TESTING
No. L2264

OET 65

TEST REPORT

Product Name	HUAWEI MediaPad
Model	S7-312u
FCC ID	QISS7-312U
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Product Name	HUAWEI MediaPad	**Model**	S7-312u
FCC ID	QISS7-312U		
Report No.	RZA1110-1739SAR		
Client	Huawei Technologies Co., Ltd.		
Manufacturer	Huawei Technologies Co., Ltd.		
Reference Standard(s)	**IEEE Std C95.1, 1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz. **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. **RSS-102 Issue 4 March 2010:** Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) **KDB 447498 D01 Mobile Portable RF Exposure v04:** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies **KDB 941225 D01 SAR test for 3G devices v02:** SAR Measurement Procedures for 3G Devices -CDMA 2000/Ev-Do –WCDMA/HSDPA/HSPA- **Tracking Number 222546**		
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 7 of this test report are below limits specified in the relevant standards. General Judgment: **Pass** (Stamp) **Date of issue: December 15th, 2011**		
Comment	The test result only responds to the measured sample.		

Approved by 韩伟中 Director **Revised by** 凌敏宝 SAR Manager **Performed by** 张先金 SAR Engineer

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Modified History

REV	DESCRIPTION	ISSUED DATE	REMARK
Rev. 1.0	Initial Test Report Release	2011-11-24	Lingminbao
Rev 1.1	1. P10: add a table to show extrapolated SAR values at 6mm distance of all worst case conditions with maximum power.	2011-12-05	Lingminbao
Rev 1.2	1. P22&27: Add the explanation for the reasoning of 16 degree tilting angle.	2011-12-05	Lingminbao
Rev 1.3	1. P151: Update the picture of antenna schemes	2011-12-15	Lingminbao

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.

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

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		
State of Sample:	Prototype Unit		
Product Name:	HUAWEI MediaPad		
IMEI:	868384000000892		
Hardware Version:	HIDS7PMS		
Software Version:	S7-312u V100R001C223		
Antenna Type:	Internal Antenna		
Device Operating Configurations :			
Supporting Mode(s):	GSM 850/GSM 1900/WCDMA Band II/WCDMA Band V; (tested) WiFi (802.11b/g/n HT20); (untested) Bluetooth; (untested)		
Test Modulation:	(GSM)GMSK; (WCDMA)QPSK		
Device Class:	C		
HSDPA UE Category:	10		
HSUPA UE Category:	6		
GPRS Multislot Class(12):	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
EGPRS Multislot Class(12):	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
Operating Frequency Range(s):	Mode	Tx (MHz)	Rx (MHz)
	GSM 850	824.2 ~ 848.8	869.2 ~ 893.8
	GSM 1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8
	WCDMA Band II	1852.4 ~ 1907.6	1932.4 ~ 1987.6
	WCDMA Band V	826.4 ~ 846.6	871.4 ~ 891.6
Power Class:	GSM 850: 4, tested with power level 5		
	GSM 1900: 1, tested with power level 0		
	WCDMA Band II: 3, tested with power control all up bits		
	WCDMA Band V: 3, tested with power control all up bits		
Test Channel: (Low - Middle - High)	128 - 190 - 251 (GSM 850) (tested) 512 - 661 - 810 (GSM 1900) (tested) 9262 - 9400 - 9538 (WCDMA Band II) (tested) 4132 - 4183 - 4233 (WCDMA Band V) (tested)		

Auxiliary Equipment Details

AE:Battery

Model: HB3G1H

Manufacturer: /

S/N: /

Equipment Under Test (EUT) is a model of HUAWEI MediaPad with Proximity Sensor. The device has an internal antenna for GSM/WCDMA Tx/Rx, and the other is BT/WiFi antenna that can be used for Tx/Rx. The detail about MediaPad and Lithium Battery is in chapter 1.5 in this report. SAR is tested for GSM 850, GSM 1900, WCDMA Band II and WCDMA Band V. Voice call is supported by hardware, but the software blocked this feature, and the user can't change these settings later on. This microphone of the EUT only used to recording.
This device is capable of multiple display orientations supporting both protrail and landscape position.

The sample under test was selected by the Client.
Components list please refer to documents of the manufacturer.

1.6. The Maximum SAR_{1g} Values

Body SAR Configuration

Mode	Channel	Position	Separation distance	SAR_{1g} (W/kg)
1Txslot GPRS 850	Middle/190	Back Side	0mm	**0.709**
2Txslots EGPRS 1900	High/810	Left Edge	0mm	**1.040**
WCDMA Band II	High/9538	Left Edge	0mm	**1.260**
WCDMA Band V	Middle/4183	Back Side	0mm	**0.452**

Mode	Channel	Position	Separation distance	SAR_{1g} (W/kg)
2Txslots GPRS 850	Middle/190	Left Edge	6mm	**0.456**
3Txslots GPRS 1900	Middle/661	Left Edge	6mm	**0.648**
WCDMA Band II	Middle/9400	Left Edge	6mm	**0.980**
WCDMA Band V	Middle/4183	Left Edge	6mm	**0.344**

Extrapolated SAR Values of the highest measured SAR

Mode	Test Position	Channel	Measured MAX SAR_{1g} (W/kg)	Conducted Power(dBm)	Tune-up procedures MAX Power(dBm)	1g Average Limit 1.6 W/kg Extrapolated Result (W/kg)
1Txslot GPRS850	Test Position 6	Middle/190	0.709	29.91	30.4	0.794
1Txslot EGPRS850	Test Position 6	Middle/190	0.700	29.89	30.4	0.787
2Txslots GPRS1900	Test Position 2	High/810	1.020	21.74	22.1	1.108
2Txslots EGPRS1900	Test Position 2	High/810	1.040	21.71	22.0	1.112
WCDMA Band II	Test Position 2	High/9538	1.260	17.01	17.2	1.316
WCDMA Band II+HSDPA	Test Position 2	High/9538	0.906	16.01	17.2	1.192
WCDMA Band II+HSUPA	Test Position 2	High/9538	0.763	17.01	17.2	0.797
WCDMA Band V	Test Position 6	Middle/4183	0.452	19.05	19.3	0.479

Extrapolated SAR Values of the highest measured SAR (6mm)

Mode	Test Position	Channel	Measured MAX SAR_{1g} (W/kg)	Conducted Power(dBm)	Tune-up procedures MAX Power(dBm)	1g Average Limit 1.6 W/kg Extrapolated Result (W/kg)
2Txslot GPRS850	Test Position 2	Middle/190	0.456	30.71	30.8	0.466
3Txslots GPRS1900	Test Position 2	Middle/661	0.648	25.74	26.2	0.720
WCDMA Band II	Test Position 2	Middle/9400	0.980	22.47	22.7	1.033
WCDMA Band V	Test Position 2	Middle/4183	0.344	22.55	22.8	0.364

1.7. Test Date

The first test is performed from October 27, 2011 to October 30, 2011.
The second test is performed on November 10, 2011.

2. Operational Conditions during Test

2.1. General Description of Test Procedures

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

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

The bottom of the tablet has a little bit of a contour. The antennas are located at locations where the contour on the bottom of the tablet may result in less conservative SAR test results than in actual use situations. In order to identify the SAR value in actual use situations, additional SAR measurement with the antenna location direct against the bottom of phantom is required.

2.2. GSM Test Configuration

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

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

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

GSM 850

GPRS（GMSK）:

Number of timeslots in uplink assignment	**reduction of maximum output power, (dB)**
1	0
2	2.6
3	2.9
4	5.5

EGPRS(8PSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	1.8
3	2.9
4	4.1

EGPRS(GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	2.5
3	2.9
4	5.5

GSM 1900

GPRS（GMSK）:

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3.0
3	4.0
4	6.0

EGPRS(8PSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	1.7
3	2.7
4	3.8

EGPRS(GMSK):

Number of timeslots in uplink assignment	reduction of maximum output power, (dB)
1	0
2	3.0
3	4.0
4	6.0

2.3. WCDMA Test Configuration

As the body SAR 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 “all ‘1’s”
2) Test loop Mode 1

For the output power, the configurations for the DPCCH and $DPDCH_1$ are as followed (EUT do not support the $DPDCH_{2-n}$)

Table 1: The configurations for the DPCCH and $DPDCH_1$

	Channel Bit Rate(kbps)	Channel Symbol Rate(ksps)	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 configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc,βd), and HS-DPCCH power offset parameters(△ACK, △NACK, △CQI)should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Table 2: Subtests for UMTS Release 5 HSDPA

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

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

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

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

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

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

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

Table 4: HSDPA UE category

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

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

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

2.5. 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.

Table 6: Maximum Output Powers with HS-DPCCH and E-DCH for test

Sub-test in table C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+24	+1.7/-5.2	+21	+2.7/-4.2
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-5.2	+21	+2.7/-4.2

Table 7：Sub-Test 5 Setup for Release 6 HSUPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	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_{ed}1: 47/15 β_{ed}2: 47/15	4 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	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Table 8: HSUPA UE category

E-DCH category	Maximum number of E-DCH codes transmitted per transport block	Minimum spreading factor	Support for 10 and 2 ms TTI EDCH	Maximum number of bits of an E-DCH transport block transmitted within a 10 ms E-DCH TTI	Maximum number of bits of an E-DCH transport block transmitted within a 2 ms E-DCH TTI
Category 1	1	SF4	10 ms TTI only	7110	-
Category 2	2	SF4	10 ms and 2 ms TTI	14484	2798
Category 3	2	SF4	10 ms TTI only	14484	-
Category 4	2	SF2	10 ms and 2 ms TTI	20000	5772
Category 5	2	SF2	10 ms TTI only	20000	-
Category 6	4	SF2	10 ms and 2 ms TTI	20000	11484
Category 7	4	SF2	10ms and 2 ms TTI	20000	22996
Category 8	4	SF2	2 ms TTI	-	11484
Category 9	4	SF2	2 ms TTI	-	22996

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

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2B of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	Rel6 HSPA	Rel6 HSPA	Rel6 HSPA	Rel6 HSPA	Rel6 HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 47/15	56/75	134/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

2.6. Proximity Sensor Operational Theory for Power Back off

There is only one sensor (proximity) built in this EUT. Due to SAR requirement for protection of the human body, this proximity sensor pad be designed close to WWAN antenna. When users are not close to sense area, the output power of module follows the regulation of 3GPP/ETSI. When users approach the EUT within 7mm, sensor IC will trigger power back off to meet SAR requirement.

Please note that even without users touching the tablet, proximity sensor is activated and power back off activated while users approach the sensor pad. Of course, it works if users touch the sensor pad as well. We use only one sensor IC, sensor pads are for sensing area coverage.

The proximity sensor is only used for power reduction in 2/3G antenna. It can cover the back side and the left edge of EUT. When users approach the back side and the left edge of EUT within 7mm, the power of 2G/3G antenna will be reduced. It is not activated for others edge. Please refer to below for sensor activation/de-activation information (Detail refer to ANNEX H Picture 4):

Since the back-off sensor activation distance for back side is 7mm, aconservative distance of 6 mm is tested for the back side.To test SAR with full power of back side at 6mm , the device sensor detection mechanism would normally be active and therefore had to be disabled via manufacturer test software. The device was placed in maximum power transmit mode with a base station simulator. The back side of device was then positioned under the tissue equivalent liquid-filled flat phantom at a distance of 6mm with the sensor deactivated (via manufacturer test software) and tested at maximum power. Since the back -off sensor activation distance for back side (Tilted 16 degree angle) is 9mm more than 7mm, the aconservative distance of 6mm is tested for the back side.

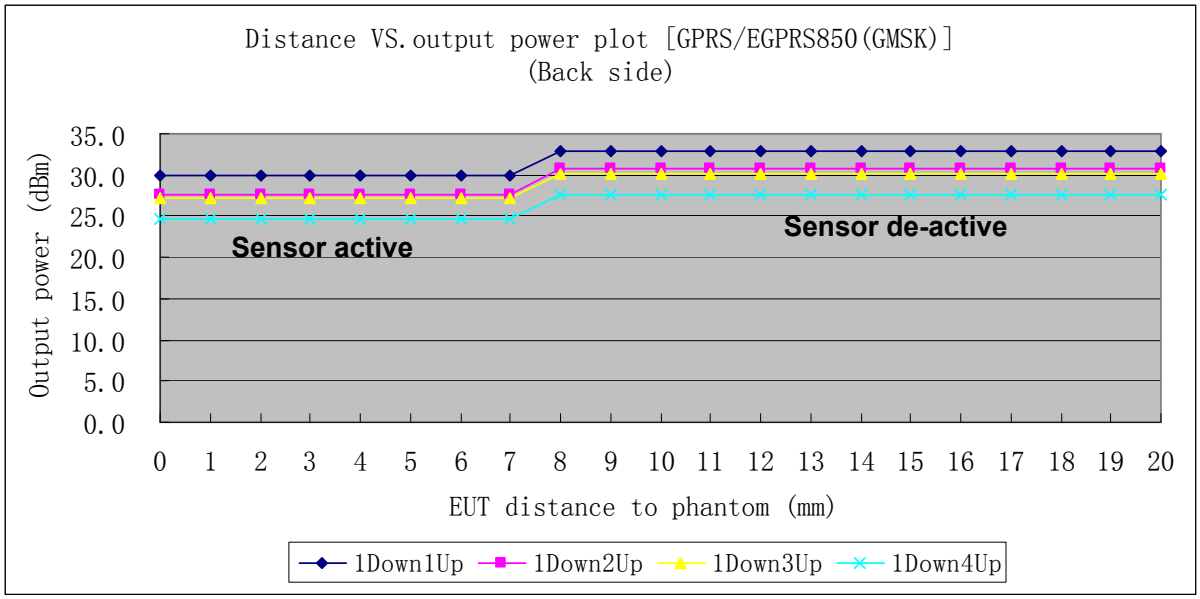
Since the back-off sensor activation distance for left edge is 7mm, aconservative distance of 6 mm is tested for the left edge.To test SAR with full power of left edge at 6mm , the device sensor detection mechanism would normally be active and therefore had to be disabled via manufacturer test software. The device was placed in maximum power transmit mode with a base station simulator. The left edge of device was then positioned under the tissue equivalent liquid-filled flat phantom at a distance of 6mm with the sensor deactivated (via manufacturer test software) and tested at maximum power.

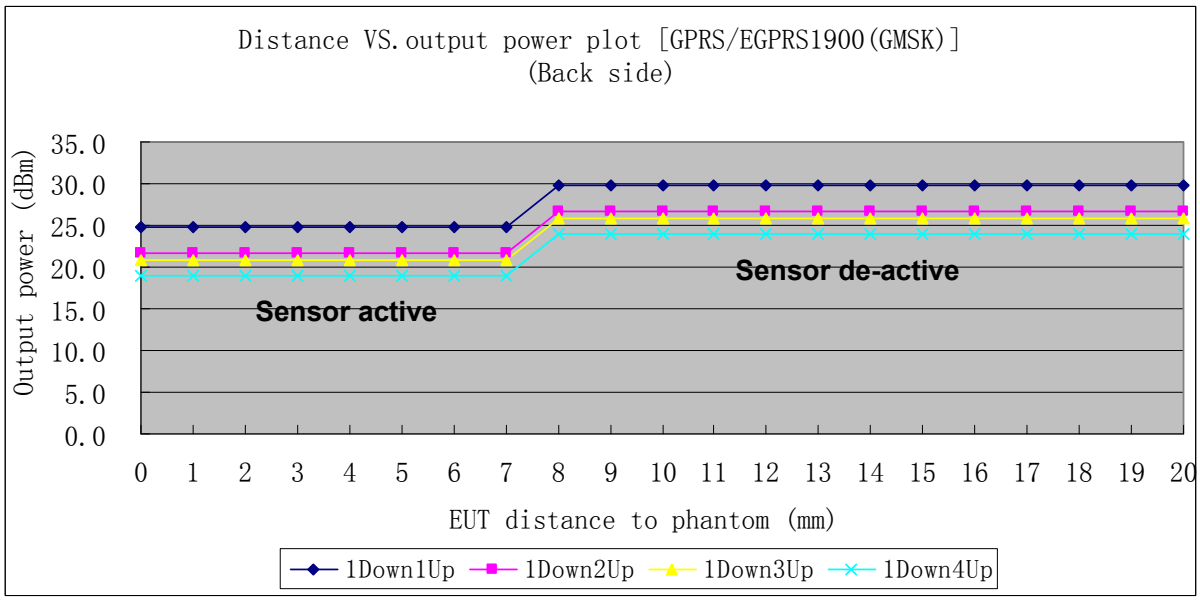
Back side of Mini-Tablet (0 degree angle) Distance from the user in 2/3G antenna

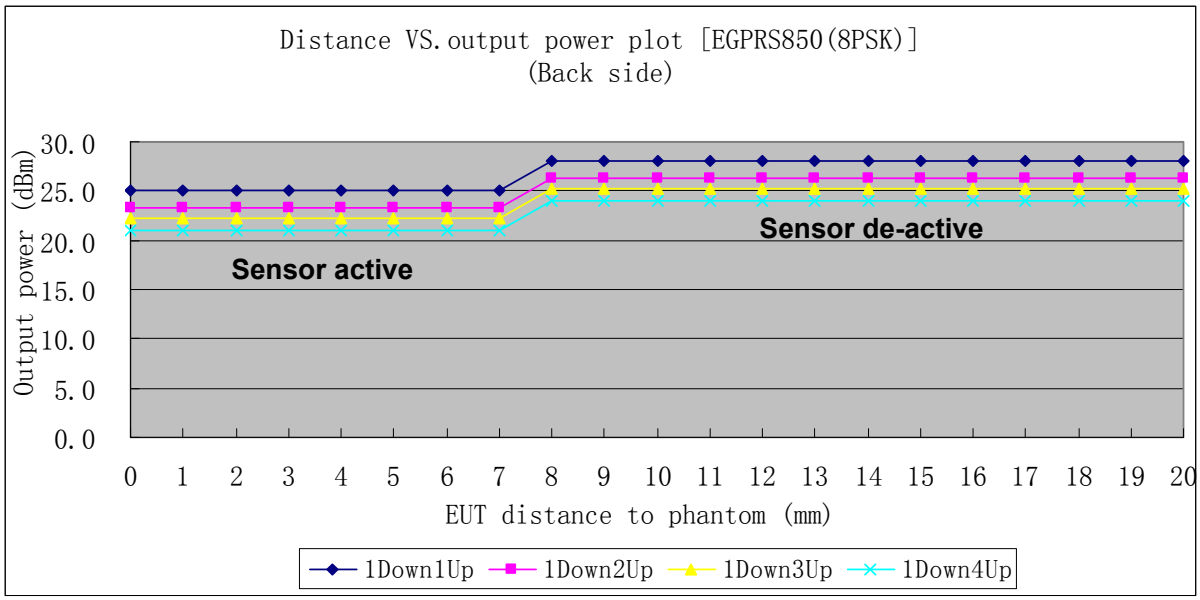
Distance in mm	0--5	6	7	8	9	10
Condition of Sensor in the back side of the device	on	on	on	off	off	off

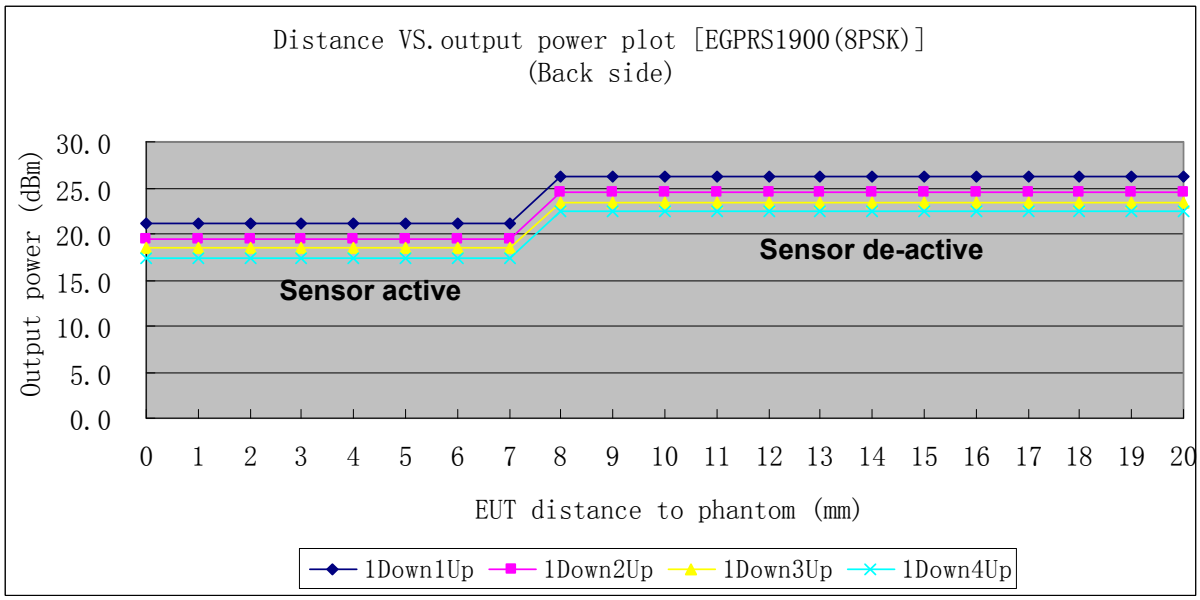
Note: 1. The distance from the camera of the EUT to the bottom of the Phantom is 6mm

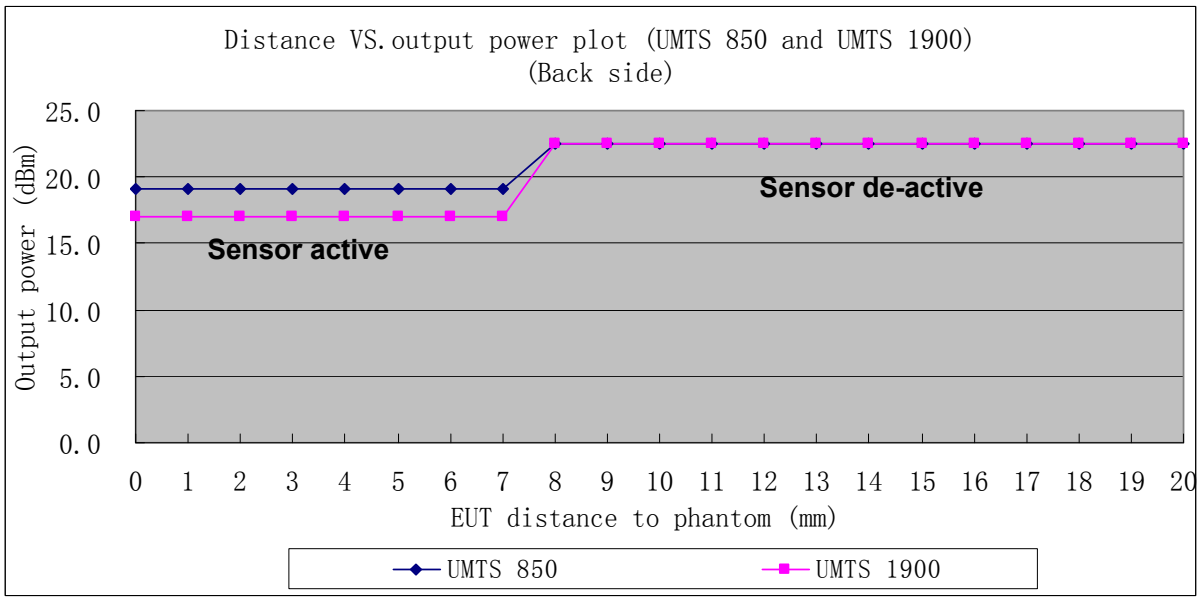
The plots show the relationship between the output power (dBm) and the EUT distance to phantom.





