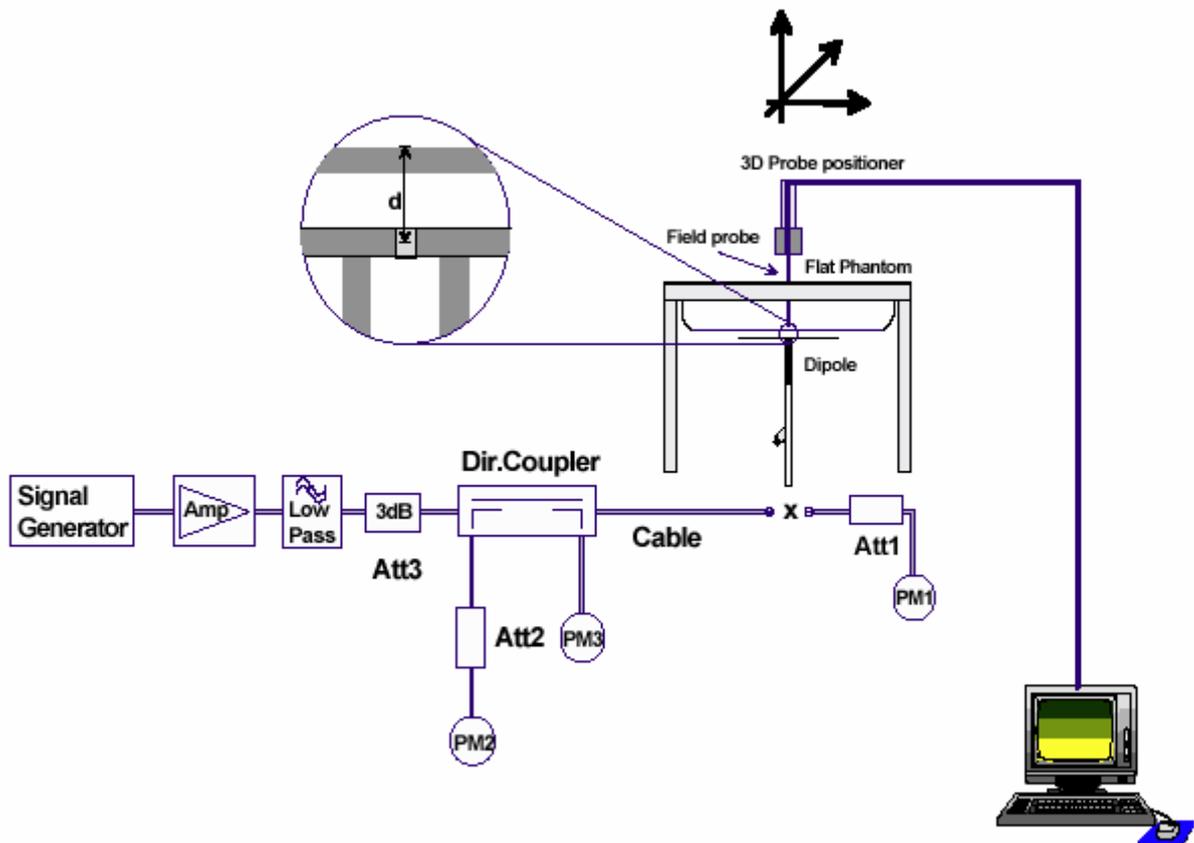


Figure 5. System Check Set-up

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3.7. Equivalent Tissues

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

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	$\epsilon=55.2$	$\sigma=0.97$

MIXTURE%	FREQUENCY (Body) 1900MHz		
Water	69.91		
Glycol monobutyl	29.96		
Salt	0.13		
Dielectric Parameters Target Value	f=1900MHz	$\epsilon=53.3$	$\sigma=1.52$

MIXTURE%	FREQUENCY(Body) 2450MHz		
Water	73.2		
Glycol	26.7		
Salt	0.1		
Dielectric Parameters Target Value	f=2450MHz	$\epsilon=52.70$	$\sigma=1.95$

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 Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

5.2. Applicable Measurement Standards

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 Radio frequency Electromagnetic Fields Additional Information for Evaluation Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio frequency Emissions

KDB 248227 D01 SAR meas for 802 11 a b g V01R02: SAR Measurement Procedures for 802.11a/b/g Transmitters

KDB 616217 D03 SAR Supp Note and Netbook Laptop v01: SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers – Supplement to KDB 616217

KDB 447498 D01 Mobile Portable RF Exposure v04: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

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

WCDMA Band II			Conducted Power(dBm)		
			Channel 9262	Channel 9400	Channel 9538
RMC	12.2kbps	Before	22.40	22.60	22.60
		After	22.41	22.62	22.61
	64kbps	Before	22.30	22.50	22.60
		After	22.29	22.51	22.59
	144kbps	Before	22.40	22.40	22.50
		After	22.41	22.42	22.51
	384kbps	Before	22.40	22.60	22.50
		After	22.39	22.62	22.51
HSDPA	Sub-Test 1	Before	22.50	22.50	22.50
		After	22.52	22.51	22.49
	Sub-Test 2	Before	22.20	22.00	21.80
		After	22.21	22.02	21.82
	Sub-Test 3	Before	21.70	21.50	21.60
		After	21.68	21.49	21.61
	Sub-Test 4	Before	21.60	21.70	21.50
		After	21.62	21.71	21.51
HSUPA	Sub-Test 1	Before	21.50	21.60	21.60
		After	21.51	21.62	21.62
	Sub-Test 2	Before	21.20	21.60	21.60
		After	21.19	21.61	21.61
	Sub-Test 3	Before	20.30	20.20	20.10
		After	20.31	20.22	20.12
	Sub-Test 4	Before	21.30	21.20	21.50
		After	21.28	21.22	21.51
Sub-Test 5	Before	21.20	21.10	20.80	
	After	21.21	21.12	20.78	
WCDMA Band V			Conducted Power(dBm)		

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			Channel 4132	Channel 4183	Channel 4233
RMC	12.2kbps	Before	22.50	22.50	22.60
		After	22.50	22.51	22.61
	64kbps	Before	22.60	22.50	22.50
		After	22.61	22.52	22.49
	144kbps	Before	22.50	22.40	22.60
		After	22.48	22.41	22.61
	384kbps	Before	22.60	22.50	22.50
		After	22.62	22.51	22.52
HSDPA	Sub-Test 1	Before	22.00	22.10	22.20
		After	22.01	22.12	22.21
	Sub-Test 2	Before	22.10	22.00	22.30
		After	22.09	22.01	22.30
	Sub-Test 3	Before	21.90	21.90	22.00
		After	21.91	21.89	22.01
	Sub-Test 4	Before	21.60	21.80	21.70
		After	21.61	21.80	21.72
HSUPA	Sub-Test 1	Before	21.50	21.40	21.60
		After	21.51	21.40	21.61
	Sub-Test 2	Before	21.40	21.70	21.80
		After	21.42	21.69	21.81
	Sub-Test 3	Before	20.40	20.60	20.50
		After	20.41	20.60	20.52
	Sub-Test 4	Before	20.40	21.50	21.60
		After	20.42	21.51	21.61
Sub-Test 5	Before	21.10	20.60	21.50	
	After	21.09	20.62	21.52	

GSM 850			Conducted Power(dBm)					Average power(dBm)		
			Channel 128	Channel 190	Channel 251	Channel 128		Channel 190	Channel 251	
GPRS (GMSK)	1TXslot	Before	32.45	32.18	32.64	-9.03dB	23.42	23.15	23.61	
		After	32.44	32.17	32.65	-9.03dB	23.41	23.14	23.62	
	2TXslots	Before	31.14	31.08	31.05	-6.02dB	25.12	25.06	25.03	
		After	31.15	31.09	31.06	-6.02dB	25.13	25.07	25.04	
	3TXslots	Before	30.56	30.53	30.54	-4.26dB	26.30	26.27	26.28	
		After	30.54	30.55	30.53	-4.26dB	26.28	26.29	26.27	
	4TXslots	Before	29.30	29.22	29.23	-3.01 dB	26.29	26.21	26.22	
		After	29.28	29.23	29.25	-3.01 dB	26.27	26.22	26.24	
EGPRS	1TXslot	Before	32.5	32.2	32.68	-9.03dB	23.47	23.17	23.65	

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(GMSK)		After	32.51	32.21	32.67	-9.03dB	23.48	23.18	23.64	
	2TXslots	Before	31.23	31.11	31.07	-6.02dB	25.21	25.09	25.05	
		After	31.24	31.12	31.08	-6.02dB	25.22	25.1	25.06	
	3TXslots	Before	30.7	30.66	30.57	-4.26 dB	26.44	26.4	26.31	
		After	30.72	30.65	30.56	-4.26 dB	26.46	26.39	26.3	
	4TXslots	Before	29.44	29.39	29.28	-3.01 dB	26.43	26.38	26.27	
		After	29.43	29.38	29.27	-3.01 dB	26.42	26.37	26.26	
	EGPRS (8PSK)	1TXslot	Before	27.64	27.50	27.50	-9.03dB	18.61	18.47	18.47
After			27.65	27.52	27.51	-9.03dB	18.62	18.49	18.48	
2TXslots		Before	25.4	25.36	25.48	-6.02dB	19.38	19.34	19.46	
		After	25.42	25.35	25.47	-6.02dB	19.4	19.33	19.45	
3TXslots		Before	24.34	24.30	24.20	-4.26 dB	20.08	20.04	19.94	
		After	24.35	24.31	24.22	-4.26 dB	20.09	20.05	19.96	
4TXslots		Before	23.41	23.45	23.55	-3.01 dB	20.4	20.44	20.54	
		After	23.42	23.46	23.53	-3.01 dB	20.41	20.45	20.52	
GSM 1900			Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810	
GPRS (GMSK)		1TXslot	Before	29.55	29.54	29.40	-9.03dB	20.52	20.51	20.37
	After		29.54	29.56	29.41	-9.03dB	20.51	20.53	20.38	
	2TXslots	Before	28.70	28.41	28.35	-6.02dB	22.68	22.39	22.33	
		After	28.71	28.42	28.34	-6.02dB	22.69	22.4	22.32	
	3TXslots	Before	27.64	27.8	27.74	-4.26 dB	23.38	23.54	23.48	
		After	27.65	27.81	27.72	-4.26 dB	23.39	23.55	23.46	
	4TXslots	Before	26.50	26.35	26.02	-3.01 dB	23.49	23.34	23.01	
		After	26.52	26.36	26.03	-3.01 dB	23.51	23.35	23.02	
EGPRS (GMSK)	1TXslot	Before	29.44	29.36	29.3	-9.03dB	20.41	20.33	20.27	
		After	29.43	29.35	29.31	-9.03dB	20.4	20.32	20.28	
	2TXslots	Before	28.68	28.4	28.35	-6.02dB	22.66	22.38	22.33	
		After	28.65	28.41	28.36	-6.02dB	22.63	22.39	22.34	
	3TXslots	Before	27.6	27.7	27.71	-4.26 dB	23.34	23.44	23.45	
		After	27.62	27.71	27.72	-4.26 dB	23.36	23.45	23.46	
	4TXslots	Before	26.5	26.4	26.18	-3.01 dB	23.49	23.39	23.17	
		After	26.51	26.42	26.17	-3.01 dB	23.5	23.41	23.16	
EGPRS (8PSK)	1TXslot	Before	26.54	26.53	26.14	-9.03dB	17.51	17.5	17.11	
		After	26.55	26.52	26.13	-9.03dB	17.52	17.49	17.1	
	2TXslots	Before	24.67	24.4	24.3	-6.02dB	18.65	18.38	18.28	
		After	24.66	24.41	24.32	-6.02dB	18.64	18.39	18.3	
	3TXslots	Before	23.41	23.44	23.4	-4.26 dB	19.15	19.18	19.14	
		After	23.42	23.43	23.41	-4.26 dB	19.16	19.17	19.15	
	4TXslots	Before	22.61	22.74	22.68	-3.01 dB	19.6	19.73	19.67	
		After	22.62	22.75	22.67	-3.01 dB	19.61	19.74	19.66	

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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- slot = 2 transmit time slots out of 8 time slots

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

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

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

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

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

7. Test Results

7.1. Dielectric Performance

Table 11: Dielectric Performance of Body Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp °C
		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 2010-9-25	55.38	1.00	21.5
1900MHz (body)	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2010-9-24	53.01	1.53	21.7
2450MHz (body)	Target value ±10% window	52.70 50.07 — 55.34	1.95 1.85 — 2.05	/
	Measurement value 2010-9-27	51.83	1.92	21.7

7.2. System Check

Table 12: System Check for Body Tissue Simulating Liquid

Frequency	Description	SAR(W/kg)		Dielectric Parameters		Temp °C
		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 2010-9-25	1.68	2.56	55.38	1.00	21.5
1900 MHz	Recommended result ±10% window	5.52 4.97 — 6.07	10.3 9.27 — 11.33	53.5	1.54	/
	Measurement value 2010-9-24	5.50	10.28	53.01	1.53	21.7
2450MHz	Recommended value ±10% window	5.97 5.37—6.57	13 11.7 — 14.3	51.8	2.01	/
	Measurement value 2010-9-27	6.46	14.00	51.83	1.92	21.7

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.

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7.3. Summary of Measurement Results

7.3.1. GSM 850 (GPRS/EGPRS)

Table 13: SAR Values [GSM 850 (GPRS/EGPRS)]

Limit of SAR			10 g Average	1g Average	Power Drift	Graph Results
			2.0 W/kg	1.6 W/kg	± 0.21 dB	
Test Case Of Body			Measurement Result (W/kg)		Power Drift (dB)	
Different Test Position	Different Timeslots	Channel	10 g Average	1 g Average		
Test Position 1	4 timeslots	Middle	0.243	0.416	-0.079	Figure 9
	3 timeslots	Middle	0.280	0.472	0.015	Figure 10
	2 timeslots	Middle	0.259	0.435	0.020	Figure 11
	1 timeslot	Middle	0.261	0.442	-0.030	Figure 12
Test Position 2	3 timeslots	Middle	0.099	0.165	0.112	Figure 13
Test Position 3	3 timeslots	High	0.342	0.556	-0.058	Figure 14
		Middle	0.327	0.531	-0.016	Figure 15
		Low	0.313	0.511	-0.017	Figure 16
Worst Case Position of GPRS with Earphone						
Test Position 3	3 timeslots	High	0.301	0.508	-0.089	Figure 17
Worst Case Position of GPRS with EGPRS (GMSK)						
Test Position 3	3 timeslots	High	0.342	0.557	-0.057	Figure 18

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

2. 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 (< 0.8W/kg) lower than the SAR limit, testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst case.
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.

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Table 14: Extrapolated SAR Values of highest measured SAR [GSM 850 (GPRS/EGPRS)]

Limit of SAR			Conducted Power	1g Average	Tune-up Procedures	1g Average
				1.6 W/kg		1.6
Test Case			Measurement Result (dBm)	Measurement Result (W/kg)	maximum Power(dBm)	Extrapolated Result (W/kg)
Test Position	Different Timeslots	Channel				
GPRS						
Test Position 3	3 timeslots	High	30.54	0.556	31.2	0.647
EGPRS (GMSK)						
Test Position 3	3 timeslots	High	30.57	0.557	31.7	0.723

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7.3.2. GSM 1900 (GPRS/EGPRS)

Table 15: SAR Values [GSM 1900 (GPRS/EGPRS)]

Limit of SAR			10 g Average	1g Average	Power Drift	Graph Results
			2.0 W/kg	1.6 W/kg	± 0.21 dB	
Test Case Of Body			Measurement Result (W/kg)		Power Drift (dB)	
Different Test Position	Different Timeslots	Channel	10 g Average	1 g Average		
Test Position 1	4 timeslots	High	0.517	1.080	0.041	Figure 19
		Middle	0.488	1.020	-0.035	Figure 20
		Low	0.385	0.787	0.002	Figure 21
	3 timeslots	High	0.507	1.050	0.092	Figure 22
		Middle	0.482	1.010	0.062	Figure 23
		Low	0.375	0.766	0.019	Figure 24
	2 timeslots	High	0.524	1.080	0.020	Figure 25
		Middle	0.500	1.040	0.099	Figure 26
		Low	0.387	0.791	0.042	Figure 27
	1 timeslot	High	0.527	1.080	0.090	Figure 28
		Middle	0.502	1.040	0.016	Figure 29
		Low	0.390	0.793	0.190	Figure 30
Test Position 2	1 timeslot	Middle	0.285	0.556	-0.026	Figure 31
Test Position 3	1 timeslot	Middle	0.249	0.532	-0.184	Figure 32
Worst Case Position of GPRS with Earphone						
Test Position 1	1 timeslot	High	0.506	1.030	0.070	Figure 33
Worst Case Position of GPRS with EGPRS (GMSK)						
Test Position 1	1 timeslot	High	0.530	1.100	0.140	Figure 34

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

2. 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 (< 0.8W/kg) lower than the SAR limit, testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst case.
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.

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Table 16: Extrapolated SAR Values of highest measured SAR [GSM 1900 (GPRS/EGPRS)]

Limit of SAR			Conducted Power	1g Average	Tune-up Procedures	1g Average
				1.6 W/kg		1.6
Test Case			Measurement Result (dBm)	Measurement Result (W/kg)	maximum Power(dBm)	Extrapolated Result (W/kg)
Test Position	Different Timeslots	Channel				
GPRS						
Test Position 1	1 timeslot	High	29.41	1.080	30.2	1.295
EGPRS (GMSK)						
Test Position 1	1 timeslot	High	29.31	1.100	30.2	1.350

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7.3.3. WCDMA Band II (WCDMA/HSDPA/HSUPA)

Table 17: SAR Values [WCDMA Band II (WCDMA/HSDPA/HSUPA)]

Limit of SAR		10 g Average	1g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
Different Test Position	Channel	10 g Average	1 g Average		
Test Position 1	High	0.473	0.975	0.060	Figure 35
	Middle	0.447	0.930	0.060	Figure 36
	Low	0.359	0.737	0.010	Figure 37
Test Position 2	Middle	0.219	0.416	0.070	Figure 38
Test Position 3	Middle	0.188	0.402	-0.008	Figure 39
Worst Case Position of RMC with Earphone					
Test Position 1	High	0.443	0.904	0.007	Figure 40
Worst Case Position of RMC with HSDPA					
Test Position 1	High	0.456	0.962	0.060	Figure 41
Worst Case Position of RMC with HSUPA					
Test Position 1	High	0.433	0.909	0.050	Figure 42

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

2. 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 (< 0.8W/kg) lower than the SAR limit, testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst case.

Table 18: Extrapolated SAR Values of Highest Measured SAR [WCDMA Band II (WCDMA/HSDPA/HSUPA)]

Limit of SAR		Conducted Power	1g Average	Tune-up Procedures maximum Power (dBm)	1g Average
			1.6 W/kg		1.6
Test Position	Channel	Measurement Result (dBm)	Measurement Result (W/kg)		Extrapolated Result (W/kg)
Test Position 1	High	22.61	0.975	23.2	1.117

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7.3.4. WCDMA Band V (WCDMA/HSDPA/HSUPA)

Table 19: SAR Values [WCDMA Band V (WCDMA/HSDPA/HSUPA)]

Limit of SAR		10 g Average	1g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
Different Test Position	Channel	10 g Average	1 g Average		
Test Position 1	Middle	0.377	0.643	0.000	Figure 43
Test Position 2	Middle	0.129	0.206	-0.001	Figure 44
Test Position 3	High	0.334	0.543	-0.029	Figure 45
	Middle	0.427	0.688	-0.001	Figure 46
	Low	0.368	0.596	-0.013	Figure 47
Worst Case Position of RMC with Earphone					
Test Position 3	Middle	0.326	0.543	-0.058	Figure 48
Worst Case Position of RMC with HSDPA					
Test Position 3	Middle	0.389	0.637	-0.069	Figure 49
Worst Case Position of RMC with HSUPA					
Test Position 3	Middle	0.327	0.526	-0.066	Figure 50

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

2. 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 (< 0.8W/kg) lower than the SAR limit, testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst case.

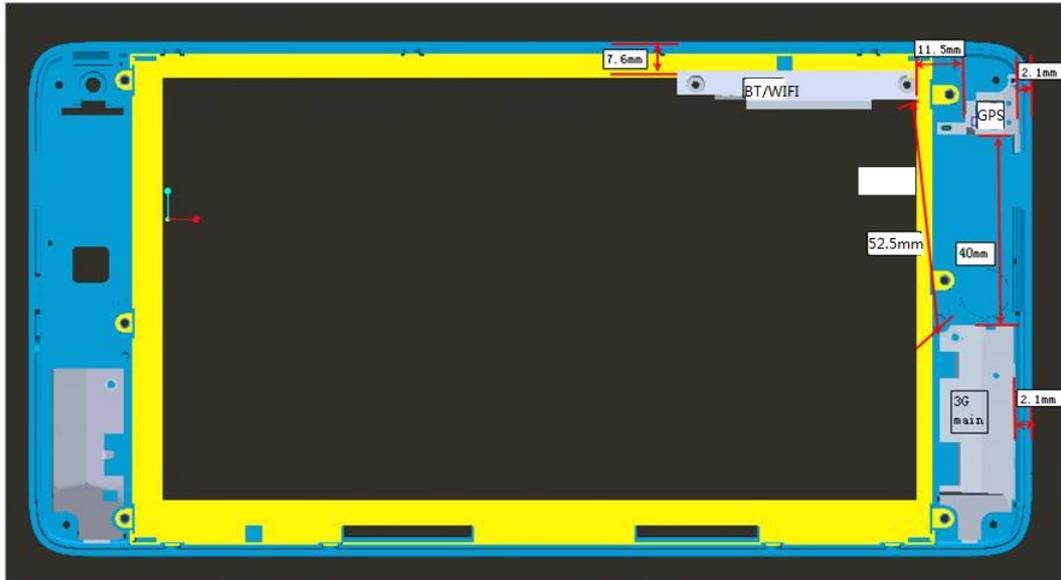
Table 20: Extrapolated SAR Values of Highest Measured SAR [WCDMA Band V (WCDMA/HSDPA/HSUPA)]

Limit of SAR		Conducted Power	1g Average	Tune-up Procedures maximum Power (dBm)	1g Average
			1.6 W/kg		1.6
Test Position	Channel	Measurement Result (dBm)	Measurement Result (W/kg)		Extrapolated Result (W/kg)
Test Position 3	Middle	22.51	0.688	23.4	0.844

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7.3.5. Bluetooth/WIFI Function

The distance between BT/WIFI antenna and GSM/WCDMA antenna is $>5\text{cm}$. The location of the antennas inside device is shown below:



The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
Peak Conducted Output Power(dBm)	4.38	4.38	4.38

The output power of WIFI antenna is as following:

Channel	Date Rate	Ch 1 2412 MHz	Ch 6 2437 MHz	Ch 11 2462 MHz
802.11b (dBm)	1M	13.74	13.83	13.57
	2M	13.44	13.54	13.40
	5.5M	13.36	13.42	13.40
	11M	13.62	13.71	13.56
802.11g (dBm)	6M	10.30	10.70	11.24
	9M	10.27	10.49	11.18
	12M	10.25	10.50	11.10
	18M	10.25	10.50	11.12
	24M	10.10	10.40	11.00
	54M	10.15	10.45	11.02
802.11n (dBm)	6.5M	8.42	8.27	8.96
	13M	8.41	8.27	8.97
	19.5M	8.42	8.26	8.94
	39M	8.40	8.27	8.94
	52M	8.40	8.26	8.95
	65M	8.39	8.26	8.92

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Note: SAR is not required for 802.11g/HT 20 channels when the maximum average output power is less than ¼ dB higher than measured on the corresponding 802.11b channels.

Stand-alone SAR

According to the conducted power measurement results, we can draw the conclusion that: stand-alone SAR is not required for BT, because the output power of BT transmitter is $< 60/f_{(GHz)}$ mW . stand-alone SAR are required for WIFI, because the output power of Wifi transmitter is $> 60/f_{(GHz)}$ mW.

Table 21: SAR Values [802.11b]

Limit of SAR		10 g Average	1g Average	Power Drift	Graph Results
		2.0 W/kg	1.6 W/kg	± 0.21 dB	
Test Case Of Body		Measurement Result (W/kg)		Power Drift (dB)	
Different Test Position	Channel	10 g Average	1 g Average		
Test Position 1	High	0.391	0.918	0.030	Figure 51
	Middle	0.431	1.010	0.010	Figure 52
	Low	0.366	0.853	-0.079	Figure 53
Test Position 3	Middle	0.001	0.009	0.030	Figure 54
Test Position 4	Middle	0.225	0.577	-0.082	Figure 55
Worst Case Position of 802.11b with Earphone					
Test Position 1	Middle	0.369	0.856	0.000	Figure 56

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

2. 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 ($< 0.8W/kg$) lower than the SAR limit, testing at the high and low channels is optional.
3. Upper and lower frequencies were measured at the worst case.

Simultaneous SAR

About BT antenna and GSM/WCDMA antenna, because stand-alone SAR are not required for BT antenna, so Simultaneous SAR are not required for BT and GSM/WCDMA antenna.

About WIFI antenna and GSM/WCDMA antenna,

According to KDB 447498 4/b)/iii/(1) – located < 5 cm from the edge and the sum of the stand-alone 1-g SAR is $<$ the SAR limit for these antennas or the SAR to peak location separation ratios are < 0.3 for all antenna pairs.

Finding: When the EUT is positioned at bottom face configuration, GSM/WCDMA antenna and WiFi antenna are within 5 cm to the body of user. The highest measured GSM/WCDMA at bottom face is 1.1 W/kg; the highest measured WiFi at bottom face is 1.01W/kg. The GSM/WCDMA and WiFi peak SAR location separation distance is 7.56 cm. The SAR-to-peak location ratio is $(1.1 + 1.01) / 7.56 = 0.28$

Conclusion: Simultaneous transmission SAR evaluation is not required since the SAR-to-peak location ratio is < 0.3

About BT and WiFi can't transmit simultaneously.