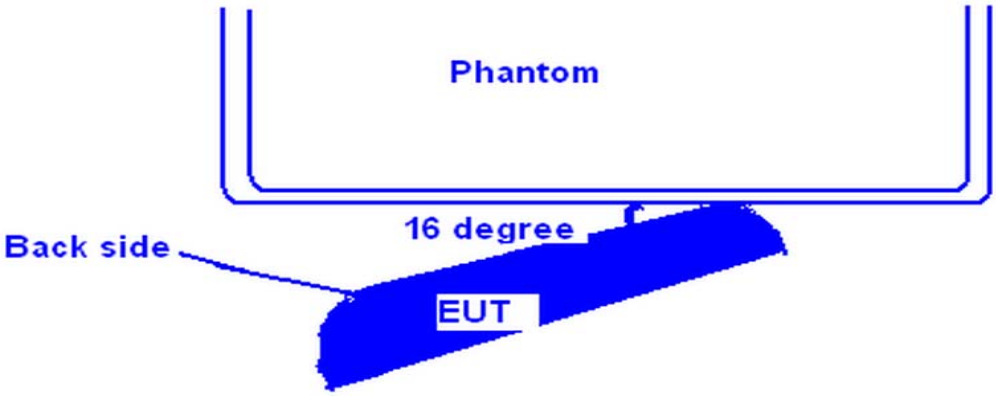

Distance VS. output power plot [EGPRS850(8PSK)]
(Back side)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up


Distance VS. output power plot [EGPRS1900(8PSK)]
(Back side)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up


Distance VS. output power plot (UMTS 850 and UMTS 1900)
(Back side)
Output power (dBm)
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
UMTS 850
UMTS 1900

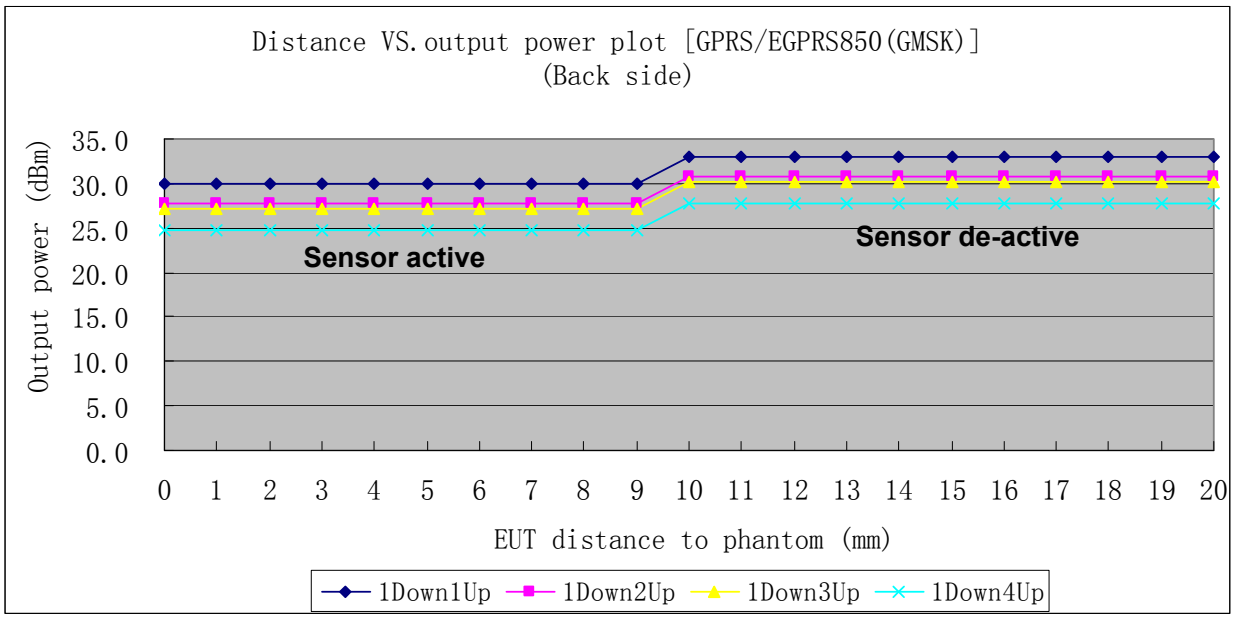
Back side of Mini-Tablet (tilted 16 degree angle) Distance from the user in 2/3G antenna

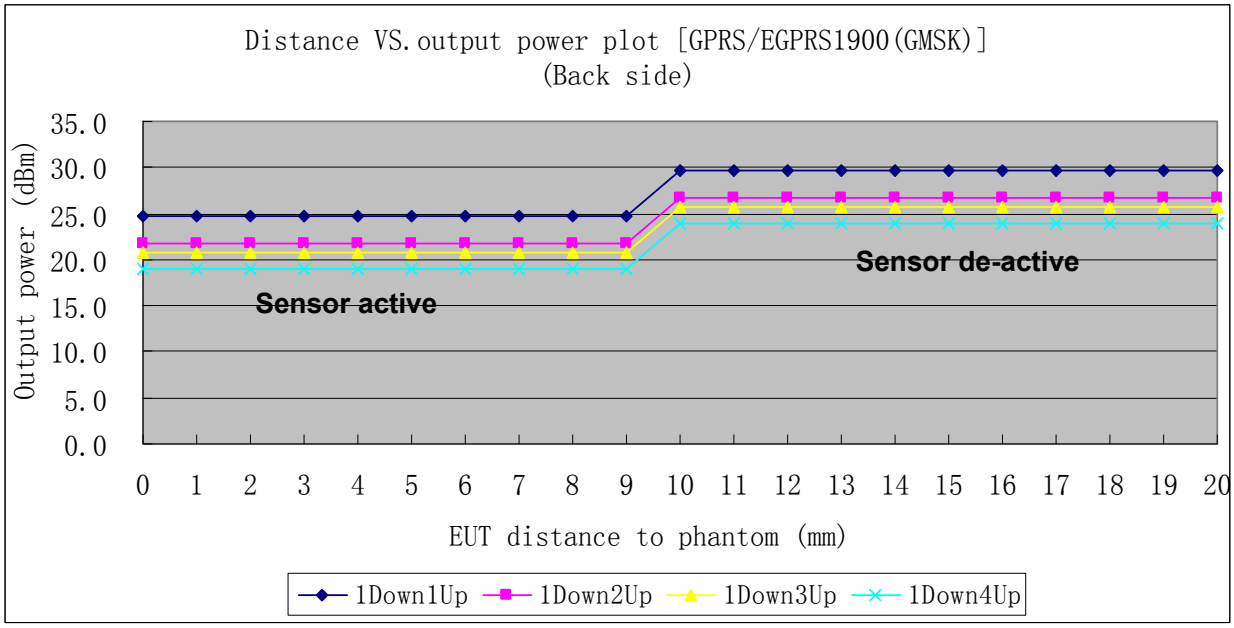
Distance in mm	0--6	7	8	9	10	11	12
Condition of Sensor in the back side of the device	on	on	on	on	off	off	off

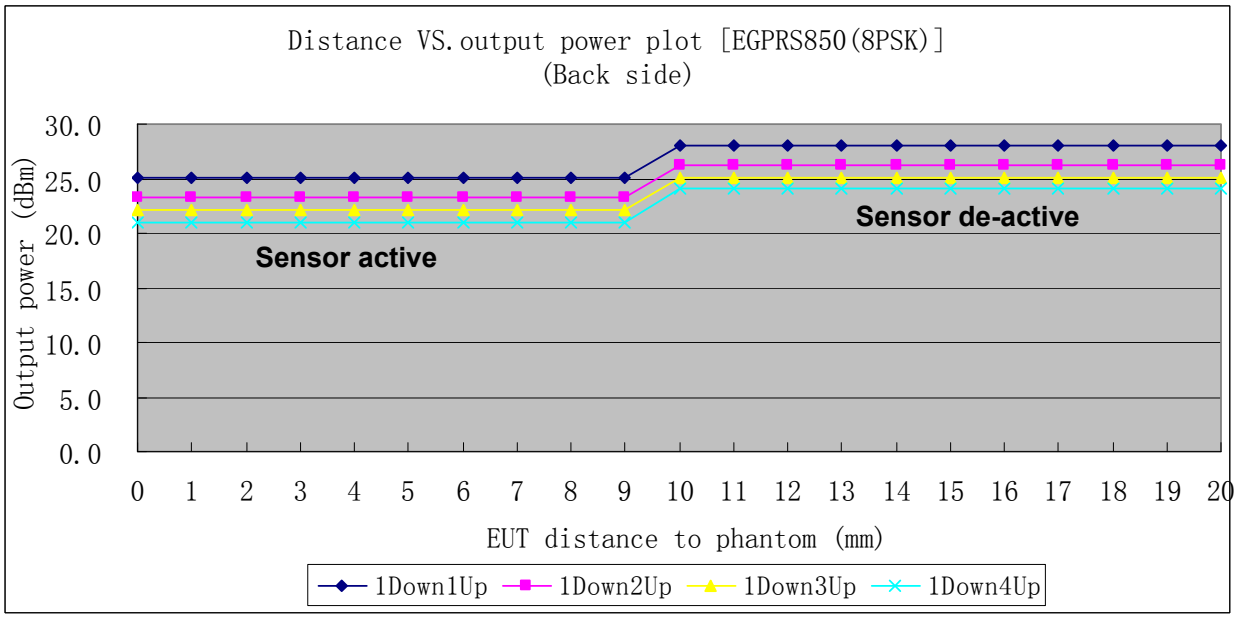


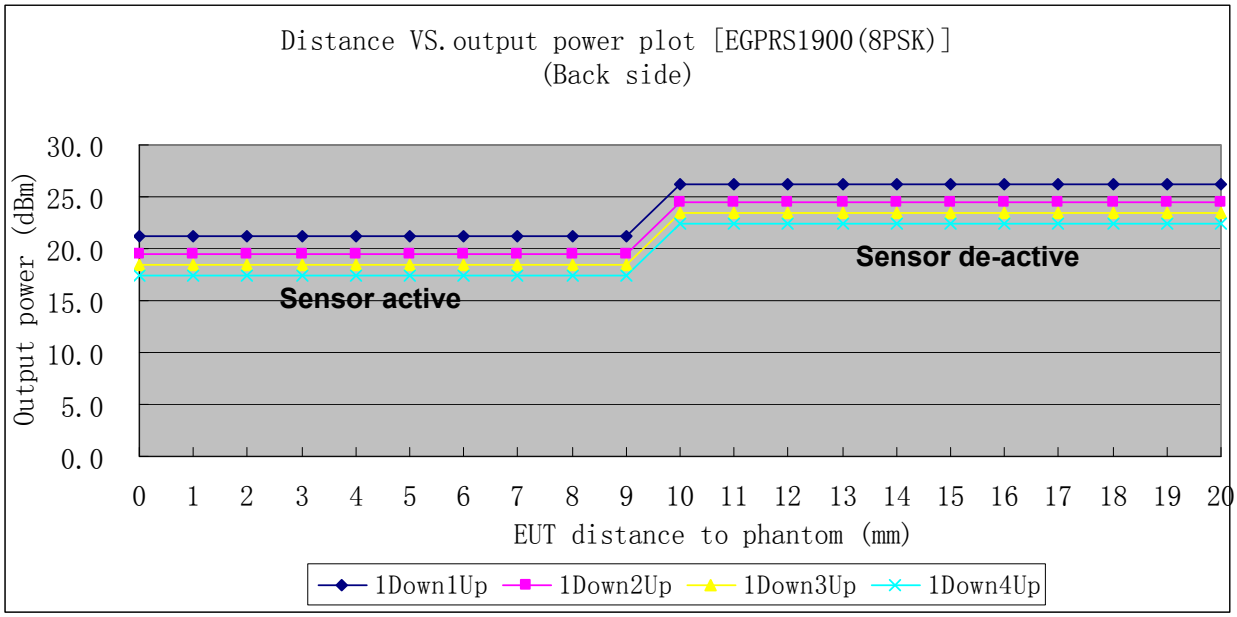
According to the suggestion of FCC KDB, the tablet has a camera stick up on the rear side next to the 2G3G antenna, to address the status consistent with actual use conditions, SAR will be tested in tip of the tablet. Based on the contour of the back side a 16 degree angle provides the smallest distance between antenna and phantom.Therefore we tested SAR at 16 degree lilting angle to simulate this scenario.

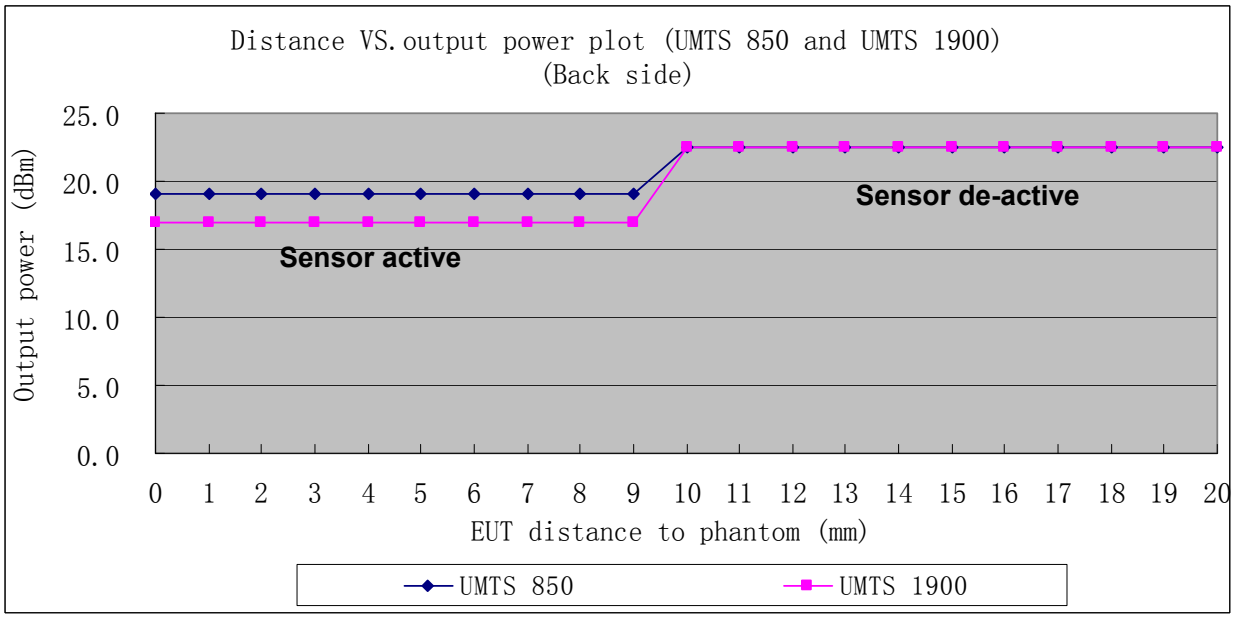
The plots show the relationship between the output power (dBm) and the EUT distance to phantom.




Distance VS. output power plot [GPRS/EGPRS1900(GMSK)]
(Back side)
Output power (dBm)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up


Distance VS. output power plot [EGPRS850(8PSK)]
(Back side)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up

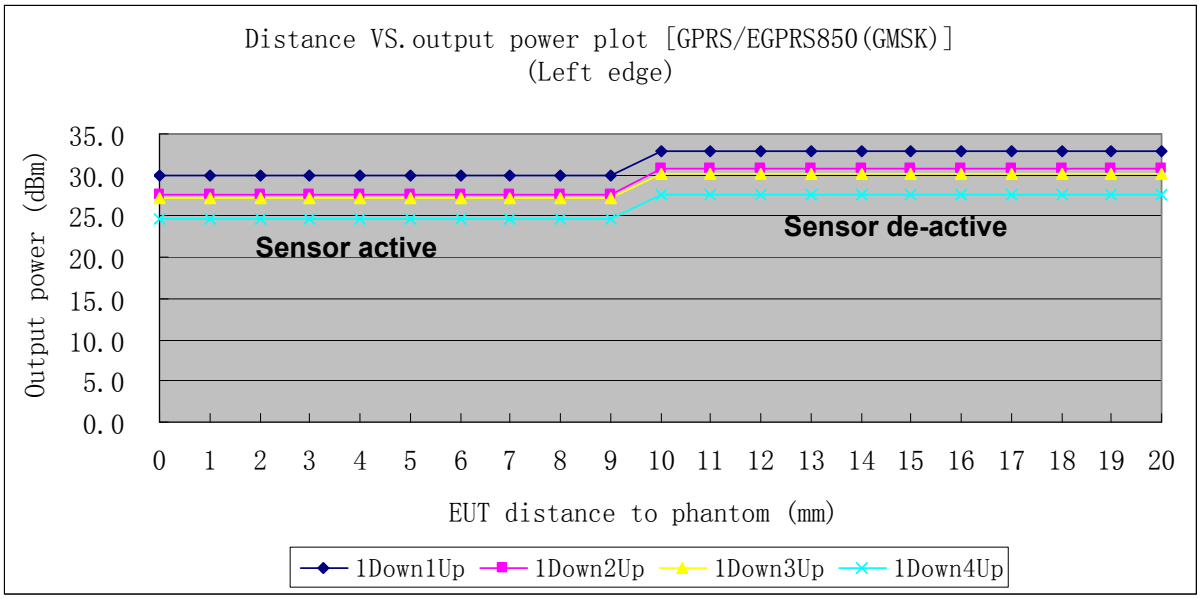

Distance VS. output power plot [EGPRS1900(8PSK)]
(Back side)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up

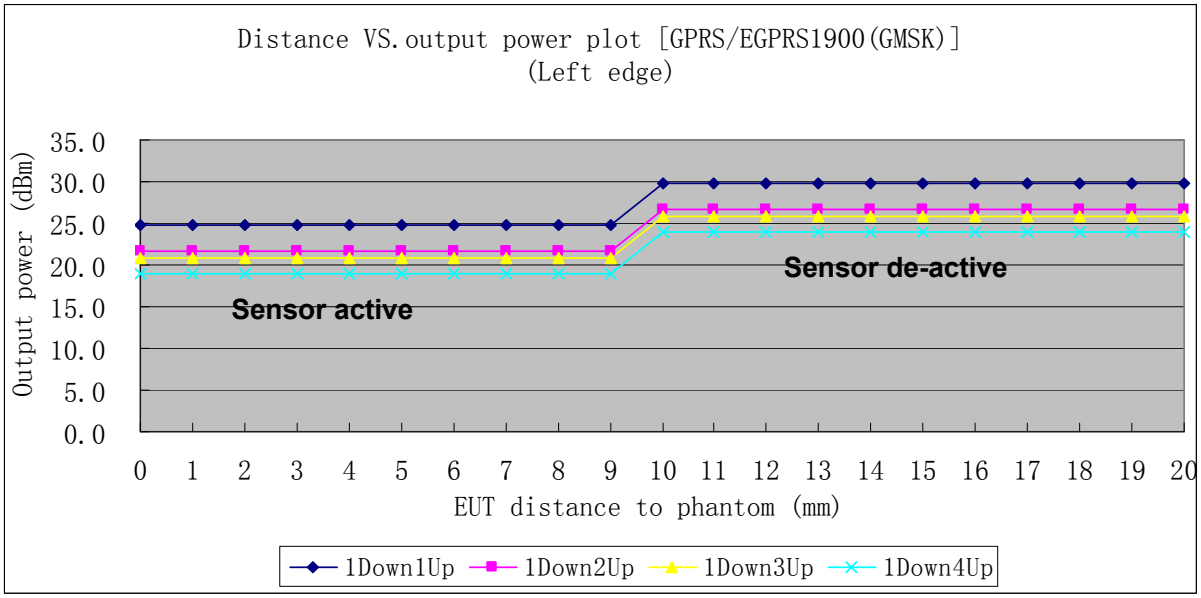

Distance VS. output power plot (UMTS 850 and UMTS 1900)
(Back side)
Output power (dBm)
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
UMTS 850
UMTS 1900

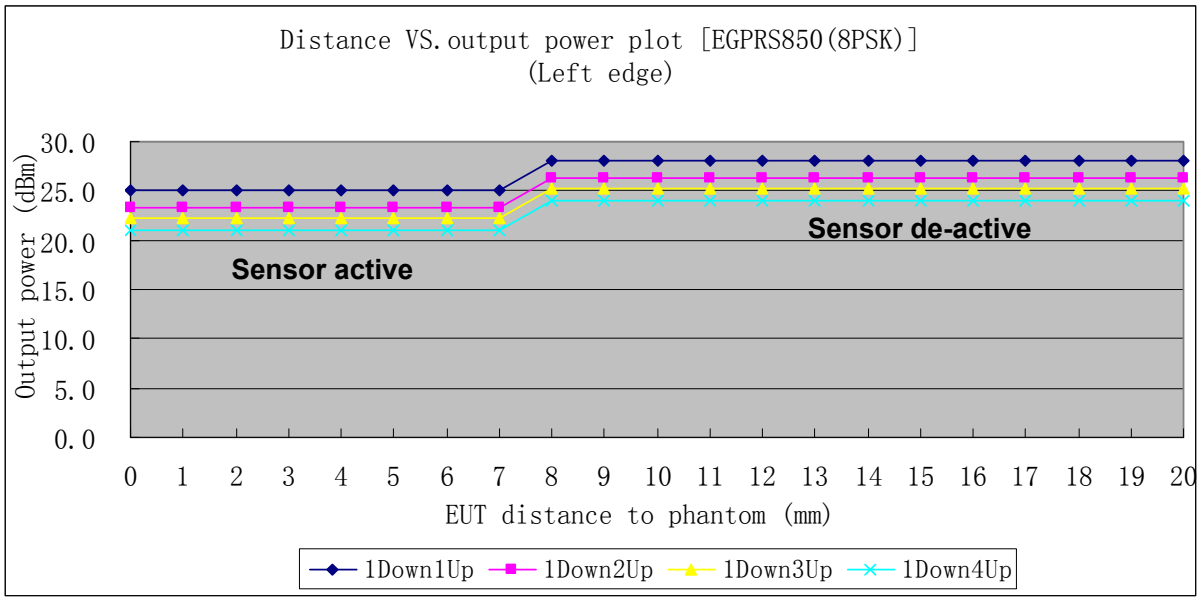
Left edge of Mini-Tablet (0 degree angle) Distance from the user in 2/3G antenna

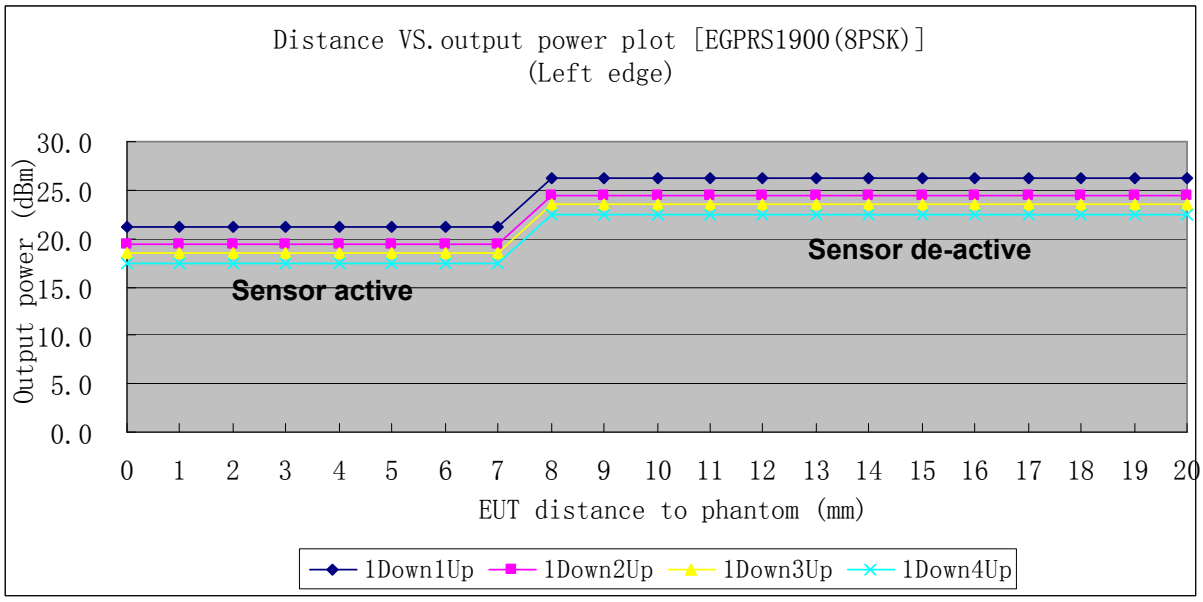
Distance in mm	0--5	6	7	8	9	10
Condition of Sensor in the left edge of the device	on	on	on	off	off	off

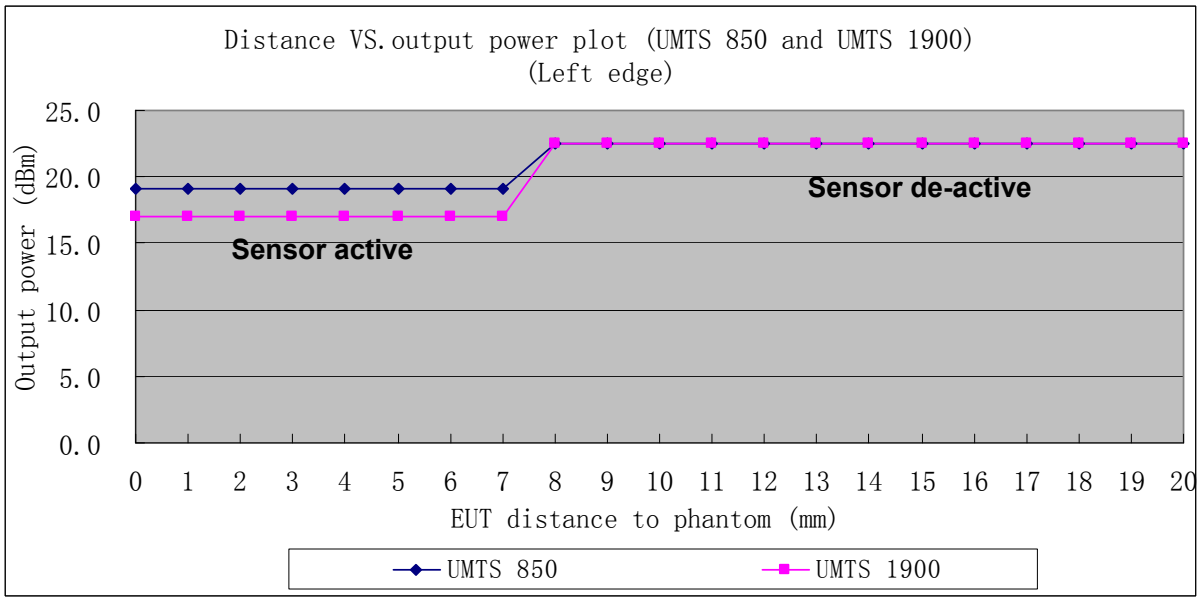
The plots show the relationship between the output power (dBm) and the EUT distance to phantom.






Distance VS. output power plot [EGPRS850(8PSK)]
(Left edge)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up


Distance VS. output power plot [EGPRS1900(8PSK)]
(Left edge)
Output power (dBm)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
1Down1Up
1Down2Up
1Down3Up
1Down4Up


Distance VS. output power plot (UMTS 850 and UMTS 1900)
(Left edge)
Output power (dBm)
25.0
20.0
15.0
10.0
5.0
0.0
Sensor active
Sensor de-active
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
EUT distance to phantom (mm)
UMTS 850
UMTS 1900

2.7. Test Positions

For tablets with a display or overall diagonal dimension 22 cm ＞20 cm, the SAR procedures in KDB 447498 should be used.

According to KDB 447498 D01 4)b)i) the bottom face (back of the device) is required to be tested touching the flat phantom. Per KDB 447498 4) b) ii) (1), SAR testing applies for the tablet edges with antennas located within 5cm of each tablet edge closest to the user. According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition.

- Test Position 1: The back side of the EUT is parallel to the bottom of the flat phantom. (ANNEX H Picture 5)
  SAR is reuired for GSM/WCDMA, Per KDB 447498 D01 4)b)i) the bottom face (back of the device) is required to be tested touching the flat phantom. (Please see ANNEX H Picture 4)

- Test Position 2: The left side of the EUT towards the bottom of the flat phantom. (ANNEX H Picture 6）
  SAR is reuired for GSM/WCDMA, since it is the most conservative exposure conditions of the edge. (Please see ANNEX H Picture 4)

- Test Position 3: The right side of the EUT towards the bottom of the flat phantom. (ANNEX H Picture 7)
  SAR is not reuired for GSM/WCDMA; 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 H Picture 4)

- Test Position 4: The top side of the EUT towards the bottom of the flat phantom. (ANNEX H Picture 8）
  SAR is not reuired 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 H Picture 4)

- Test Position 5: The bottom side of the EUT towards the bottom of the flat phantom. (ANNEX H Picture 9）
  SAR is reuired for GSM/WCDMA antenna, since it is the most conservative exposure conditions of the edge. (Please see ANNEX H Picture 4)

- Test Position 6: The back side of the EUT is tilted 16 degree angle with the bottom of the flat phantom, and the antenna location direct against the bottom of the flat phantom. (ANNEX H Picture 10）
  (According to the suggestion of FCC KDB, the tablet has a camera stick up on the rear side next to the 2G3G antenna, to address the status consistent with actual use conditions, SAR will be tested

in tip of the tablet. Based on the contour of the back side a 16 degree angle provides the smallest distance between antenna and phantom. Therefore we tested SAR at 16 degree lilting angle to simulate this scenario.)