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8. Measurement Uncertainty

No.	source	Type	Uncertainty Value (%)	Probability Distribution	k	c _i	Standard uncertainty 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	2.9	5
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								

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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	5.0	N	1	0.64	3.2	∞
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
24	-liquid permittivity (measurement uncertainty)	B	5.0	N	1	0.6	3.0	∞
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$				12.0		
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N	k=2	24.0		

9. Main Test Instruments

Table 22: List of Main Instruments

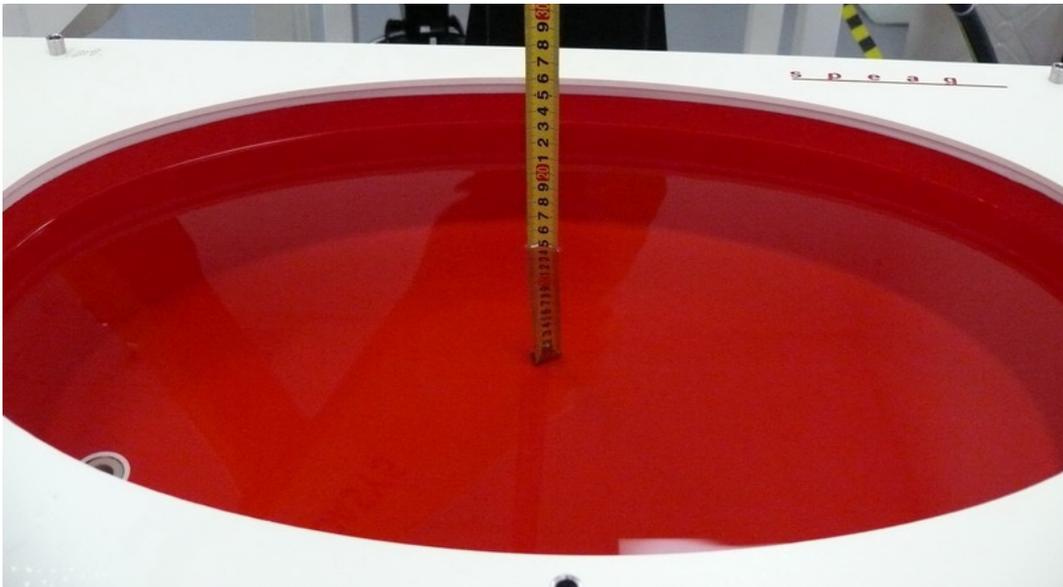
No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 13, 2010	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 13, 2010	One year
04	Power sensor	Agilent 8481H	MY41091316	March 26, 2010	One year
05	Signal Generator	HP 8341B	2730A00804	September 13, 2010	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	Validation Kit 835MHz	D835V2	4d092	January 14, 2010	One year
08	Validation Kit 1900MHz	D1900V2	5d018	June 15, 2010	One year
09	Validation Kit 2450MHz	D2450V2	712	February 19, 2010	One year
10	BTS	E5515C	MY48360988	December 4, 2009	One year
11	E-field Probe	EX3DV4	3661	December 30, 2009	One year
12	DAE	DAE4	871	November 11, 2009	One year

END OF REPORT BODY

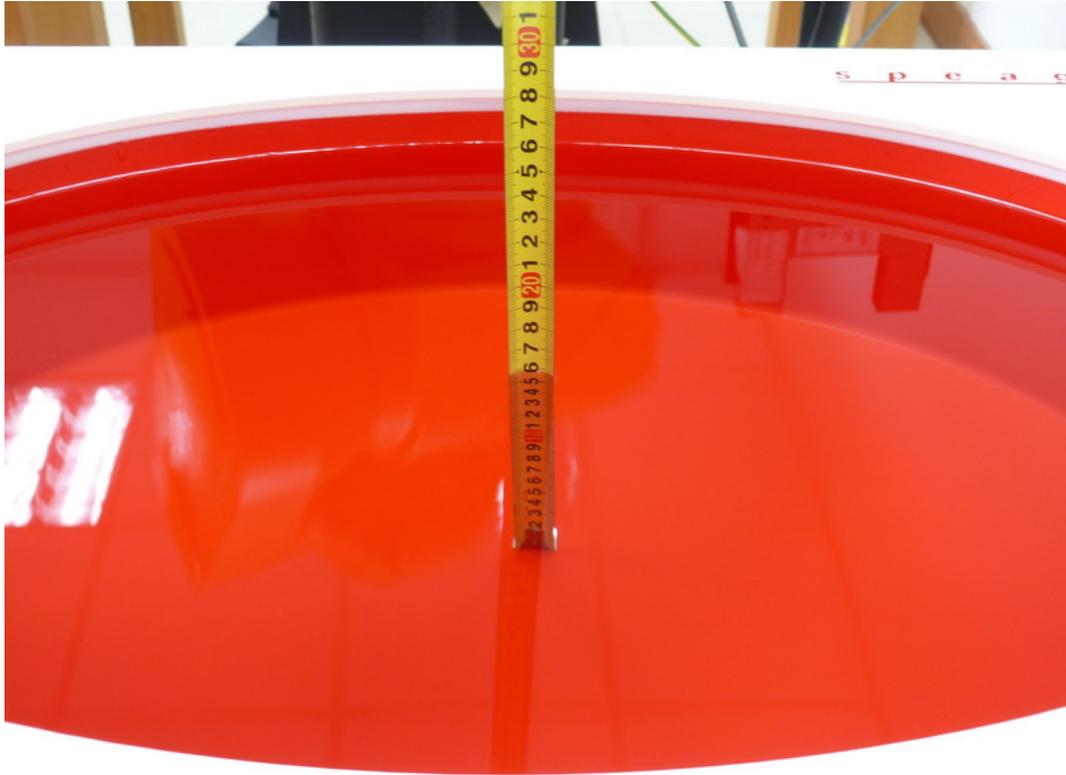
ANNEX A: Test Layout



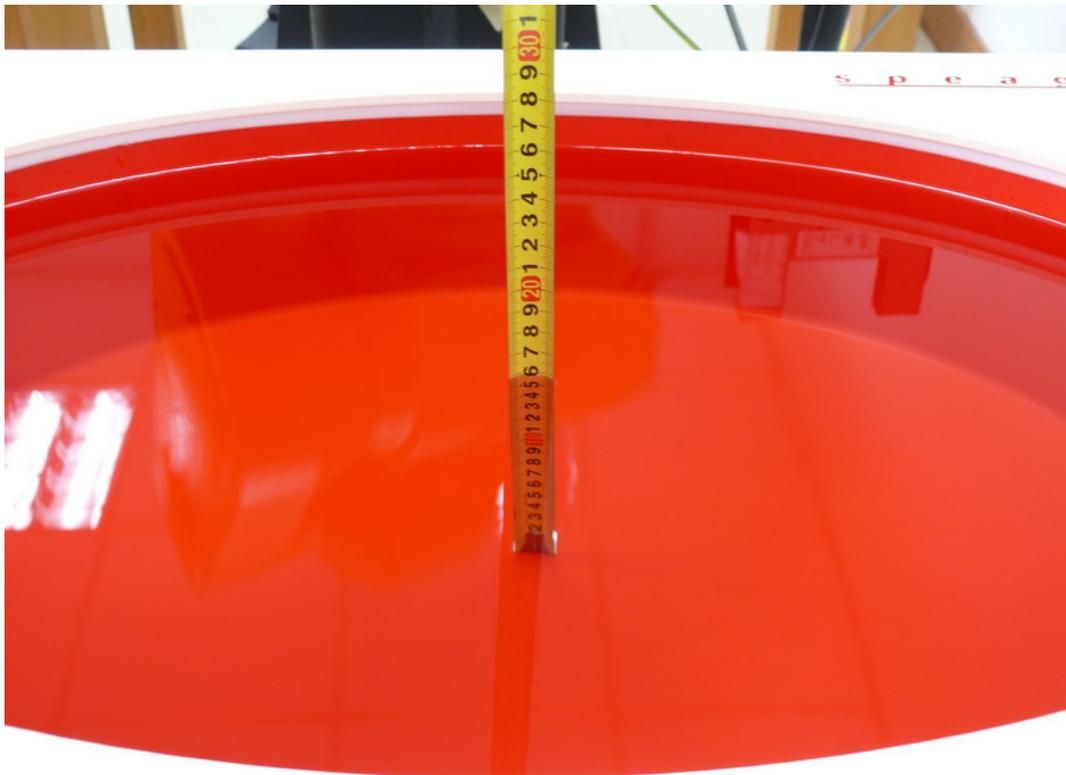
Picture 1: Specific Absorption Rate Test Layout



Picture 2: Liquid depth in the Flat Phantom (835 MHz, 15.1cm depth)



Picture 3: Liquid depth in the Flat Phantom (1900 MHz, 15.4cm depth)



Picture 4: Liquid depth in the flat Phantom (2450 MHz, 15.4cm depth)

ANNEX B: System Check Results

System Performance Check at 835 MHz

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

Date/Time: 9/25/2010 8:42:20 AM

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

Medium parameters used: $f = 835$ MHz; $\sigma = 1.00$ mho/m; $\epsilon_r = 55.38$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

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

Maximum value of SAR (interpolated) = 2.77 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) = 3.68 W/kg

SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.68 mW/g

Maximum value of SAR (measured) = 2.77 mW/g

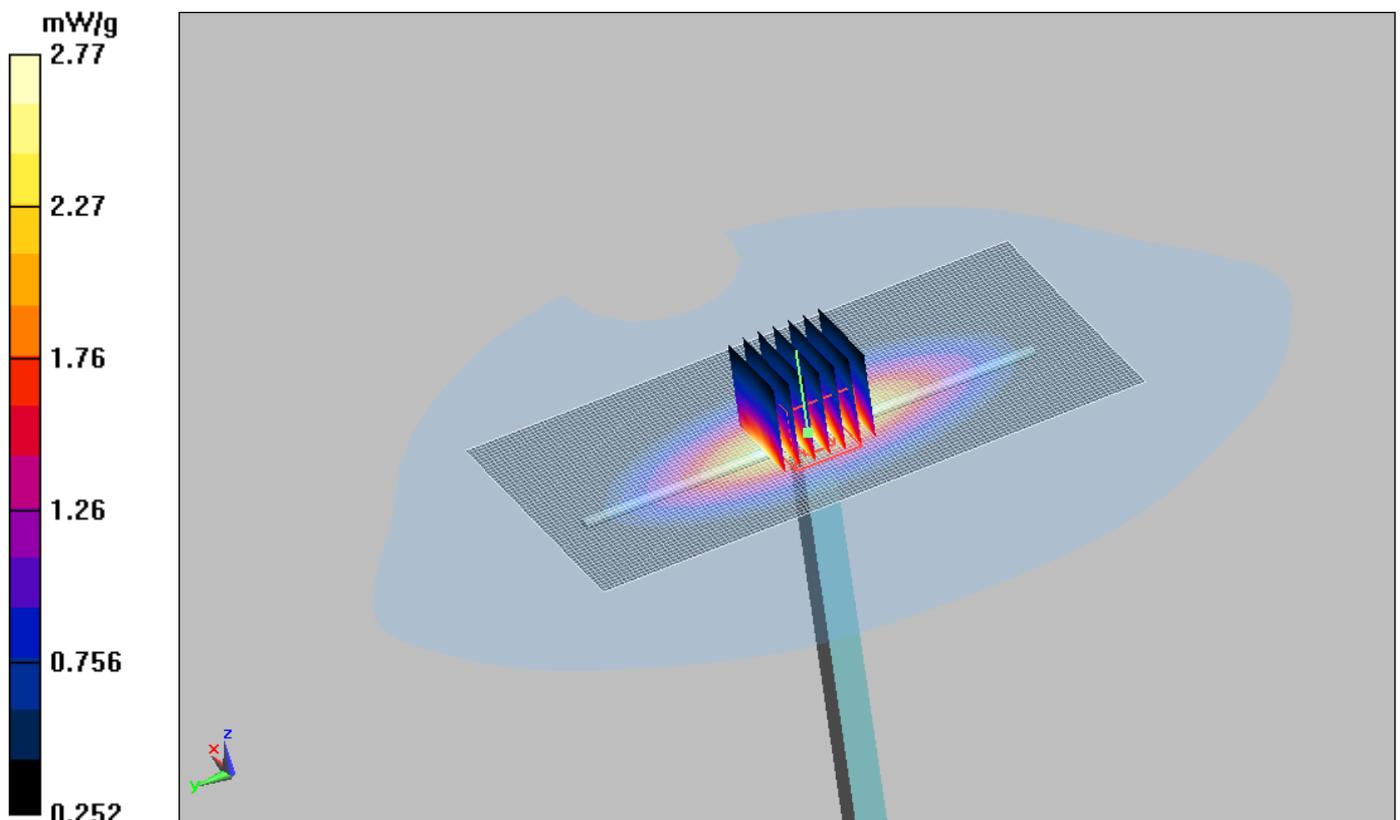


Figure 6 System Performance Check 835MHz 250mW

System Performance Check at 1900 MHz

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

Date/Time: 9/24/2010 10:00:19 AM

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 53.01$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

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

Maximum value of SAR (interpolated) = 12.5 mW/g

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

Reference Value = 75.9 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 10.28 mW/g; SAR(10 g) = 5.50 mW/g

Maximum value of SAR (measured) = 11 mW/g

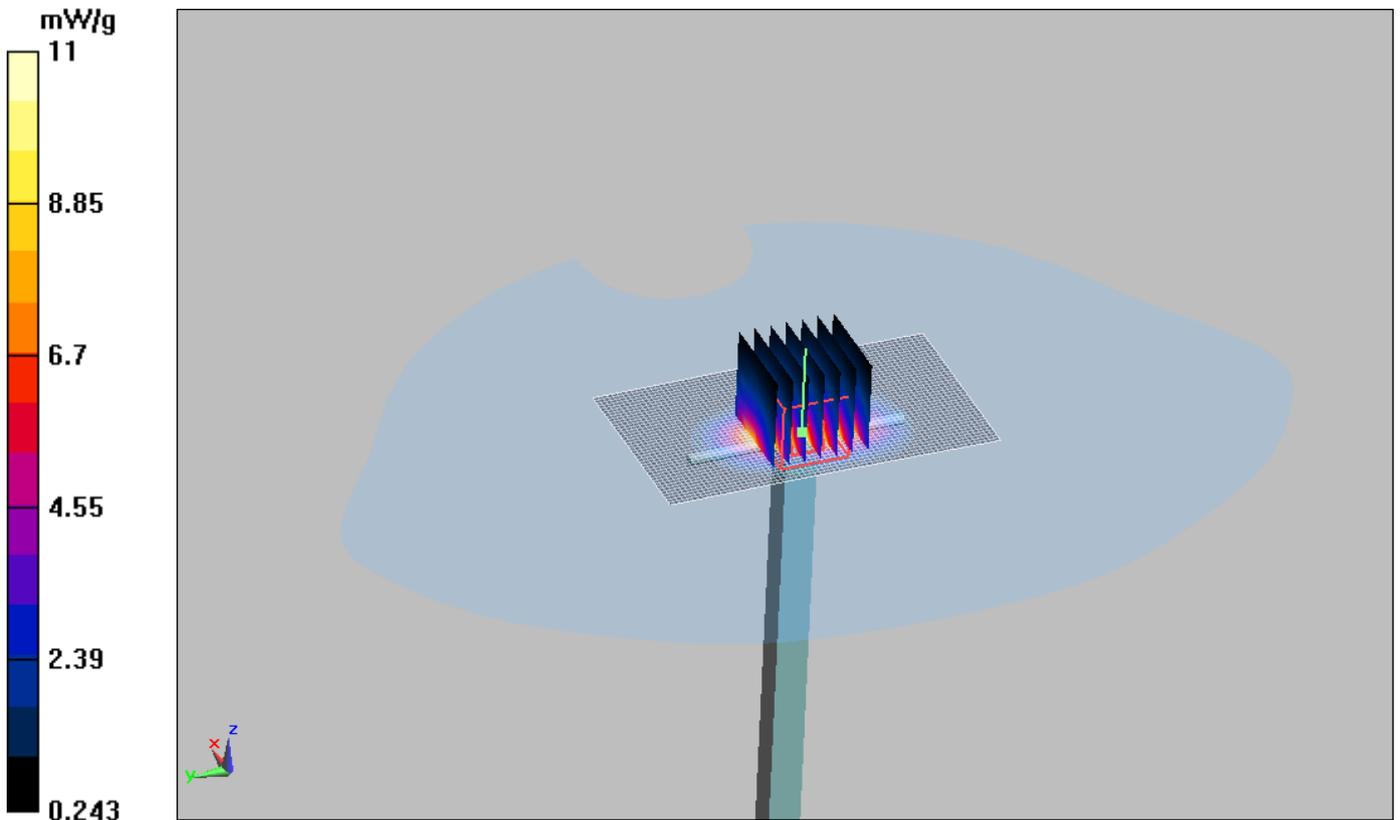


Figure 7 System Performance Check 1900MHz 250mW

System Performance Check at 2450 MHz

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 735

Date/Time: 9/27/2010 8:06:36 PM

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.92$ mho/m; $\epsilon_r = 51.83$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

Phantom section: Flat Section

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

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

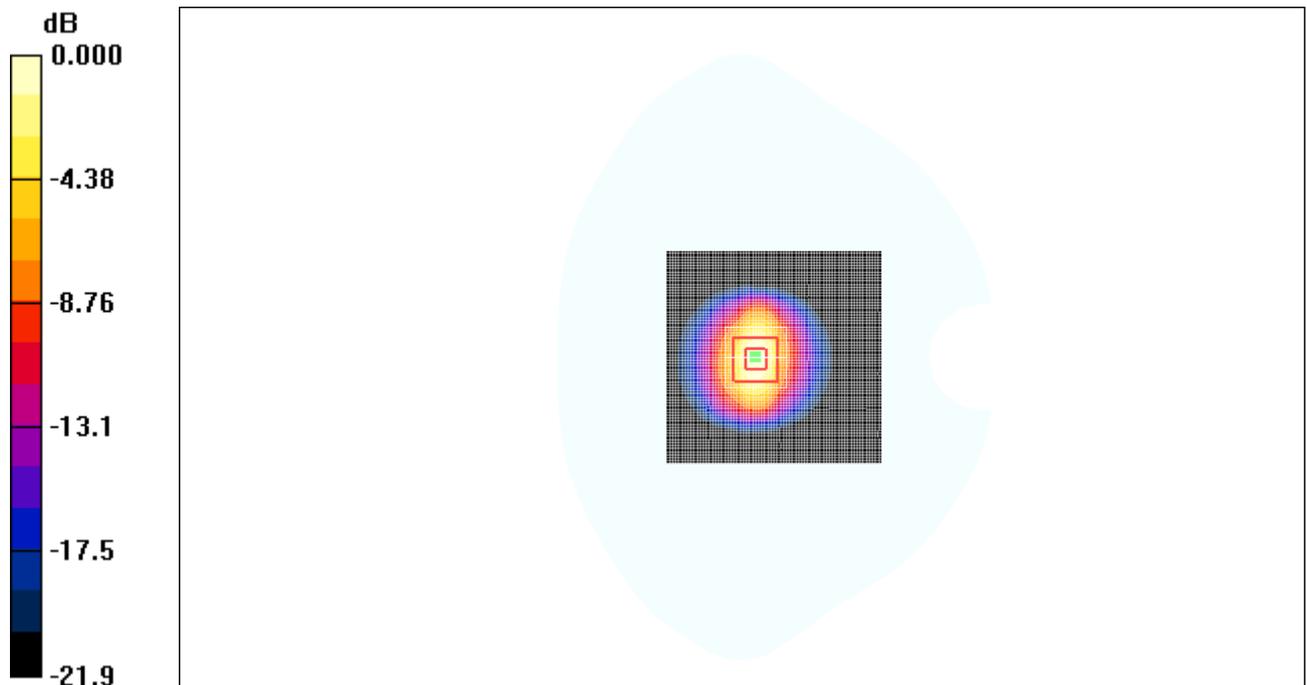
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 28.2 W/kg

SAR(1 g) = 14.0 mW/g; SAR(10 g) = 6.46 mW/g

Maximum value of SAR (measured) = 19.8 mW/g



0 dB = 19.8mW/g

Figure 8 System Performance Check 2450MHz 250mW

ANNEX C: Graph Results

GSM 850 GPRS (4Up) Test Position 1 Middle

Date/Time: 9/25/2010 12:22:16 PM

Communication System: GSM 850+GPRS(4Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.075

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.488 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.2 V/m; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 0.853 W/kg

SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.243 mW/g

Maximum value of SAR (measured) = 0.437 mW/g

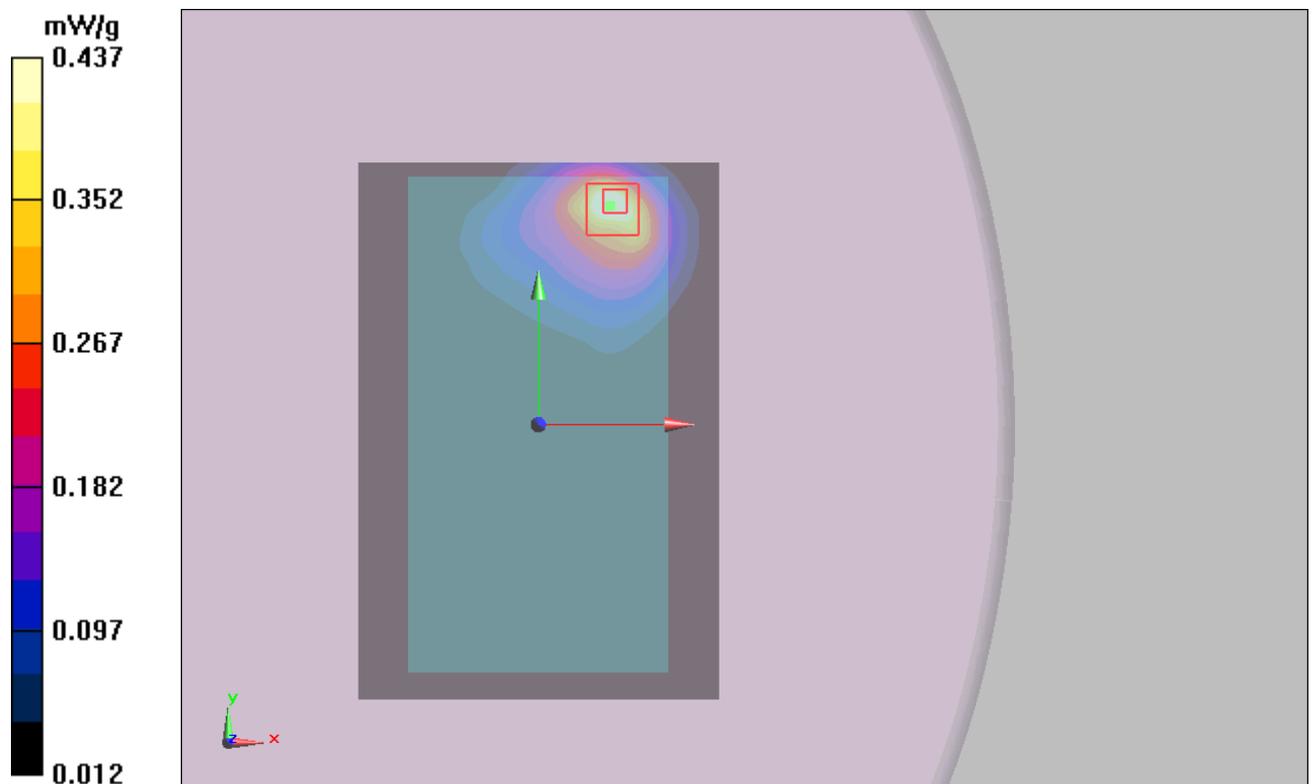


Figure 9 GSM 850 GPRS (4Up) Test Position 1 Channel 190

GSM 850 GPRS (3Up) Test Position 1 Middle

Date/Time: 9/25/2010 11:53:01 AM

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.577 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.44 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.776 W/kg

SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.280 mW/g

Maximum value of SAR (measured) = 0.511 mW/g

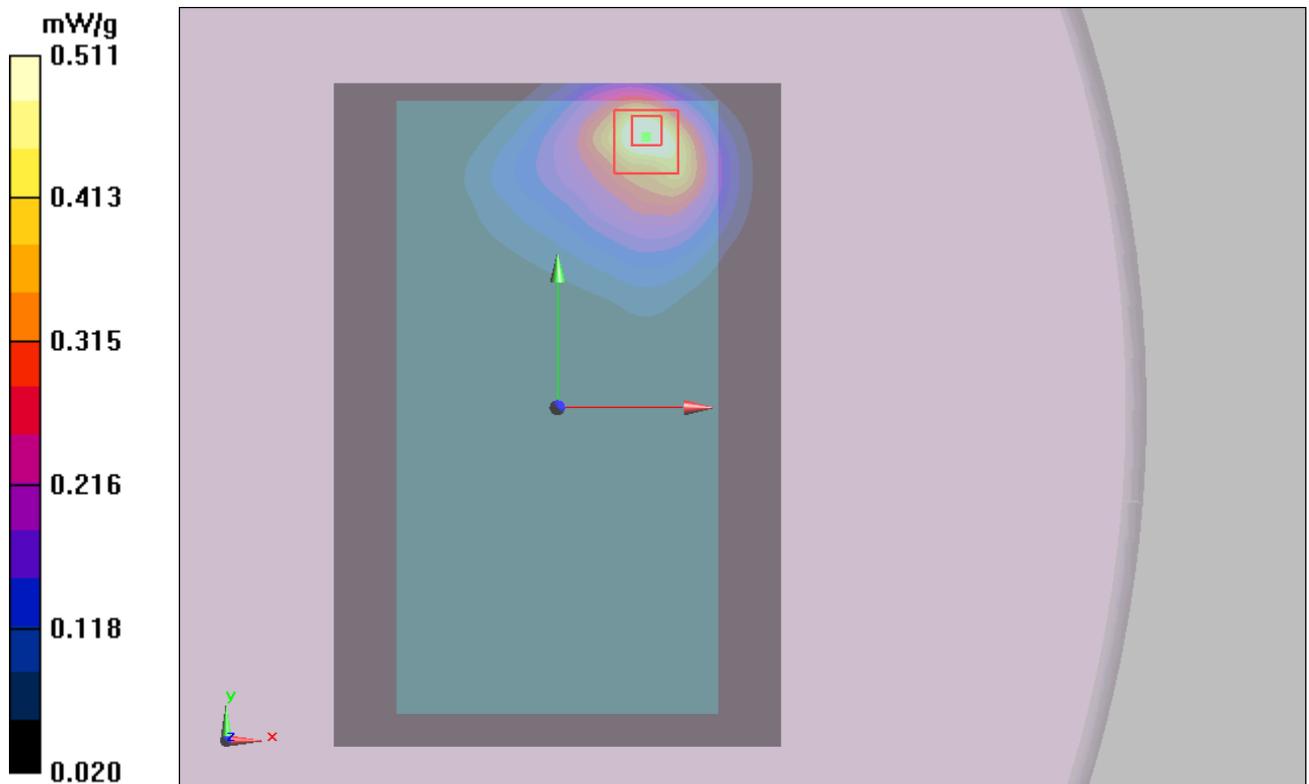


Figure 10 GSM 850 GPRS (3Up) Test Position 1 Channel 190

GSM 850 GPRS (2Up) Test Position 1 Middle

Date/Time: 9/25/2010 11:24:20 AM

Communication System: GSM850 + GPRS(2Up); Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.529 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.69 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.744 W/kg

SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.259 mW/g

Maximum value of SAR (measured) = 0.467 mW/g

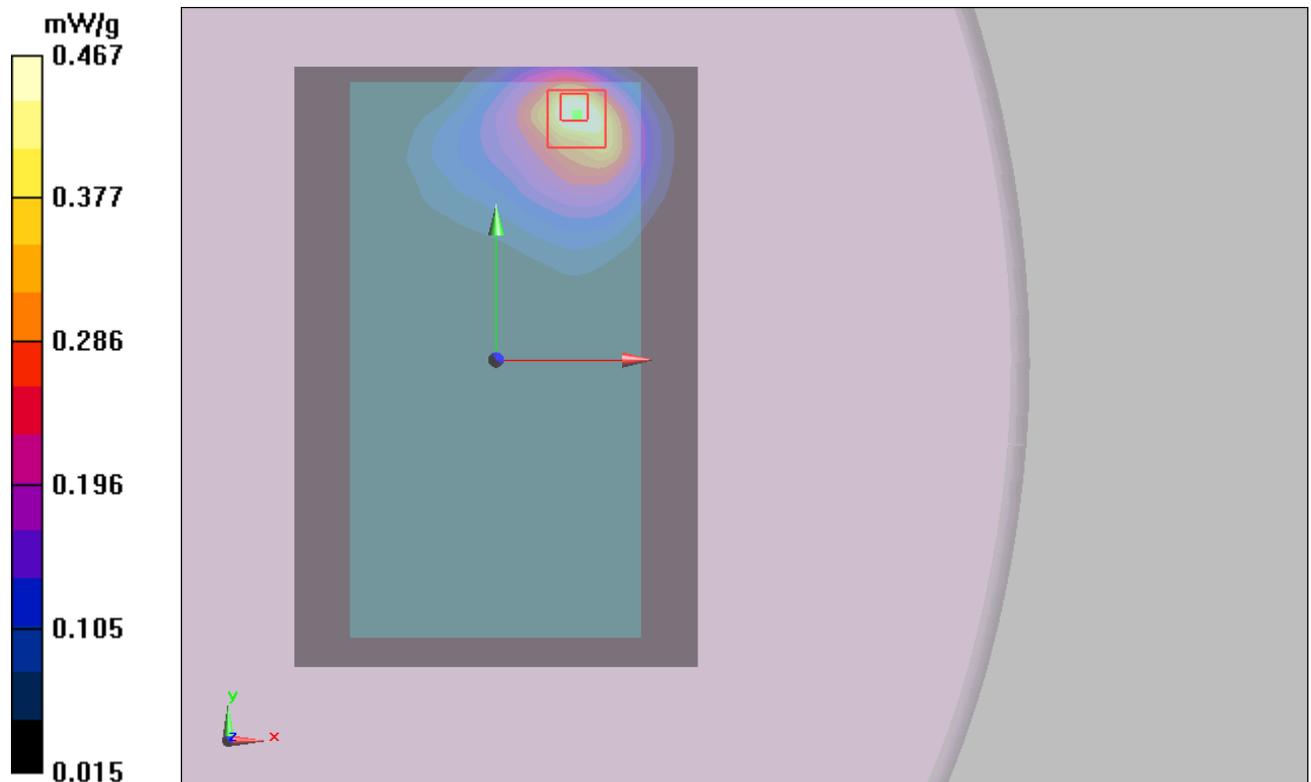


Figure 11 GSM 850 GPRS (2Up) Test Position 1 Channel 190

GSM 850 GPRS (1Up) Test Position 1 Middle

Date/Time: 9/25/2010 10:44:46 AM

Communication System: GSM850 + GPRS(1Up); Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.524 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.5 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.750 W/kg

SAR(1 g) = 0.442 mW/g; SAR(10 g) = 0.261 mW/g

Maximum value of SAR (measured) = 0.475 mW/g

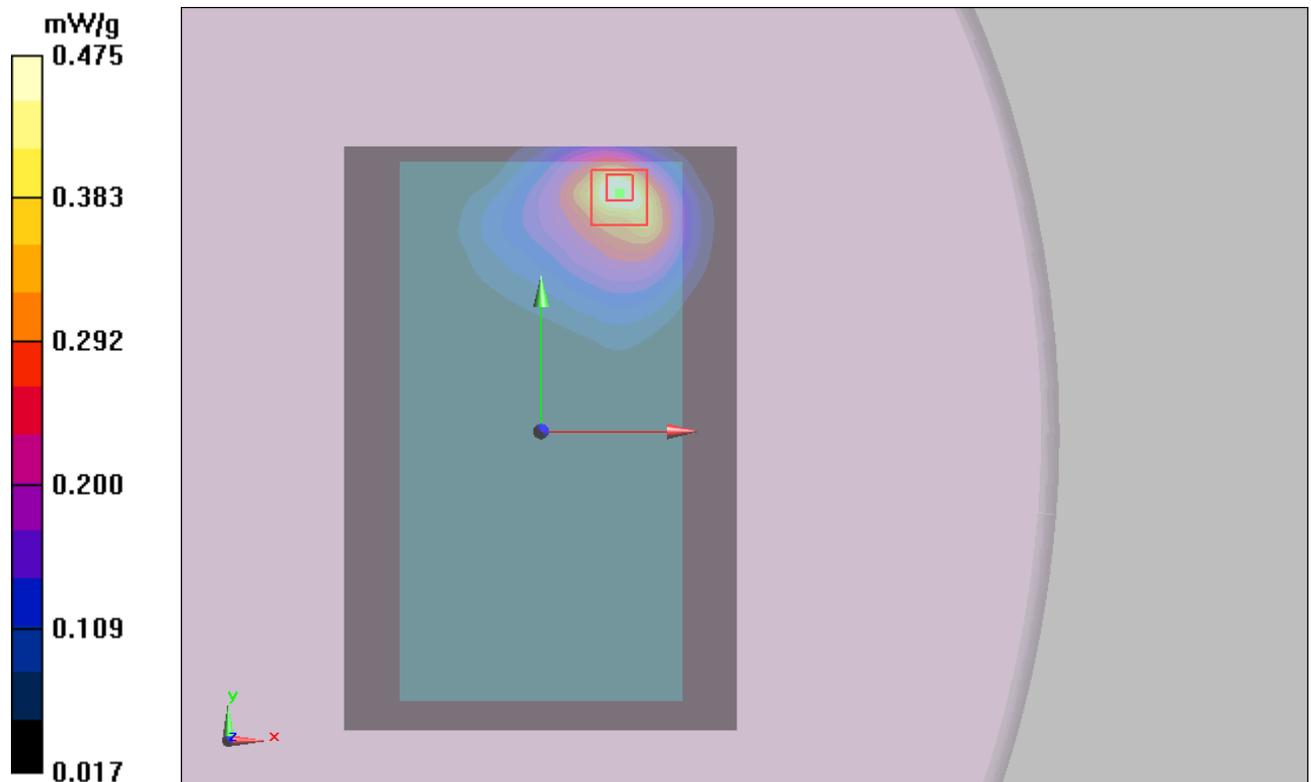


Figure 12 GSM 850 GPRS (1Up) Test Position 1 Channel 190

GSM 850 GPRS (3Up) Test Position 2 Middle

Date/Time: 9/25/2010 6:54:25 PM

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 2 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.182 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.88 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.309 W/kg

SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.099 mW/g

Maximum value of SAR (measured) = 0.182 mW/g

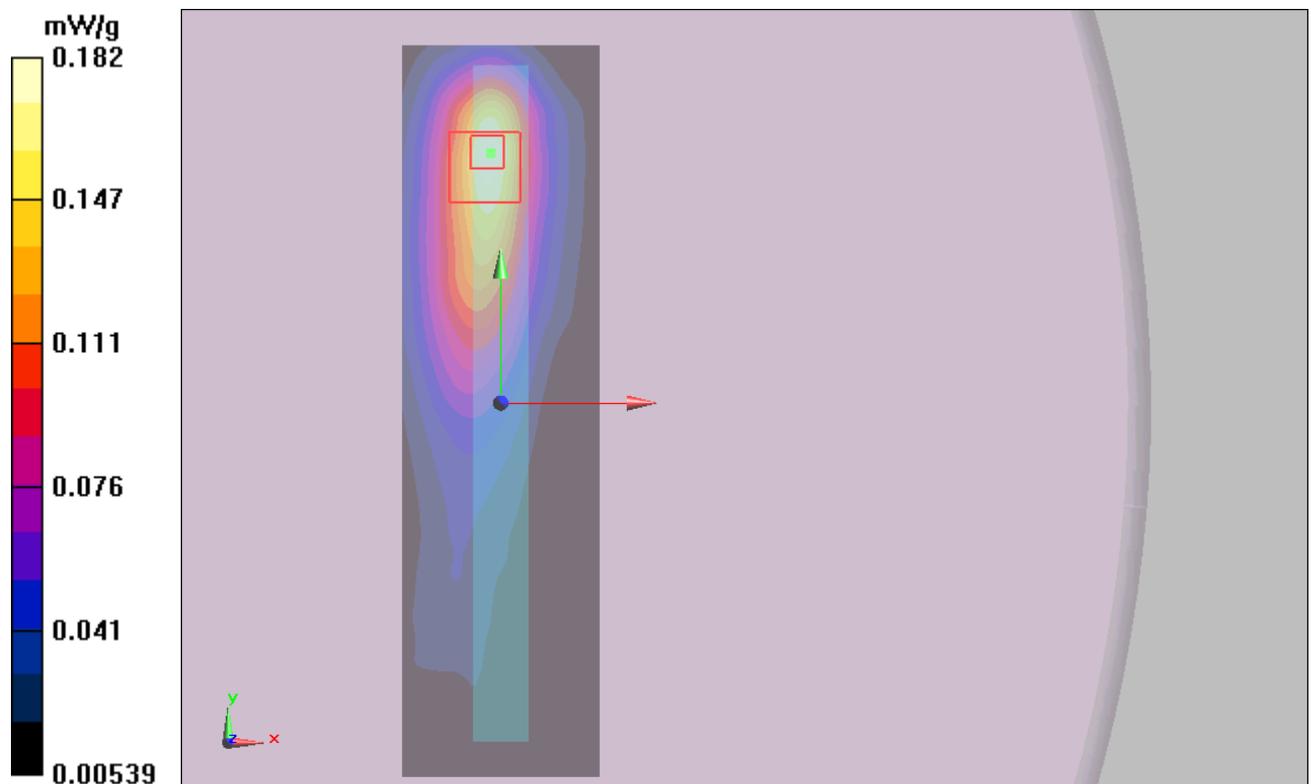


Figure 13 GSM 850 GPRS (3Up) Test Position 2 Channel 190

GSM 850 GPRS (3Up) Test Position 3 High

Date/Time: 9/25/2010 7:29:56 PM

Communication System: GSM850 + GPRS(3Up); Frequency: 848.8 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 849$ MHz; $\sigma = 1.02$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 High/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.591 mW/g

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.5 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.342 mW/g

Maximum value of SAR (measured) = 0.599 mW/g

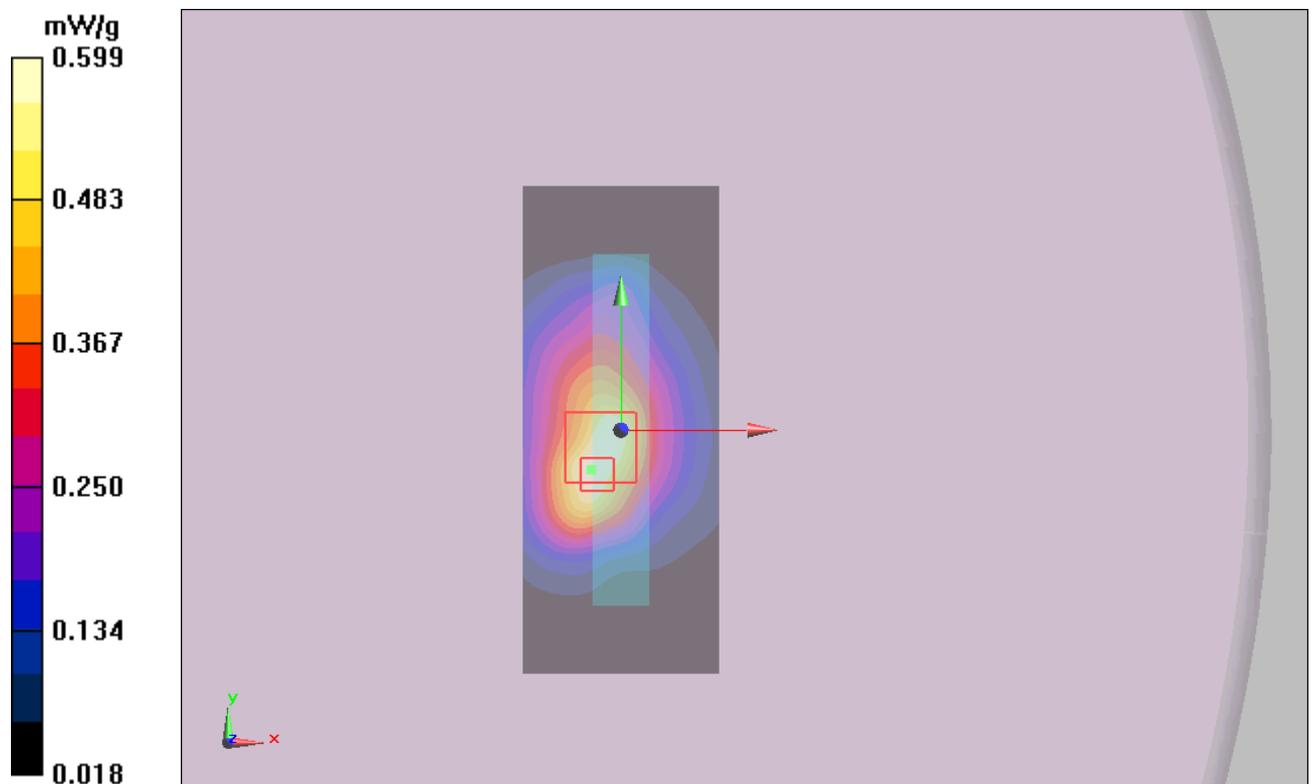


Figure 14 GSM 850 GPRS (3Up) Test Position 3 Channel 251

GSM 850 GPRS (3Up) Test Position 3 Middle

Date/Time: 9/25/2010 7:14:53 PM

Communication System: GSM850 + GPRS(3Up); Frequency: 836.6 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.559 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.962 W/kg

SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.327 mW/g

Maximum value of SAR (measured) = 0.600 mW/g

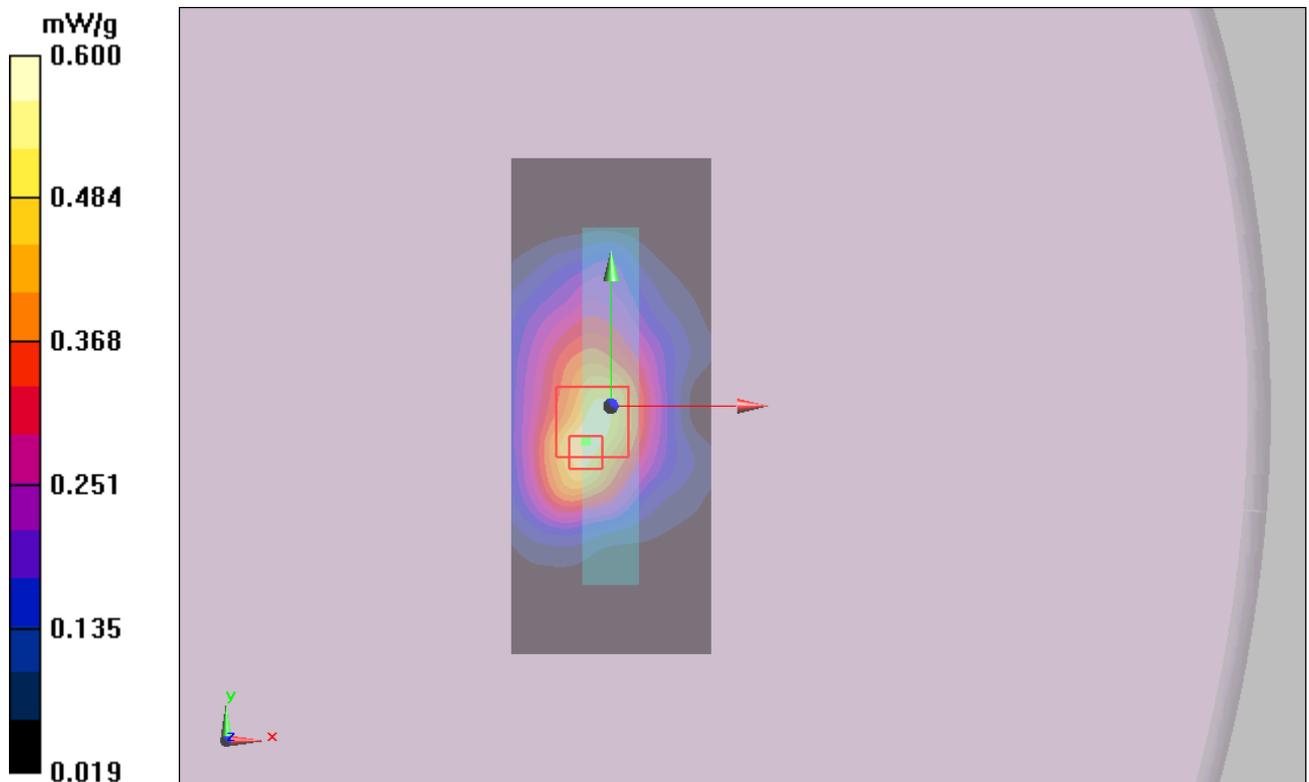


Figure 15 GSM 850 GPRS (3Up) Test Position 3 Channel 190

GSM 850 GPRS (3Up) Test Position 3 Low

Date/Time: 9/25/2010 7:44:39 PM

Communication System: GSM850 + GPRS(3Up); Frequency: 824.2 MHz; Duty Cycle: 1:2.767

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.992$ mho/m; $\epsilon_r = 55.5$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Low/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.536 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.6 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.929 W/kg

SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.313 mW/g

Maximum value of SAR (measured) = 0.580 mW/g

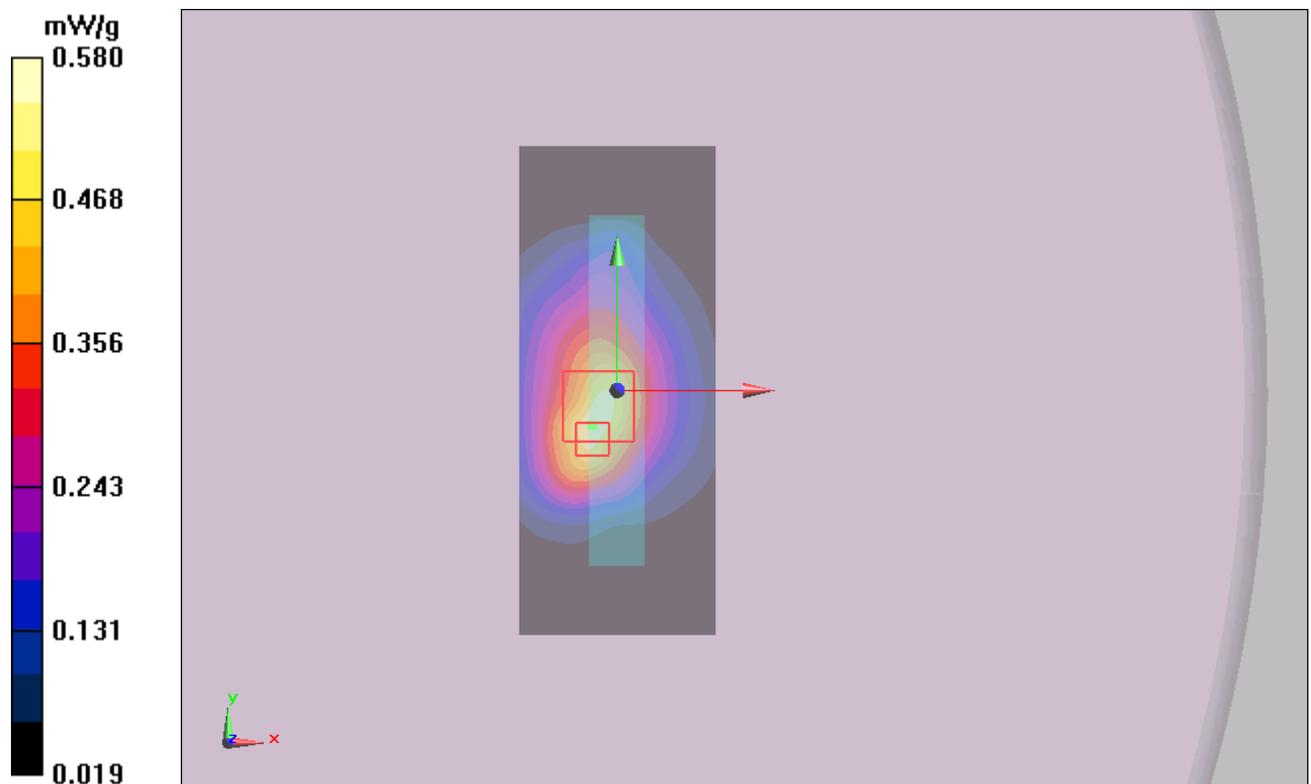


Figure 16 GSM 850 GPRS (3Up) Test Position 3 Channel 128

GSM 850 with Earphone GPRS (3Up) Test Position 3 High

Date/Time: 9/25/2010 8:21:16 PM

Communication System: GSM850 + GPRS(3Up); Frequency: 848.8 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 849$ MHz; $\sigma = 1.02$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 High/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.625 mW/g

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.7 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.508 mW/g; SAR(10 g) = 0.301 mW/g

Maximum value of SAR (measured) = 0.573 mW/g

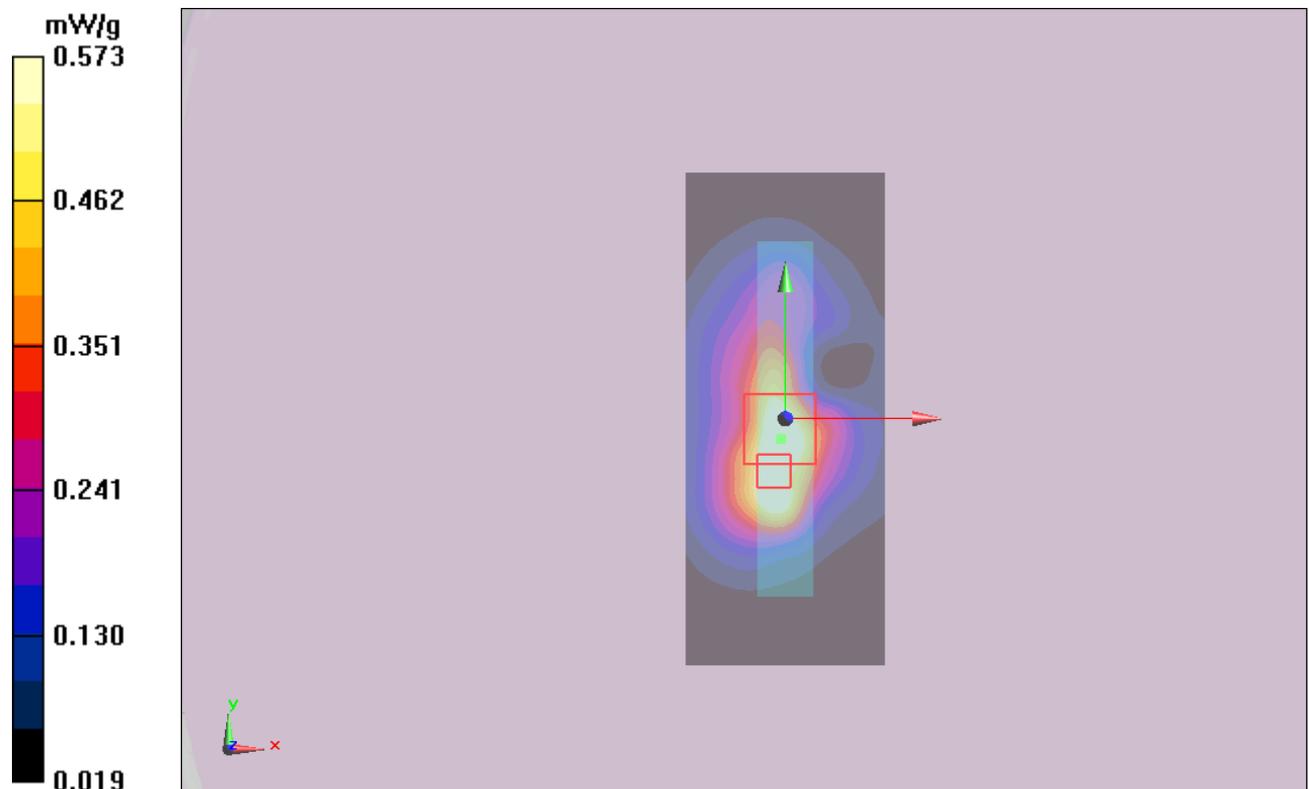


Figure 17 GSM 850 with Earphone GPRS (3Up) Test Position 3 Channel 251

GSM 850 EGPRS (3Up) Test Position 3 High

Date/Time: 9/25/2010 8:00:08 PM

Communication System: GSM850 + EGPRS(3Up); Frequency: 848.8 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 849$ MHz; $\sigma = 1.02$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 High/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.595 mW/g

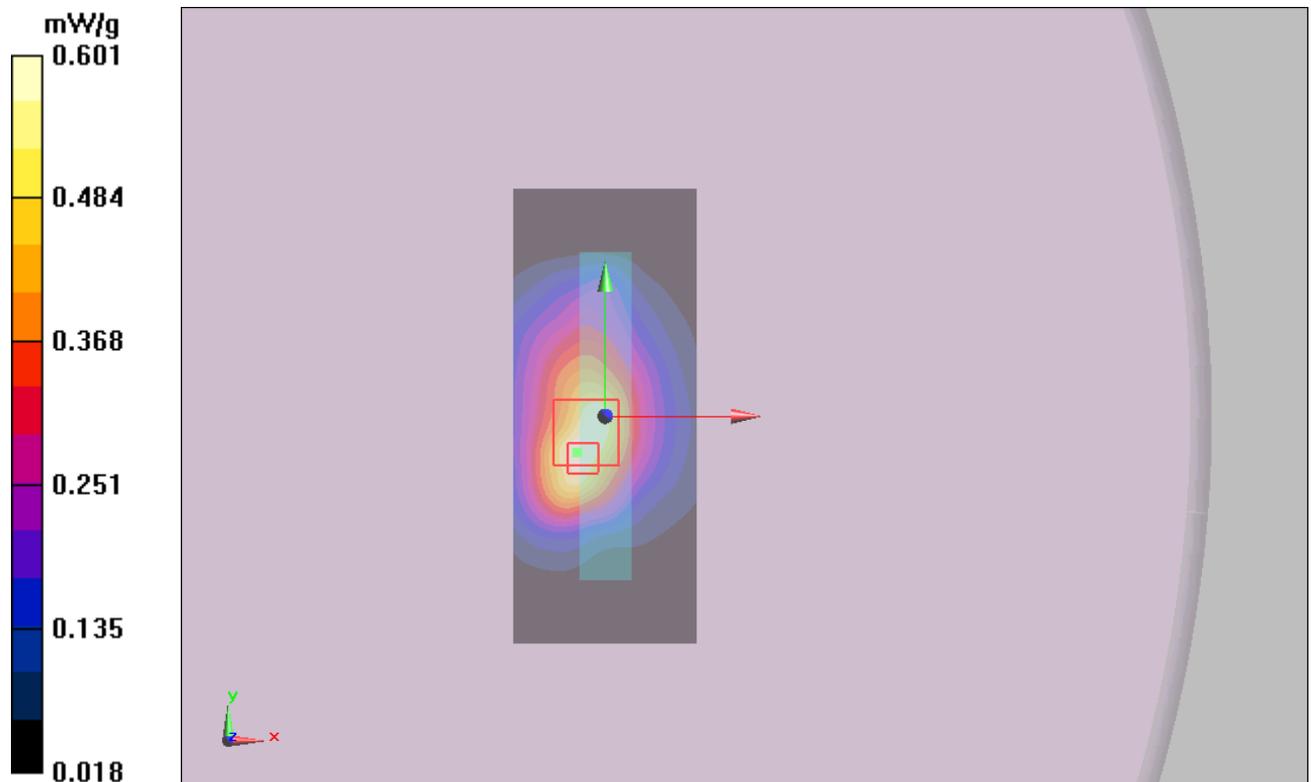
Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.5 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.557 mW/g; SAR(10 g) = 0.342 mW/g

Maximum value of SAR (measured) = 0.601 mW/g



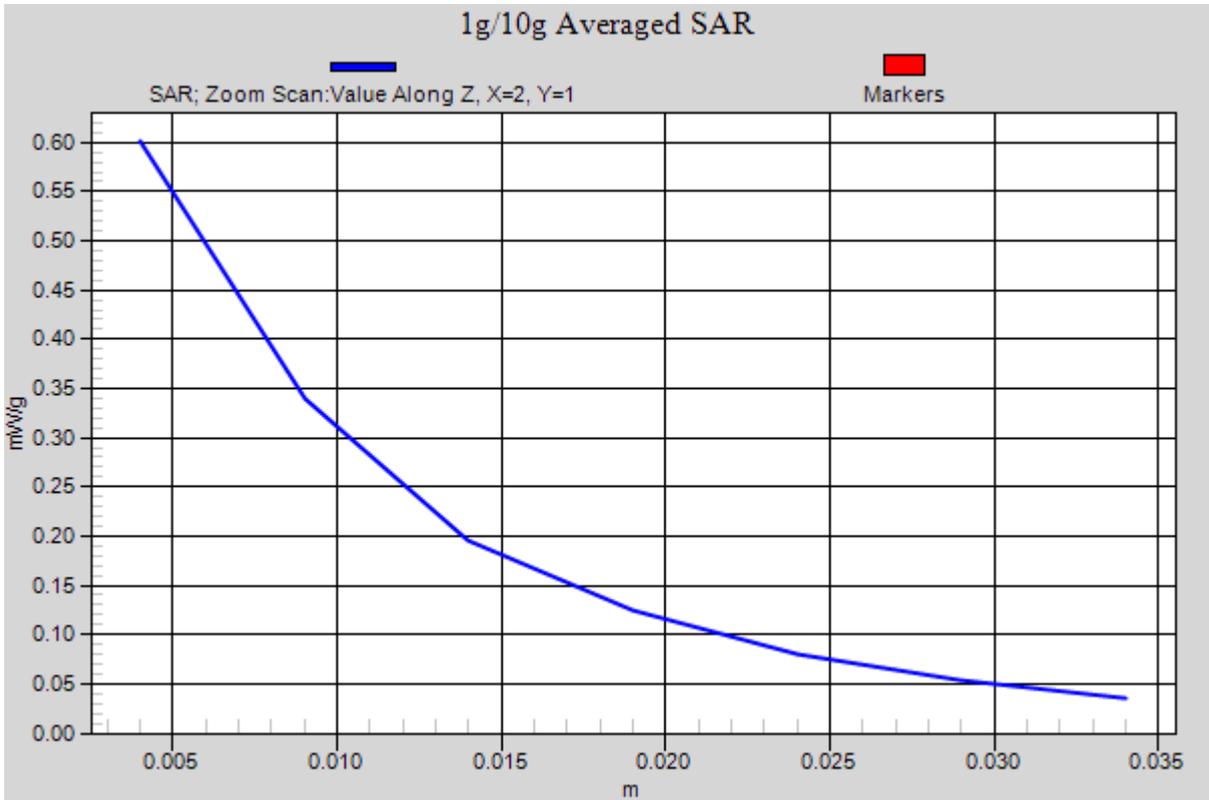


Figure 18 GSM 850 EGPRS (3Up) Test Position 3 Channel 251

GSM 1900 GPRS (4Up) Test Position 1 High

Date/Time: 9/24/2010 8:00:56 PM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1909.8 MHz; Duty Cycle: 1:2.075

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.35 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.73 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.517 mW/g