SAR is reuired for GSM/WCDMA, since it is the most conservative exposure conditions of the edge. (Please see ANNEX H Picture 4)

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.

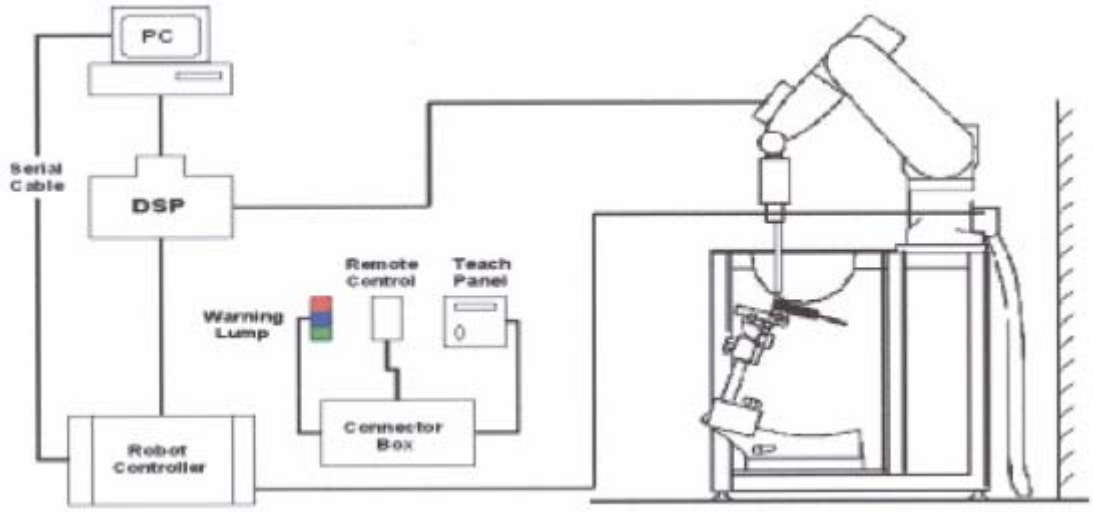


Figure 1 SAR Lab Test Measurement Set-up

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 μW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

Figure 2.EX3DV4 E-field Probe

Figure 3. EX3DV4 E-field probe

3.2.2. E-field Probe Calibration

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

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

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

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

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

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

3.3. Other Test Equipment

3.3.1. Device Holder for Transmitters

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

Figure 4 Device Holder

3.3.2. Phantom

Phantom for compliance testing of handheld andbody-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI isfully compatible with the IEC 62209-2 standard and all known tissuesimulating liquids. ELI has been optimized regarding its performance and can beintegrated into our standard phantom tables. A cover prevents evaporation ofthe liquid. Reference markings on the phantom allow installation of thecomplete setup, including all predefined phantom positions and measurementgrids, by teaching three points. The phantom is compatible with all SPEAGdosimetric probes and dipoles.

Shell Thickness	2±0.2 mm
Filling Volume	Approx. 30 liters
Dimensions	190×600×0 mm (H x L x W)

Figure 5.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. ± 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 ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- Area Scan

  The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged.

  After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

- Zoom Scan

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

- Spatial Peak Detection

  The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The 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 ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

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

3.5.2. Data Evaluation by SEMCAD

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

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

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the 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.

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

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

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

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

cf = crest factor of exciting field (DASY parameter)

dcp_i = diode compression point (DASY parameter)

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

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

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

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

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

$ConvF$ = sensitivity enhancement in solution

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

f = carrier frequency [GHz]

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

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

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

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

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

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

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

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

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

ρ = equivalent tissue density in g/cm^3

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

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

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

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

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

3.6. System Check

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

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

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

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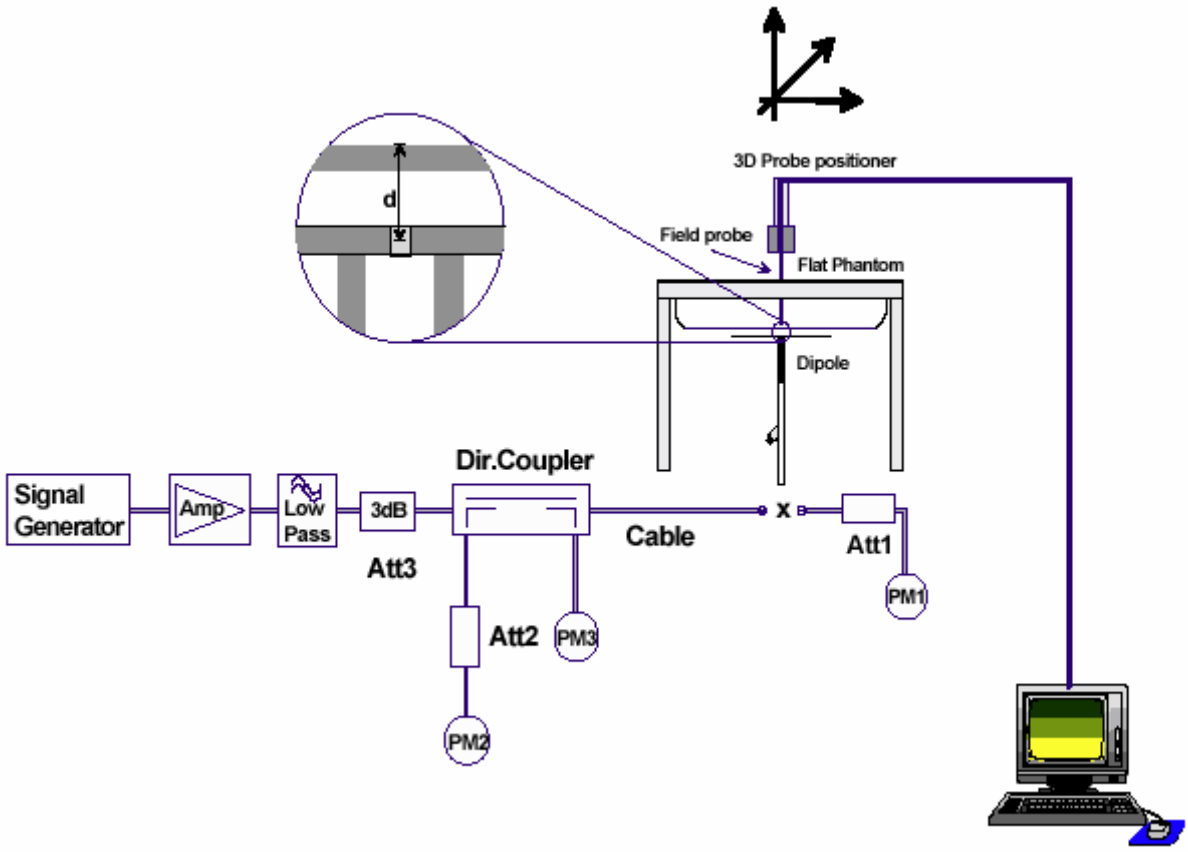


Figure 6 System Check Set-up

3.7. Equivalent Tissues

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case. The table 9 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the OET 65.

Table 9: Composition of the Body Tissue Equivalent Matter

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

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

4. Laboratory Environment

Table 10: The Ambient Conditions during Test

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

5. Characteristics of the Test

5.1. Applicable Limit Regulations

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

5.2. Applicable Measurement Standards

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.

RSS-102 Issue 4 March 2010: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

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

KDB 941225 D01 SAR test for 3G devices v02: SAR Measurement Procedures for 3G Devices -CDMA 2000/Ev-Do –WCDMA/HSDPA/HSPA-

KDB 941225 D02 Guidance for 3GPP R6 and R7 HSPA v02v01: 3GPP R6 HSPA and R7 HSPA+ SAR Guidance

KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01: Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE

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. Proximity sensor is not activated, Conducted Power Results

Table 11: Proximity sensor is not activated, Conducted Power Measurement Results

GSM 850		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GPRS (GMSK)	1Txslot	33.23	32.91	32.88	-9.03dB	24.2	23.88	23.85
	2Txslots	30.63	30.71	30.67	-6.02dB	24.61	24.69	24.65
	3Txslots	30.31	30.25	29.96	-4.26dB	**26.05**	**25.99**	**25.7**
	4Txslots	27.72	27.66	27.58	-3.01dB	24.71	24.65	24.57
EGPRS (GMSK)	1Txslot	33.27	32.89	32.85	-9.03dB	24.24	23.86	23.82
	2Txslots	30.65	30.75	30.69	-6.02dB	24.63	24.73	24.67
	3Txslots	30.35	30.27	29.91	-4.26dB	**26.09**	**26.01**	**25.65**
	4Txslots	27.77	27.69	27.55	-3.01dB	24.76	24.68	24.54
EGPRS (8PSK)	1Txslot	28.03	28.01	27.97	-9.03dB	19	18.98	18.94
	2Txslots	26.27	26.22	26.24	-6.02dB	20.25	20.2	20.22
	3Txslots	25.12	25.15	25.17	-4.26dB	20.86	20.89	20.91
	4Txslots	23.98	24.02	24.01	-3.01dB	**20.97**	**21.01**	**21**
GSM 1900		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GPRS (GMSK)	1Txslot	29.67	29.71	29.62	-9.03dB	20.64	20.68	20.59
	2Txslots	26.81	26.76	26.74	-6.02dB	20.79	20.74	20.72
	3Txslots	25.97	25.74	25.69	-4.26dB	**21.71**	**21.48**	**21.43**
	4Txslots	23.63	23.92	23.81	-3.01dB	20.62	20.91	20.8
EGPRS (GMSK)	1Txslot	29.64	29.73	29.67	-9.03dB	20.61	20.7	20.64
	2Txslots	26.77	26.73	26.71	-6.02dB	20.75	20.71	20.69

	3Txslots	25.89	25.77	25.65	-4.26dB	**21.63**	**21.51**	**21.39**
	4Txslots	23.68	23.88	23.85	-3.01dB	20.67	20.87	20.84
EGPRS (8PSK)	1Txslot	26.24	26.18	26.13	-9.03dB	17.21	17.15	17.1
	2Txslots	24.52	24.49	24.47	-6.02dB	18.5	18.47	18.45
	3Txslots	23.51	23.46	23.42	-4.26dB	19.25	19.2	19.16
	4Txslots	22.45	22.41	22.37	-3.01dB	**19.44**	**19.4**	**19.36**

Note:

1) Division Factors

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

1Txslot = 1 transmit time slot out of 8 time slots

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

2Txslots = 2 transmit time slots out of 8 time slots

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

3Txslots = 3 transmit time slots out of 8 time slots

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

4Txslots = 4 transmit time slots out of 8 time slots

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

3) Average power numbers

The maximum power numbers are marks in bold.

WCDMA Band II		**Conducted Power (dBm)**		
		Channel 9262	Channel 9400	Channel 9538
RMC	12.2kbps RMC	22.38	22.47	22.51
	64kbps RMC	22.34	22.49	22.55
	144kbps RMC	22.33	22.45	22.53
	384kbps RMC	22.35	22.51	22.48
HSDPA	Sub - Test 1	21.45	21.66	21.51
	Sub - Test 2	21.21	21.19	21.16
	Sub - Test 3	21.13	21.03	21.18
	Sub - Test 4	21.04	21.24	21.21
HSUPA	Sub Test - 1	22.38	22.47	22.51
	Sub Test - 2	20.36	20.43	20.43
	Sub Test - 3	21.48	21.53	21.55
	Sub Test - 4	20.29	20.82	20.59
	Sub Test - 5	22.38	22.47	22.51
WCDMA Band V		**Conducted Power (dBm)**		

		Channel 4132	Channel 4183	Channel 4233
RMC	12.2kbps RMC	22.53	22.55	22.49
	64kbps RMC	22.56	22.57	22.52
	144kbps RMC	22.51	22.54	22.57
	384kbps RMC	22.59	22.52	22.56
HSDPA	Sub - Test 1	21.42	21.51	21.45
	Sub - Test 2	21.05	21.23	21.18
	Sub - Test 3	20.90	21.05	21.11
	Sub - Test 4	20.88	21.10	21.08
HSUPA	Sub Test - 1	22.53	22.55	22.49
	Sub Test - 2	20.50	20.56	20.40
	Sub Test - 3	21.52	21.55	21.56
	Sub Test - 4	20.58	20.57	20.52
	Sub Test - 5	22.53	22.55	22.49

MPR results

WCDMA Band II		**Conducted Power (dBm)**			
		Channel 9262	Channel 9400	Channel 9538	MPR
HSUPA	Sub Test - 1	22.38	22.47	22.51	0
	Sub Test - 2	20.36	20.43	20.43	2
	Sub Test - 3	21.48	21.53	21.55	1
	Sub Test - 4	20.29	20.82	20.59	2
	Sub Test - 5	22.38	22.47	22.51	0
WCDMA Band V		**Conducted Power (dBm)**			
		Channel 4132	Channel 4183	Channel 4233	MPR
HSUPA	Sub Test - 1	22.53	22.55	22.49	0
	Sub Test - 2	20.50	20.56	20.40	2
	Sub Test - 3	21.52	21.55	21.56	1
	Sub Test - 4	20.58	20.57	20.52	2
	Sub Test - 5	22.53	22.55	22.49	0

6.3. Proximity sensor is activated, Conducted Power Results

Power Reduction Design Specification

Mode	Power Reduction (1DN 4UP)	Power Reduction (1DN 3UP)	Power Reduction (1DN 2UP)	Power Reduction (1DN 1UP)
850 GPRS/EGPRS	-3	-3	-3	-3
1900 GPRS/EGPRS	-5	-5	-5	-5

Mode	Power Reduction
850 UMTS (RMC,HSDPA/HSUPA)	-3.5
1900 UMTS (RMC,HSDPA/HSUPA)	-5.5

Table 12: Proximity sensor is activated, the Conducted Power Measurement Results

GSM 850		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 128	Channel 190	Channel 251		Channel 128	Channel 190	Channel 251
GPRS (GMSK)	1Txslot	30.23	29.91	29.88	-9.03dB	21.2	20.88	20.85
	2Txslots	27.63	27.71	27.67	-6.02dB	21.61	21.69	21.65
	3Txslots	27.31	27.25	26.96	-4.26dB	**23.05**	**22.99**	**22.7**
	4Txslots	24.72	24.66	24.58	-3.01dB	21.71	21.65	21.57
EGPRS (GMSK)	1Txslot	30.27	29.89	29.85	-9.03dB	21.24	20.86	20.82
	2Txslots	27.65	27.75	27.69	-6.02dB	21.63	21.73	21.67
	3Txslots	27.35	27.27	26.91	-4.26dB	**23.09**	**23.01**	**22.65**
	4Txslots	24.77	24.69	24.55	-3.01dB	21.76	21.68	21.54
EGPRS (8PSK)	1Txslot	25.03	25.01	24.97	-9.03dB	16	15.98	15.94
	2Txslots	23.27	23.22	23.24	-6.02dB	17.25	17.2	17.22
	3Txslots	22.12	22.15	22.17	-4.26dB	17.86	17.89	17.91
	4Txslots	20.98	21.02	21.01	-3.01dB	**17.97**	**18.01**	**18.0**
GSM 1900		Burst Conducted Power(dBm)				Average power(dBm)		
		Channel 512	Channel 661	Channel 810		Channel 512	Channel 661	Channel 810
GPRS (GMSK)	1Txslot	24.67	24.71	24.62	-9.03dB	15.64	15.68	15.59
	2Txslots	21.81	21.76	21.74	-6.02dB	15.79	15.74	15.72
	3Txslots	20.97	20.74	20.69	-4.26dB	**16.71**	**16.48**	**16.43**

	4Txslots	18.63	18.92	18.81	-3.01dB	15.62	15.91	15.8
EGPRS (GMSK)	1Txslot	24.64	24.73	24.67	-9.03dB	15.61	15.7	15.64
	2Txslots	21.77	21.73	21.71	-6.02dB	15.75	15.71	15.69
	3Txslots	20.89	20.77	20.65	-4.26dB	**16.63**	**16.51**	**16.39**
	4Txslots	18.68	18.88	18.85	-3.01dB	15.67	15.87	15.84
EGPRS (8PSK)	1Txslot	21.24	21.18	21.13	-9.03dB	12.21	12.15	12.1
	2Txslots	19.52	19.49	19.47	-6.02dB	13.5	13.47	13.45
	3Txslots	18.51	18.46	18.42	-4.26dB	14.25	14.2	14.16
	4Txslots	17.45	17.41	17.37	-3.01dB	**14.44**	**14.4**	**14.36**

Note:

1) Division Factors

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

1Txslot = 1 transmit time slot out of 8 time slots
=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots
=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots
=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots
=> conducted power divided by (8/4) => -3.01 dB

3) Average power numbers

The maximum power numbers are marks in bold.

WCDMA Band II		**Conducted Power (dBm)**		
		Channel 9262	Channel 9400	Channel 9538
RMC	12.2kbps RMC	16.88	16.97	17.01
	64kbps RMC	16.84	16.99	17.05
	144kbps RMC	16.83	16.95	17.03
	384kbps RMC	16.85	17.01	16.98
HSDPA	Sub - Test 1	15.95	16.16	16.01
	Sub - Test 2	15.71	15.69	15.66
	Sub - Test 3	15.63	15.53	15.68
	Sub - Test 4	15.54	15.74	15.71
HSUPA	Sub Test - 1	16.88	16.97	17.01
	Sub Test - 2	14.86	14.93	14.93
	Sub Test - 3	15.98	16.03	16.05

	Sub Test - 4	14.79	15.32	15.09
	Sub Test - 5	16.88	16.97	17.01
WCDMA Band V		**Conducted Power (dBm)**		
		Channel 4132	Channel 4183	Channel 4233
RMC	12.2kbps RMC	19.03	19.05	18.99
	64kbps RMC	19.06	19.07	19.02
	144kbps RMC	19.01	19.04	19.07
	384kbps RMC	19.09	19.02	19.06
HSDPA	Sub - Test 1	17.92	18.01	17.95
	Sub - Test 2	17.55	17.73	17.68
	Sub - Test 3	17.40	17.55	17.61
	Sub - Test 4	17.38	17.60	17.58
HSUPA	Sub Test - 1	19.03	19.05	18.99
	Sub Test - 2	17.00	17.06	16.90
	Sub Test - 3	18.02	18.05	18.06
	Sub Test - 4	17.08	17.07	17.02
	Sub Test - 5	19.03	19.05	18.99

MPR results

WCDMA Band II		**Conducted Power (dBm)**			
		Channel 9262	Channel 9400	Channel 9538	MPR
HSUPA	Sub Test - 1	16.9	17.0	17.0	0
	Sub Test - 2	14.9	14.9	14.9	2
	Sub Test - 3	16.0	16.0	16.1	1
	Sub Test - 4	14.8	15.3	15.1	2
	Sub Test - 5	16.9	17.0	17.0	0
WCDMA Band V		**Conducted Power (dBm)**			
		Channel 4132	Channel 4183	Channel 4233	MPR
HSUPA	Sub Test - 1	19.03	19.05	18.99	0
	Sub Test - 2	17.00	17.06	16.90	2
	Sub Test - 3	18.02	18.05	18.06	1
	Sub Test - 4	17.08	17.07	17.02	2
	Sub Test - 5	19.03	19.05	18.99	0

7. Test Results

7.1. Dielectric Performance

Table 13: Dielectric Performance of Body Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp ℃
		ε_r	σ(s/m)	
849MHz (High)	Target value ±5% window	55.16 52.40 — 57.92	0.99 0.94 — 1.04	/
	Measurement value 2011-10-29	55.3	1.01	21.7
	Measurement value 2011-11-10	54.65	1.00	21.8
837MHz (Middle)	Target value ±5% window	55.19 52.43 — 57.95	0.97 0.92 — 1.02	/
	Measurement value 2011-10-29	55.4	1.01	21.7
	Measurement value 2011-11-10	54.74	1.00	21.8
824MHz (Low)	Target value ±5% window	55.24 52.48— 58.00	0.97 0.92 — 1.02	/
	Measurement value 2011-10-29	55.5	0.99	21.7
	Measurement value 2011-11-10	54.94	0.98	21.8
1910MHz (High)	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2011-10-27	52.2	1.56	21.8
	Measurement value 2011-11-10	51.5	1.57	21.9
1880MHz (Middle)	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2011-10-27	52.3	1.54	21.8
	Measurement value 2011-11-10	51.7	1.53	21.9
1850MHz (Low)	Target value ±5% window	53.30 50.64 — 55.97	1.52 1.44 — 1.60	/
	Measurement value 2011-10-27	52.5	1.49	21.8
	Measurement value 2011-11-10	51.7	1.51	21.9

7.2. System Check Results

Table 14: System Check for Body Tissue Simulating Liquid

Frequency	Description	Dielectric Parameters		Temp	Input Power	Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Deviation
		ε_r	σ(s/m)	(℃)	(W)	(W/kg)	(W/kg)	(W/kg)	(%)
835MHz	2011-10-29	55.39	1.00	21.7	0.25	2.54	10.16	9.46	7.40
	2011-11-10	54.81	0.99	21.8	0.25	2.47	9.88		4.44
1900 MHz	2011-10-27	52.29	1.56	21.8	0.25	10.2	40.8	41.7	-2.16
	2011-11-10	51.57	1.55	21.9	0.25	10.22	40.88		-1.97

Note: 1. The graph results see ANNEX B.

7.3. Summary of Measurement Results

7.3.1. GSM 850 (GPRS/EGPRS)

Table 15: SAR Values [GSM 850 (GPRS/EGPRS)]

Limit of SAR				10 g Average	1 g 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)	
Test Position	Timeslots	Channel	Conducted Power(dBm)	10 g Average	1 g Average		
Test Position of GPRS(Proximity sensor is activated, Distance 0mm)							
Test Position 1	1Txslot	Middle/190	29.91	0.383	0.585	0.141	Figure 11
	2Txslots	Middle/190	27.71	0.331	0.506	-0.005	Figure 12
	3Txslots	Middle/190	27.25	0.322	0.492	-0.129	Figure 13
	4Txslots	Middle/190	24.66	0.328	0.502	-0.163	Figure 14
Test Position 2	1Txslot	Middle/190	29.91	0.341	0.619	-0.121	Figure 15
Test Position 6	1Txslot	Middle/190	29.91	0.422(max.cube)	0.709(max.cube)	-0.047	Figure 16
Test Position of GPRS(Proximity sensor is not activated, Distance 0mm)							
Test Position 3	NA	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA	NA
Test Position 5	1Txslot	Middle/190	32.91	0.111	0.194	0.156	Figure 17
Test Position of GPRS(Proximity sensor is not activated, Distance 6mm)							
Test Position 1	1Txslot	Middle/190	32.91	0.248	0.359	-0.044	Figure 18
	2Txslots	Middle/190	30.71	0.261	0.377	-0.098	Figure 19
	3Txslots	Middle/190	30.25	0.261	0.374	-0.040	Figure 20
	4Txslots	Middle/190	27.66	0.210	0.303	-0.026	Figure 21
Test Position 2	2Txslots	Middle/190	30.71	0.294	0.456	-0.086	Figure 22
Test Position 3	NA	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA	NA
Worst Case Position of GPRS with EGPRS (Proximity sensor is activated, GMSK, Distance 0mm)							
Test Position 6	1Txslot	Middle/190	29.89	0.435	0.700	0.012	Figure 23

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 lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

3. 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.

4. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.
5. The proximity sensor is not activated for test position 5 (bottom edge of the device), so the SAR measurement of test position 5 at the separation distance is not required.
6. The (max.cube) labeling indicates that during the grid scanning an additional peak was found which was within 2.0dB of the highest peak. The value of the highest cube is given in the table above; the value from the second assessed cube is given in the SAR distribution plots (See ANNEX C).

7.3.2. GSM 1900 (GPRS/EGPRS)

Table 16: SAR Values [GSM 1900(GPRS/EGPRS)]

Limit of SAR				10 g Average	1 g 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)	
Test Position	Timeslots	Channel	Conducted Power(dBm)	10 g Average	1 g Average		
Test position of GPRS (Proximity sensor is activated, Distance 0mm)							
Test Position 1	1Txslot	Middle/661	24.71	0.115	0.261	0.072	Figure 24
	2Txslots	Middle/661	21.76	0.179	0.388	0.080	Figure 25
	3Txslots	Middle/661	20.74	0.164	0.355	0.098	Figure 26
	4Txslots	Middle/661	18.92	0.172	0.371	-0.128	Figure 27
Test Position 2	2Txslots	High/810	21.74	0.450	1.020	0.132	Figure 28
		Middle/661	21.76	0.404	0.927	0.038	Figure 29
		Low/512	21.81	0.349	0.812	0.086	Figure 30
Test Position 6	2Txslots	Middle/661	21.76	0.273	0.588	-0.046	Figure 31
Test Position of GPRS(Proximity sensor is not activated, Distance 0mm)							
Test Position 3	NA	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA	NA
Test Position 5	2Txslots	Middle/661	26.76	0.056	0.132	0.078	Figure 32
Test Position of Body (Proximity sensor is not activated, Distance 6mm)							
Test Position 1	1Txslot	Middle/661	29.71	0.177	0.328	-0.036	Figure 33
	2Txslots	Middle/661	26.76	0.174	0.315	-0.046	Figure 34
	3Txslots	Middle/661	25.74	0.208	0.379	-0.035	Figure 35
	4Txslots	Middle/661	23.92	0.177	0.323	-0.046	Figure 36
Test Position 2	3Txslots	Middle/661	25.74	0.319	0.648	0.081	Figure 37
Test Position 3	NA	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA	NA
Worst Case Position of GPRS with EGPRS (Proximity sensor is activated, GMSK, Distance 0mm)							
Test Position 2	2Txslots	High/810	21.71	0.457	1.040	0.124	Figure 38

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 lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.