Maximum value of SAR (measured) = 1.18 mW/g

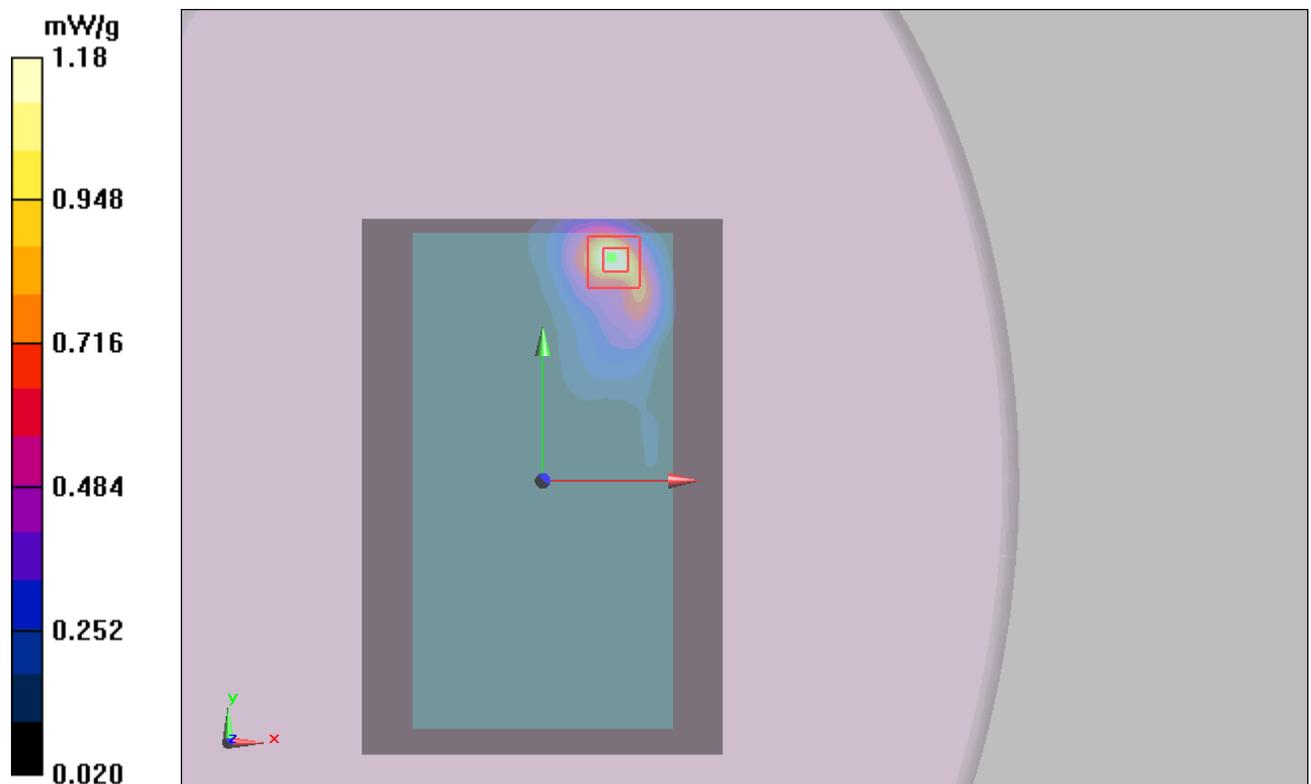


Figure 19 GSM 1900 GPRS (4Up) Test Position 1 Channel 810

GSM 1900 GPRS (4Up) Test Position 1 Middle

Date/Time: 9/24/2010 11:24:12 AM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1880 MHz; Duty Cycle: 1:2.075

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.11 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.57 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 2 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.488 mW/g

Maximum value of SAR (measured) = 1.16 mW/g

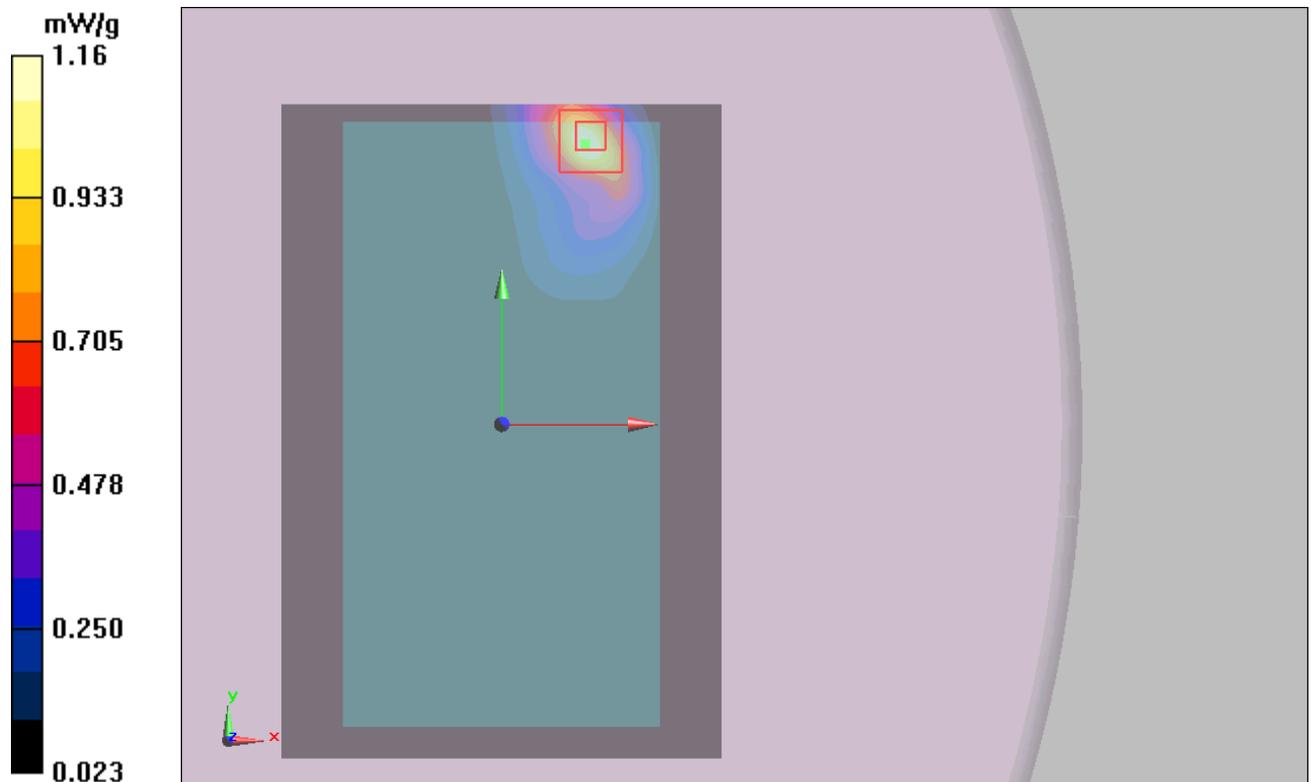


Figure 20 GSM 1900 GPRS (4Up) Test Position 1 Channel 661

GSM 1900 GPRS (4Up) Test Position 1 Low

Date/Time: 9/24/2010 7:32:00 PM

Communication System: PCS 1900+GPRS(4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2.075

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.990 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.61 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.385 mW/g

Maximum value of SAR (measured) = 0.860 mW/g



Figure 21 GSM 1900 GPRS (4Up) Test Position 1 Channel 512

GSM 1900 GPRS (3Up) Test Position 1 High

Date/Time: 9/24/2010 6:32:48 PM

Communication System: PCS 1900+GPRS(3Up); Frequency: 1909.8 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.32 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.54 V/m; Power Drift = 0.092 dB

Peak SAR (extrapolated) = 2.11 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.507 mW/g

Maximum value of SAR (measured) = 1.14 mW/g

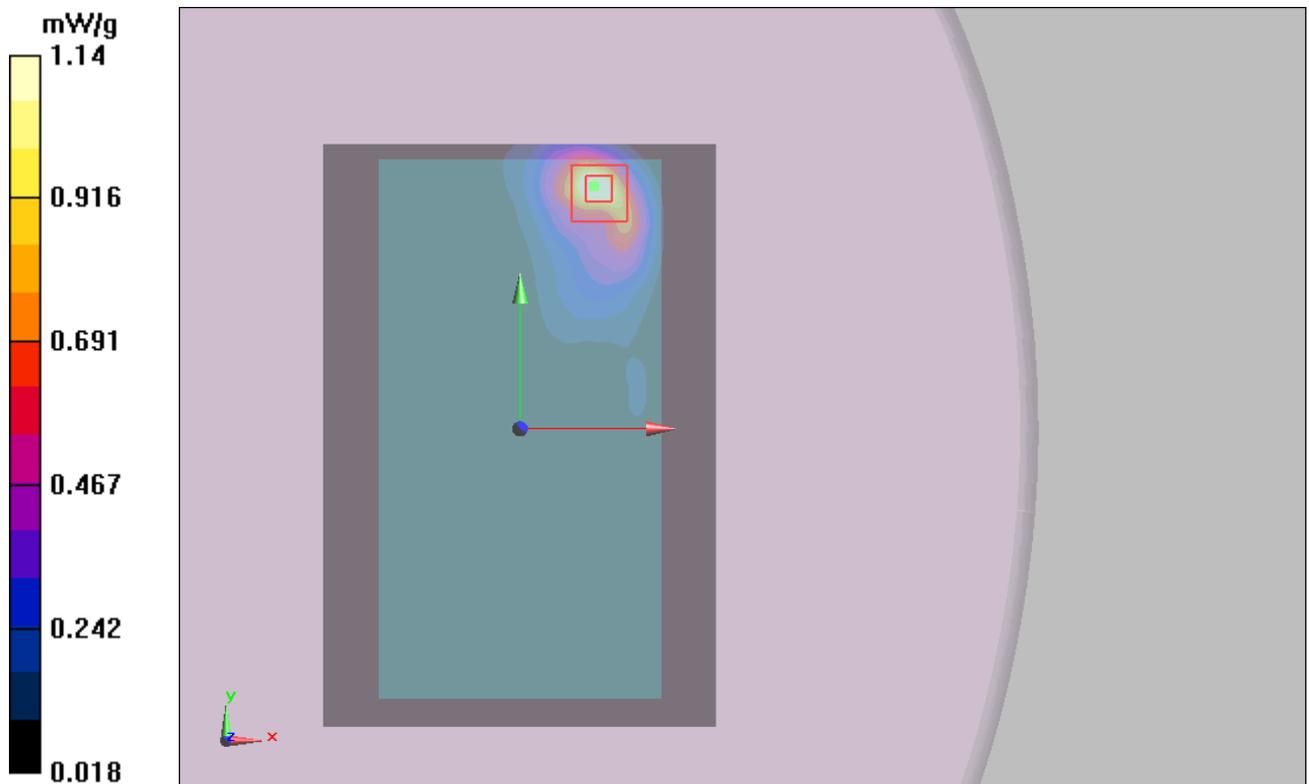


Figure 22 GSM 1900 GPRS (3Up) Test Position 1 Channel 810

GSM 1900 GPRS (3Up) Test Position 1 Middle

Date/Time: 9/24/2010 12:06:19 PM

Communication System: PCS 1900+GPRS(3Up); Frequency: 1880 MHz; Duty Cycle: 1:2.767

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.93 V/m; Power Drift = 0.062 dB

Peak SAR (extrapolated) = 2.07 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.482 mW/g

Maximum value of SAR (measured) = 1.09 mW/g

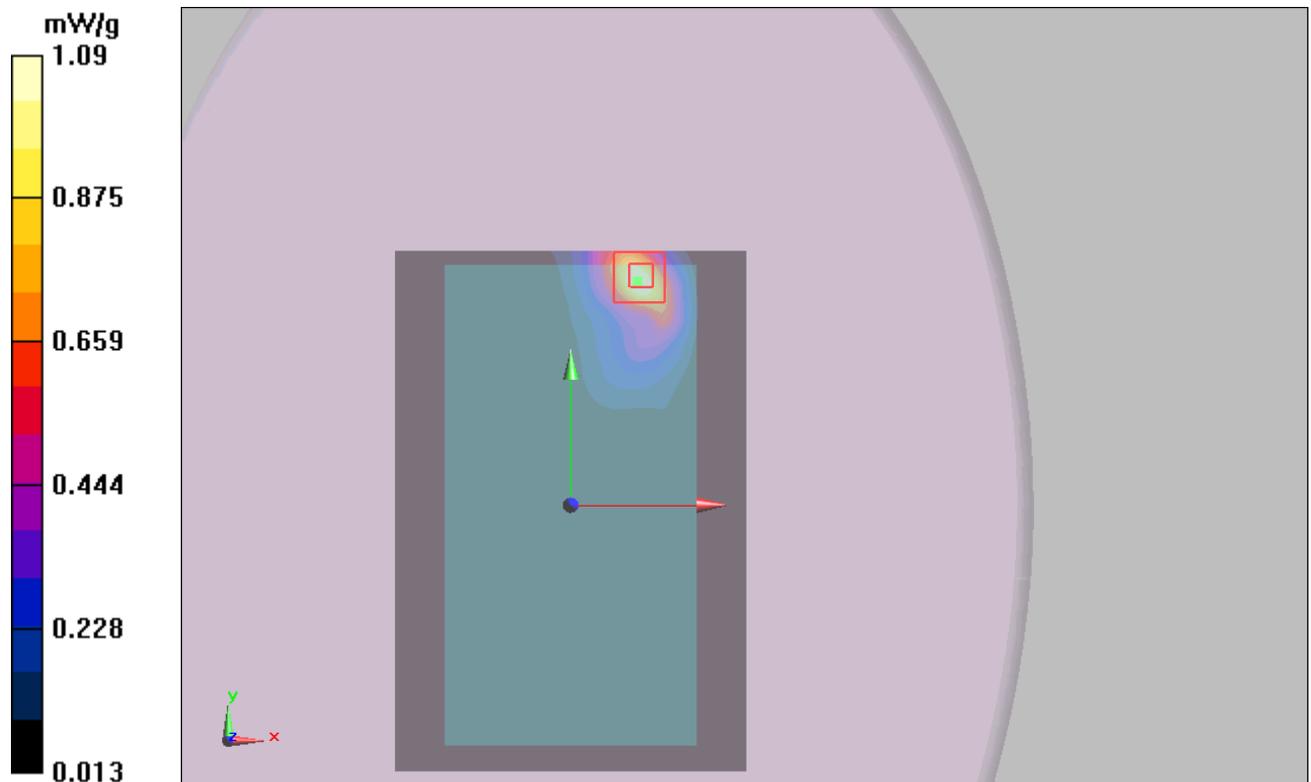


Figure 23 GSM 1900 GPRS (3Up) Test Position 1 Channel 661

GSM 1900 GPRS (3Up) Test Position 1 Low

Date/Time: 9/24/2010 7:01:31 PM

Communication System: PCS 1900+GPRS(3Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2.767

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.966 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.79 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.766 mW/g; SAR(10 g) = 0.375 mW/g

Maximum value of SAR (measured) = 0.842 mW/g

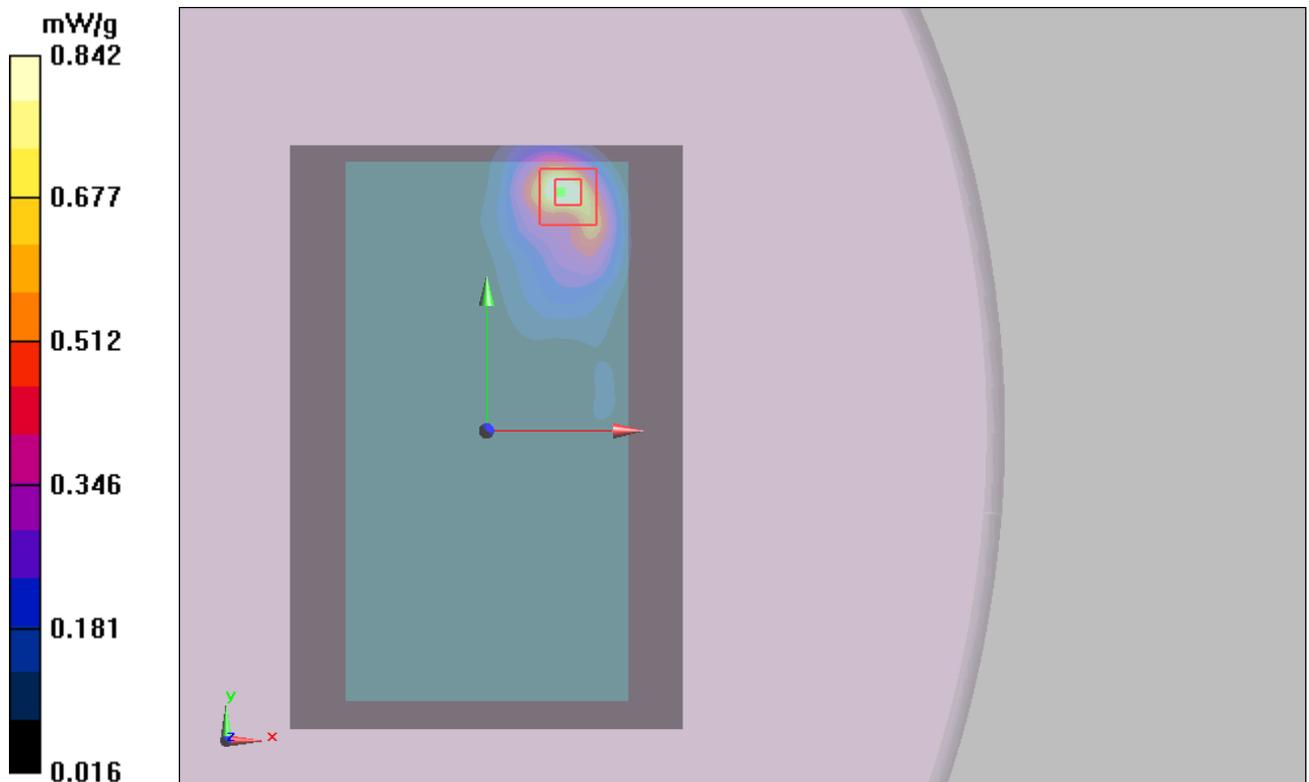


Figure 24 GSM 1900 GPRS (3Up) Test Position 1 Channel 512

GSM 1900 GPRS (2Up) Test Position 1 High

Date/Time: 9/24/2010 6:03:27 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.36 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.62 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.524 mW/g

Maximum value of SAR (measured) = 1.18 mW/g

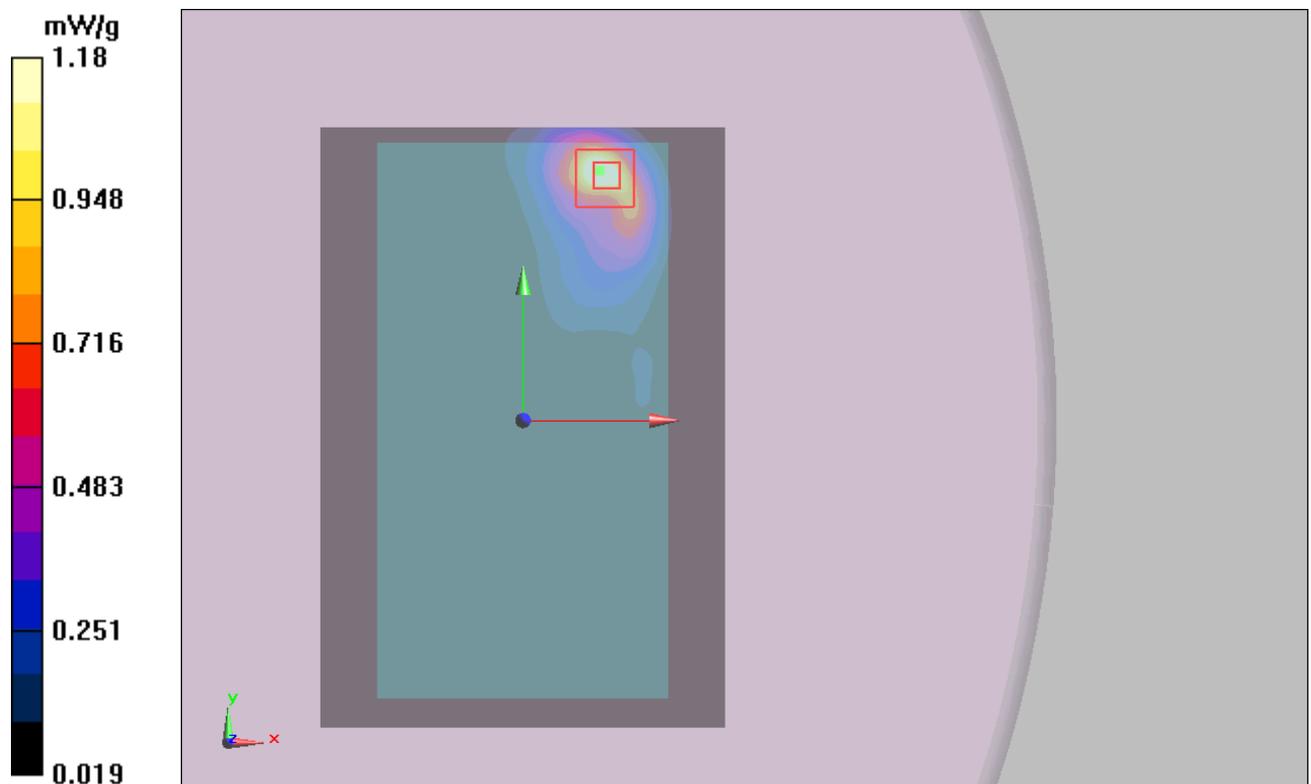


Figure 25 GSM 1900 GPRS (2Up) Test Position 1 Channel 810

GSM 1900 GPRS (2Up) Test Position 1 Middle

Date/Time: 9/24/2010 12:34:43 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.12 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.68 V/m; Power Drift = 0.099 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.500 mW/g

Maximum value of SAR (measured) = 1.14 mW/g

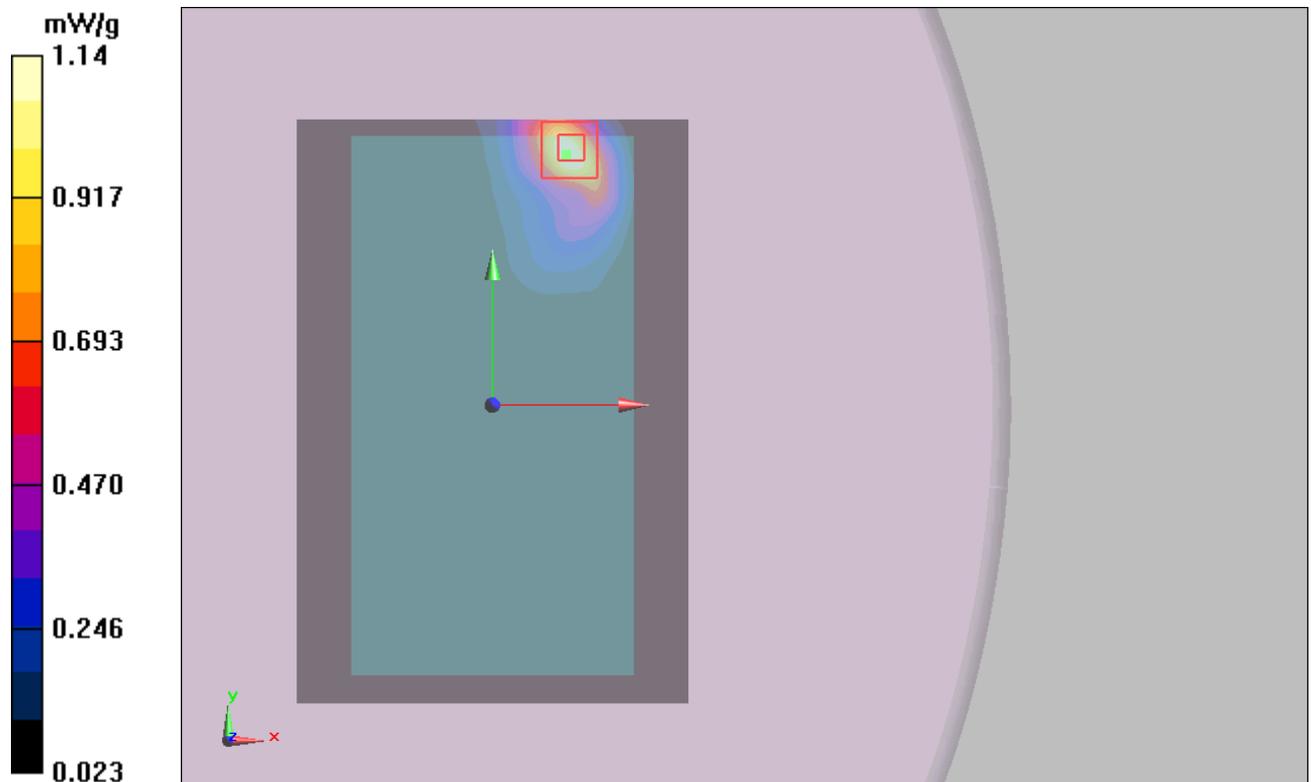


Figure 26 GSM 1900 GPRS (2Up) Test Position 1 Channel 661

GSM 1900 GPRS (2Up) Test Position 1 Low

Date/Time: 9/24/2010 5:35:01 PM

Communication System: PCS 1900+GPRS(2Up); Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.989 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2 V/m; Power Drift = 0.042 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.791 mW/g; SAR(10 g) = 0.387 mW/g

Maximum value of SAR (measured) = 0.868 mW/g

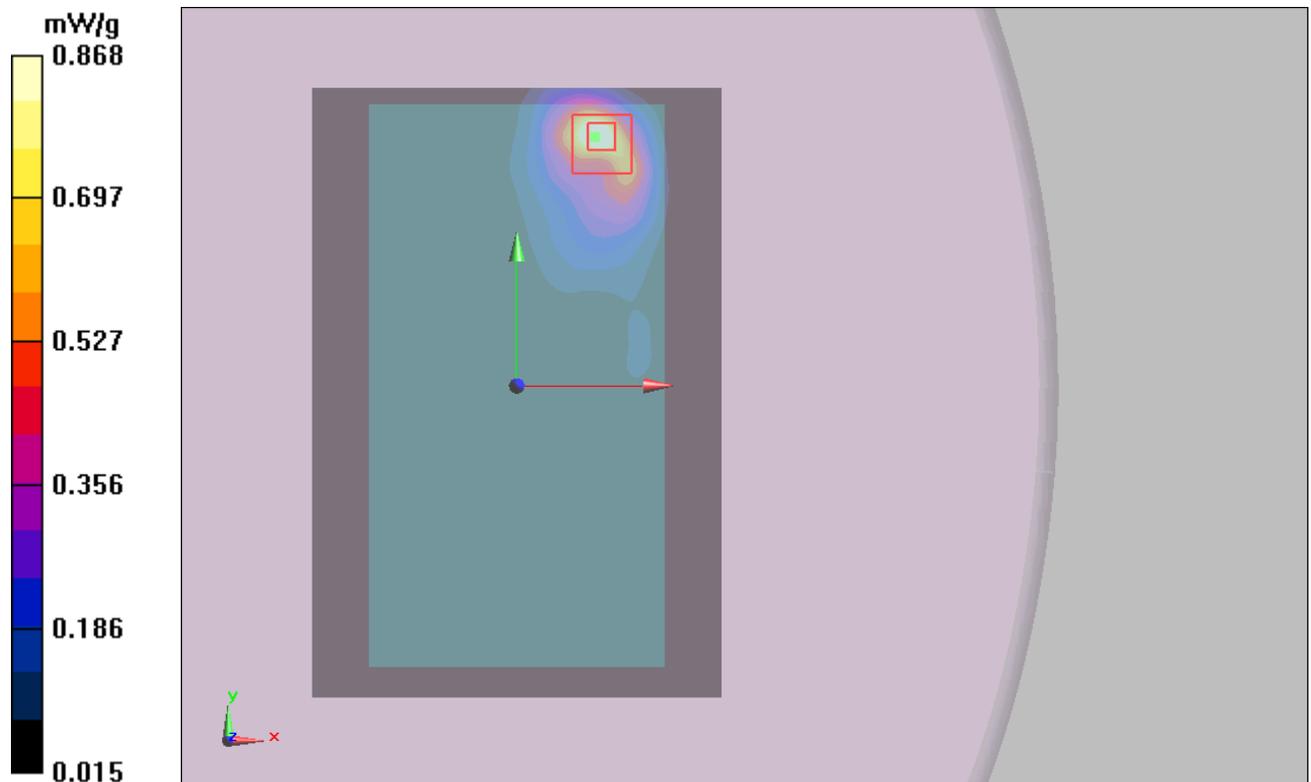


Figure 27 GSM 1900 GPRS (2Up) Test Position 1 Channel 512

GSM 1900 GPRS (1Up) Test Position 1 High

Date/Time: 9/24/2010 4:37:52 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.35 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.97 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 2.16 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.527 mW/g

Maximum value of SAR (measured) = 1.16 mW/g

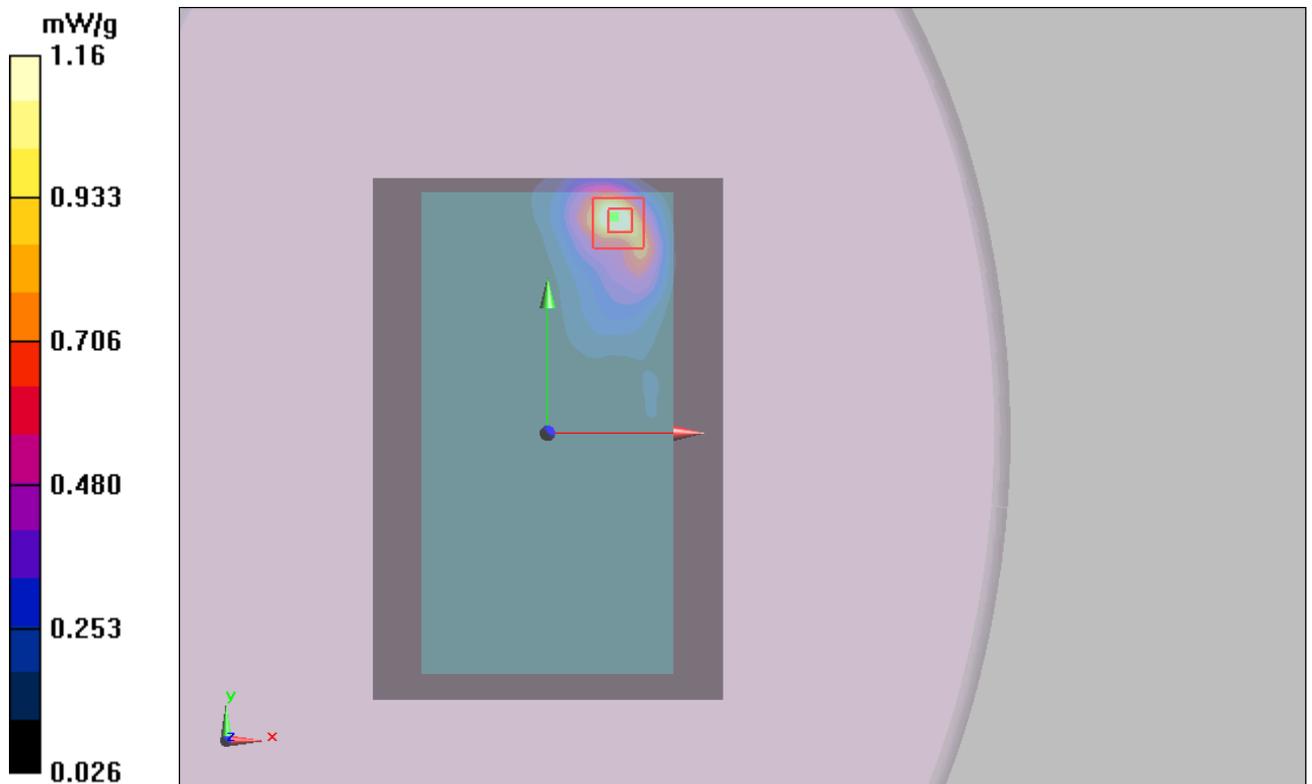


Figure 28 GSM 1900 GPRS (1Up) Test Position 1 Channel 810

GSM 1900 GPRS (1Up) Test Position 1 Middle

Date/Time: 9/24/2010 2:06:19 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.14 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.95 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 2.08 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.502 mW/g

Maximum value of SAR (measured) = 1.14 mW/g

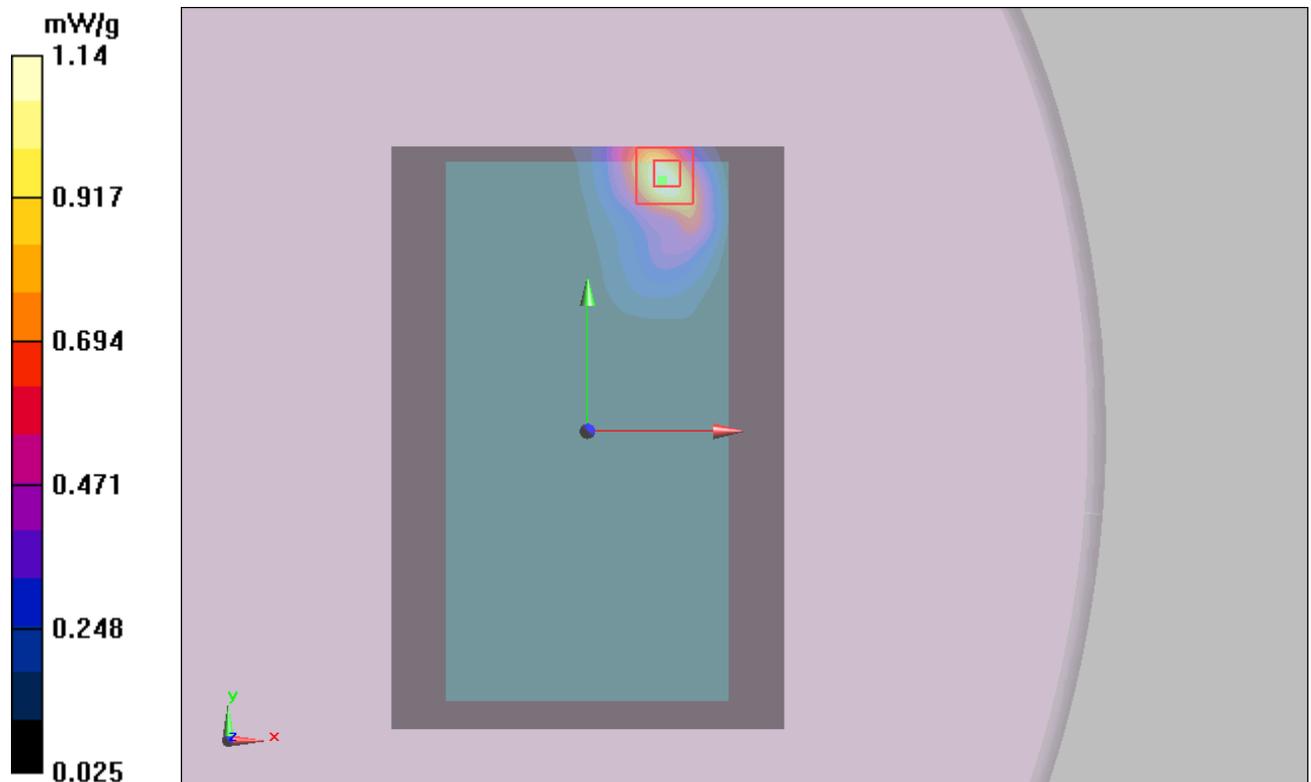


Figure 29 GSM 1900 GPRS (1Up) Test Position 1 Channel 661

GSM 1900 GPRS (1Up) Test Position 1 Low

Date/Time: 9/24/2010 5:06:08 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.996 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.83 V/m; Power Drift = 0.190 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.793 mW/g; SAR(10 g) = 0.390 mW/g

Maximum value of SAR (measured) = 0.870 mW/g

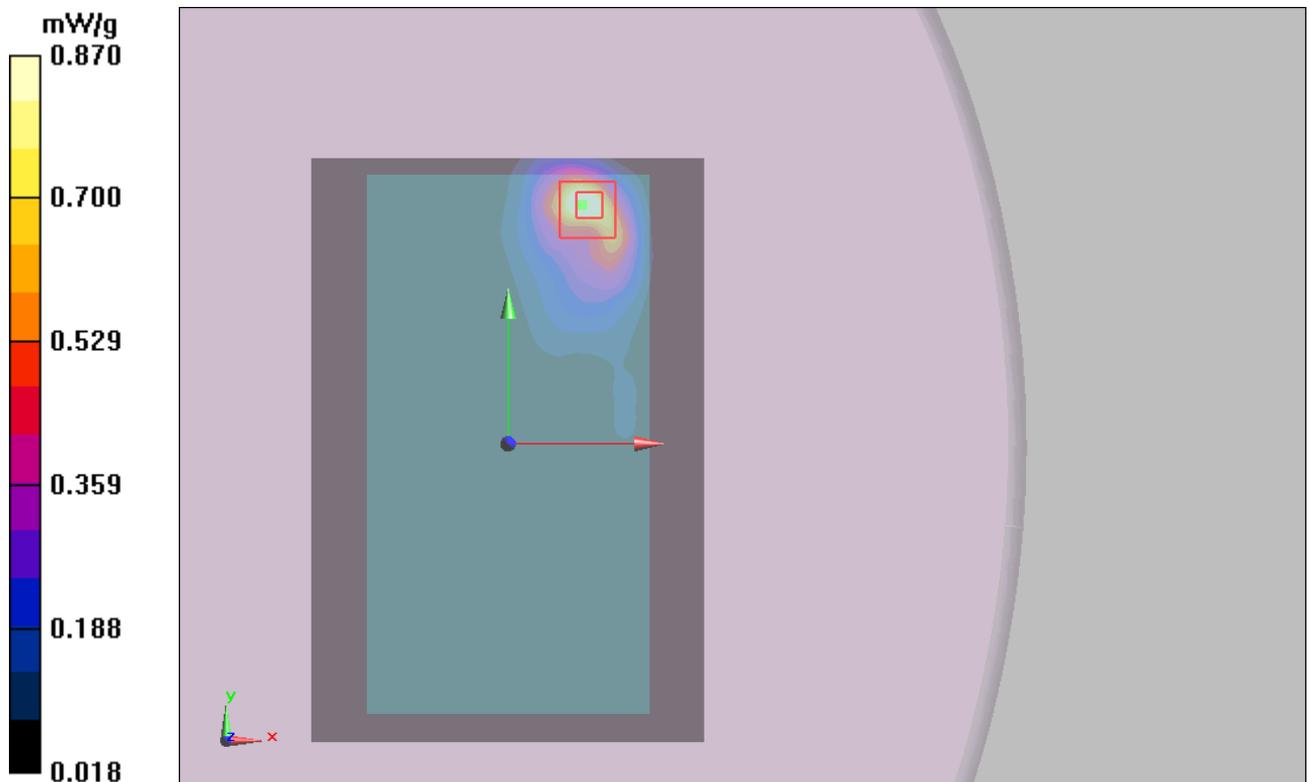


Figure 30 GSM 1900 GPRS (1Up) Test Position 1 Channel 512

GSM 1900 GPRS (1Up) Test Position 2 Middle

Date/Time: 9/24/2010 3:44:39 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 2 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.544 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.1 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 0.903 W/kg

SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.285 mW/g

Maximum value of SAR (measured) = 0.651 mW/g

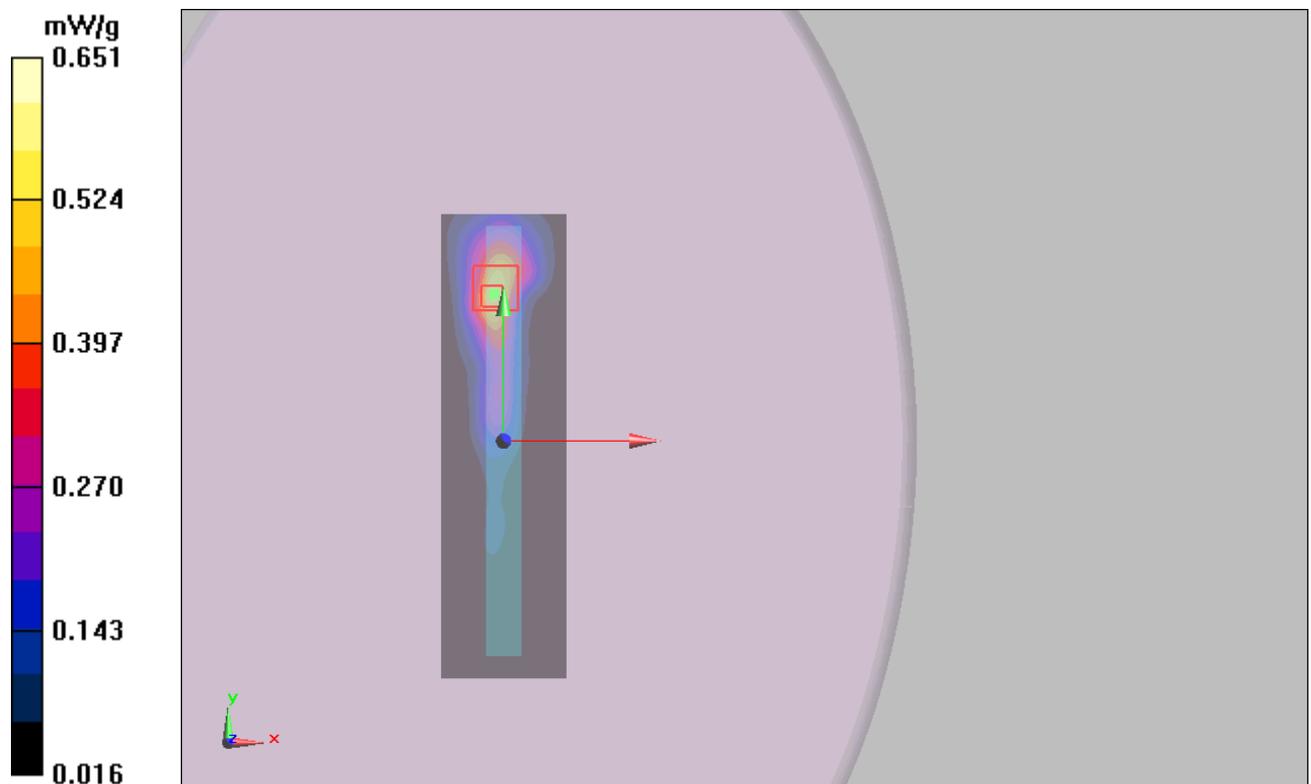


Figure 31 GSM 1900 GPRS (1Up) Test Position 2 Channel 661

GSM 1900 GPRS (1Up) Test Position 3 Middle

Date/Time: 9/24/2010 4:19:23 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.575 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.5 V/m; Power Drift = -0.184 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.249 mW/g

Maximum value of SAR (measured) = 0.633 mW/g

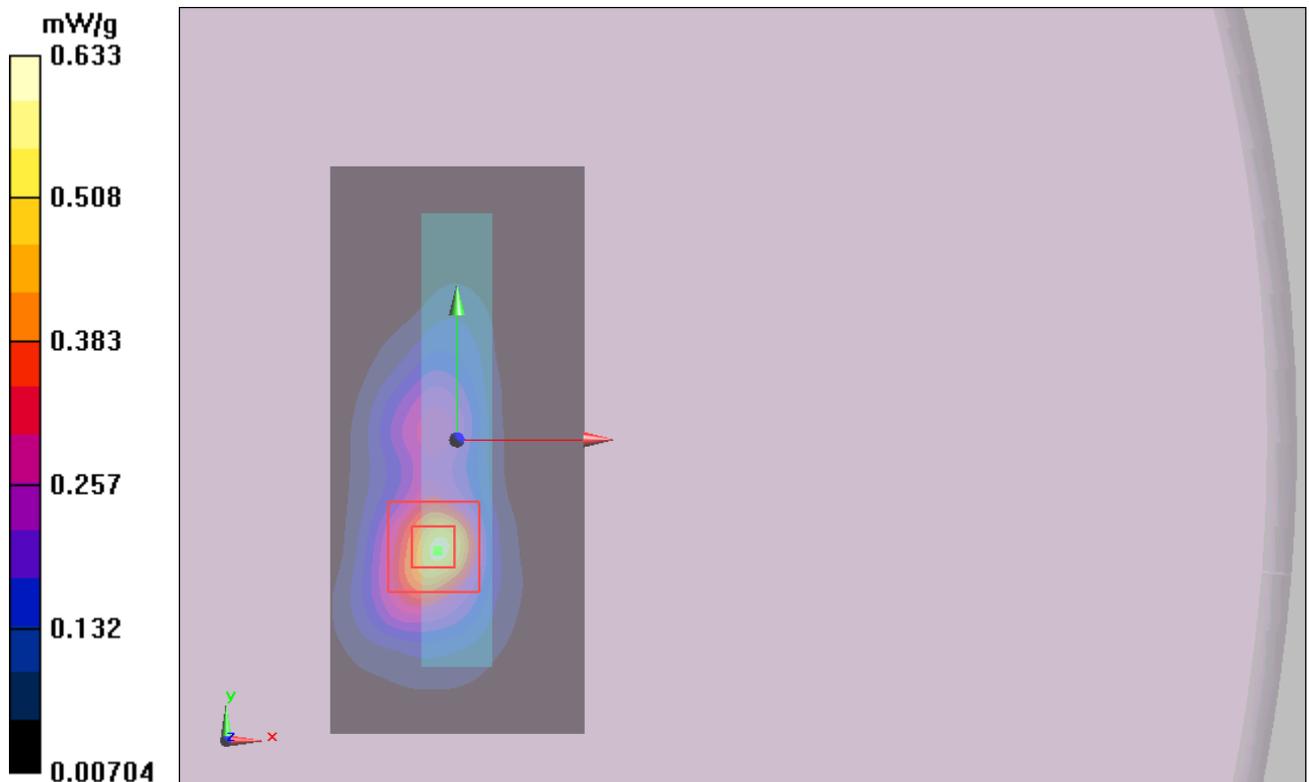


Figure 32 GSM 1900 GPRS (1Up) Test Position 3 Channel 661

GSM 1900 with Earphone GPRS (1Up) Test Position 1 High

Date/Time: 9/24/2010 11:43:31 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.23 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.84 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 2.05 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.506 mW/g

Maximum value of SAR (measured) = 1.11 mW/g

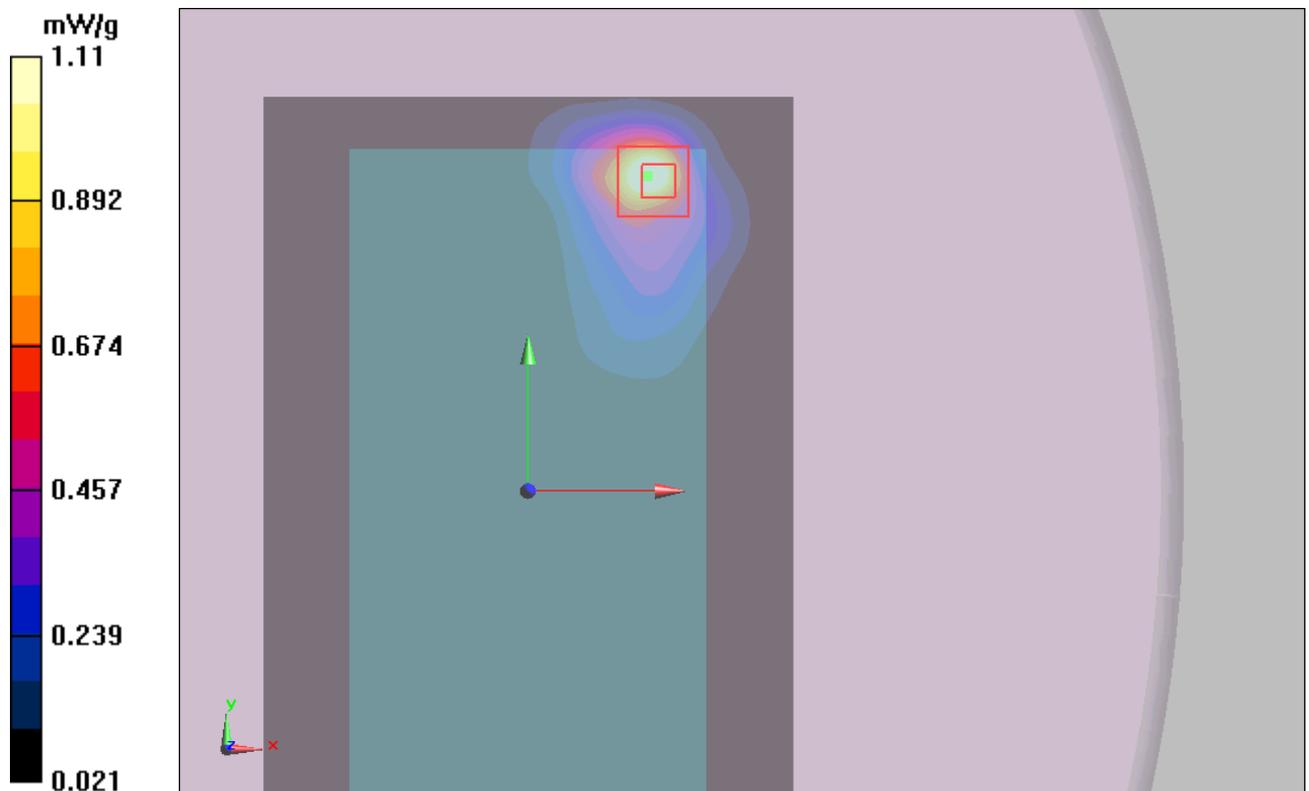


Figure 33 GSM 1900 with Earphone GPRS (1Up) Test Position 1 Channel 810

GSM 1900 EGPRS (1Up) Test Position 1 High

Date/Time: 9/24/2010 8:33:47 PM

Communication System: PCS 1900+GPRS(1Up); Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.38 mW/g

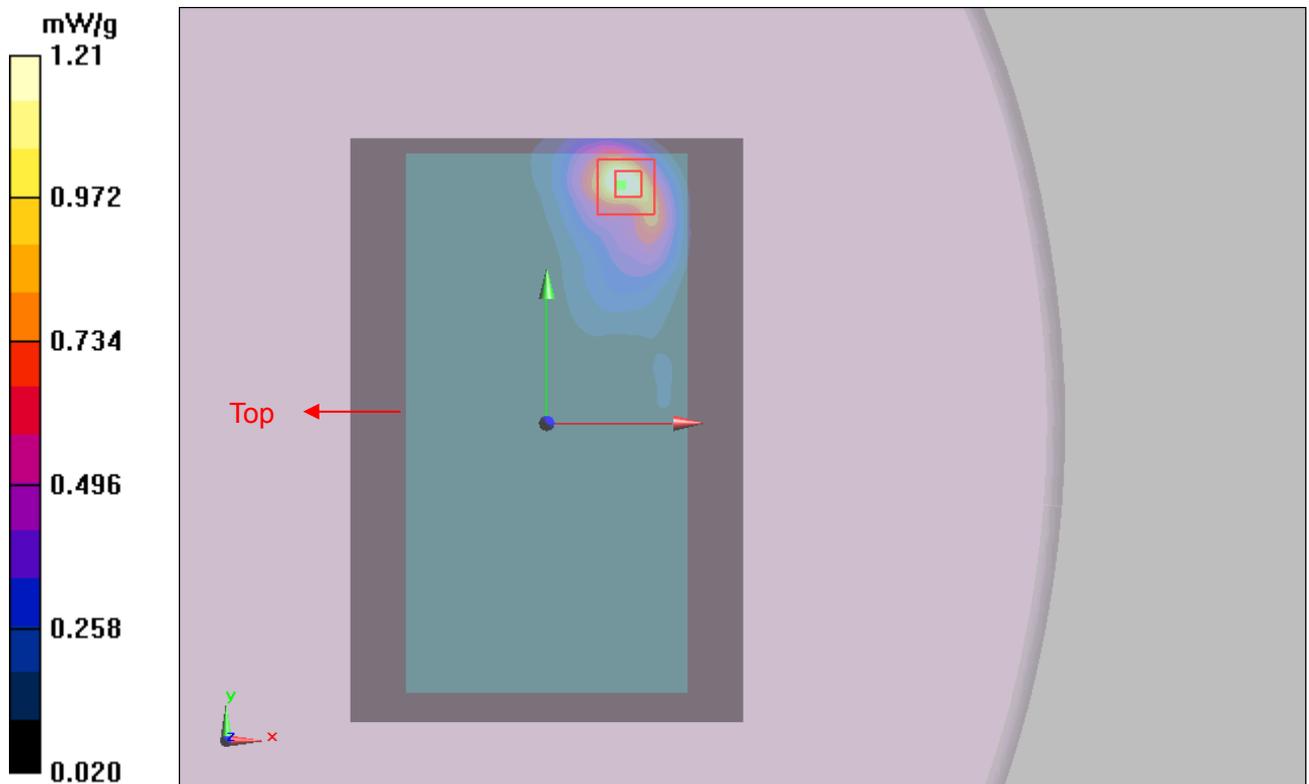
Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.72 V/m; Power Drift = 0.140 dB

Peak SAR (extrapolated) = 2.18 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.530 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



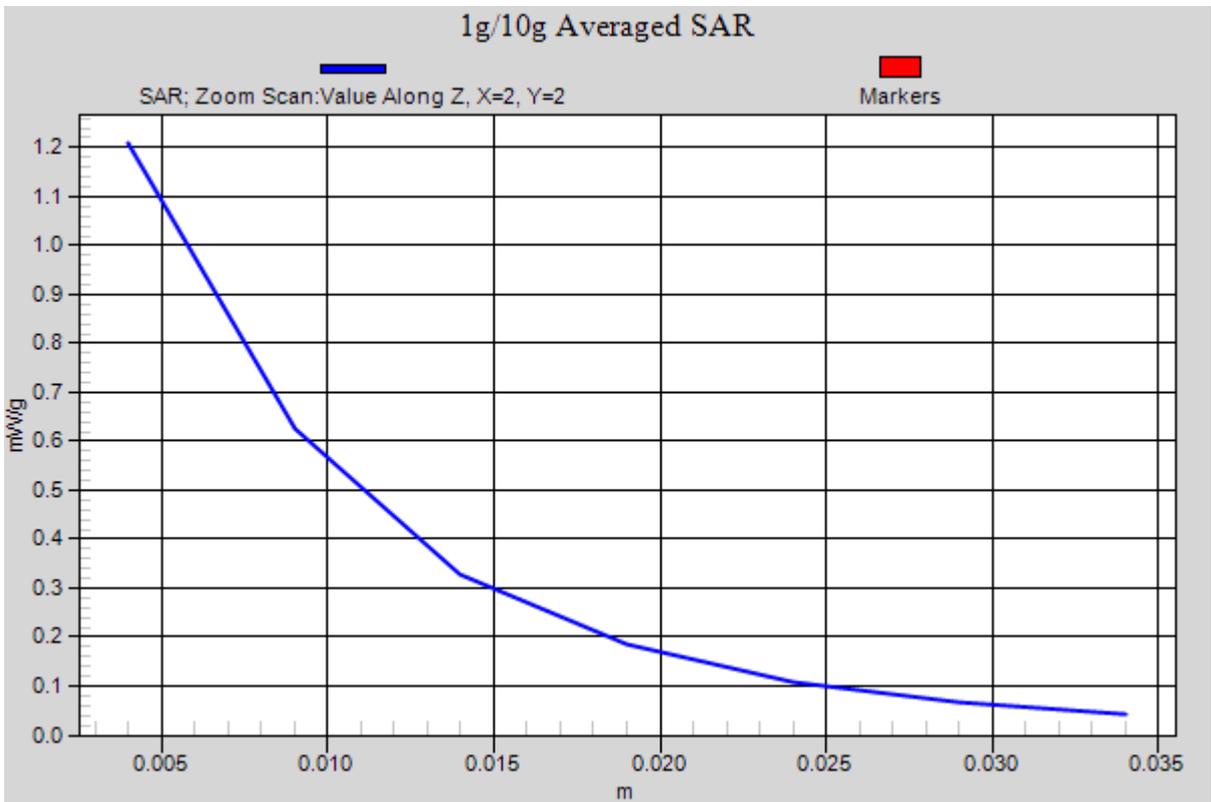


Figure 34 GSM 1900 EGPRS (1Up) Test Position 1 Channel 810

WCDMA Band II Test Position 1 High

Date/Time: 9/24/2010 9:03:58 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.21 mW/g

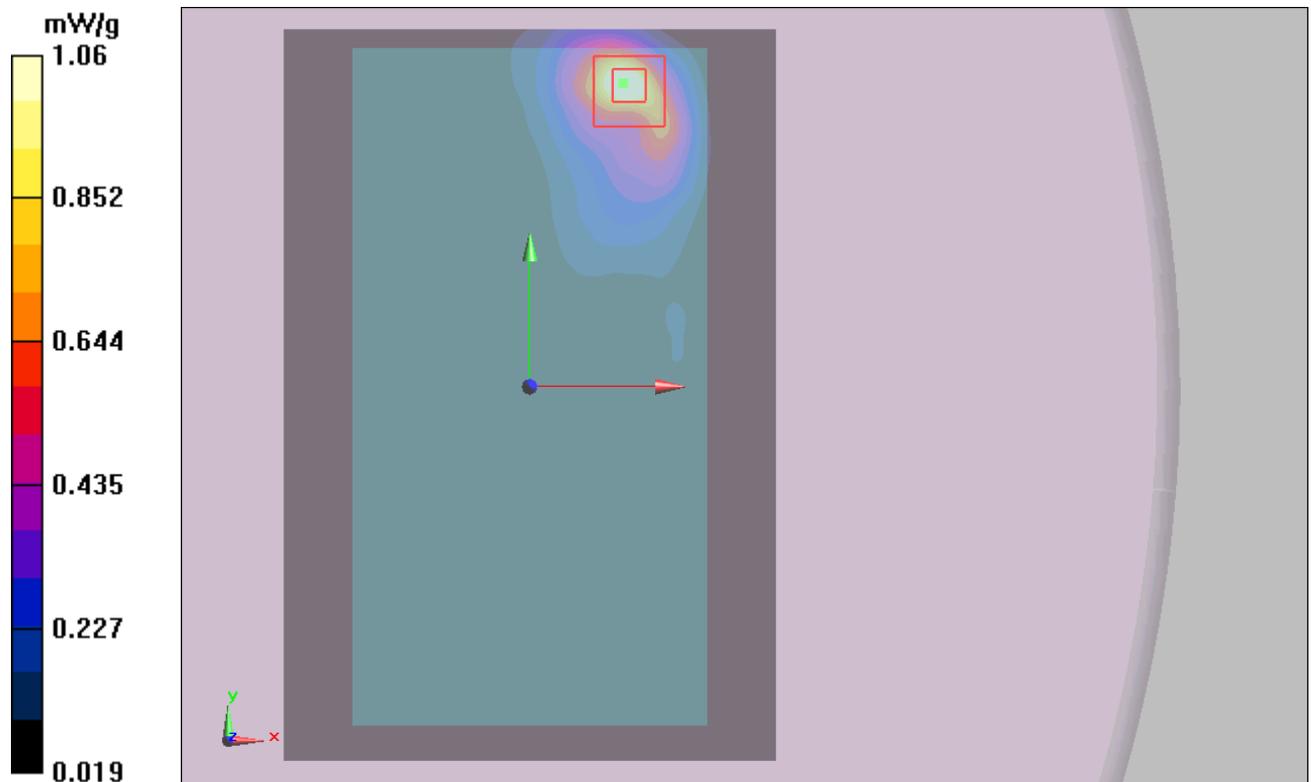
Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.66 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 1.94 W/kg