3. 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.

4. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.

5.The proximity sensor is not activated for test position 5 (bottom edge of the device), so the SAR measurement of test position 5 at the separation distance is not required.

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	1 g 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)	
Test Position	Channel	Conducted Power(dBm)	10 g Average	1 g Average		
Test Position of RMC (Proximity sensor is activated, Distance 0mm)						
Test Position 1	Middle/9400	16.97	0.280	0.578	0.030	Figure 39
Test Position 2	High/9538	17.01	0.562	1.260	0.093	Figure 40
	Middle/9400	16.97	0.534	1.230	-0.033	Figure 41
	Low/9262	16.88	0.457	1.080	-0.009	Figure 42
Test Position 6	High/9538	17.01	0.368	0.805	-0.034	Figure 43
	Middle/9400	16.97	0.377	0.818	-0.070	Figure 44
	Low/9262	16.88	0.349	0.749	-0.085	Figure 45
Test Position of RMC (Proximity sensor is not activated, Distance 0mm)						
Test Position 3	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA
Test Position 5	Middle/9400	22.47	0.062	0.120	0.020	Figure 46
Test Position of RMC (Proximity sensor is not activated, Distance 6mm)						
Test Position 1	Middle/9400	22.47	0.306	0.561	-0.104	Figure 47
Test Position 2	High/9538	22.51	0.485	0.958	-0.052	Figure 48
	Middle/9400	22.47	0.493	0.980	-0.131	Figure 49
	Low/9262	22.38	0.465	0.932	-0.094	Figure 50
Test Position 3	NA	NA	NA	NA	NA	NA
Test Position 4	NA	NA	NA	NA	NA	NA
Worst Case Position of RMC with HSDPA (Proximity sensor is activated, Distance 0mm)						
Test Position 2	High/9538	16.01	0.396	0.906	0.102	Figure 51
Worst Case Position of RMC with HSUPA (Proximity sensor is activated, Distance 0mm)						
Test Position 2	High/9538	17.01	0.333	0.763	0.050	Figure 52

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 lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.
3. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.
4. The proximity sensor is not activated for test position 5 (bottom edge of the device), so the SAR measurement of test position 5 at the separation distance is not required.

7.3.4. WCDMA Band V (WCDMA)

Table 18: SAR Values [WCDMA Band V (WCDMA)]

Limit of SAR			10 g Average	1 g 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)	
Test Position	Channel	Conducted Power(dBm)	10 g Average	1 g Average		
Test Position of RMC (Proximity sensor is activated, Distance 0mm)						
Test Position 1	Middle/4183	19.05	0.237	0.368	-0.128	Figure 53
Test Position 2	Middle/4183	19.05	0.211	0.361	-0.047	Figure 54
Test Position 6	Middle/4183	19.05	0.282	0.452	-0.124	Figure 55
Test Position of RMC (Proximity sensor is not activated, Distance 0mm)						
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 5	Middle/4183	22.55	0.065	0.113	0.062	Figure 56
Test Position of RMC (Proximity sensor is not activated, Distance 6mm)						
Test Position 1	Middle/4183	22.55	0.204	0.294	0.165	Figure 57
Test Position 2	Middle/4183	22.55	0.225	0.344	0.094	Figure 58
Test Position 3	N/A	N/A	N/A	N/A	N/A	N/A
Test Position 4	N/A	N/A	N/A	N/A	N/A	N/A

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

2. The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8W/kg), testing at the high and low channels is optional.
3. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.
4. WCDMA mode were tested under RMC 12.2kbps with HSPA (HSDPA/HSUPA) inactive per KDB Publication 941225 D01. HSPA (HSDPA/HSUPA) SAR for body was not required since the average output power of the HSPA (HSDPA/HSUPA) subtests was not more than 0.25 dB higher than the RMC level and the maximum SAR for 12.2kbps RMC was less than 75% (1.2 W/kg) SAR limit.
5. The proximity sensor is not activated for test position 5 (bottom edge of the device), so the SAR measurement of test position 5 at the separation distance is not required.

7.3.5. Bluetooth/WiFi Function

The location of the antennas inside tablet is shown in Annex H:

Stand-alone SAR

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

The output power of BT antenna is as following:

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
GFSK Test result (dBm)	7.33	8.24	9.37
EDR3M-8DPSK Test result (dBm)	8.23	8.16	9.34

Because the output power of BT transmitter is ≤60/f(GHz). Stand-alone SAR is not required for BT,

The output power of WIFI antenna is as following:

Mode	Date rata(Mbps)	Average power (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	12.42	12.51	12.78
	2	12.53	12.15	12.68
	5.5	12.27	12.65	12.69
	11	12.61	12.42	12.74
802.11g	6	11.72	11.33	11.57
	9	11.41	11.67	11.74
	12	11.82	11.29	11.53
	18	11.26	11.42	11.55
	24	11.72	11.26	11.68
	36	11.34	11.61	11.79
	48	11.14	11.41	11.32
	54	11.23	11.56	11.83
802.11n HT20	6.5	11.70	11.40	11.60
	13	11.60	11.20	11.70
	19.5	11.20	11.70	11.40
	26	11.30	11.50	11.80
	39	11.60	11.20	11.70

	52	11.40	11.60	11.10
	58.5	11.50	11.20	11.40
	65	11.70	11.60	11.80

Because the output power of WIFI transmitter is ≤60/f(GHz). Stand-alone SAR is not required for WIFI.

Simultaneous Transmission information

Bluetooth and WiFi cann't transmit simultaneously since they share the same circuit path and are switched by the radio.

Since the output power of the BT antenna is ≤60/f(GHz , BT and WLAN 2.4GHz SAR are not required for both back side and edge exposure conditions.

Simultaneous Transmission Analysis

About BT and GSM/WCDMA Antenna,

SAR1g(W/kg) / Test Position	GSM850	GSM1900	WCDMA Band II	WCDMA Band V	BT	MAX. ΣSAR_{1g}
Test Position 1(0mm)	**0.585**	0.388	0.578	0.368	0	0.585
Test Position 1(6mm)	0.377	0.379	**0.561**	0.294	0	0.561
Test Position 2(0mm)	0.619	1.040	**1.260**	0.361	0	**1.260**
Test Position 2(6mm)	0.456	0.648	**0.980**	0.344	0	0.980
Test Position 3(0mm)	N/A	N/A	N/A	N/A	**0**	0
Test Position4(0mm)	N/A	N/A	N/A	N/A	**0**	0
Test Position 5(0mm)	**0.190**	0.132	0.120	0.113	0	0.190
Test Position 6(0mm)	0.709	0.588	**0.818**	0.452	0	0.818

Note :1. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.

2. Stand alone SAR for BT is not requird.Its SAR is considered 0 in the 1-g SAR summing process to determine simultaneous transmission SAR evaluation requirments.

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 (1.6W/kg) for these antenna, so the Simultaneous SAR are not required for BT and GSM/WCDMA Antenna.

About WI-FI and GSM/WCDMA Antenna

SAR1g(W/kg) / Test Position	GSM850	GSM1900	WCDMA Band II	WCDMA Band V	Wifi (2.4GHz)	MAX. ΣSAR_{1g}
Test Position 1(0mm)	**0.585**	0.388	0.578	0.368	0	0.585
Test Position 1(6mm)	0.377	0.379	**0.561**	0.294	0	0.561
Test Position 2(0mm)	0.619	1.040	**1.260**	0.361	0	**1.260**
Test Position 2(6mm)	0.456	0.648	**0.980**	0.344	0	0.980
Test Position 3(0mm)	N/A	N/A	N/A	N/A	**0**	0
Test Position4(0mm)	N/A	N/A	N/A	N/A	**0**	0
Test Position 5(0mm)	**0.190**	0.132	0.120	0.113	0	0.190
Test Position 6(0mm)	0.709	0.588	**0.818**	0.452	0	0.818

Note: 1. NA: According to KDB 447498 4)b)ii)(2),for each antenna, SAR is only required for the edge with the most conservative exposure condition. So these position are not required for SAR measurement.

2. Stand alone SAR for WI-FI is not requird. Its SAR is considered 0 in the 1-g SAR summing process to determine simultaneous transmission SAR evaluation requirments.

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 (1.6W/kg) for these antenna, So the Simultaneous SAR are not required for WI-FI and GSM/WCDMA Antenna.

8. Measurement Uncertainty

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

21	-liquid conductivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.64	1.8	∞
22	-liquid conductivity (measurement uncertainty)	B	2.5	N	1	0.64	1.6	9
23	-liquid permittivity (deviation from target)	B	5.0	R	$\sqrt{3}$	0.6	1.7	∞
24	-liquid permittivity (measurement uncertainty)	B	2.5	N	1	0.6	1.5	9
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					12.12	
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$		N		k=2	24.24	

9. Main Test Instruments

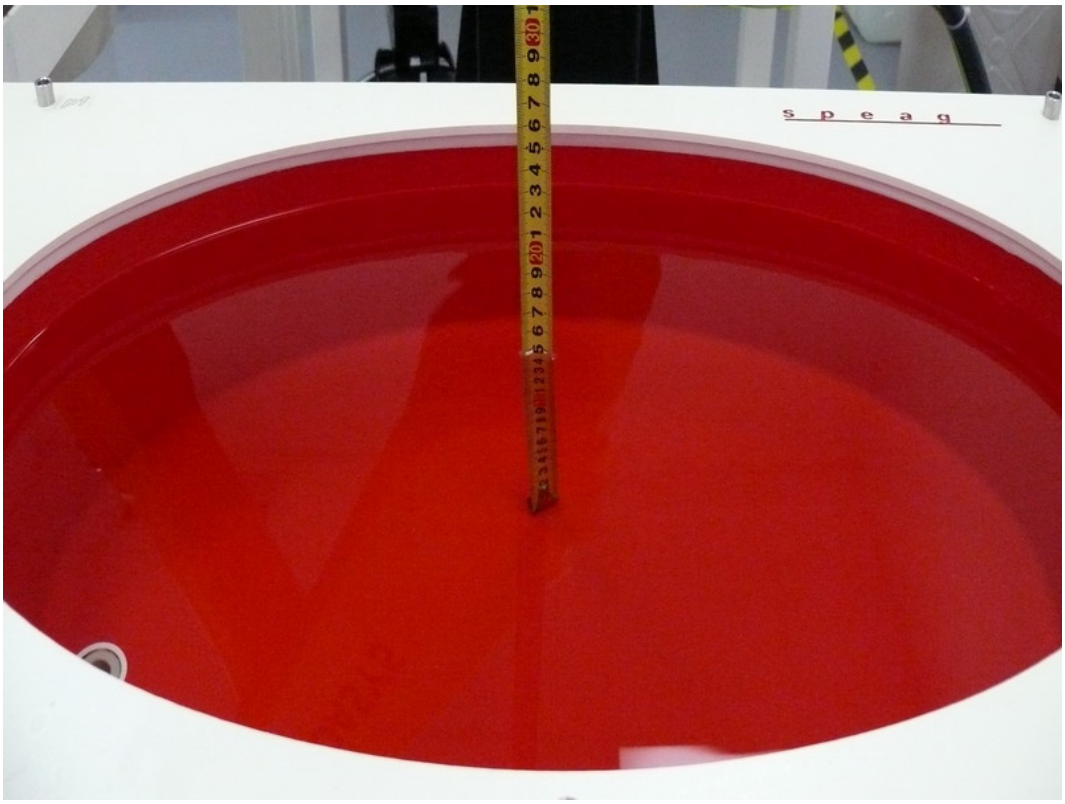
Table 19: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent 8753E	US37390326	September 12, 2011	One year
02	Dielectric Probe Kit	Agilent 85070E	US44020115	No Calibration Requested	
03	Power meter	Agilent E4417A	GB41291714	March 12, 2011	One year
04	Power sensor	Agilent N8481H	MY50350004	September 25, 2011	One year
05	Signal Generator	HP 8341B	2730A00804	September 12, 2011	One year
06	Amplifier	IXA-020	0401	No Calibration Requested	
07	BTS	E5515C	MY48360988	December 3, 2010	One year
08	E-field Probe	EX3DV4	3677	November 24, 2010	One year
09	DAE	DAE4	871	November 18, 2010	One year
10	Validation Kit 835MHz	D835V2	4d020	August 26, 2011	One year
11	Validation Kit 1900MHz	D1900V2	5d060	August 31, 2011	One year

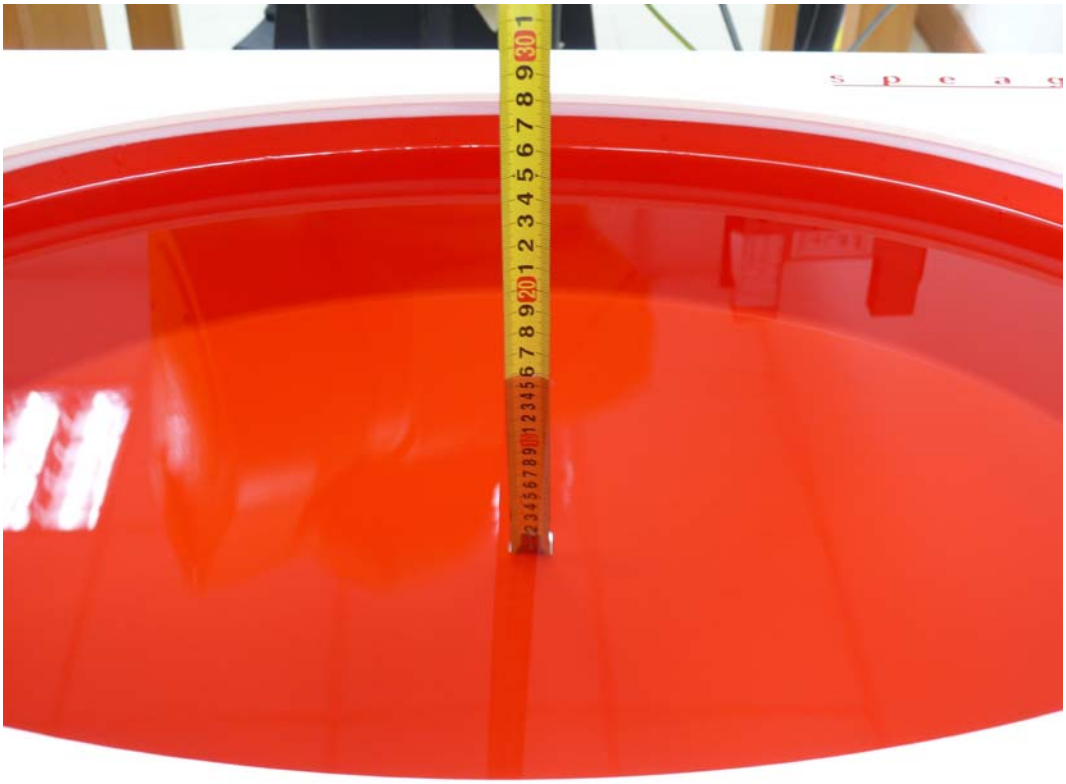
*******END OF REPORT BODY*******

ANNEX A: Test Layout

Picture 1: Specific Absorption Rate Test Layout



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



Picture 3: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)

ANNEX B: System Check Results

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date/Time: 10/29/2011 12:09:20 AM

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

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

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.7℃

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

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

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

Peak SAR (extrapolated) = 3.63 W/kg

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

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

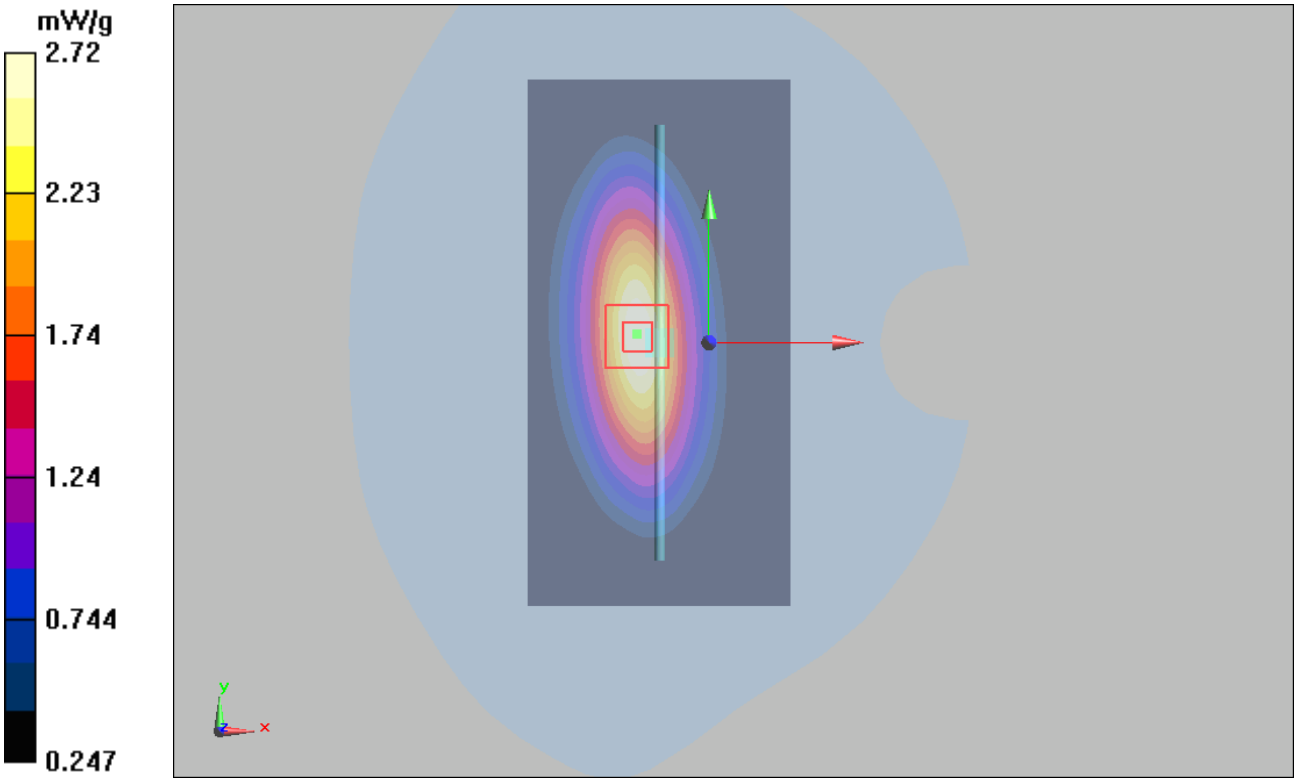


Figure 7 System Performance Check 835MHz 250Mw

System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date/Time: 11/10/2011 11:40:20 AM

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

Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.81; ρ = 1000 kg/m^3

Ambient Temperature:22.3℃ Liqiud Temperature: 21.8℃

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

Maximum value of SAR (interpolated) = 2.93 mW/g

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

Reference Value = 55.7 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 3.59 W/kg

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.58 mW/g

Maximum value of SAR (measured) = 2.92 mW/g

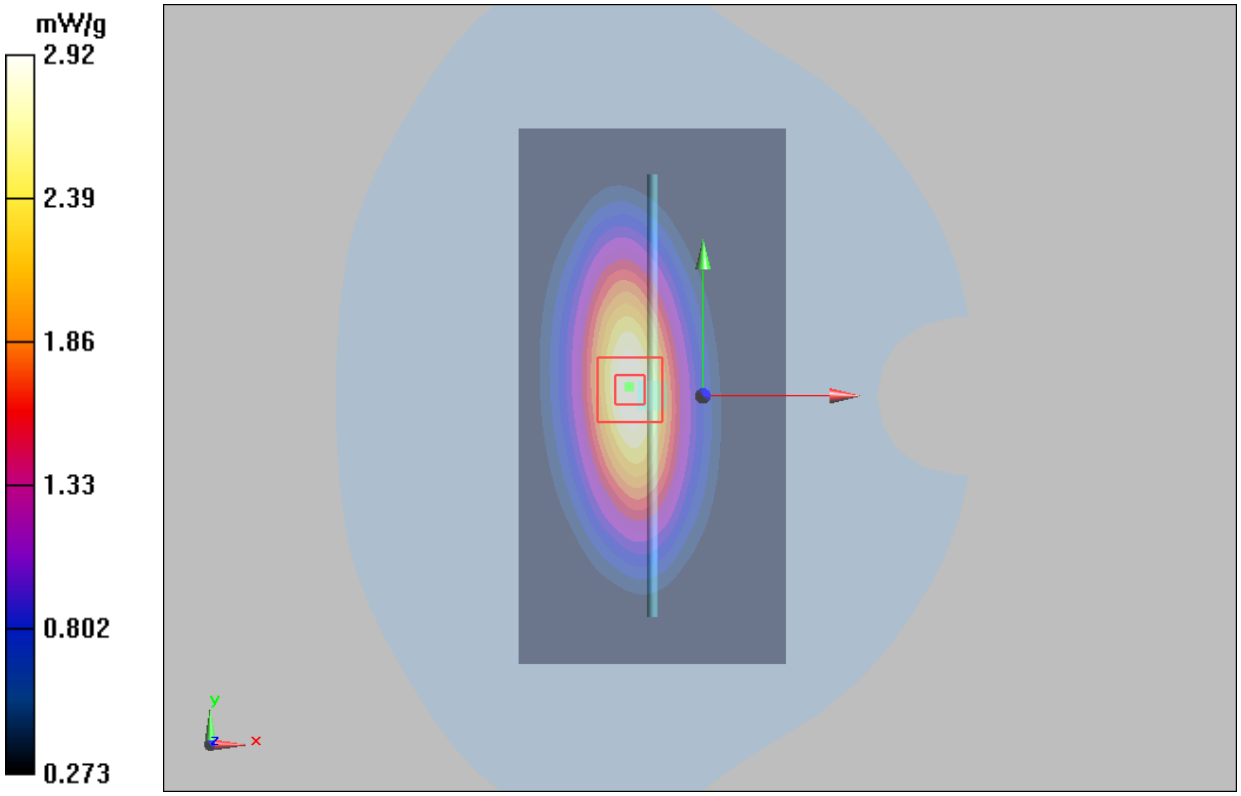


Figure 8 System Performance Check 835MHz 250mW

System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date/Time: 10/27/2011 8:20:19 AM

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

Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 52.29; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.8℃

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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

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

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

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

Peak SAR (extrapolated) = 17.6 W/kg

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

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

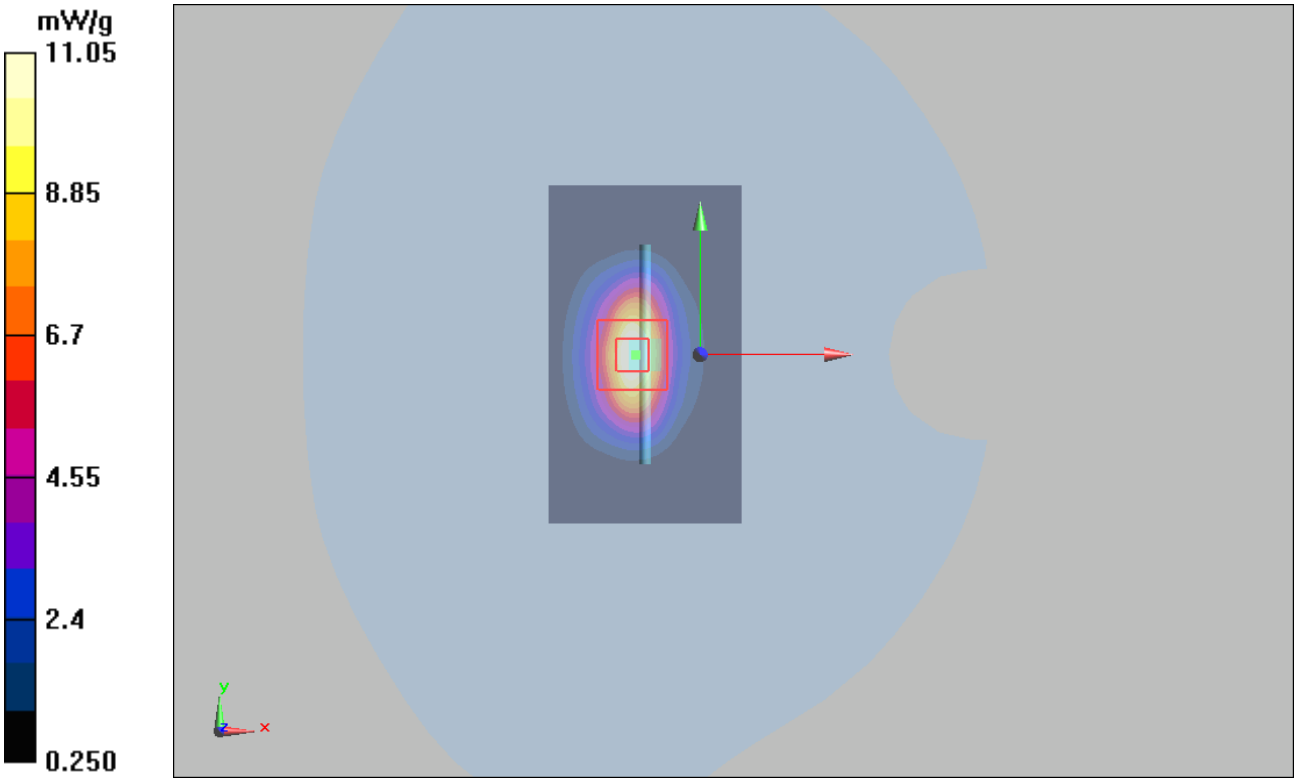


Figure 9System Performance Check 1900MHz 250mW

System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date/Time: 11/10/2011 3:00:19 PM

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

Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 51.57; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liqiud Temperature: 21.9℃

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

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) = 10.22 mW/g; SAR(10 g) = 5.40 mW/g