SAR(1 g) = 0.975 mW/g; SAR(10 g) = 0.473 mW/g

Maximum value of SAR (measured) = 1.06 mW/g



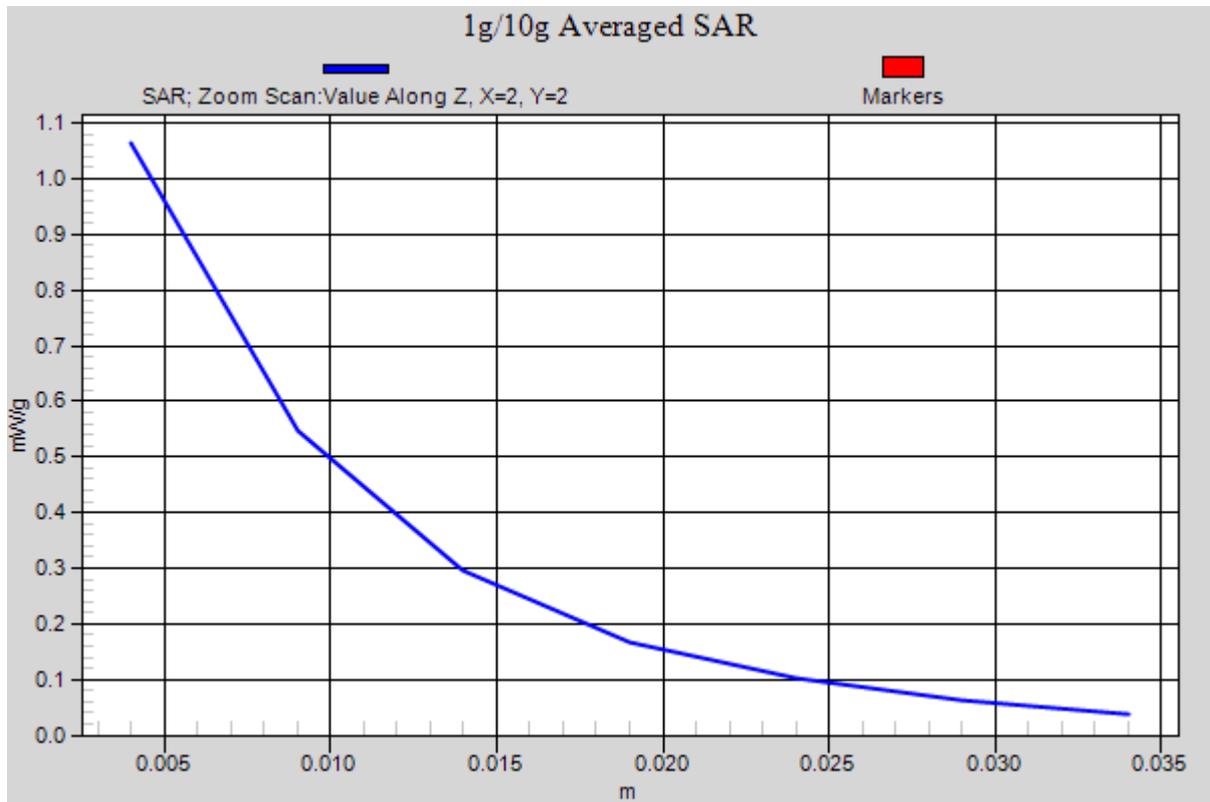


Figure 35 WCDMA Band II Test Position 1 Channel 9538

WCDMA Band II Test Position 1 Middle

Date/Time: 9/24/2010 2:51:58 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.04 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.447 mW/g

Maximum value of SAR (measured) = 1.03 mW/g

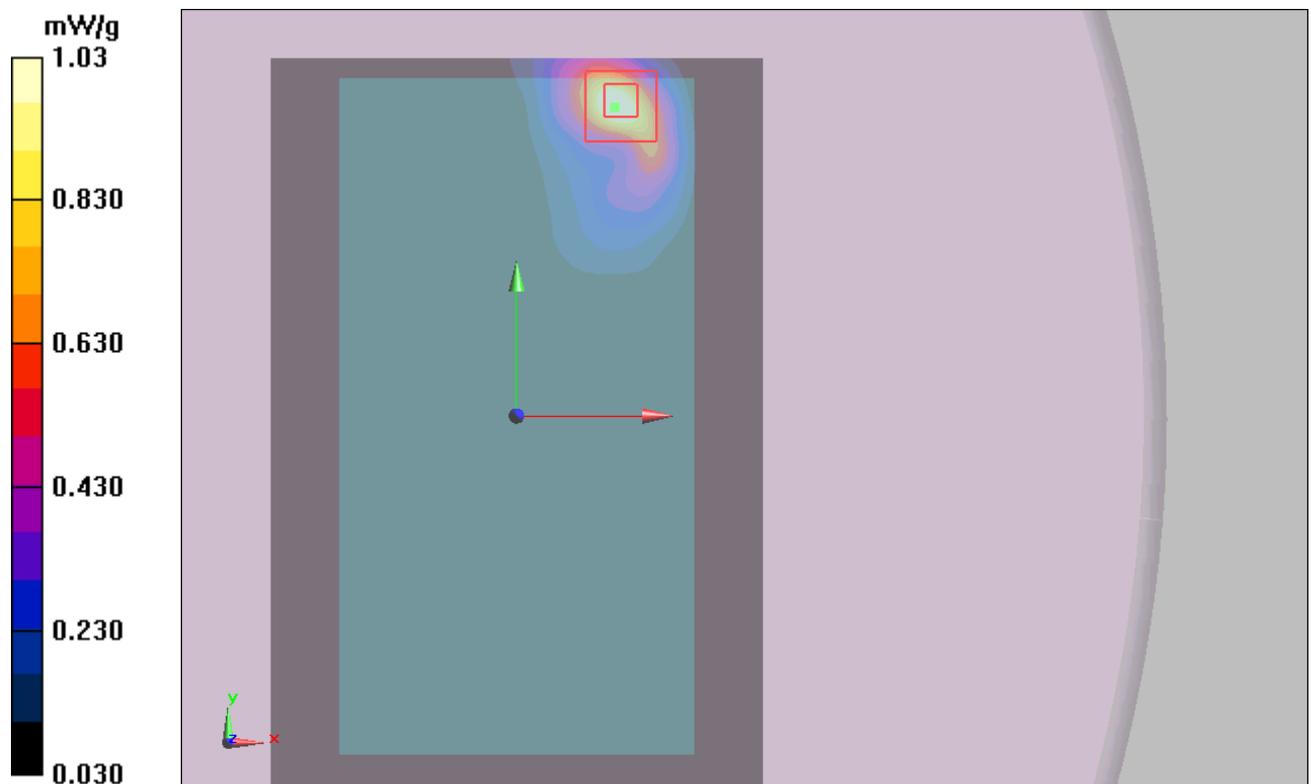


Figure 36 WCDMA Band II Test Position 1 Channel 9400

WCDMA Band II Test Position 1 Low

Date/Time: 9/24/2010 9:32:46 PM

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.922 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.7 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.359 mW/g

Maximum value of SAR (measured) = 0.802 mW/g

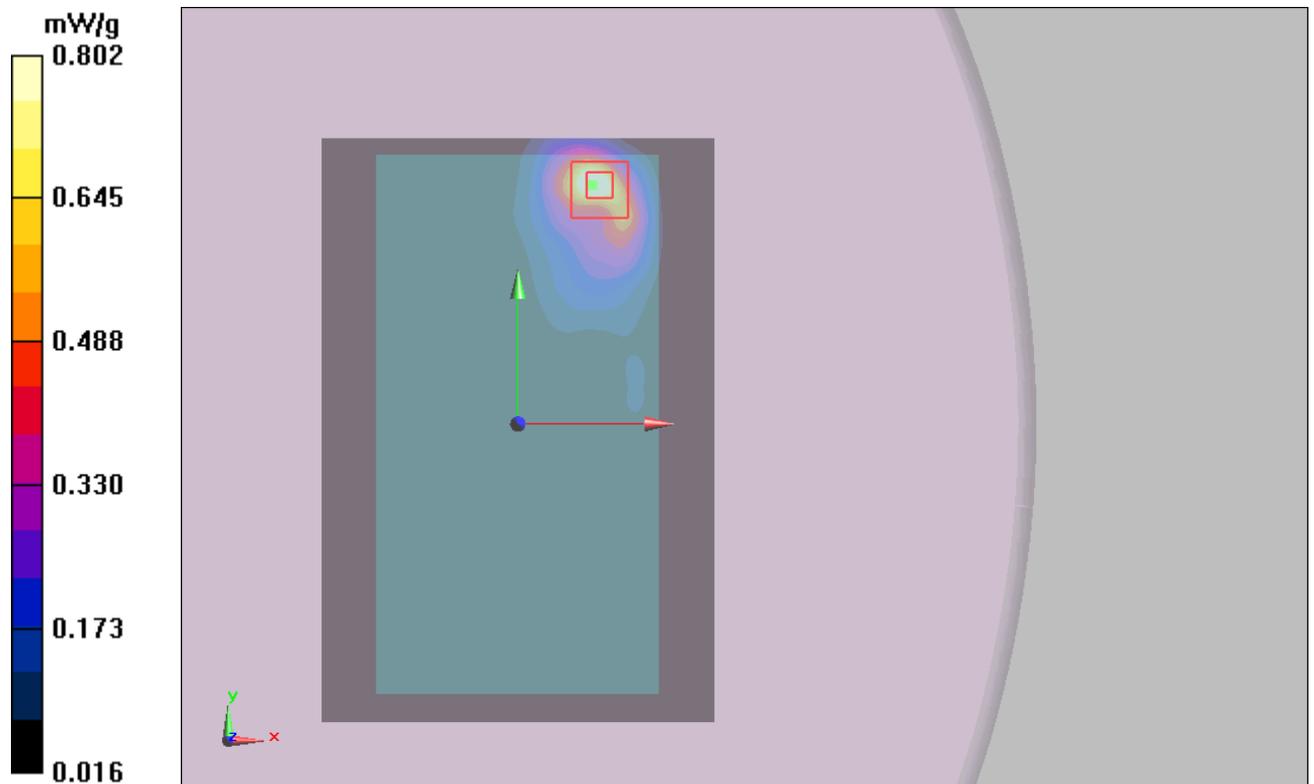


Figure 37 WCDMA Band II Test Position 1 Channel 9262

WCDMA Band II Test Position 2 Middle

Date/Time: 9/24/2010 2:25:50 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 2 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.445 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.31 V/m; Power Drift = 0.070 dB

Peak SAR (extrapolated) = 0.721 W/kg

SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.219 mW/g

Maximum value of SAR (measured) = 0.464 mW/g

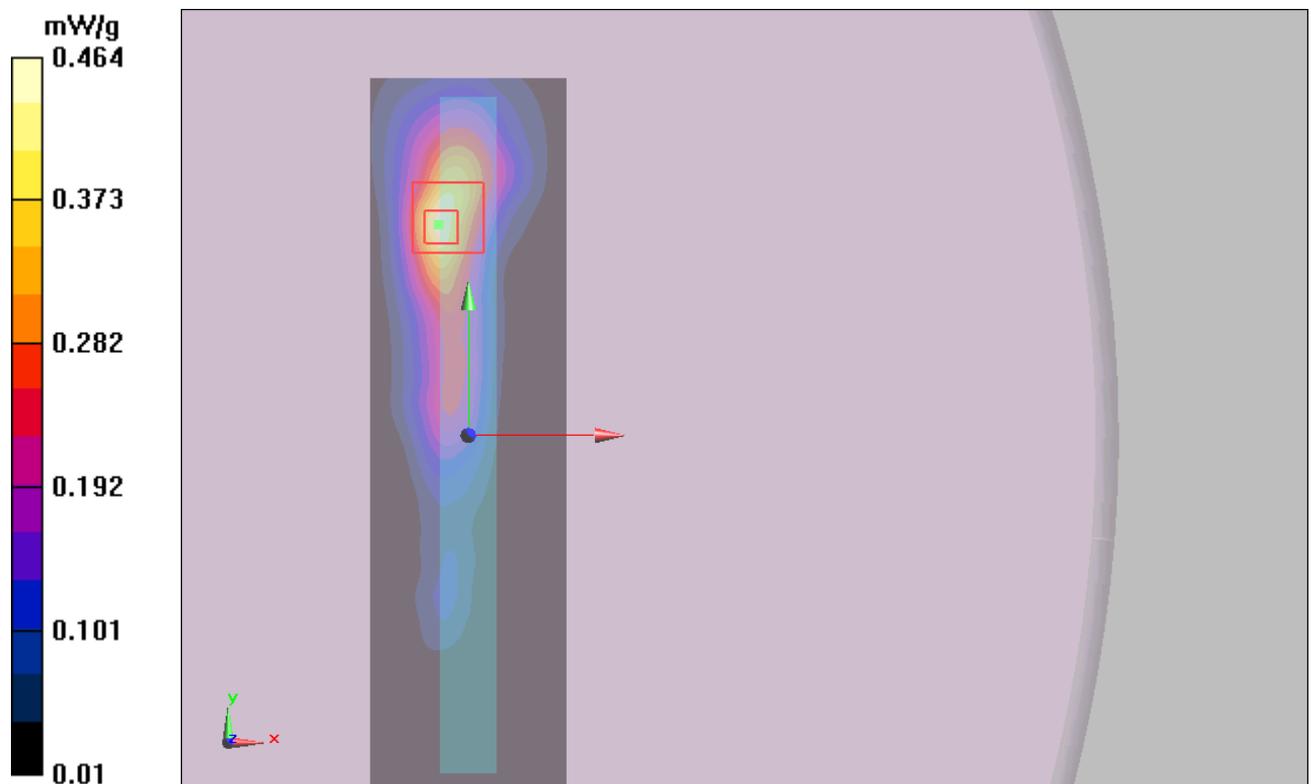


Figure 38 WCDMA Band II Test Position 2 Channel 9400

WCDMA Band II Test Position 3 Middle

Date/Time: 9/24/2010 3:10:53 PM

Communication System: WCDMA Band II; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.444 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.7 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.786 W/kg

SAR(1 g) = 0.402 mW/g; SAR(10 g) = 0.188 mW/g

Maximum value of SAR (measured) = 0.473 mW/g

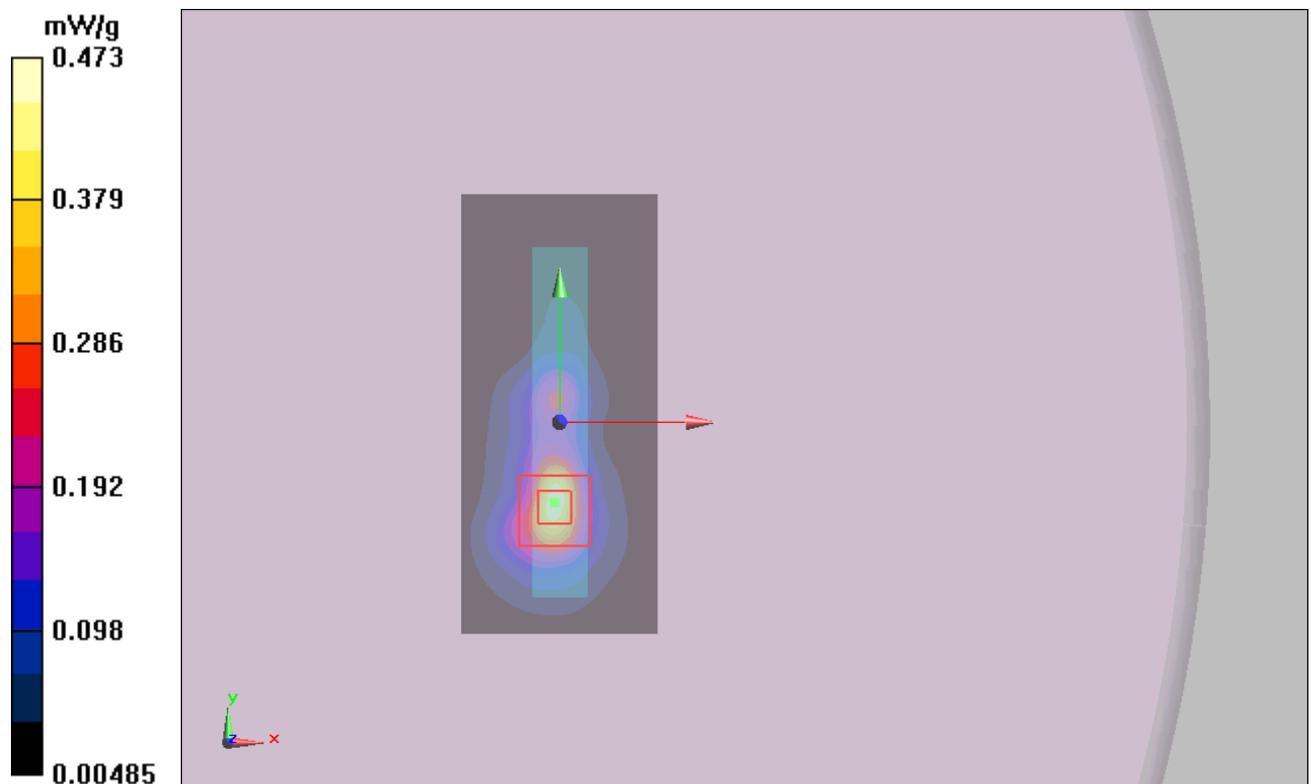


Figure 39 WCDMA Band II Test Position 3 Channel 9400

WCDMA Band II with Earphone Test Position 1 High

Date/Time: 9/24/2010 11:59:42 PM

Communication System: WCDMA Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.26 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 1.79 W/kg

SAR(1 g) = 0.904 mW/g; SAR(10 g) = 0.443 mW/g

Maximum value of SAR (measured) = 0.966 mW/g

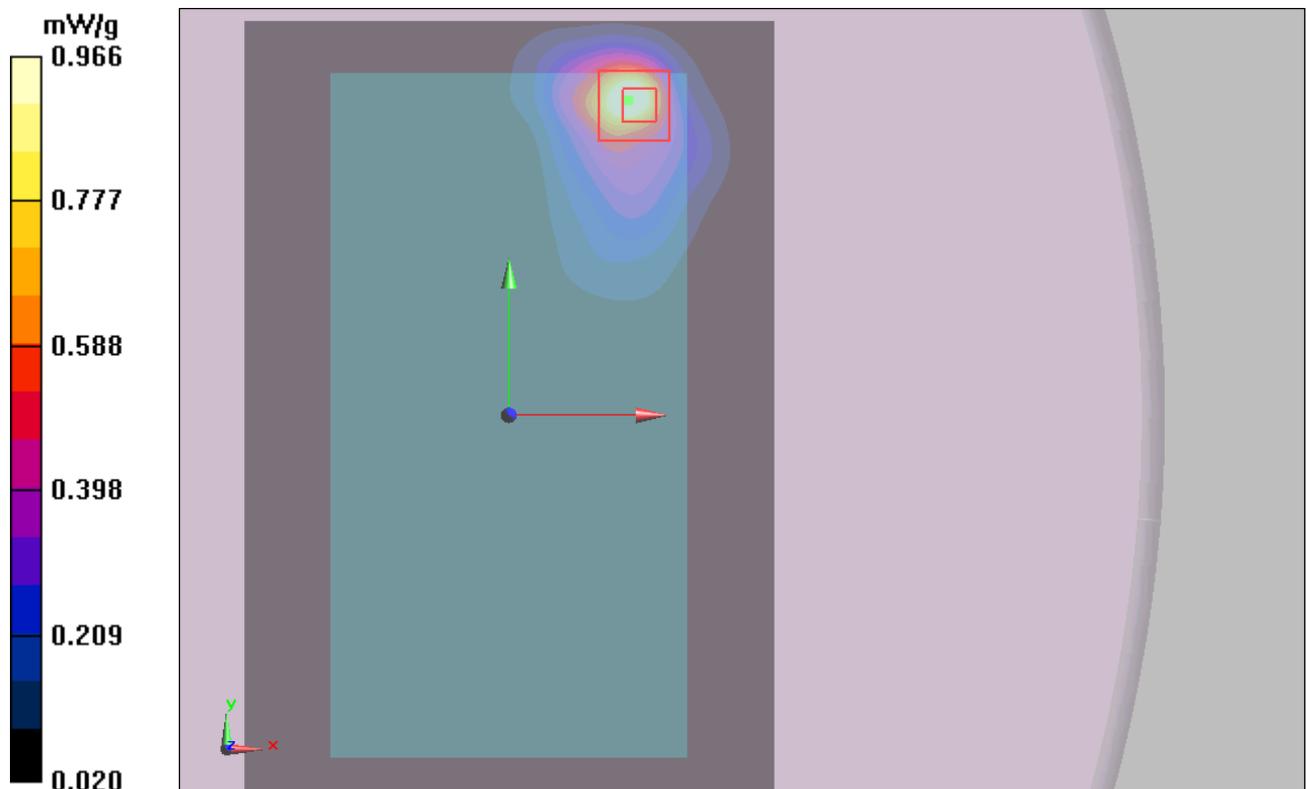


Figure 40 WCDMA Band II with Earphone Test Position 1 Channel 9538

WCDMA Band II HSDPA Test Position 1 High

Date/Time: 9/24/2010 10:55:00 PM

Communication System: WCDMA Band II+HSDPA; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.11 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.1 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 1.95 W/kg

SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.456 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

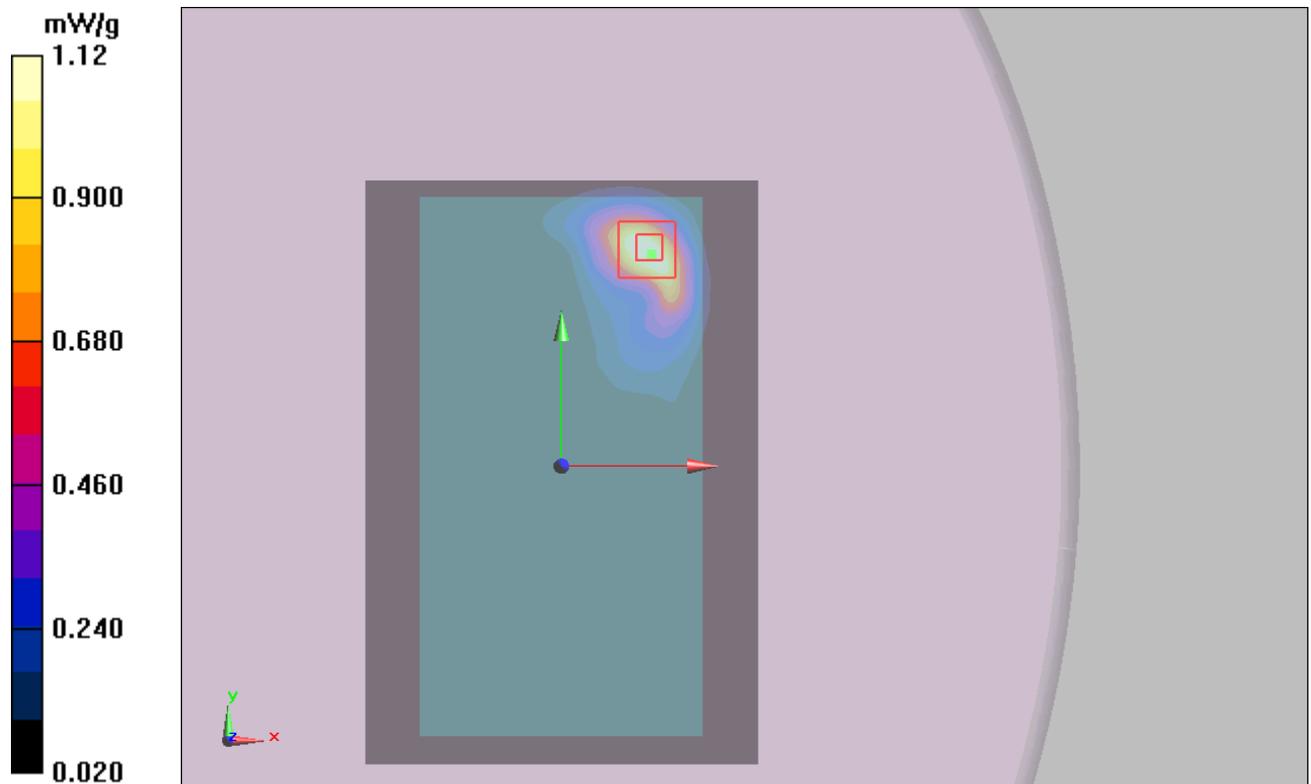


Figure 41 WCDMA Band II HSDPA Test Position 1 Channel 9538

WCDMA Band II HSUPA Test Position 1 High

Date/Time: 9/24/2010 11:26:01 PM

Communication System: WCDMA Band II+HSUPA; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53$; $\rho = 1000$ kg/m³

Ambient Temperature:22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.60, 7.60, 7.60); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.935 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.92 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 0.909 mW/g; SAR(10 g) = 0.433 mW/g

Maximum value of SAR (measured) = 0.973 mW/g

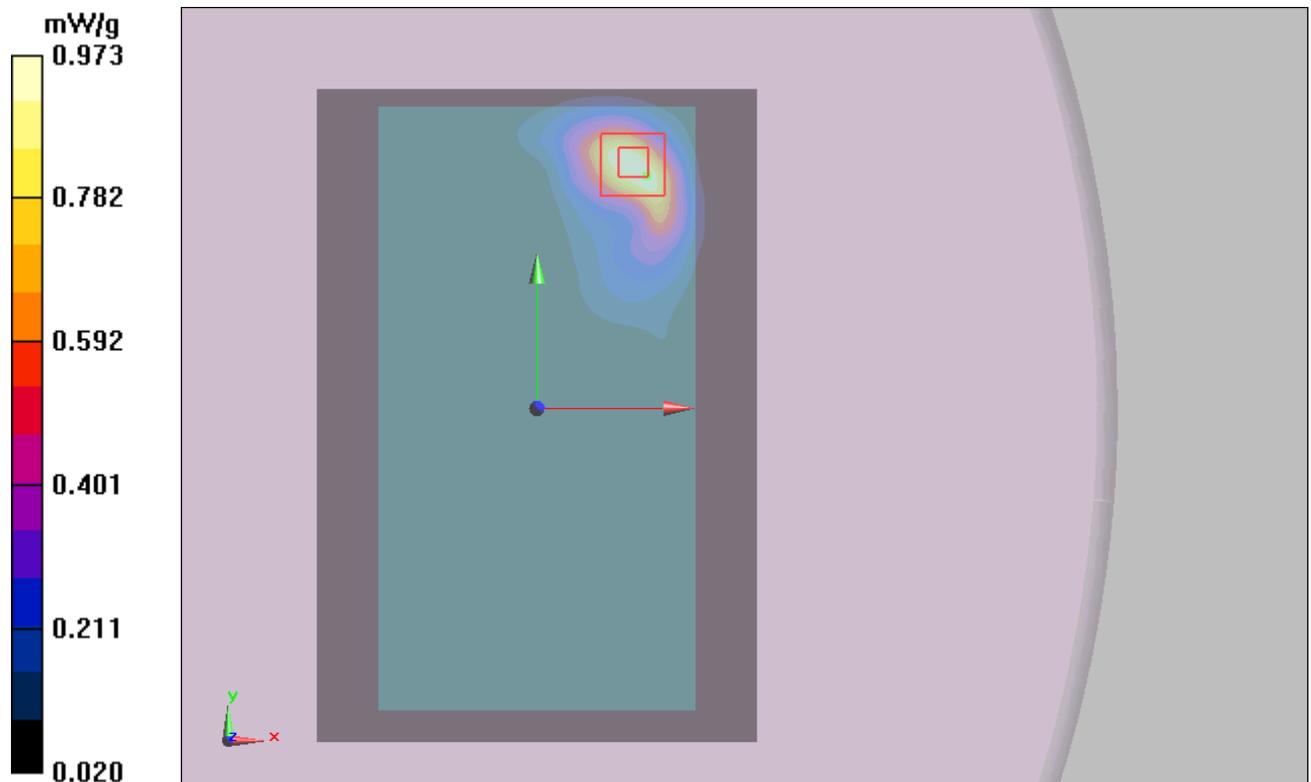


Figure 42 WCDMA Band II HSUPA Test Position 1 Channel 9538

WCDMA Band V Test Position 1 Middle

Date/Time: 9/25/2010 10:08:24 AM

Communication System: WCDMA Band V; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.768 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.04 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 1.1 W/kg

SAR(1 g) = 0.643 mW/g; SAR(10 g) = 0.377 mW/g

Maximum value of SAR (measured) = 0.688 mW/g

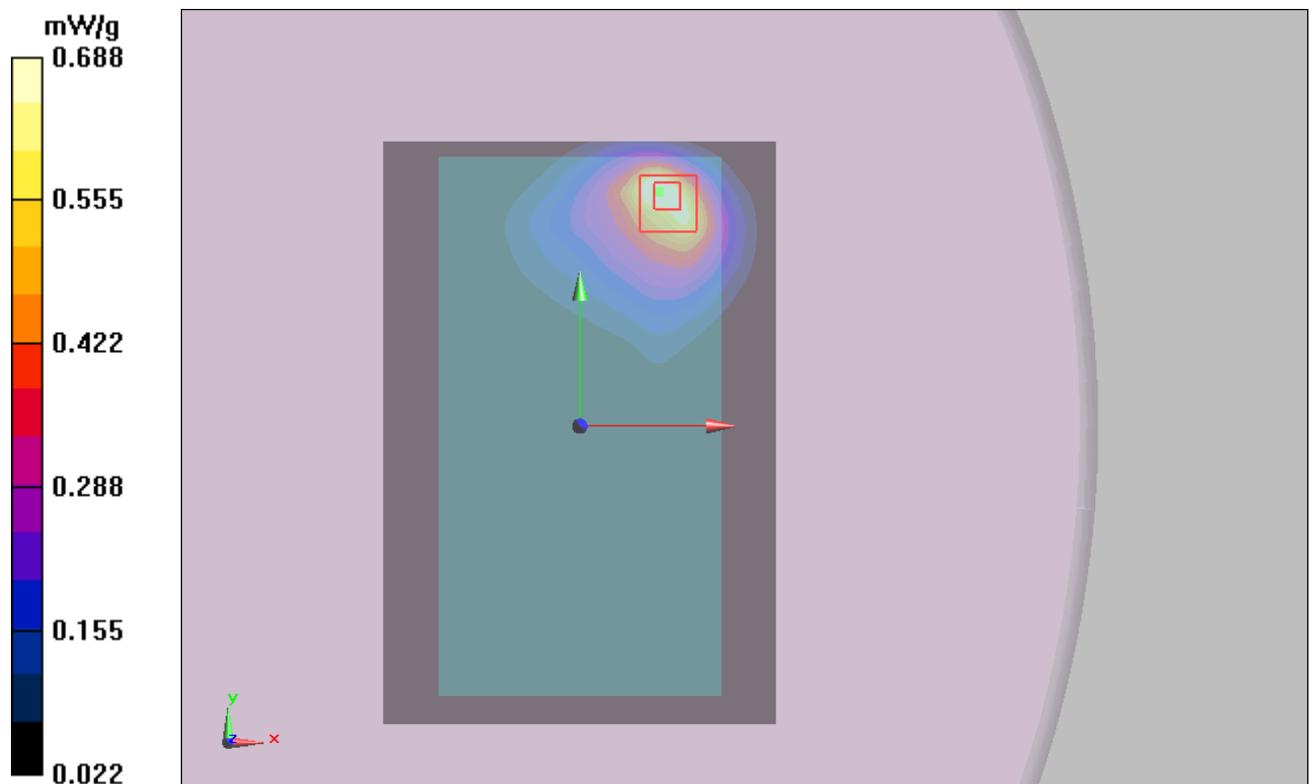


Figure 43 WCDMA Band V Test Position 1 Channel 4183

WCDMA Band V Test Position 2 Middle

Date/Time: 9/25/2010 3:58:05 PM

Communication System: WCDMA Band V; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 2 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.221 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.89 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 0.314 W/kg

SAR(1 g) = 0.206 mW/g; SAR(10 g) = 0.129 mW/g

Maximum value of SAR (measured) = 0.223 mW/g

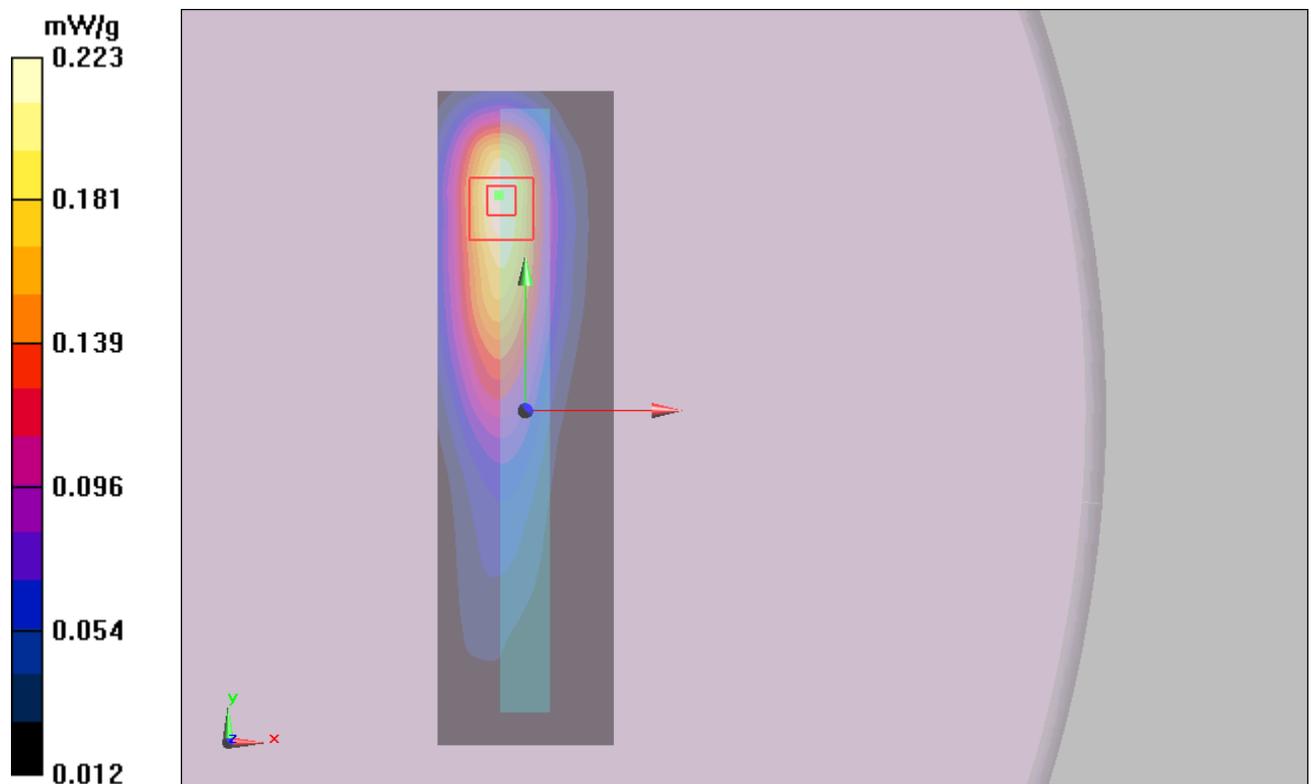


Figure 44 WCDMA Band V Test Position 2 Channel 4183

WCDMA Band V Test Position 3 High

Date/Time: 9/25/2010 4:23:31 PM

Communication System: WCDMA Band V; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 847$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 High/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.581 mW/g

Test Position 3 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.1 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.994 W/kg

SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.334 mW/g

Maximum value of SAR (measured) = 0.607 mW/g

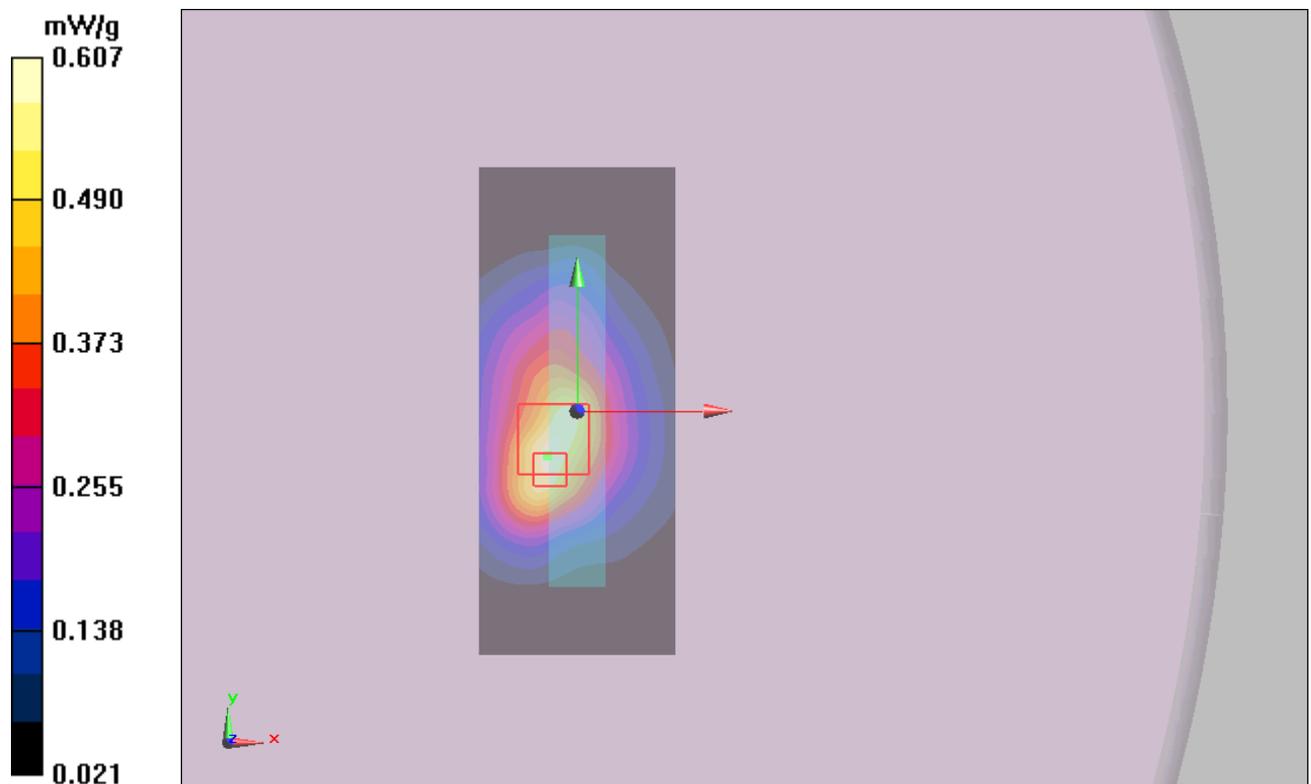


Figure 45 WCDMA Band V Test Position 3 Channel 4233

WCDMA Band V Test Position 3 Middle

Date/Time: 9/25/2010 3:40:24 PM

Communication System: WCDMA Band V; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.779 mW/g

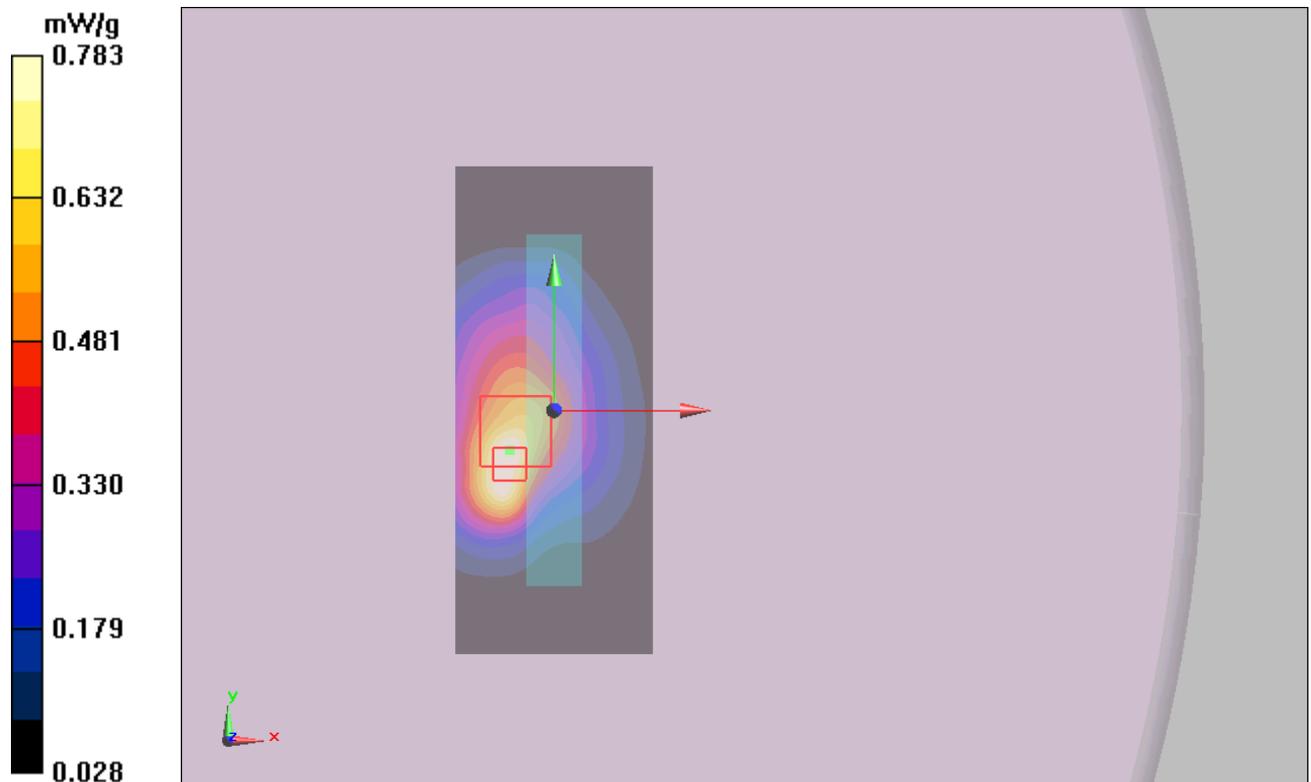
Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.6 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.688 mW/g; SAR(10 g) = 0.427 mW/g

Maximum value of SAR (measured) = 0.783 mW/g



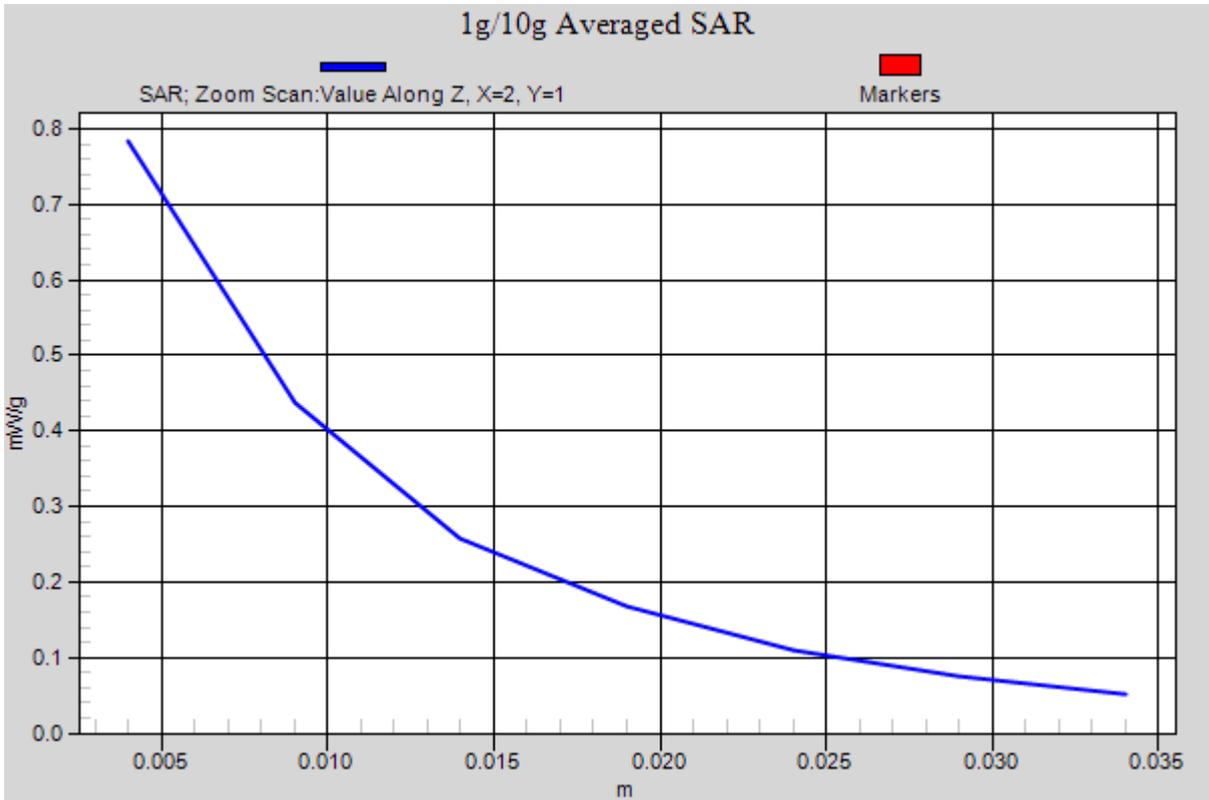


Figure 46 WCDMA Band V Test Position 3 Channel 4183

WCDMA Band V Test Position 3 Low

Date/Time: 9/25/2010 4:38:48 PM

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 826.4$ MHz; $\sigma = 0.994$ mho/m; $\epsilon_r = 55.5$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Low/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.638 mW/g

Test Position 3 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.3 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.368 mW/g

Maximum value of SAR (measured) = 0.684 mW/g

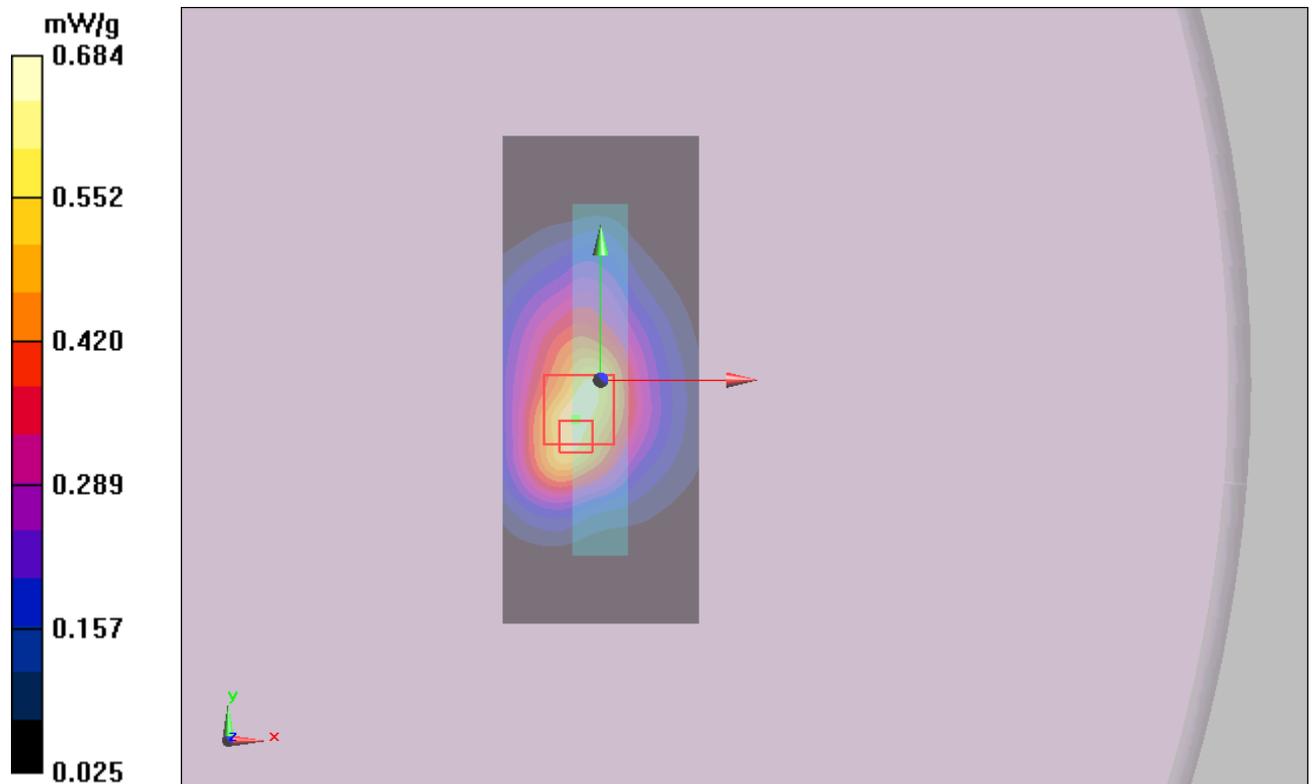


Figure 47 WCDMA Band V Test Position 3 Channel 4132

WCDMA Band V with Earphone Test Position 3 Middle

Date/Time: 9/25/2010 8:40:29 PM

Communication System: WCDMA Band V; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.611 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.326 mW/g

Maximum value of SAR (measured) = 0.618 mW/g

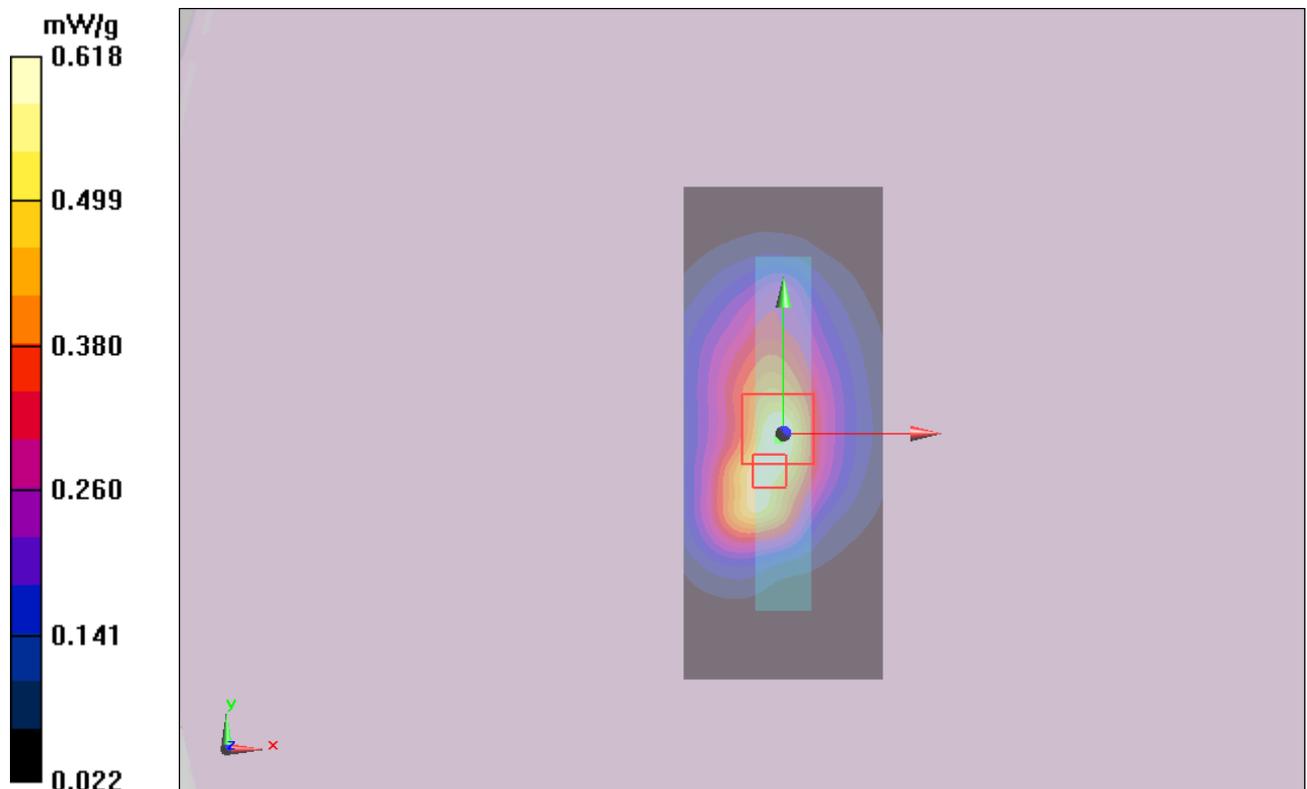


Figure 48 WCDMA Band V with Earphone Test Position 3 Channel 4183

WCDMA Band V HSDPA Test Position 3 Middle

Date/Time: 9/25/2010 5:42:39 PM

Communication System: WCDMA Band V+HSDPA; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.682 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 23.8 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.389 mW/g

Maximum value of SAR (measured) = 0.735 mW/g

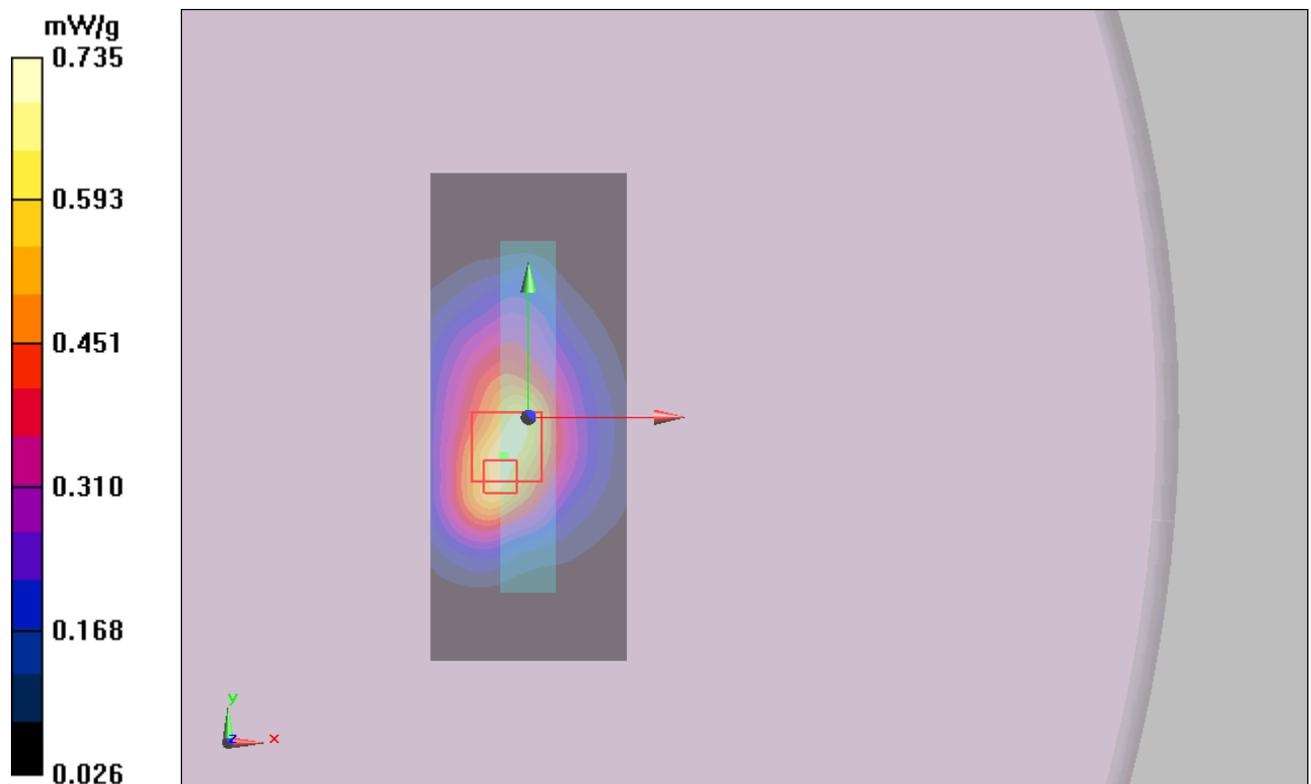


Figure 49 WCDMA Band V HSDPA Test Position 3 Channel 4183

WCDMA Band V HSUPA Test Position 3 Middle

Date/Time: 9/25/2010 5:21:32 PM

Communication System: WCDMA Band V+HSUPA; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 837$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(9.24, 9.24, 9.24); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.544 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.8 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 0.937 W/kg