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

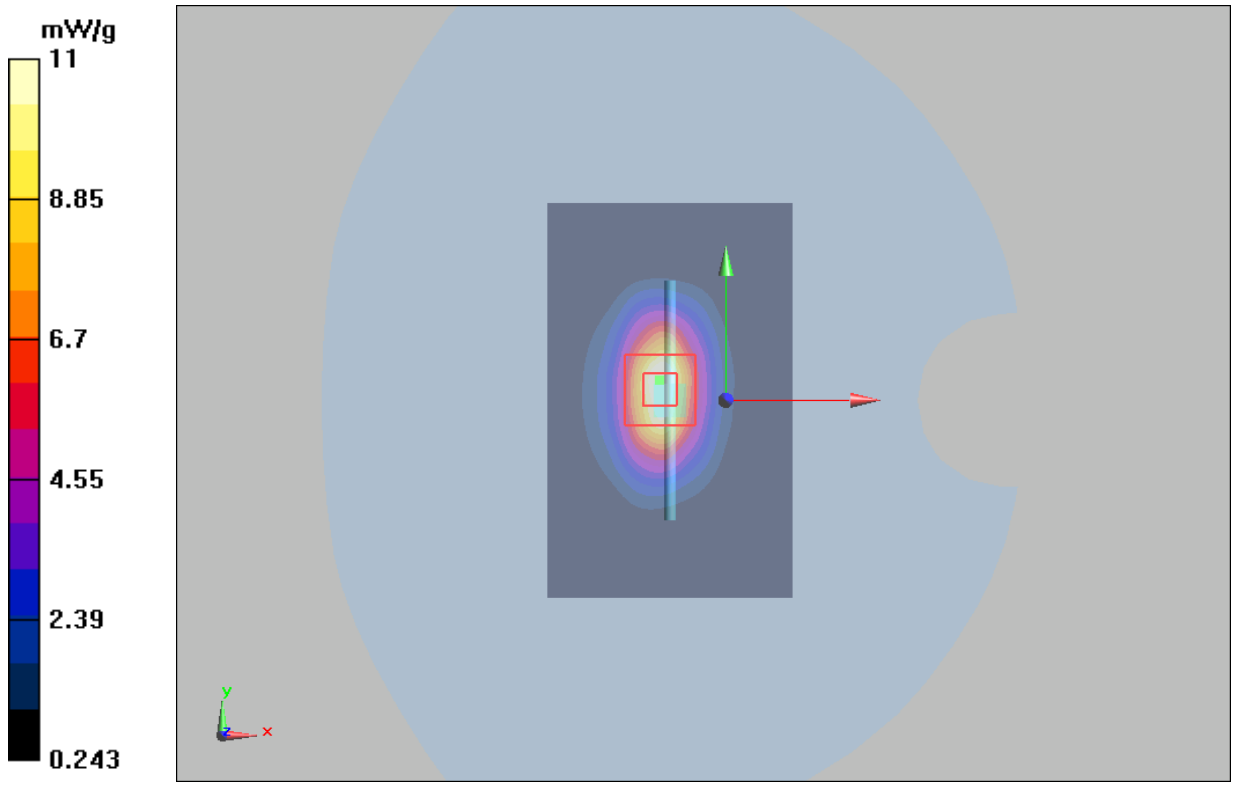


Figure 10 System Performance Check 1900MHz 250mW

ANNEX C: Graph Results

GSM 850 GPRS (1Txslot) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/29/2011 3:06:04 AM
Communication System: GPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.655 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.38 V/m; Power Drift = 0.141 dB
Peak SAR (extrapolated) = 0.902 W/kg
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.383 mW/g
Maximum value of SAR (measured) = 0.631 mW/g

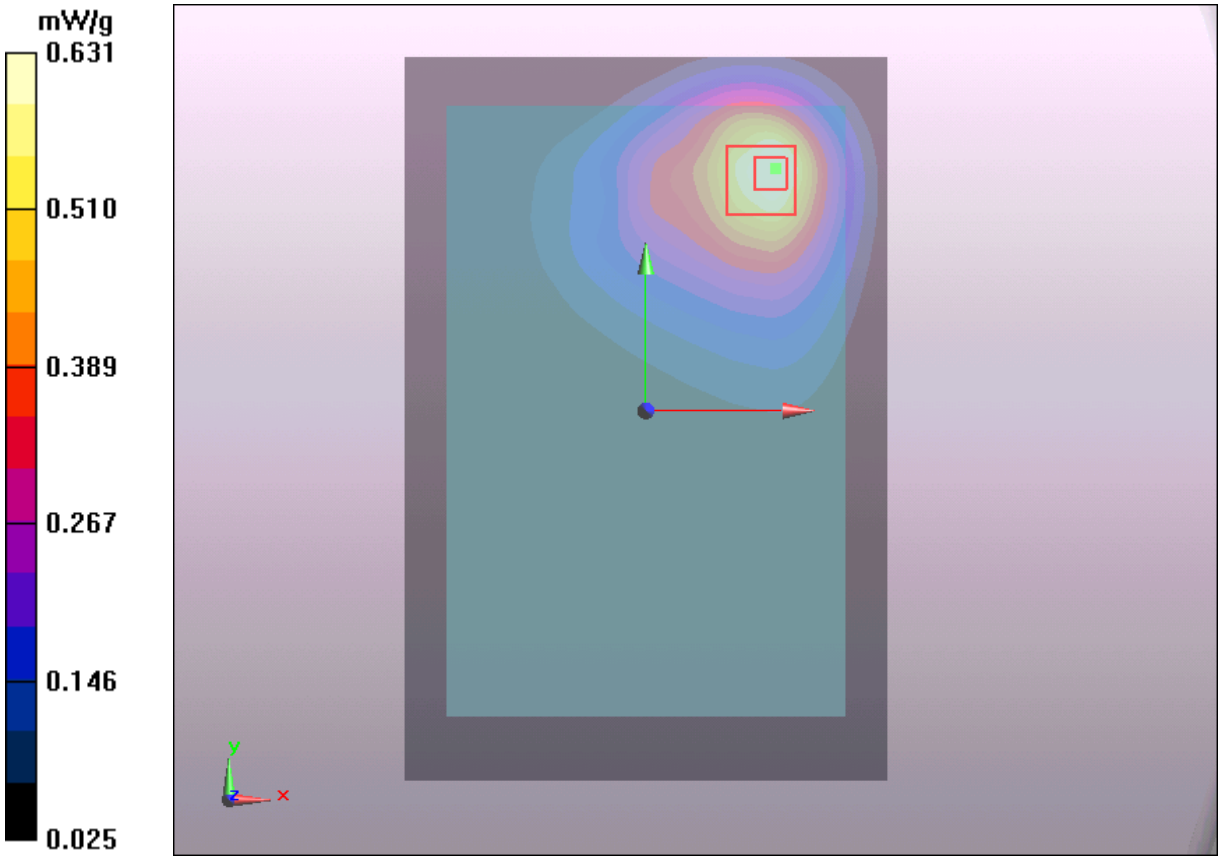


Figure 11 Body, Test Position 1, GSM 850 GPRS (1Txslot) Channel 190

GSM 850 GPRS (2Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/29/2011 4:00:37 AM
Communication System: GPRS 2TX ; Frequency: 836.6 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.570 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.22 V/m; Power Drift = -0.005 dB
Peak SAR (extrapolated) = 0.787 W/kg
SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.331 mW/g
Maximum value of SAR (measured) = 0.544 mW/g

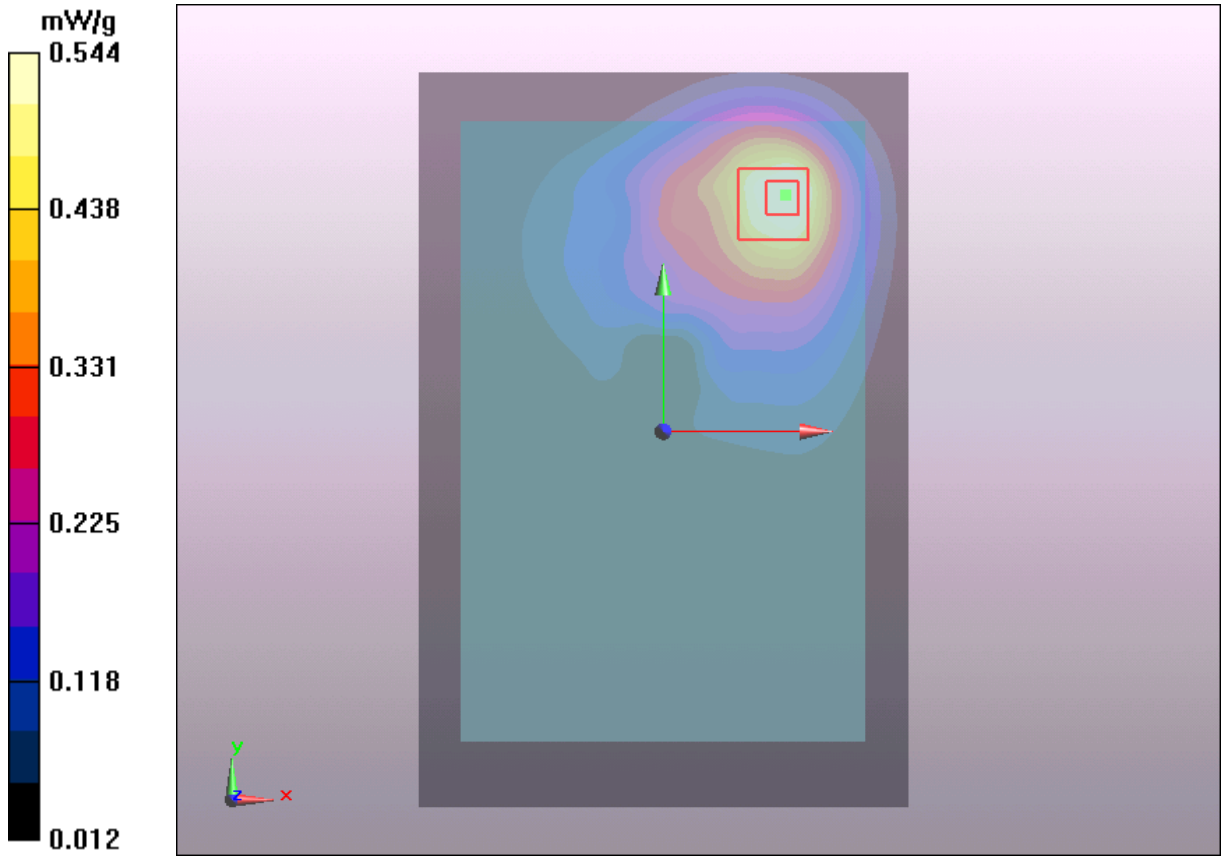


Figure 12 Body, Test Position 1, GSM 850 GPRS (**2Txslots**) Channel 190

GSM 850 GPRS (3Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/29/2011 12:10:54 PM
Communication System: GPRS 3TX; Frequency: 836.6 MHz;Duty Cycle: 1:2.76694
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.554 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.24 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 0.762 W/kg
SAR(1 g) = 0.492 mW/g; SAR(10 g) = 0.322 mW/g
Maximum value of SAR (measured) = 0.527 mW/g

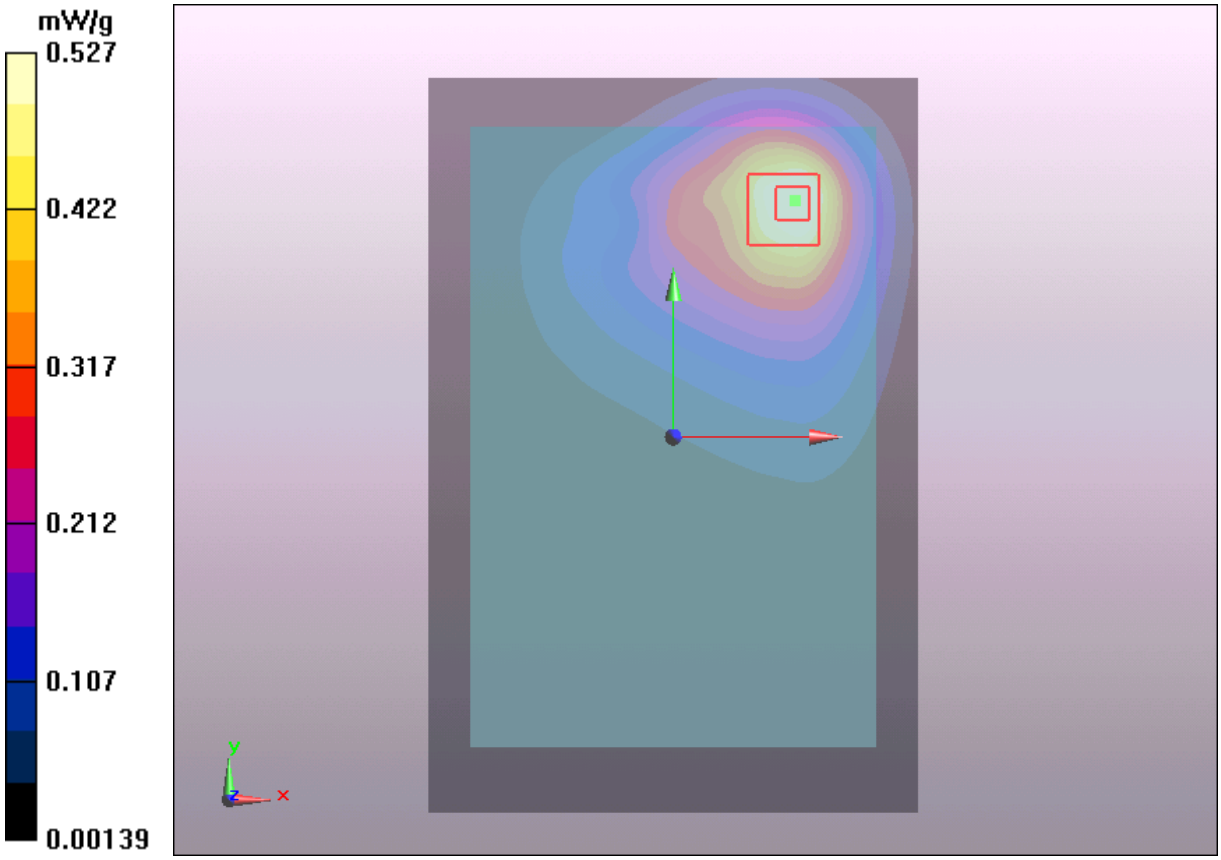


Figure 13 Body, Test Position 1, GSM 850 GPRS (3Txslots) Channel 190

GSM 850 GPRS (4Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/29/2011 12:47:47 PM
Communication System: GPRS 4TX; Frequency: 836.6 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.561 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.3 V/m; Power Drift = -0.163 dB
Peak SAR (extrapolated) = 0.792 W/kg
SAR(1 g) = 0.502 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.543 mW/g

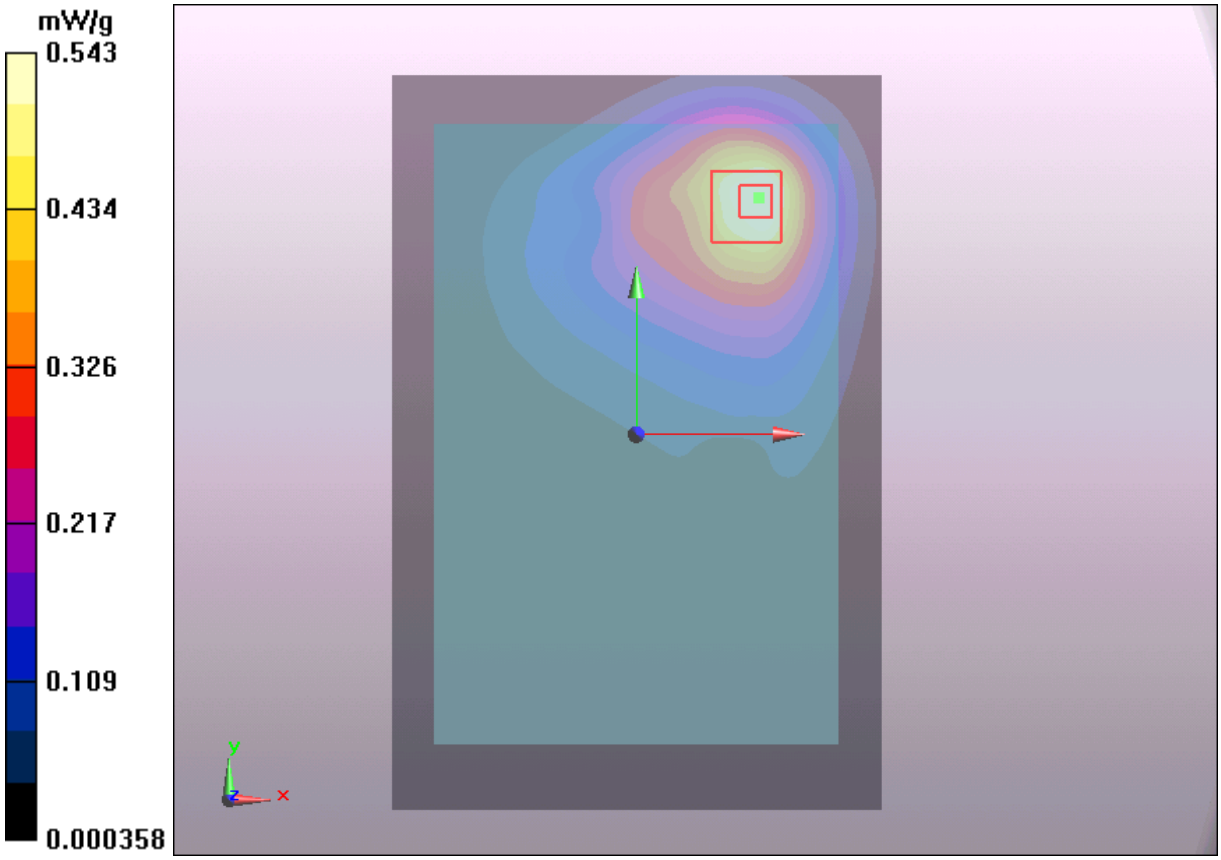


Figure 14 Body, Test Position 1, GSM 850 GPRS (4Txslots) Channel 190

GSM 850 GPRS (1Txslot) Test Position 2 Middle (Distance 0mm)

Date/Time: 10/29/2011 11:06:52 AM
Communication System: GPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.704 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.619 mW/g; SAR(10 g) = 0.341 mW/g
Maximum value of SAR (measured) = 0.712 mW/g

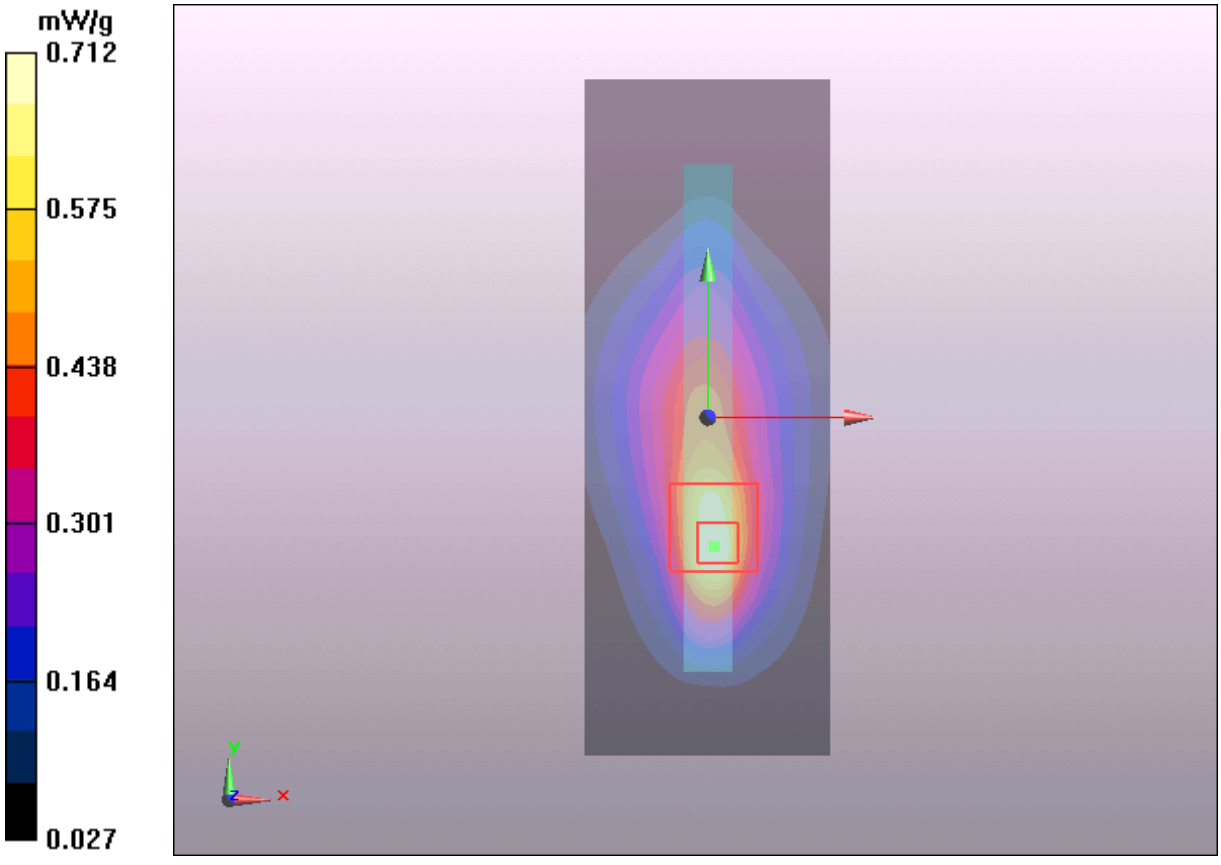
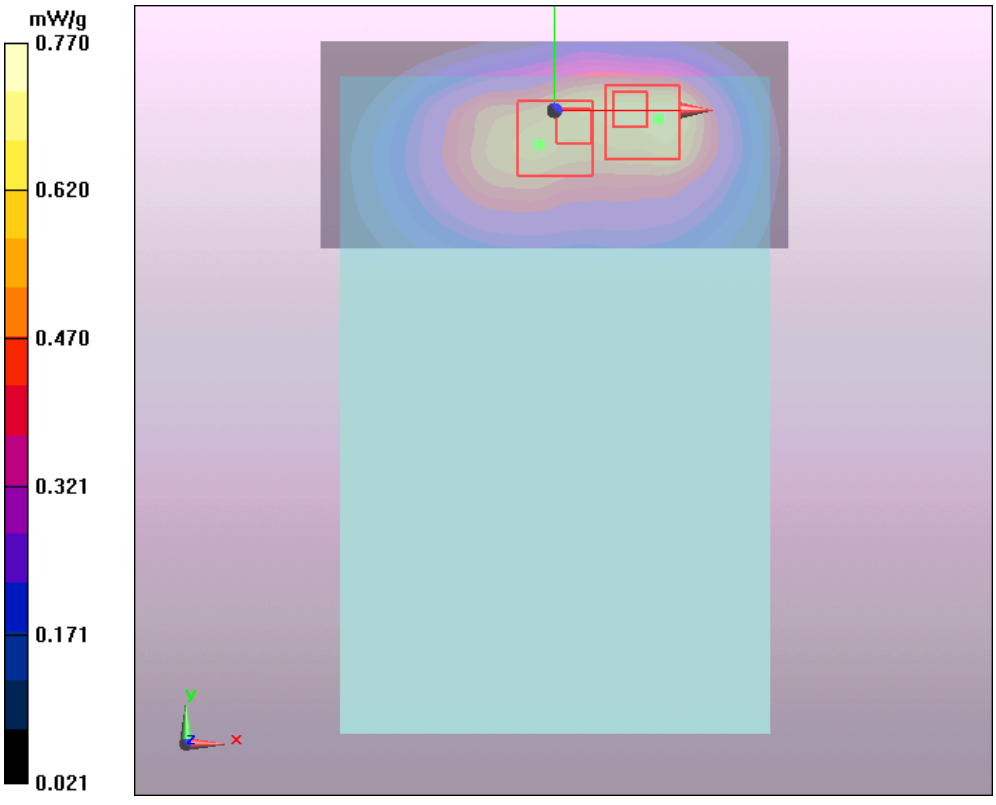
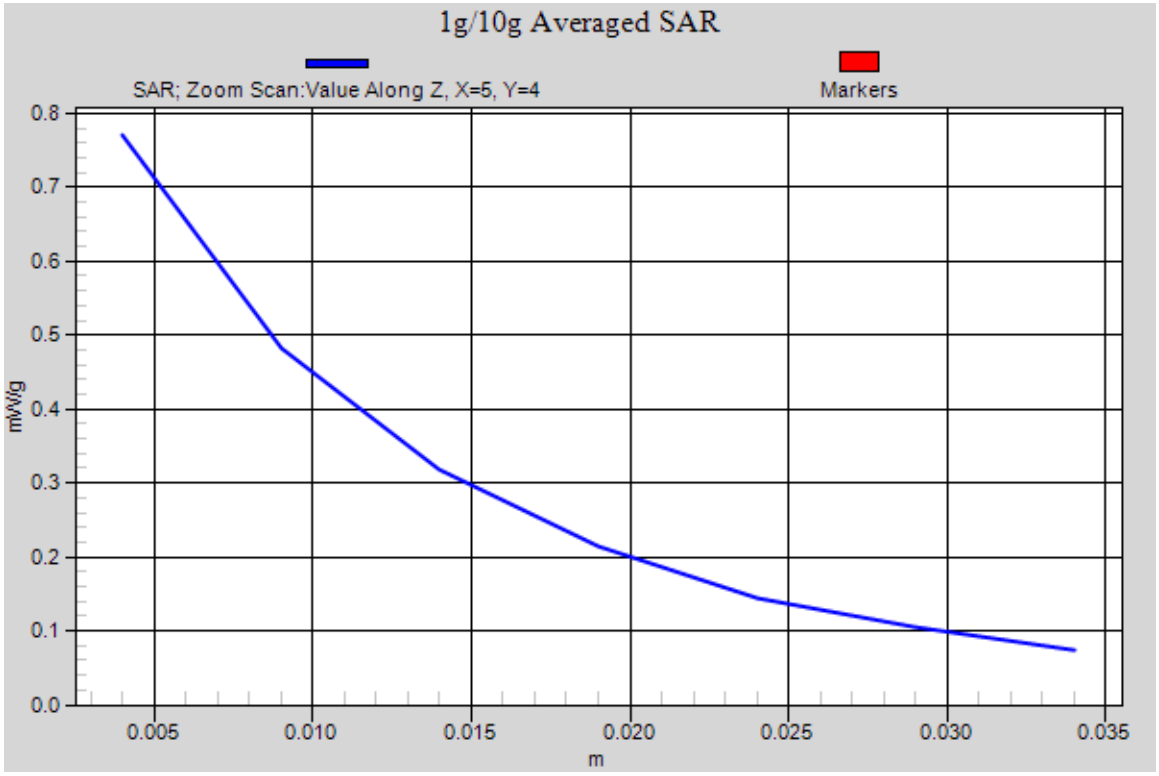


Figure 15 Body, Test Position 2, GSM 850 GPRS (1Txslot) Channel 190

GSM 850 GPRS (1Txslot) Test Position 6 Middle (Distance 0mm)

Date/Time: 11/10/2011 9:57:47 PM,
Communication System: GPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.00 mho/m; ε_r = 54.74; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59
Test Position 6 Middle /Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.676 mW/g
Test Position 6 Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.709 mW/g; SAR(10 g) = 0.422 mW/g
Maximum value of SAR (measured) = 0.770 mW/g
Test Position 6 Middle /Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = 0.047dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.408 mW/g
Maximum value of SAR (measured) = 0.682 mW/g





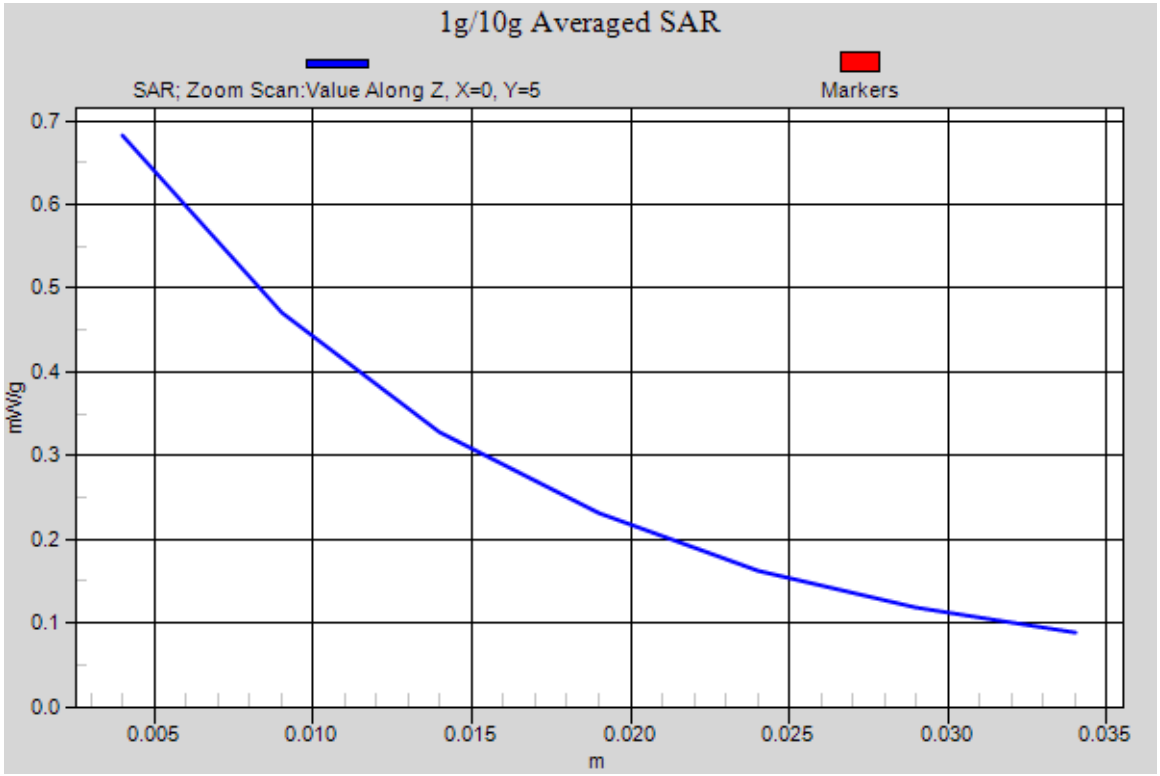


Figure 16 Body, Test Position 6, GSM 850 GPRS (1Txslot) Channel 190

GSM 850 GPRS (1Txslot) Test Position 5 Middle (Distance 0mm)

Date/Time: 10/29/2011 3:28:14 AM
Communication System: GPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 5 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.200 mW/g

Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.18 V/m; Power Drift = 0.156 dB
Peak SAR (extrapolated) = 0.351 W/kg
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.111 mW/g
Maximum value of SAR (measured) = 0.216 mW/g

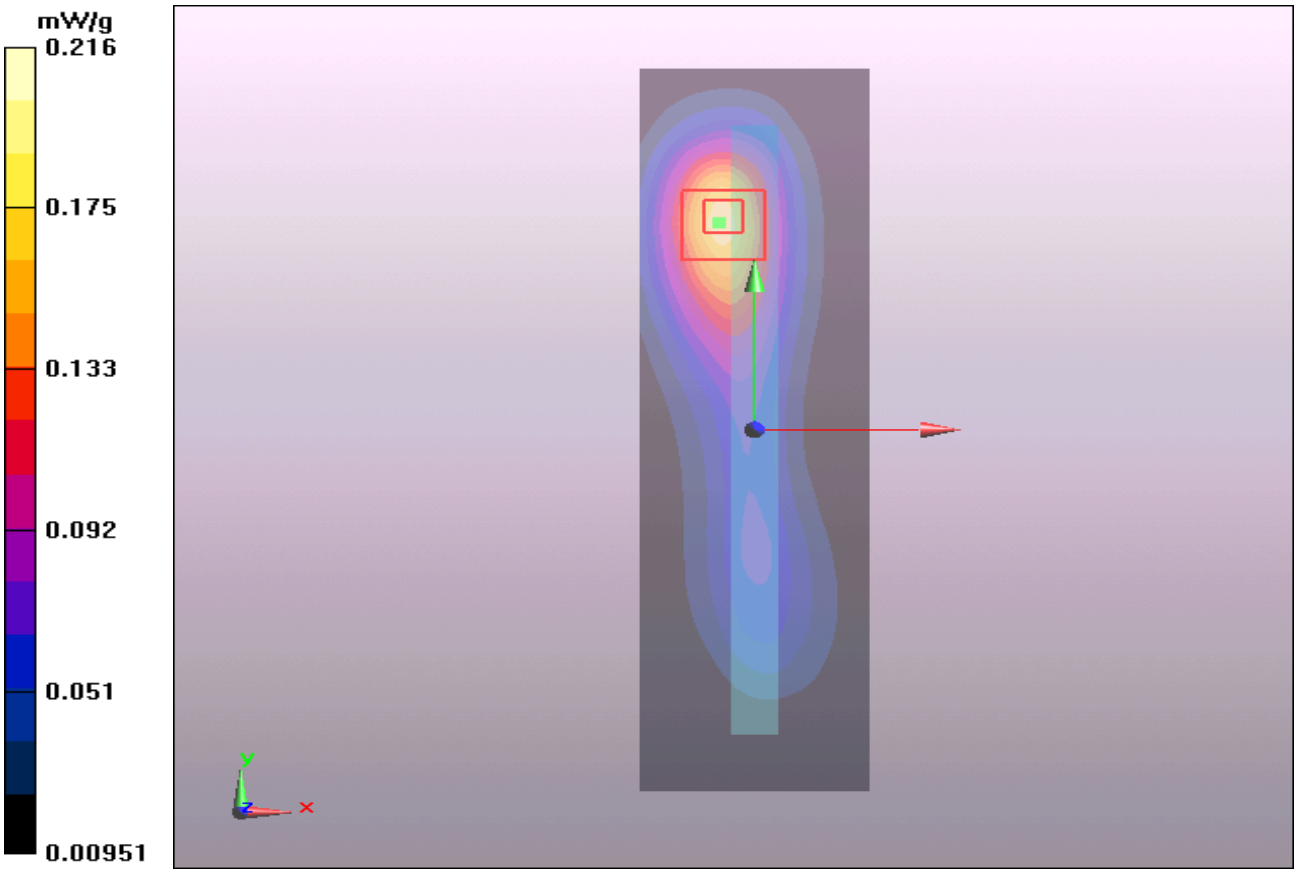


Figure 17 Body, Test Position 5, GSM 850 GPRS (1Txslot) Channel 190

GSM 850 GPRS (1Txslot) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/29/2011 1:48:47 AM
Communication System: GPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.390 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.359 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.381 mW/g

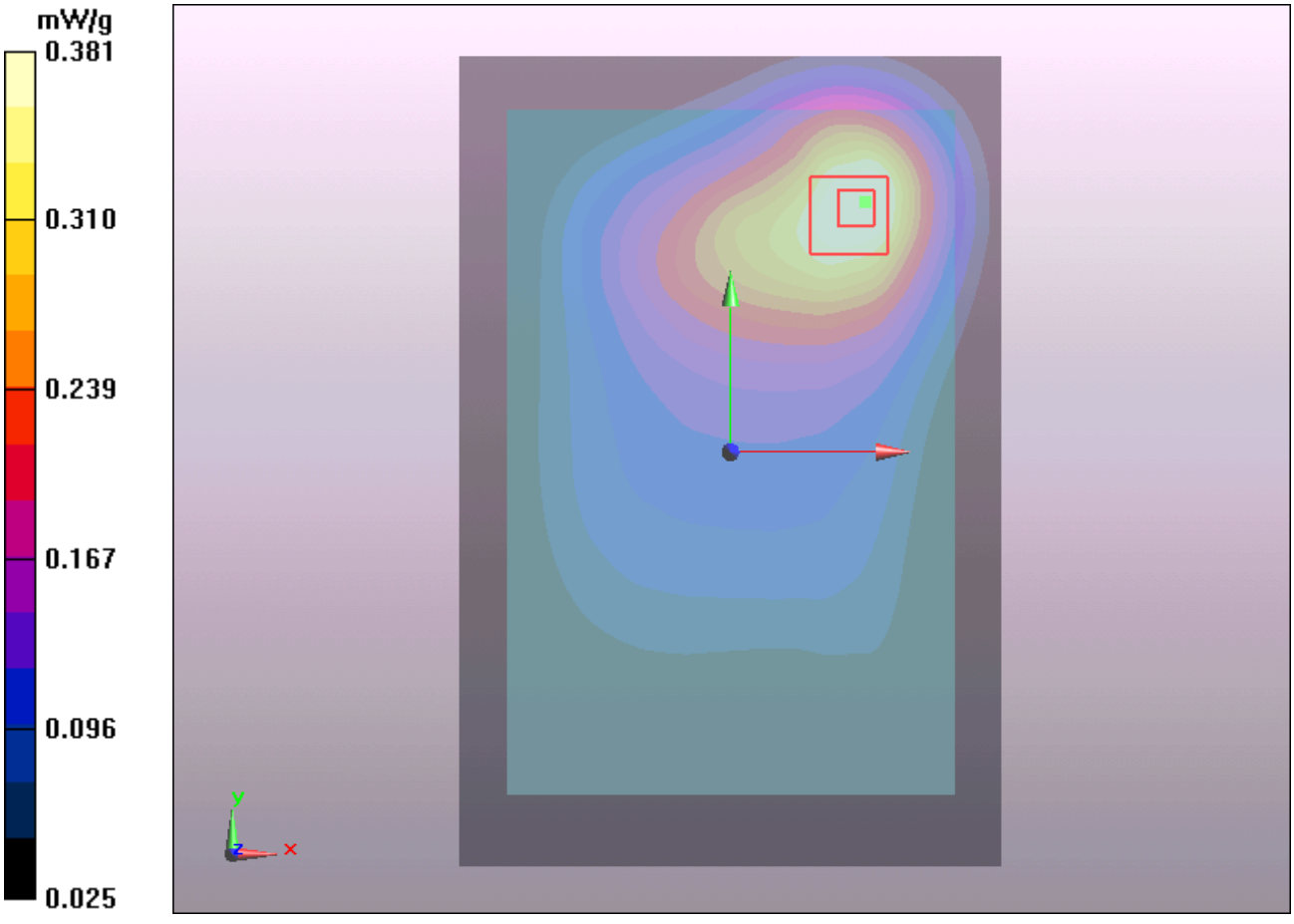


Figure 18 Body, Test Position 1, GSM 850 GPRS (1Txslot) Channel 190

GSM 850 GPRS (2Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/29/2011 1:28:54 AM
Communication System: GPRS 2TX ; Frequency: 836.6 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.412 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = -0.098 dB
Peak SAR (extrapolated) = 0.537 W/kg
SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.261 mW/g
Maximum value of SAR (measured) = 0.403 mW/g

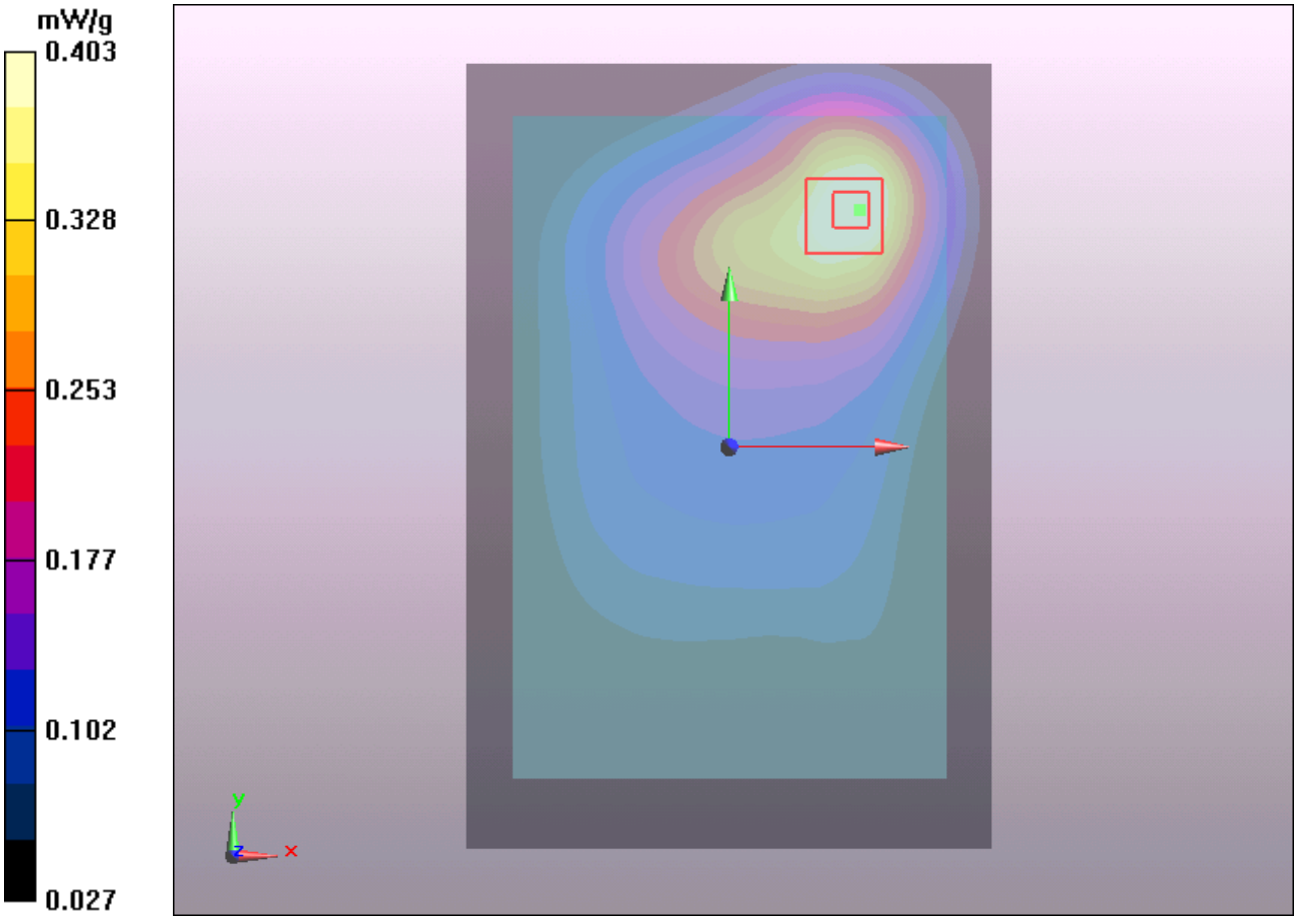


Figure 19 Body, Test Position 1, GSM 850 GPRS (2Txslots) Channel 190

GSM 850 GPRS (3Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/29/2011 2:06:46 AM
Communication System: GPRS 3TX; Frequency: 836.6 MHz;Duty Cycle: 1:2.76694
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.418 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.559 W/kg
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.261 mW/g
Maximum value of SAR (measured) = 0.399 mW/g

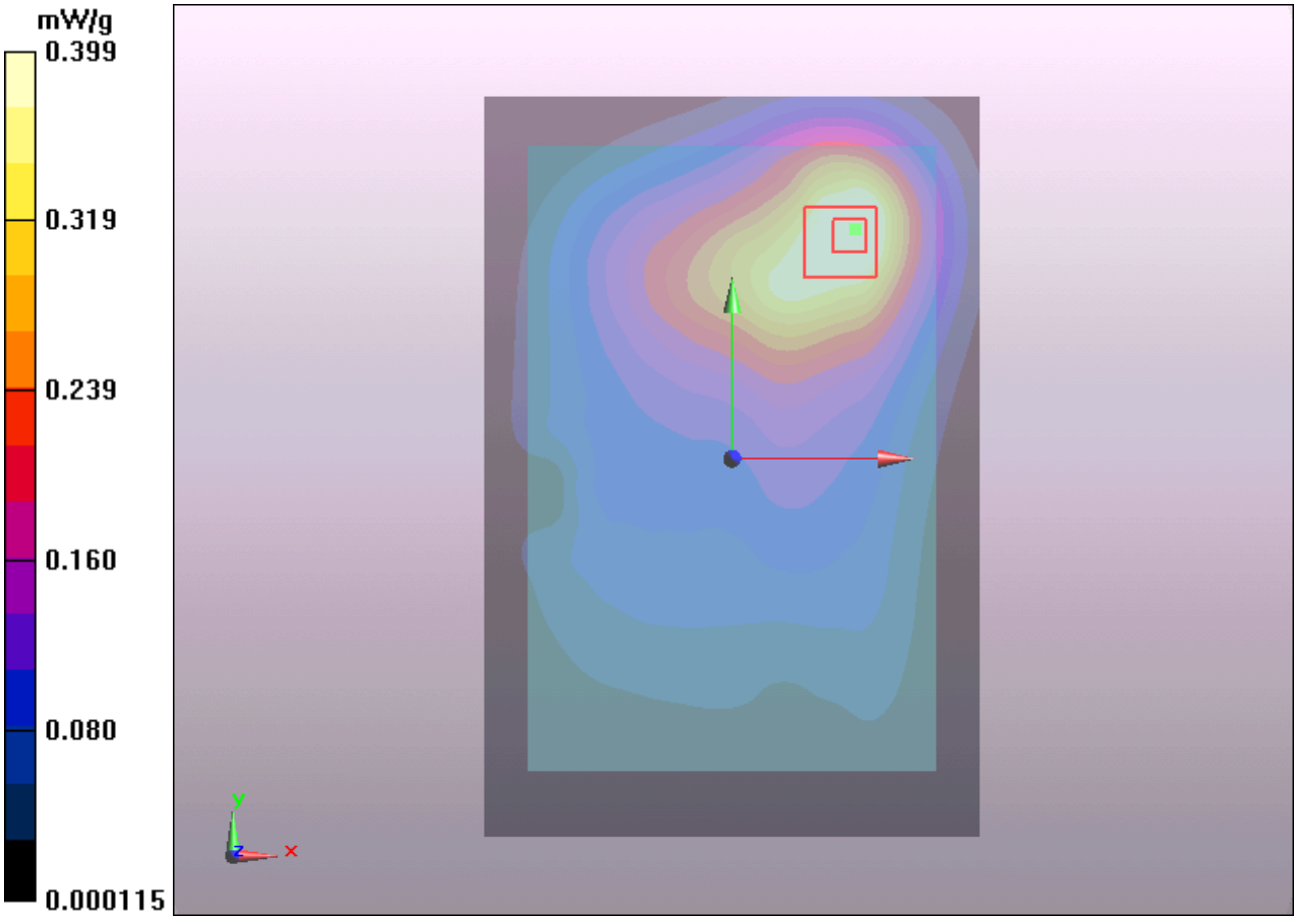


Figure 20 Body, Test Position 1, GSM 850 GPRS (3Txslots) Channel 190

GSM 850 GPRS (4Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/29/2011 2:44:44 AM
Communication System: GPRS 4TX; Frequency: 836.6 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.327 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.31 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.434 W/kg
SAR(1 g) = 0.303 mW/g; SAR(10 g) = 0.210 mW/g
Maximum value of SAR (measured) = 0.322 mW/g

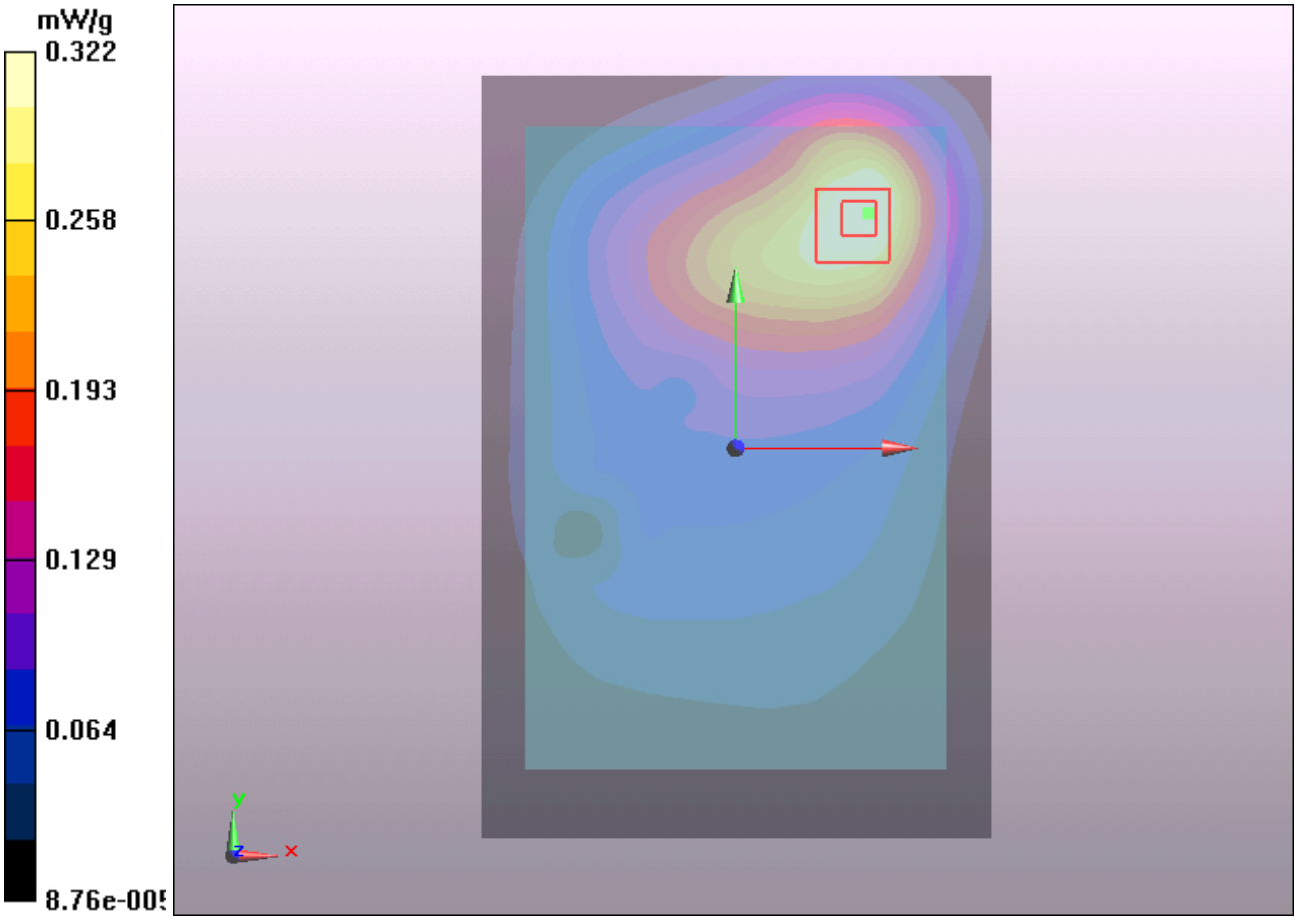


Figure 21 Body, Test Position 1, GSM 850 GPRS (4Txslots) Channel 190

GSM 850 GPRS (2Txslots) Test Position 2 Middle (Distance 6mm)

Date/Time: 10/29/2011 10:24:48 AM
Communication System: GPRS 2TX ; Frequency: 836.6 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 837 MHz; σ = 1.01 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.502 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = -0.086 dB
Peak SAR (extrapolated) = 0.707 W/kg
SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.294 mW/g
Maximum value of SAR (measured) = 0.498 mW/g