SAR(1 g) = 0.526 mW/g; SAR(10 g) = 0.327 mW/g

Maximum value of SAR (measured) = 0.606 mW/g

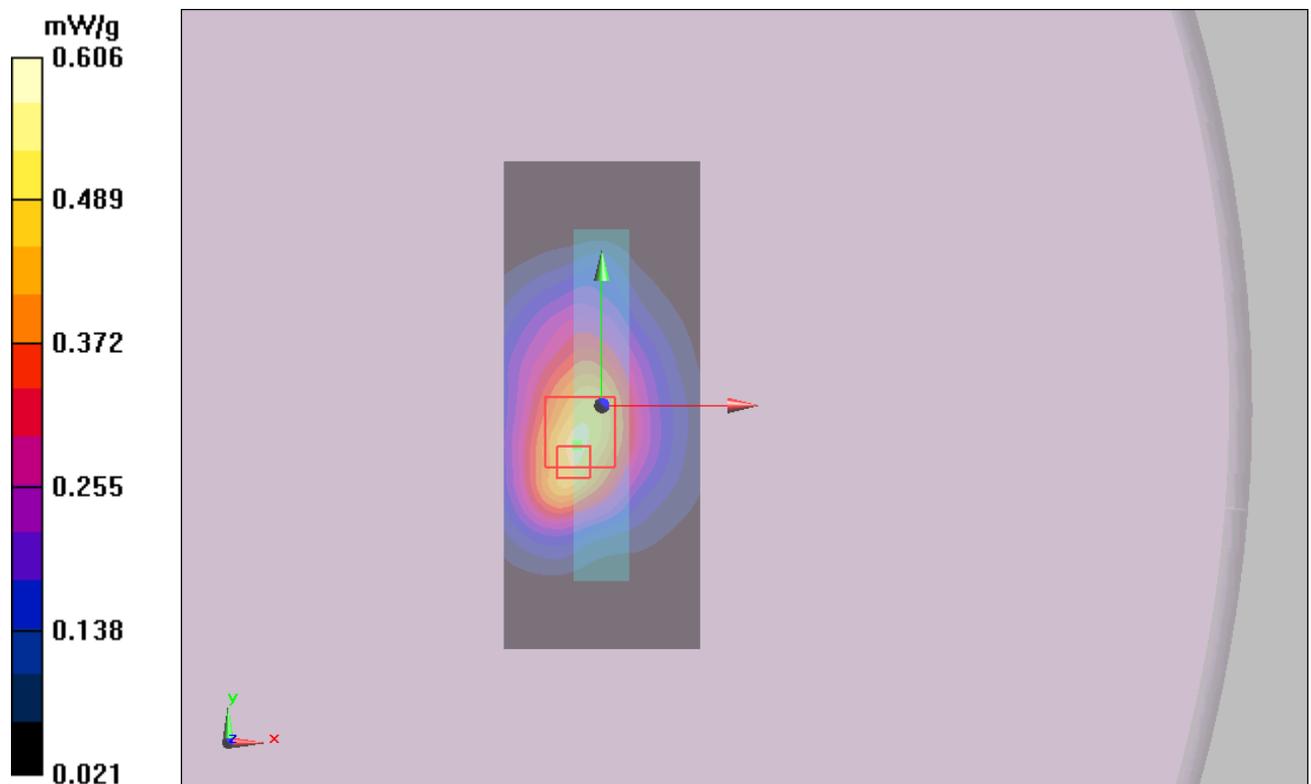


Figure 50 WCDMA Band V HSUPA Test Position 3 Channel 4183

802.11b Test Position 1 High

Date/Time: 9/27/2010 10:52:47 PM

Communication System: 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.94$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 High/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.635 mW/g

Test Position 1 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.48 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 0.918 mW/g; SAR(10 g) = 0.391 mW/g

Maximum value of SAR (measured) = 1.06 mW/g

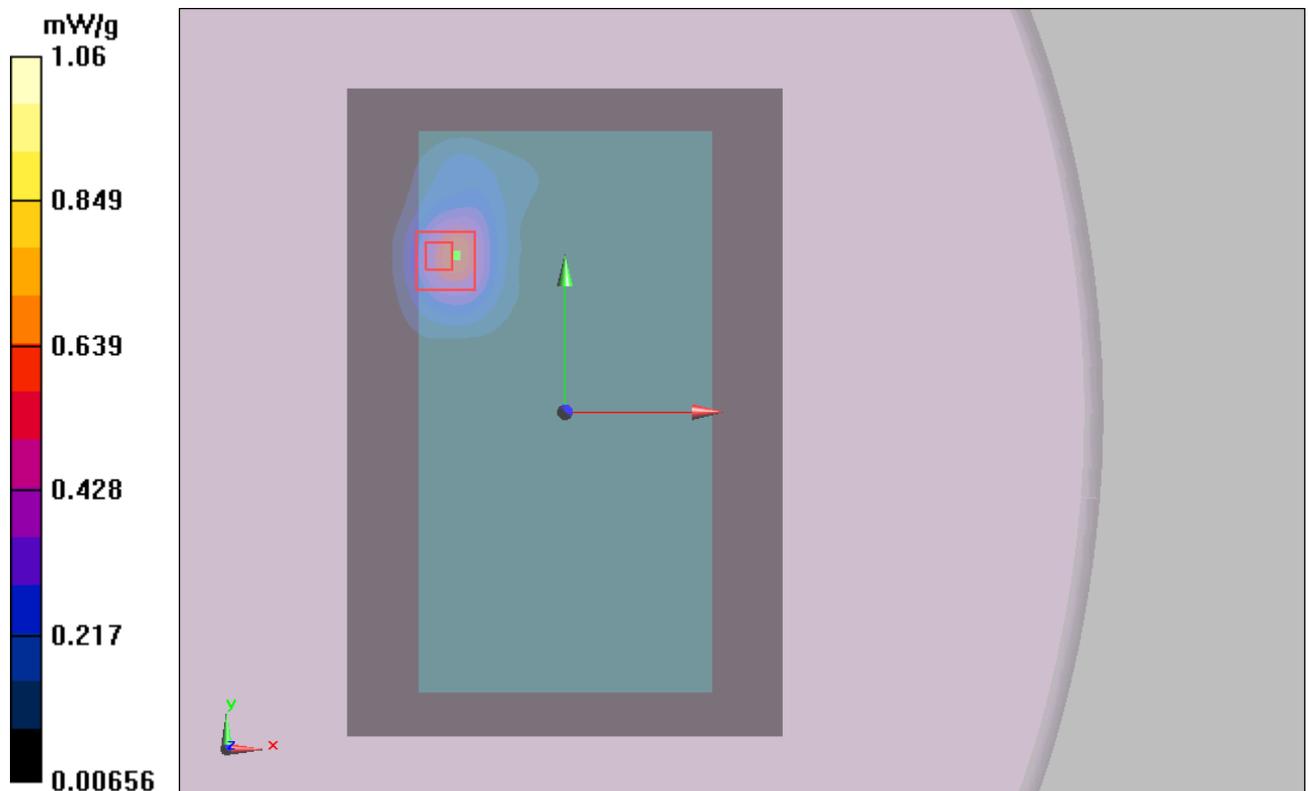


Figure 51 802.11b Test Position 1 Channel 11

802.11b Test Position 1 Middle

Date/Time: 9/27/2010 9:35:57 PM

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.02 mW/g

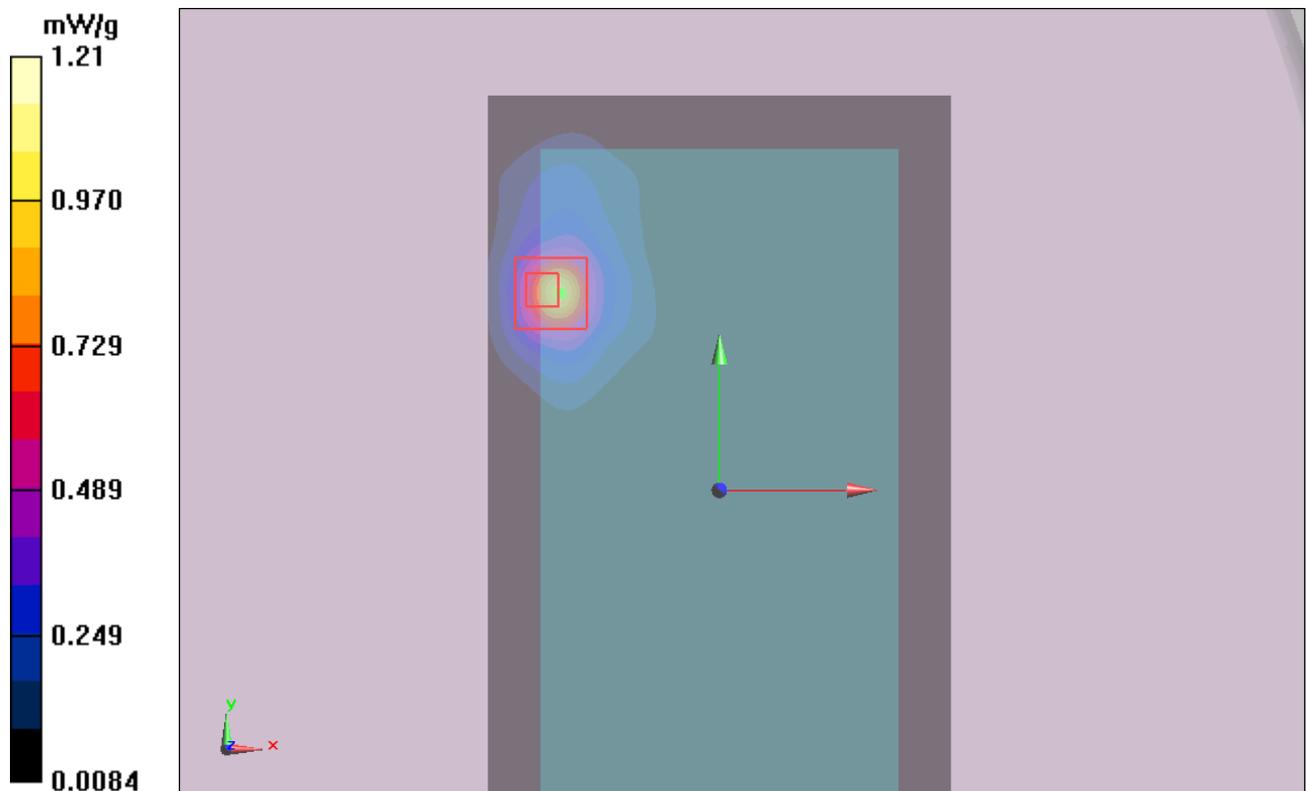
Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.7 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 2.46 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.431 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



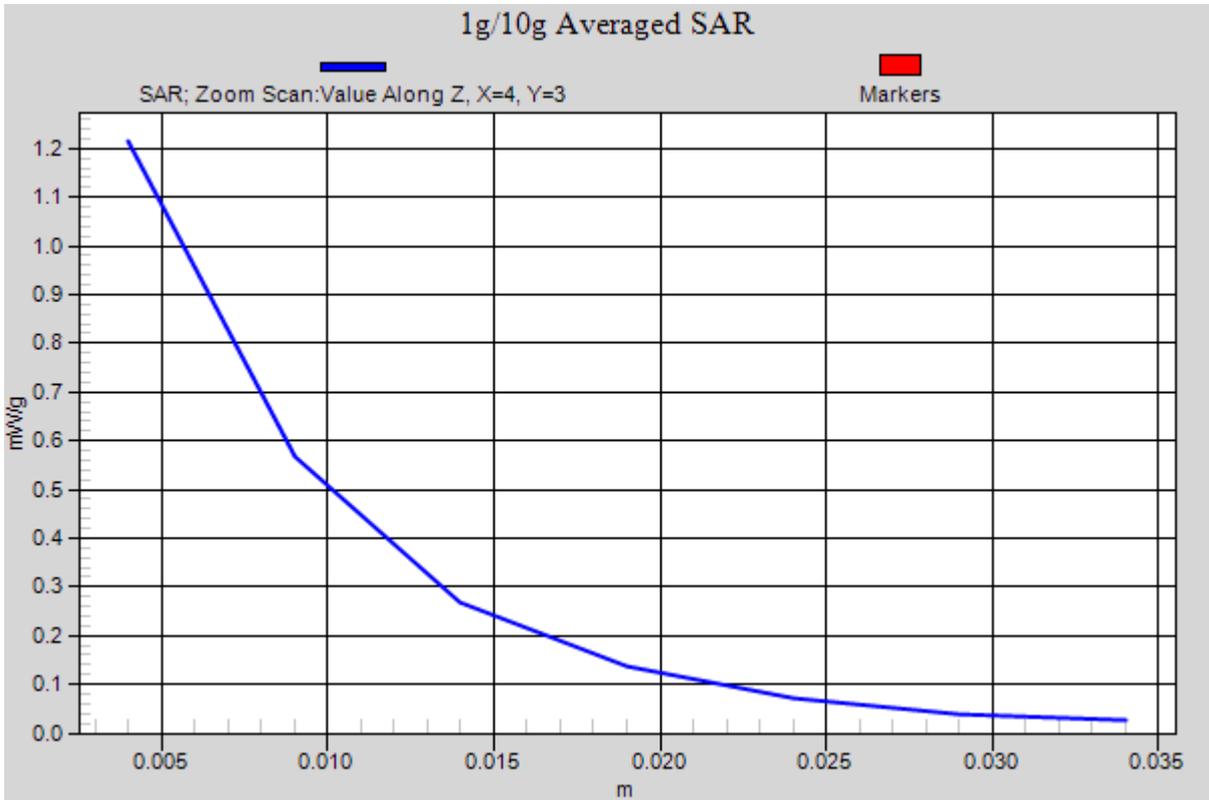


Figure 52 802.11b Test Position 1 Channel 6

802.11b Test Position 1 Low

Date/Time: 9/27/2010 10:18:59 PM

Communication System: 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.88 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: $22.3 \text{ }^\circ\text{C}$ Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Low/Area Scan (101x151x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.03 mW/g

Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.8 V/m ; Power Drift = -0.079 dB

Peak SAR (extrapolated) = 1.9 W/kg

SAR(1 g) = 0.853 mW/g ; SAR(10 g) = 0.366 mW/g

Maximum value of SAR (measured) = 0.982 mW/g

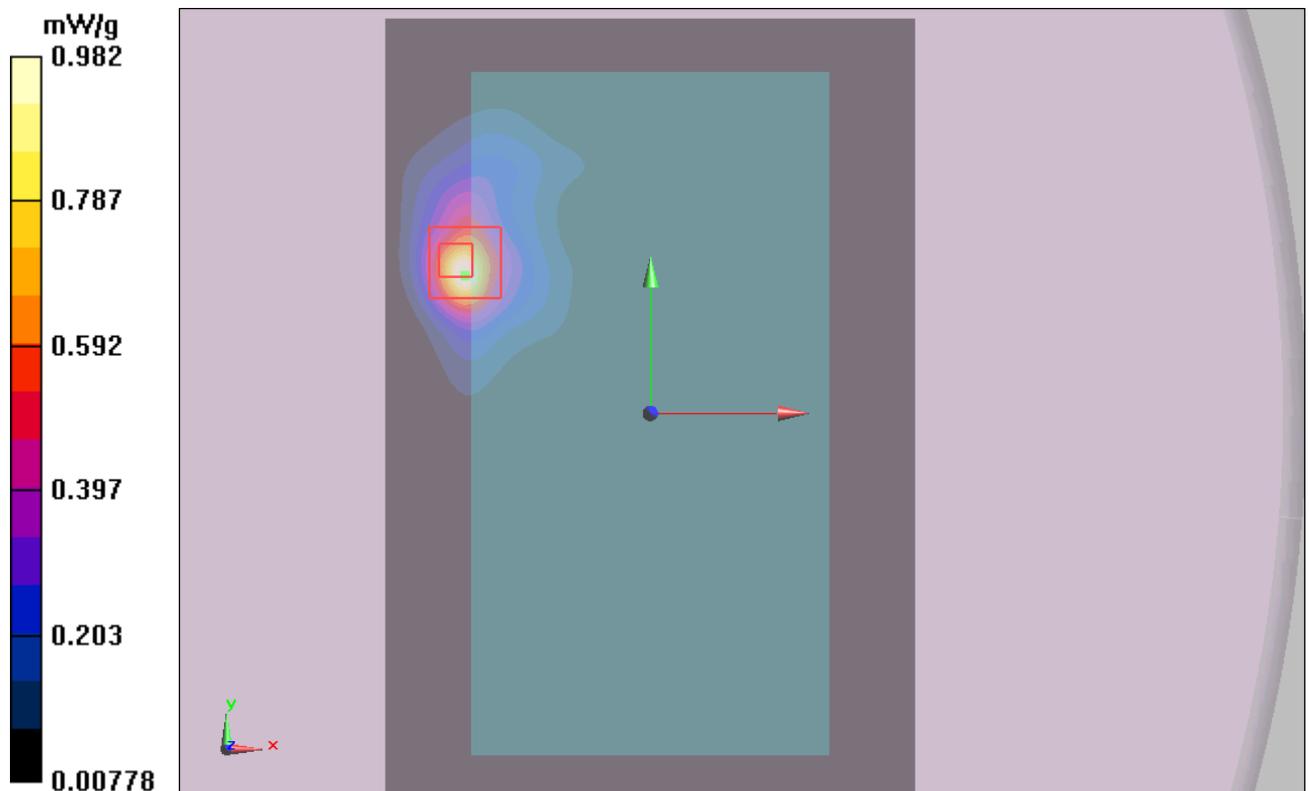


Figure 53 802.11b Test Position 1 Channel 1

802.11b Test Position 3 Middle

Date/Time: 9/28/2010 12:39:50 AM

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 3 Middle/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.013 mW/g

Test Position 3 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.06 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.067 W/kg

SAR(1 g) = 0.009 mW/g; SAR(10 g) = 0.001 mW/g

Maximum value of SAR (measured) = 0.020 mW/g

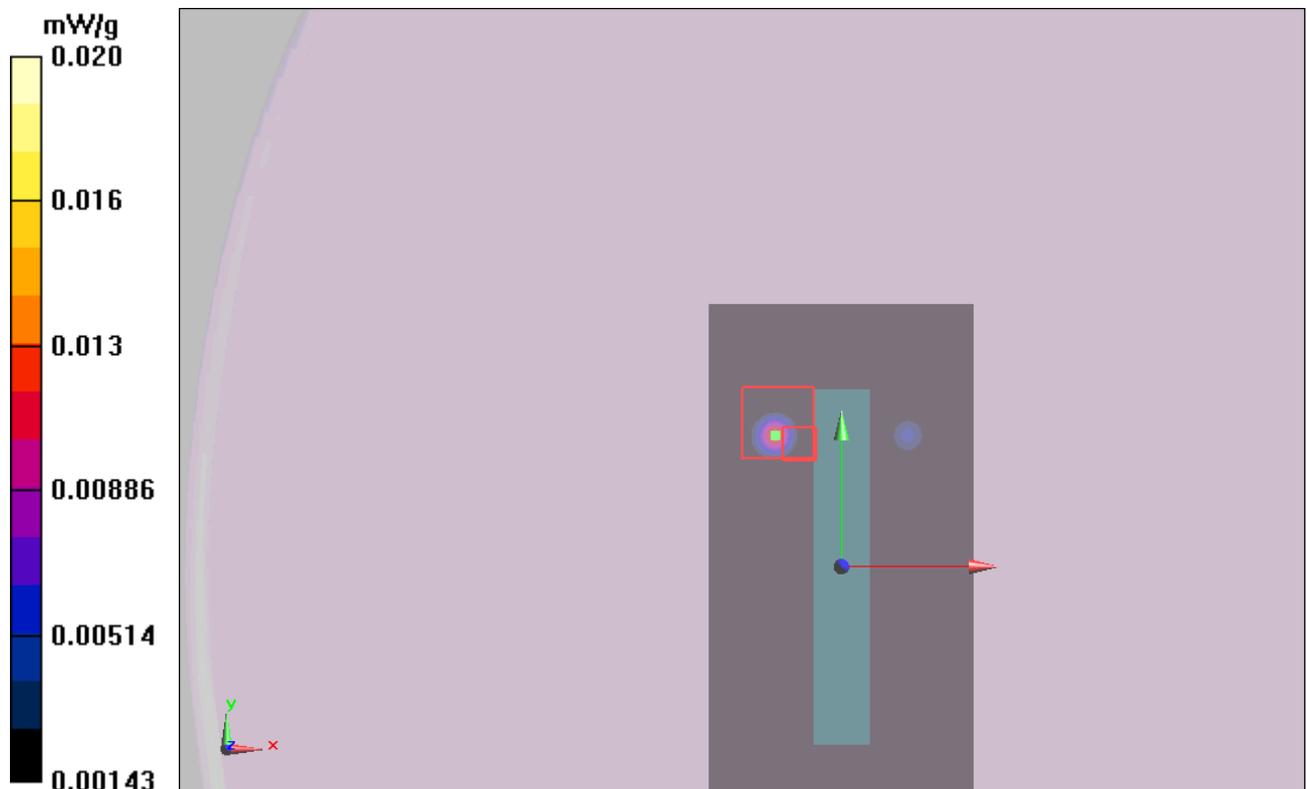


Figure 54 802.11b Test Position 3 Channel 6

802.11b Test Position 4 Middle

Date/Time: 9/27/2010 11:28:09 PM

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5°C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 4 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.429 mW/g

Test Position 4 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.83 V/m; Power Drift = -0.082 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.577 mW/g; SAR(10 g) = 0.225 mW/g

Maximum value of SAR (measured) = 0.678 mW/g

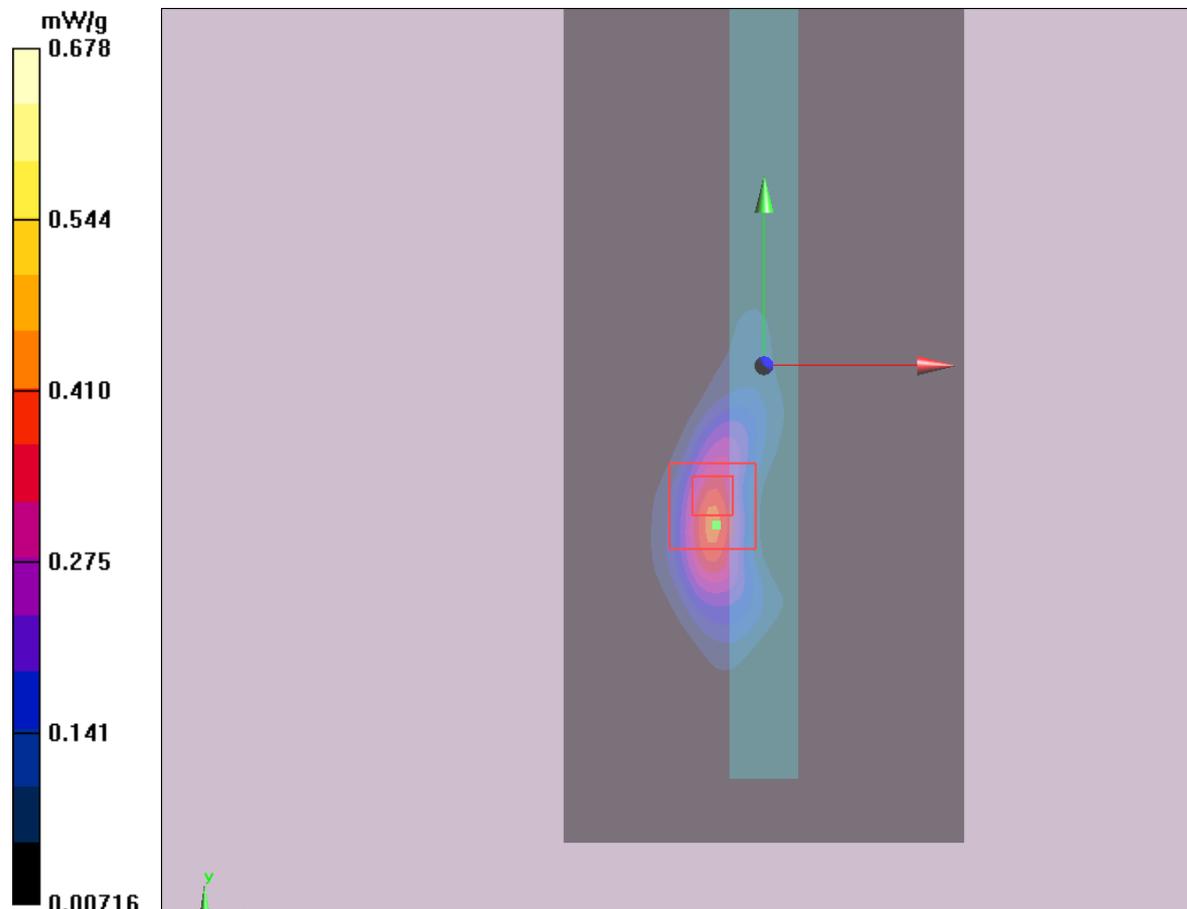


Figure 55 802.11b Test Position 4 Channel 6

802.11b with Earphone Test Position 1 Middle

Date/Time: 9/28/2010 1:10:34 AM

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.3 °C Liquid Temperature: 21.5 °C

DASY5 Configuration:

Probe: EX3DV4 - SN3661; ConvF(7.34, 7.34, 7.34); Calibrated: 12/30/2009

Electronics: DAE4 Sn871; Calibrated: 11/11/2009

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Test Position 1 Middle/Area Scan (41x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.749 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.62 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 1.92 W/kg

SAR(1 g) = 0.856 mW/g; SAR(10 g) = 0.369 mW/g

Maximum value of SAR (measured) = 0.958 mW/g

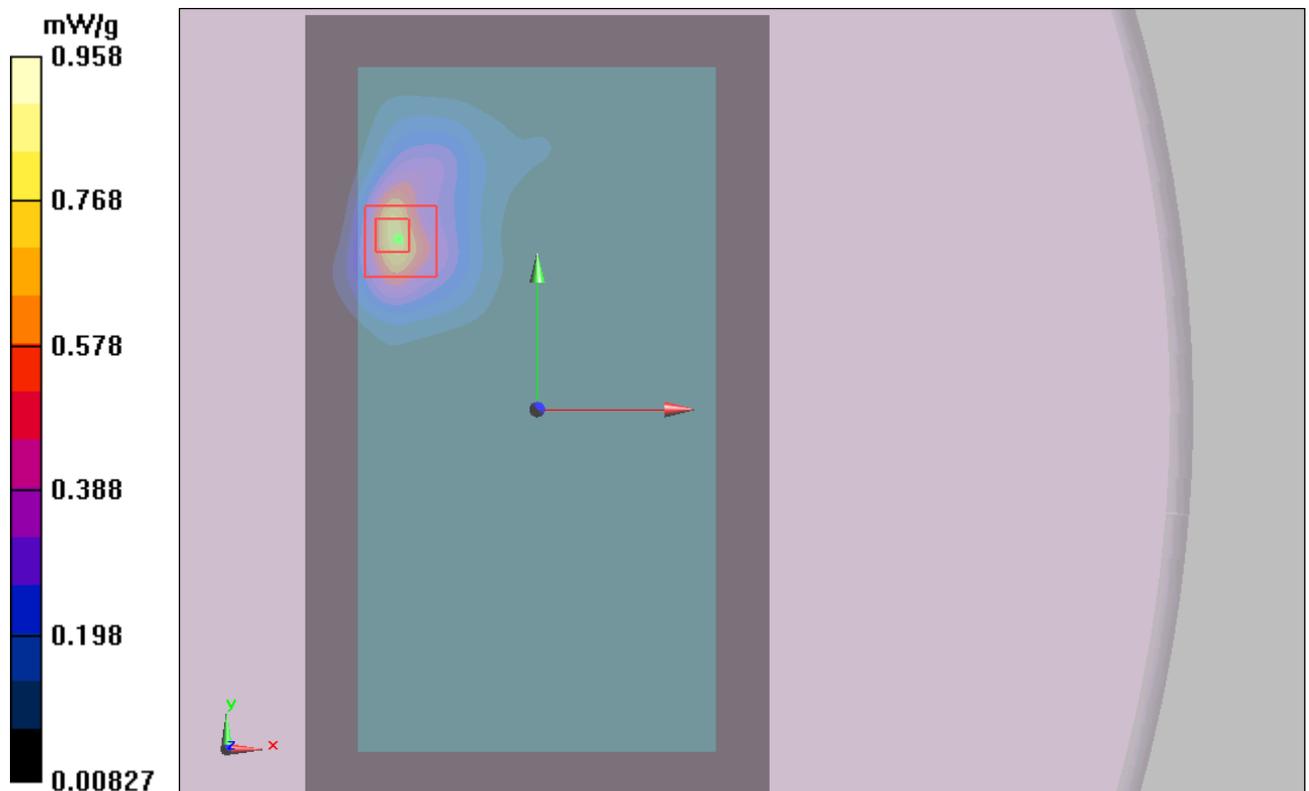


Figure 56 802.11b with Earphone Test Position 1 Channel 6