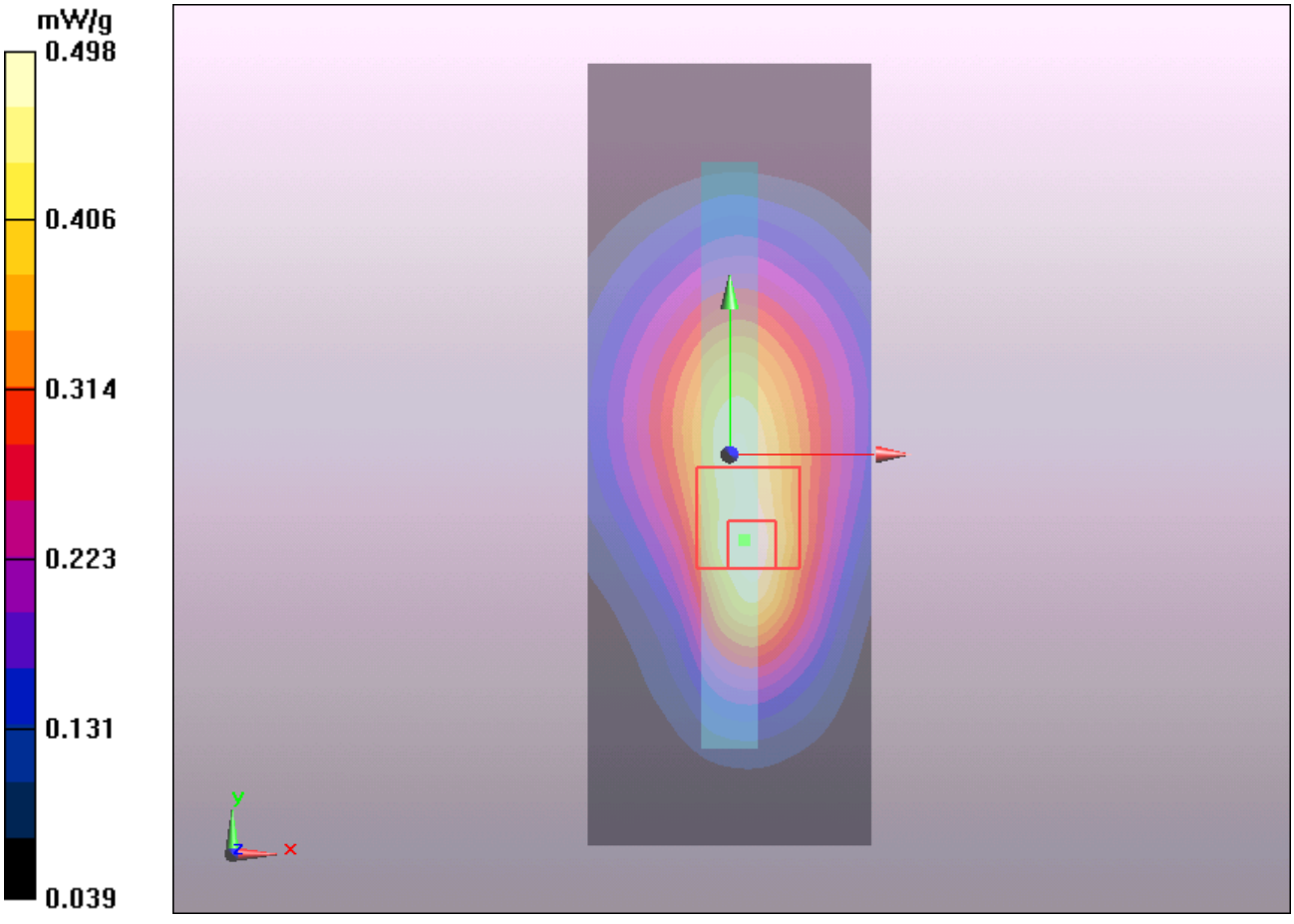


Figure 22 Body, Test Position 2, GSM 850 GPRS (2Txslots) Channel 190

GSM 850 EGPRS (1Txslot) Test Position 6 Middle (Distance 0mm)

Date/Time: 11/10/2011 9:57:47 PM
Communication System: EGPRS 1TX; Frequency: 836.6 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 1.00 mho/m; ε_r = 54.74; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 Middle/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.809 mW/g

Test Position 6 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.5 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.700 mW/g; SAR(10 g) = 0.435 mW/g
Maximum value of SAR (measured) = 0.754 mW/g

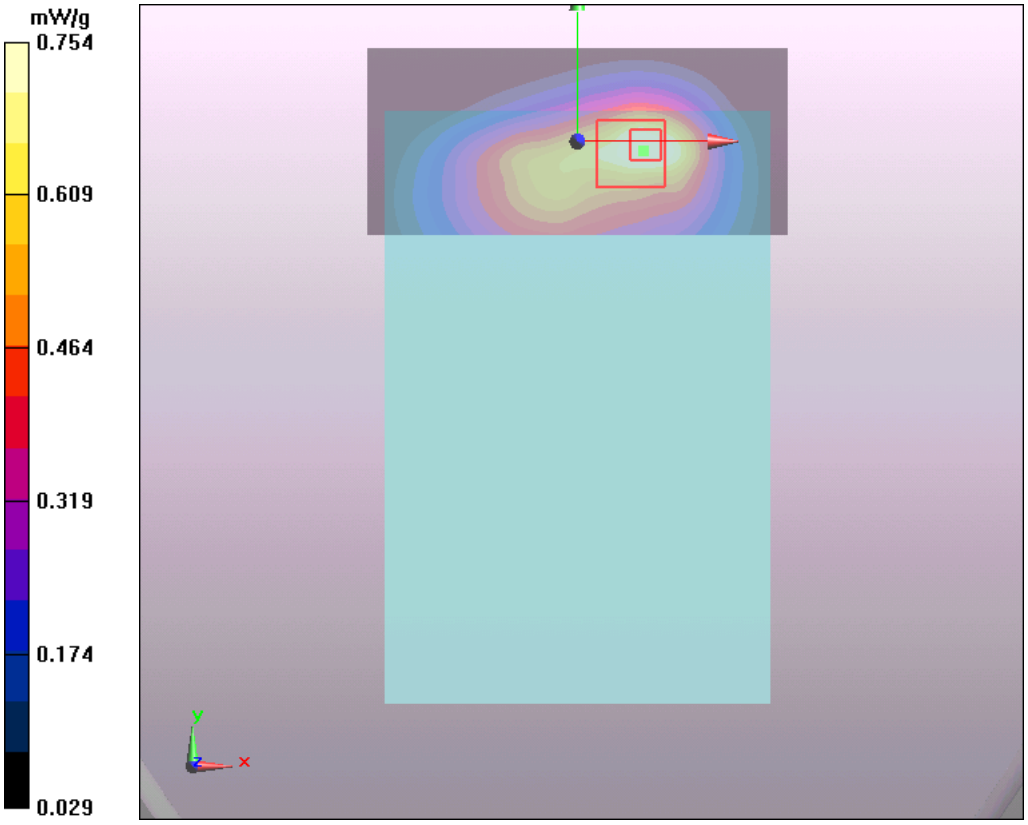


Figure 23 Body, Test Position 2, GSM 850 EGPRS (1Txslot) Channel 190

GSM 1900 GPRS (1Txslot) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/27/2011 10:47:37 AM
Communication System: GPRS 1TX; Frequency: 1880 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.240 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.66 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.523 W/kg
SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.115 mW/g
Maximum value of SAR (measured) = 0.296 mW/g

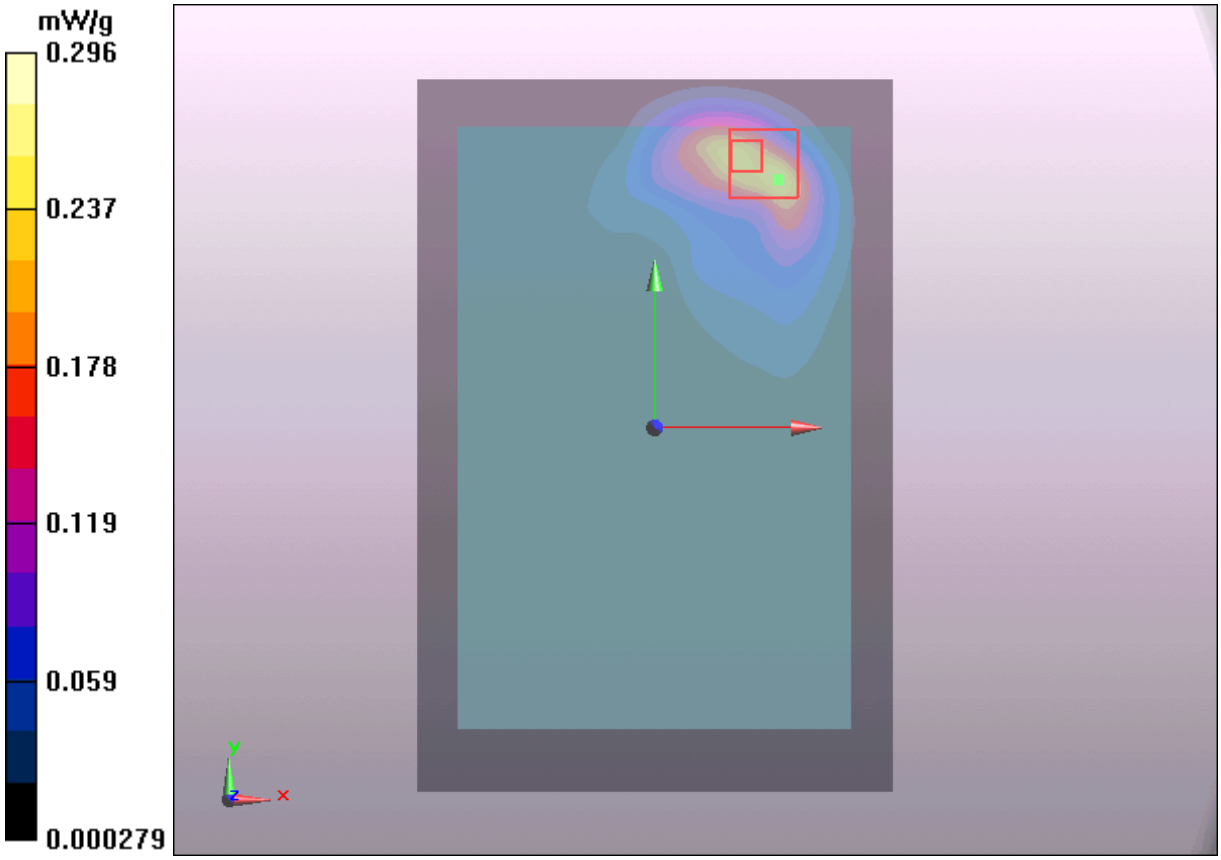


Figure 24 Body, Test Position 1, GSM 1900 GPRS (1Txslot) Channel 661

GSM 1900 GPRS (2Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/27/2011 10:08:56 AM
Communication System: GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.385 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.18 V/m; Power Drift = 0.080 dB
Peak SAR (extrapolated) = 0.774 W/kg
SAR(1 g) = 0.388 mW/g; SAR(10 g) = 0.179 mW/g
Maximum value of SAR (measured) = 0.444 mW/g

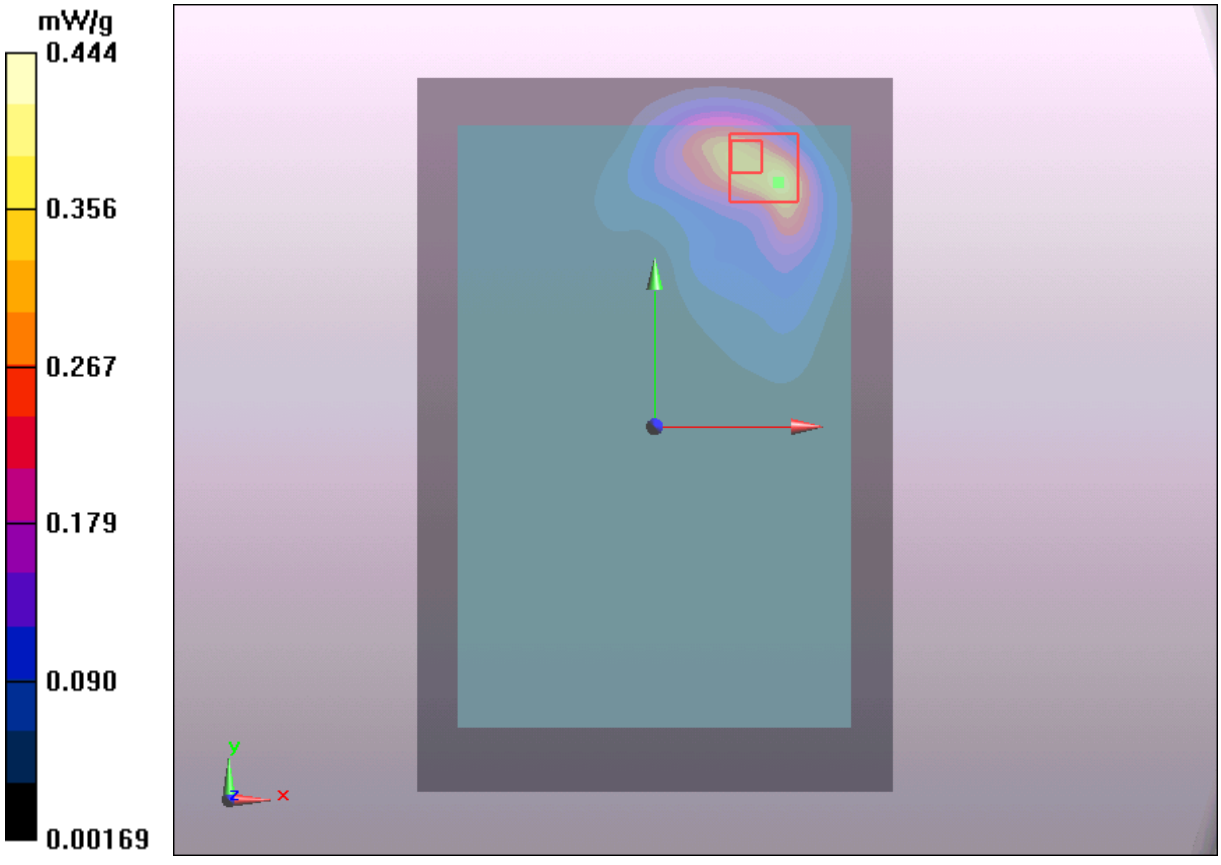


Figure 25 Body, Test Position 1, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (3Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/27/2011 11:54:24 AM
Communication System: GPRS 3TX; Frequency: 1880 MHz;Duty Cycle: 1:2.76694
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.357 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.716 W/kg
SAR(1 g) = 0.355 mW/g; SAR(10 g) = 0.164 mW/g
Maximum value of SAR (measured) = 0.416 mW/g

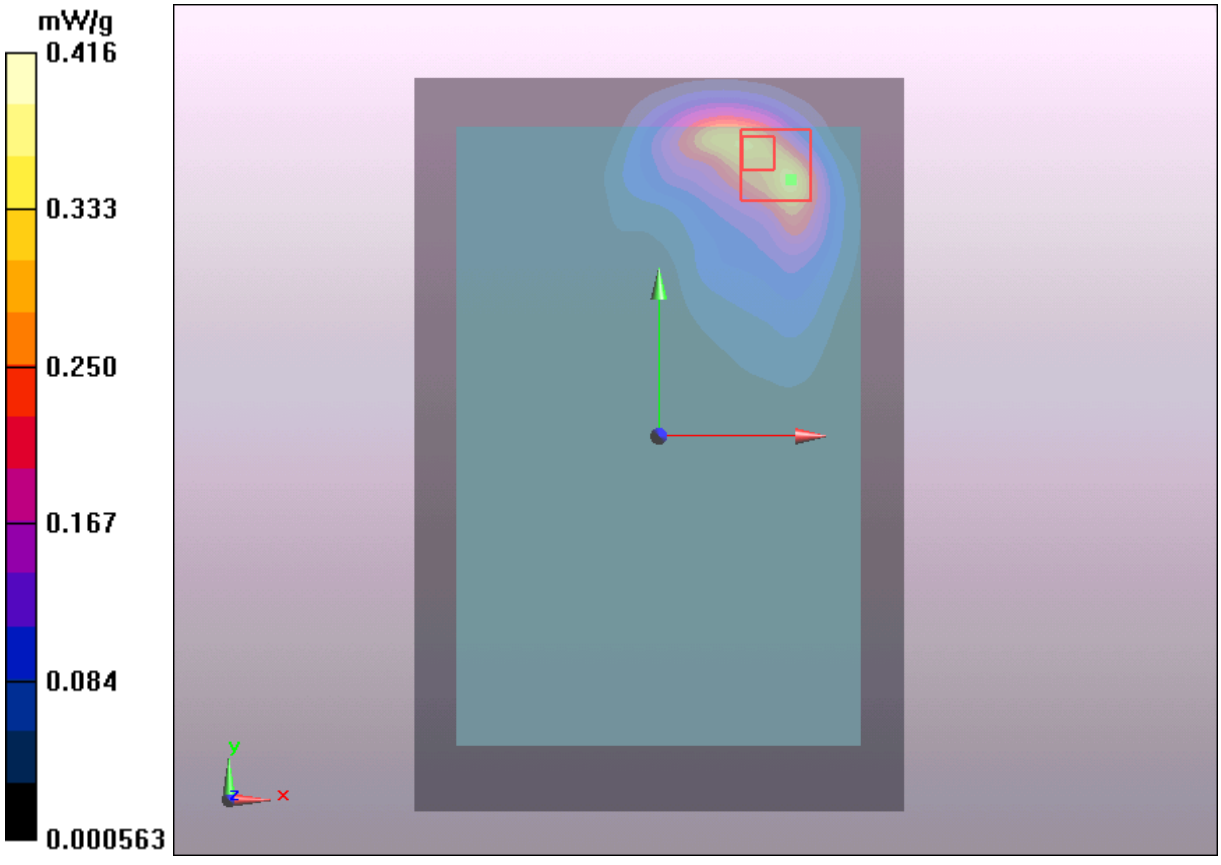


Figure 26 Body, Test Position 1, GSM 1900 GPRS (3Txslots) Channel 661

GSM 1900 GPRS (4Txslots) Test Position 1 Middle (Distance 0mm)

Date/Time: 10/27/2011 12:30:41 PM
Communication System: GPRS 4TX; Frequency: 1880 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.375 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.16 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 0.731 W/kg
SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.172 mW/g
Maximum value of SAR (measured) = 0.432 mW/g

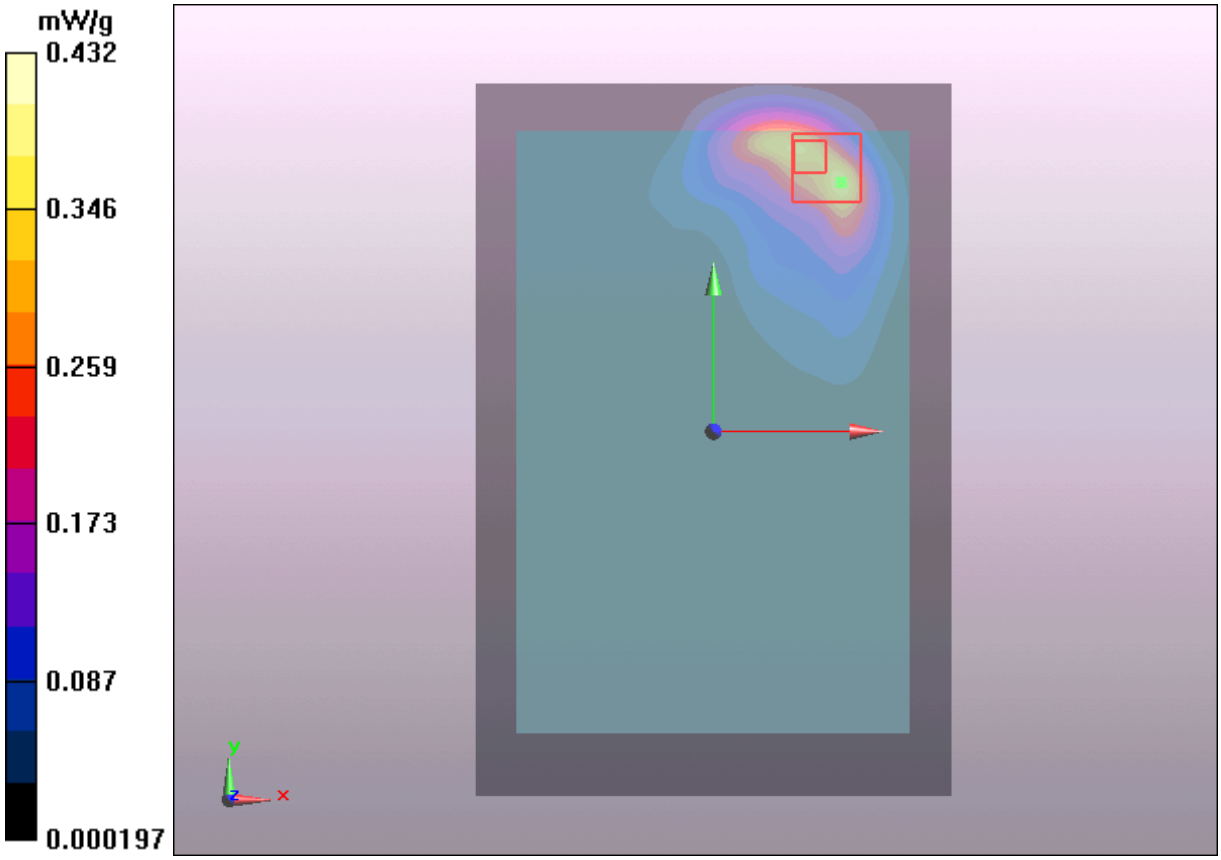


Figure 27 Body, Test Position 1, GSM 1900 GPRS (4Txslots) Channel 661

GSM 1900 GPRS (2Txslots)) Test Position 2 High (Distance 0mm)

Date/Time: 10/27/2011 2:47:18 PM
Communication System: GPRS 2TX ; Frequency: 1909.8 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = 0.132 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.450 mW/g
Maximum value of SAR (measured) = 1.21 mW/g

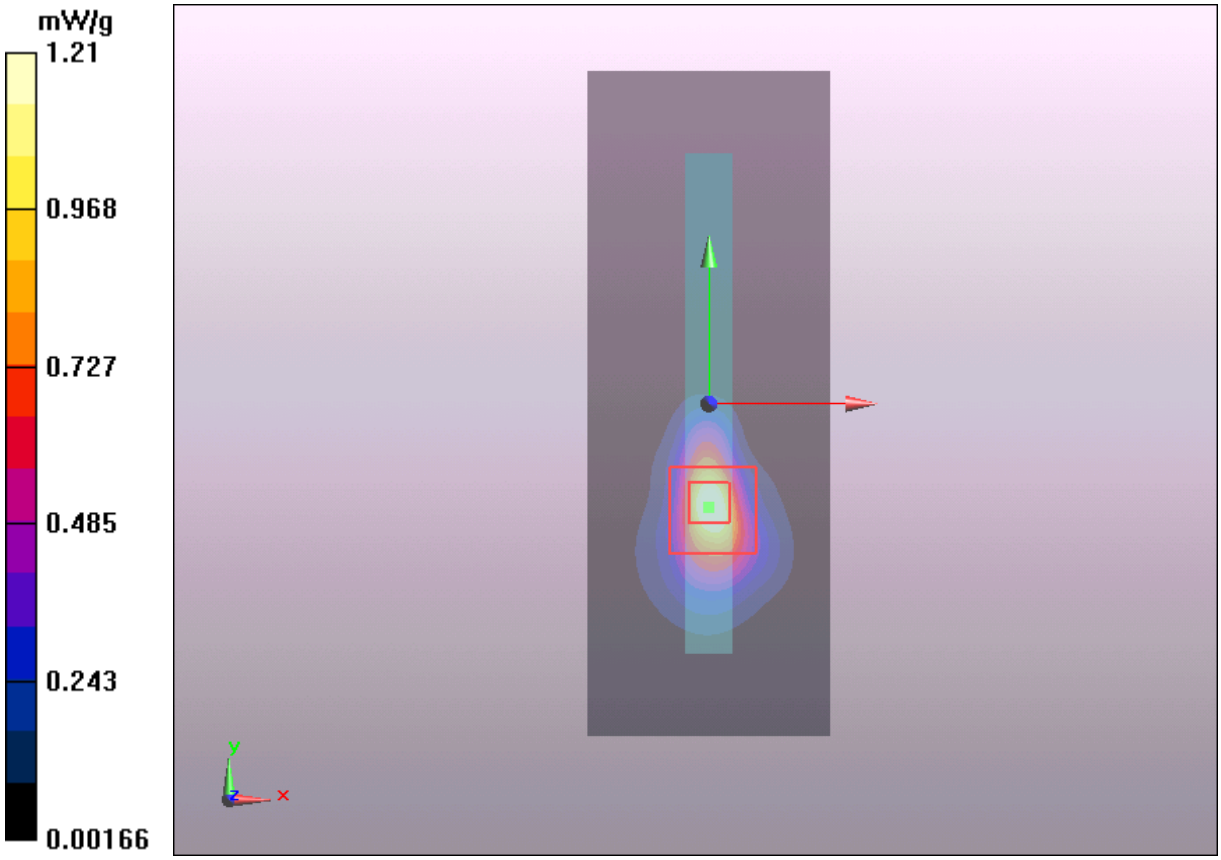


Figure 28 Body, Test Position 2, GSM 1900 GPRS (2Txslots) Channel 810

GSM 1900 GPRS (2Txslots)) Test Position 2 Middle (Distance 0mm)

Date/Time: 10/27/2011 2:24:11 PM
Communication System: GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.7 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 2.12 W/kg
SAR(1 g) = 0.927 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 1.1 mW/g

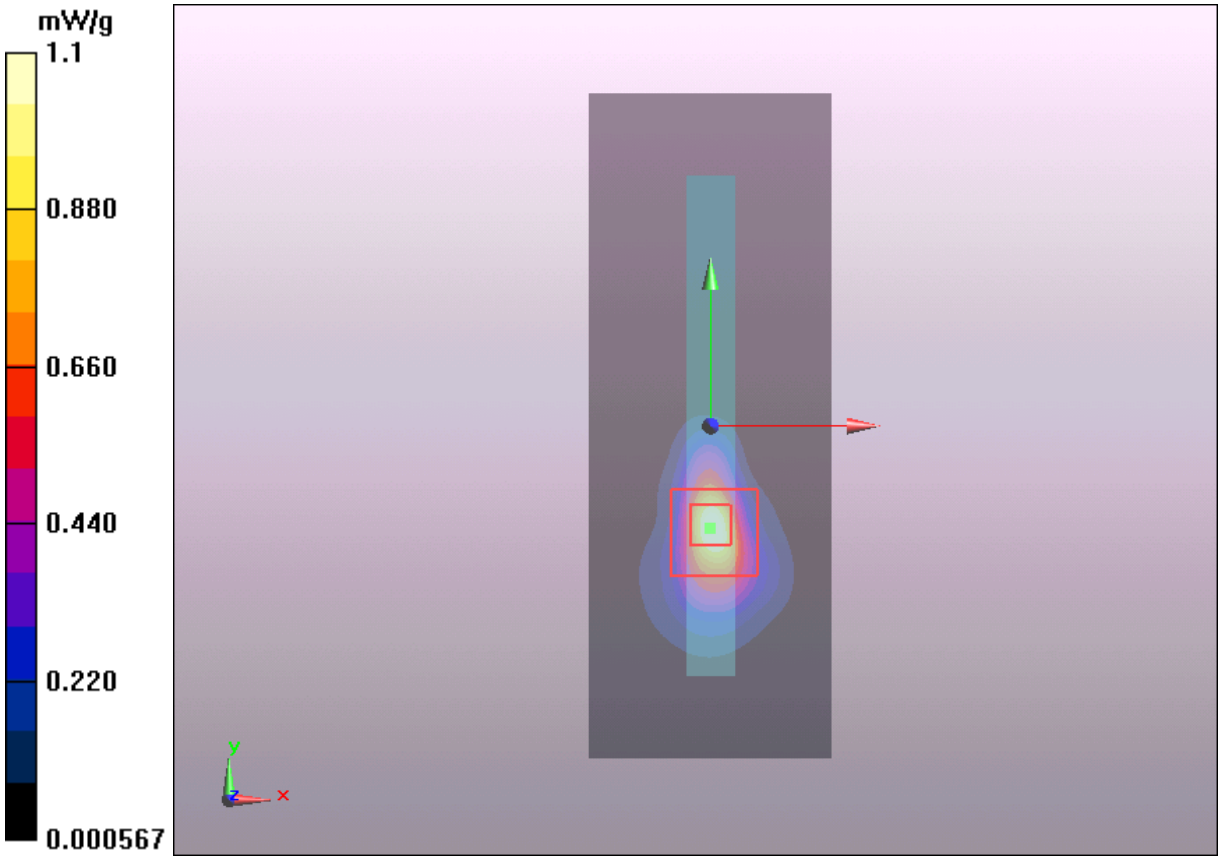


Figure 29 Body, **Test Position 2**, GSM 1900 GPRS (**2Txslots**) Channel 661

GSM 1900 GPRS (2Txslots)) Test Position 2 Low (Distance 0mm)

Date/Time: 10/27/2011 3:09:55 PM
Communication System: GPRS 2TX ; Frequency: 1850.2 MHz;Duty Cycle: 1:4.14954
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.49 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Low/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = 0.086 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.812 mW/g; SAR(10 g) = 0.349 mW/g
Maximum value of SAR (measured) = 0.976 mW/g

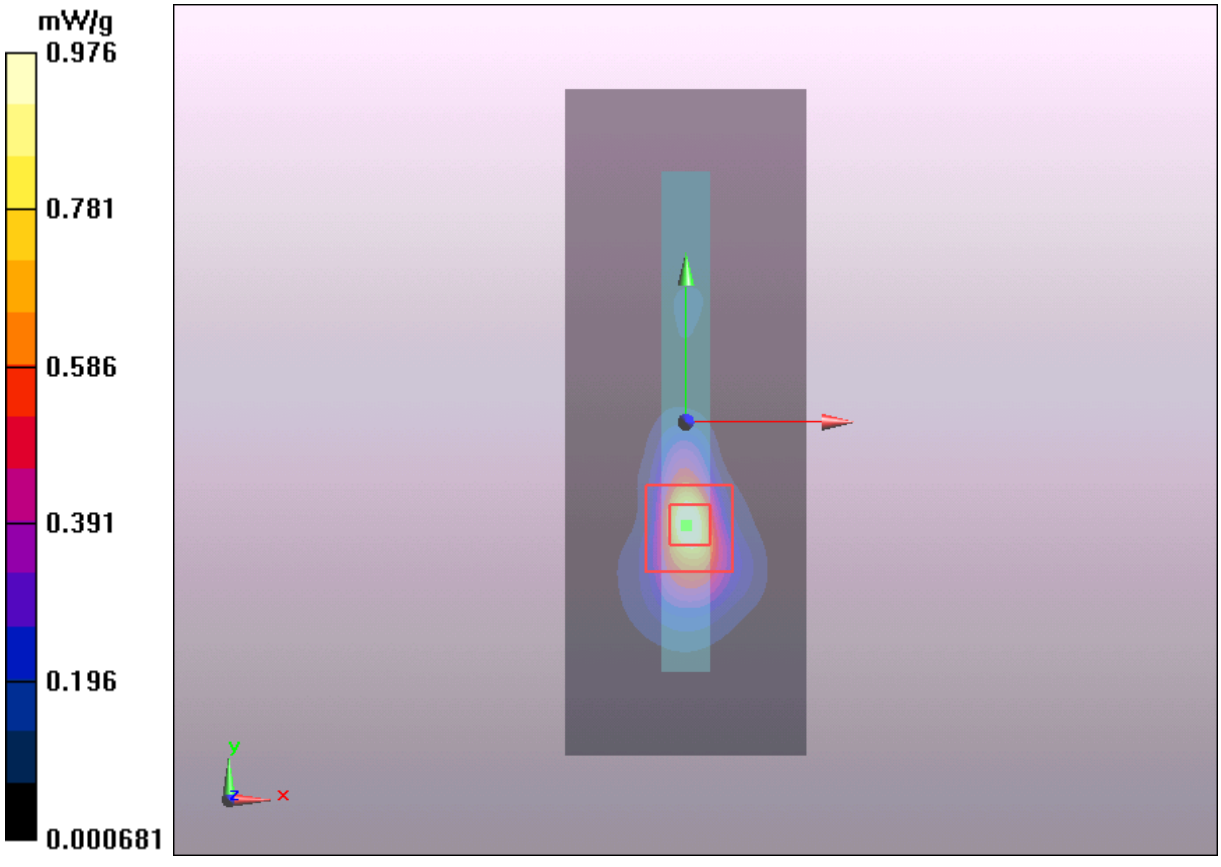


Figure 30 Body, Test Position 2, GSM 1900 GPRS (2Txslots) Channel 512

GSM 1900 GPRS (2Txslots) Test Position 6 Middle (Distance 0mm)

Date/Time: 11/10/2011 5:40:25 PM

Communication System: GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954

Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 Middle/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.636 mW/g

Test Position 6 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.1 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.273 mW/g

Maximum value of SAR (measured) = 0.659 mW/g

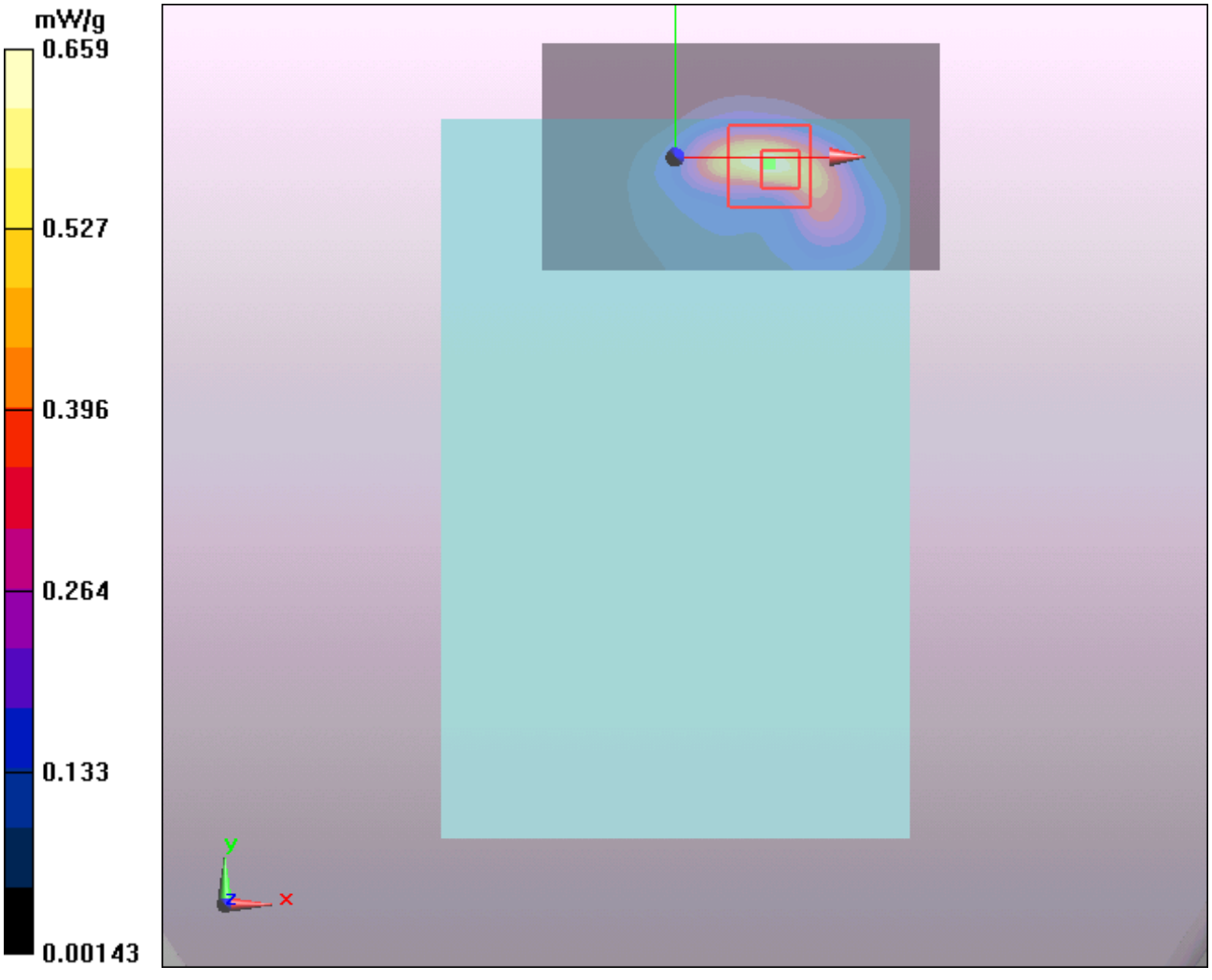


Figure 31 Body, Test Position 6, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (2Txslots) Test Position 5 Middle (Distance 0mm)

Date/Time: 10/27/2011 1:39:31 PM
Communication System: GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 5 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.110 mW/g

Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.41 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 0.438 W/kg
SAR(1 g) = 0.132 mW/g; SAR(10 g) = 0.056 mW/g
Maximum value of SAR (measured) = 0.121 mW/g

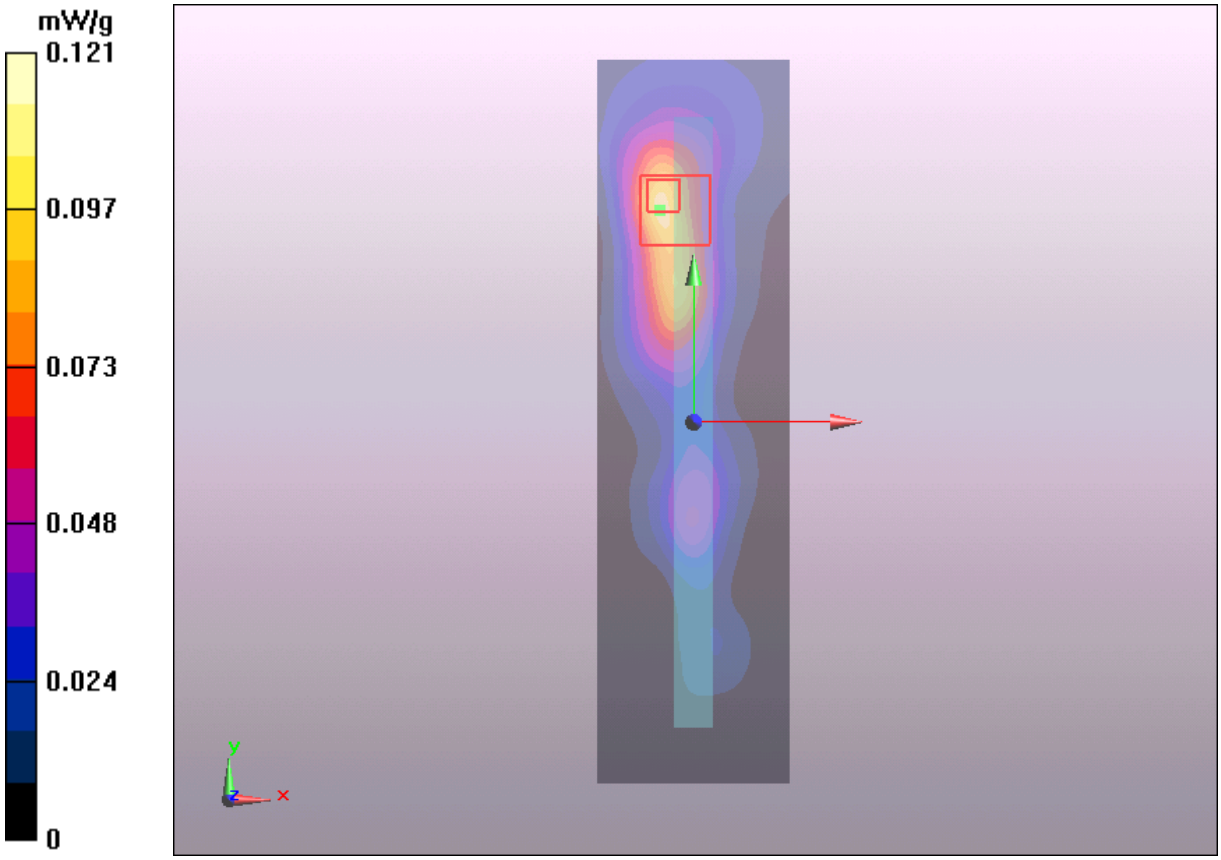


Figure 32 Body, Test Position 5, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (1Txslot) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/27/2011 2:10:21 PM
Communication System: GPRS 1TX; Frequency: 1880 MHz;Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.313 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.01 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.663 W/kg
SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 0.355 mW/g

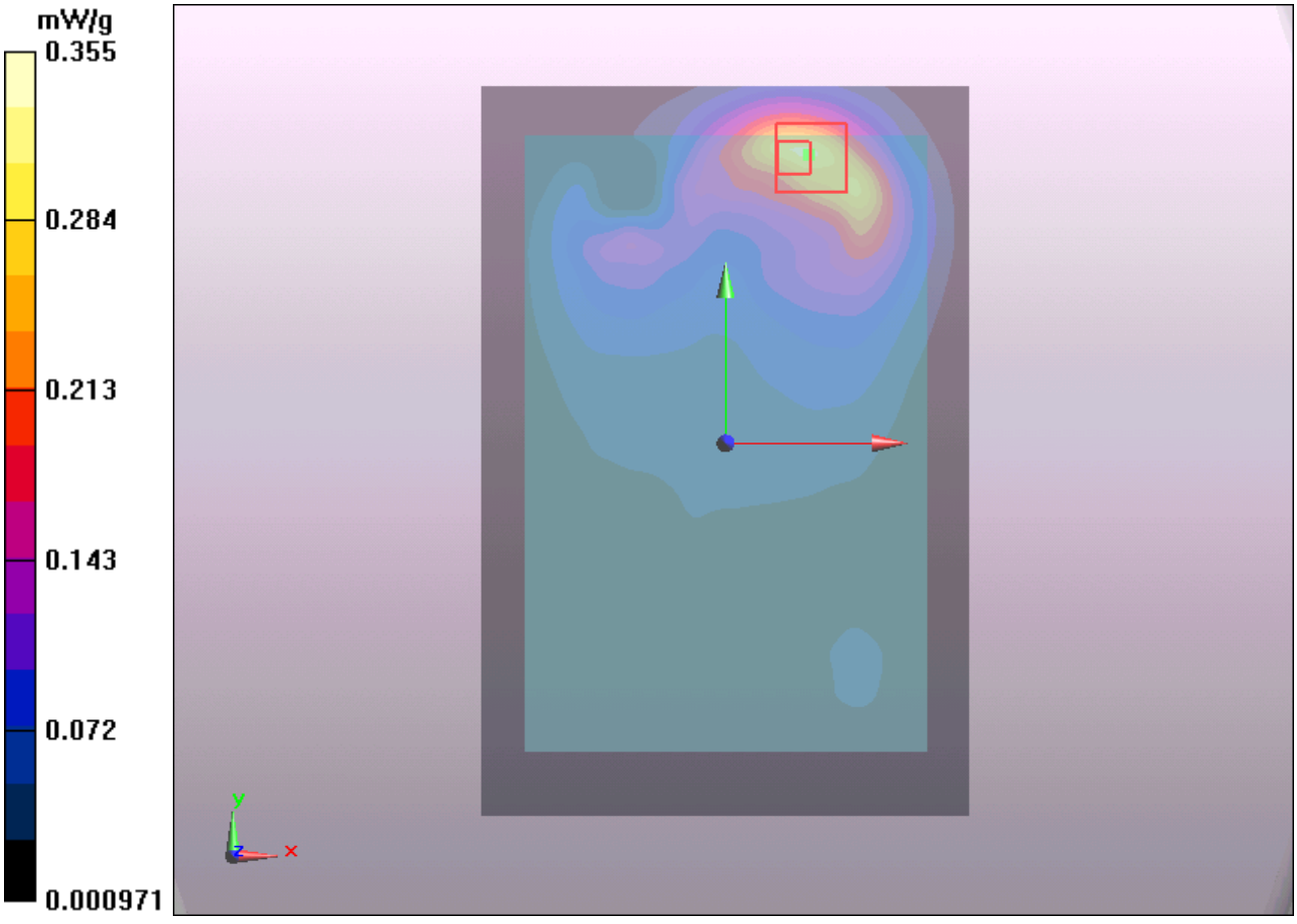


Figure 33 Body, Test Position 1, GSM 1900 GPRS (1Txslot) Channel 661

GSM 1900 GPRS (2Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/27/2011 9:40:08 AM
Communication System: GPRS 2TX ; Frequency: 1880 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.320 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.07 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.556 W/kg
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.174 mW/g
Maximum value of SAR (measured) = 0.352 mW/g

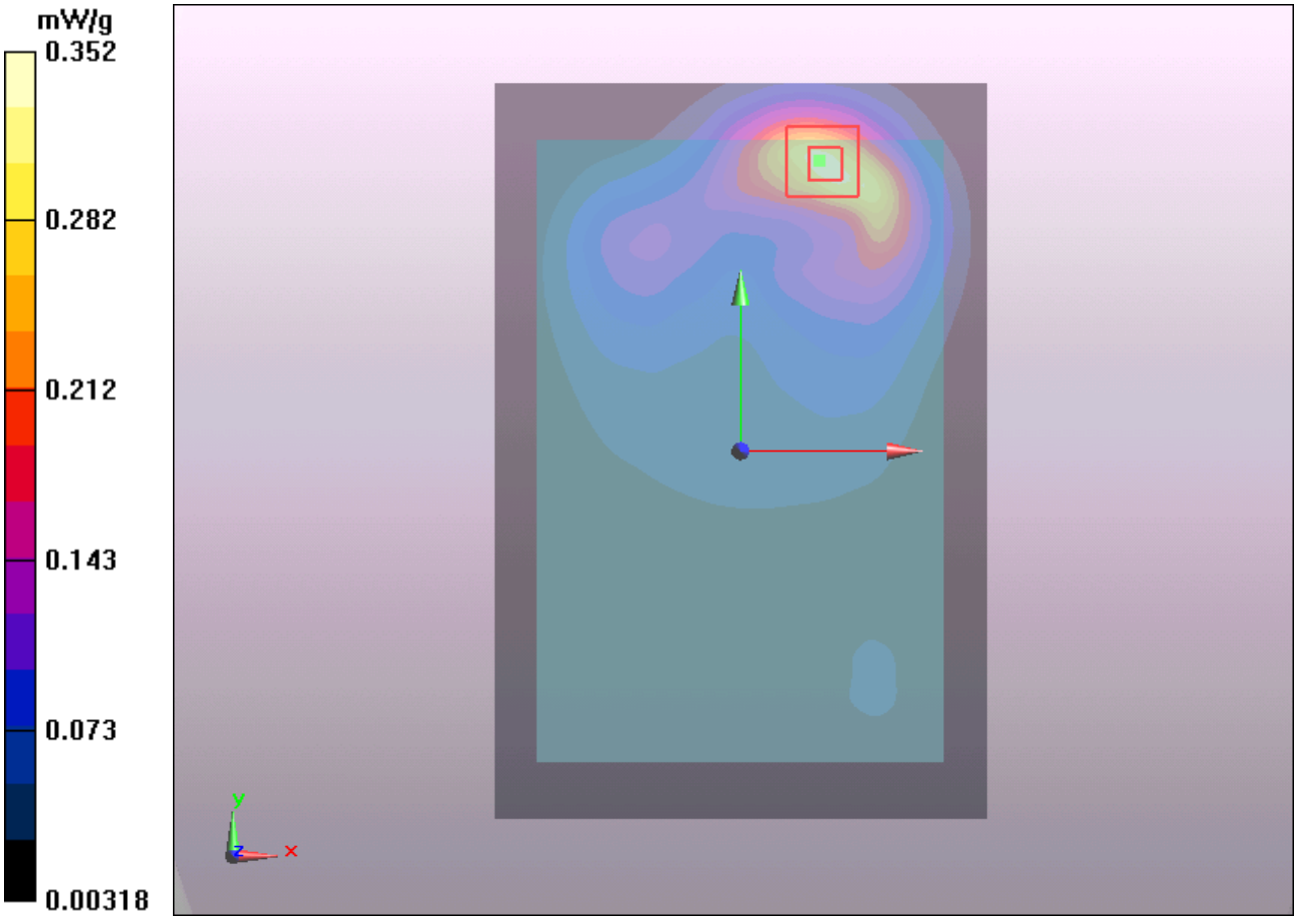


Figure 34 Body, Test Position 1, GSM 1900 GPRS (2Txslots) Channel 661

GSM 1900 GPRS (3Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/27/2011 3:39:01 PM
Communication System: GPRS 3TX; Frequency: 1880 MHz;Duty Cycle: 1:2.76694
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.388 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.6 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.664 W/kg
SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.208 mW/g
Maximum value of SAR (measured) = 0.423 mW/g

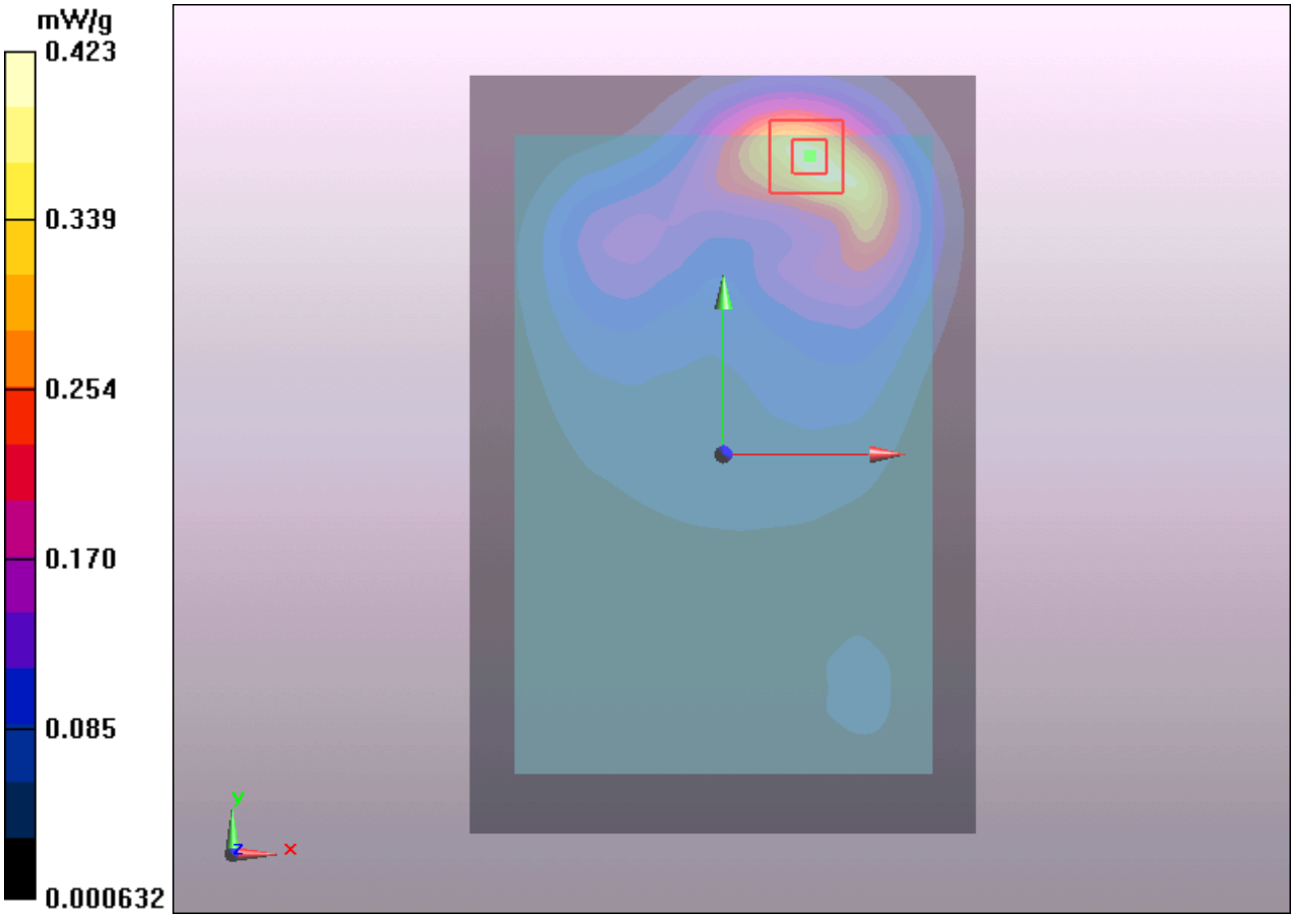


Figure 35 Body, Test Position 1, GSM 1900 GPRS (3Txslots) Channel 661

GSM 1900 GPRS (4Txslots) Test Position 1 Middle (Distance 6mm)

Date/Time: 10/27/2011 4:17:12 PM
Communication System: GPRS 4TX; Frequency: 1880 MHz;Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.331 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.17 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.561 W/kg
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 0.360 mW/g

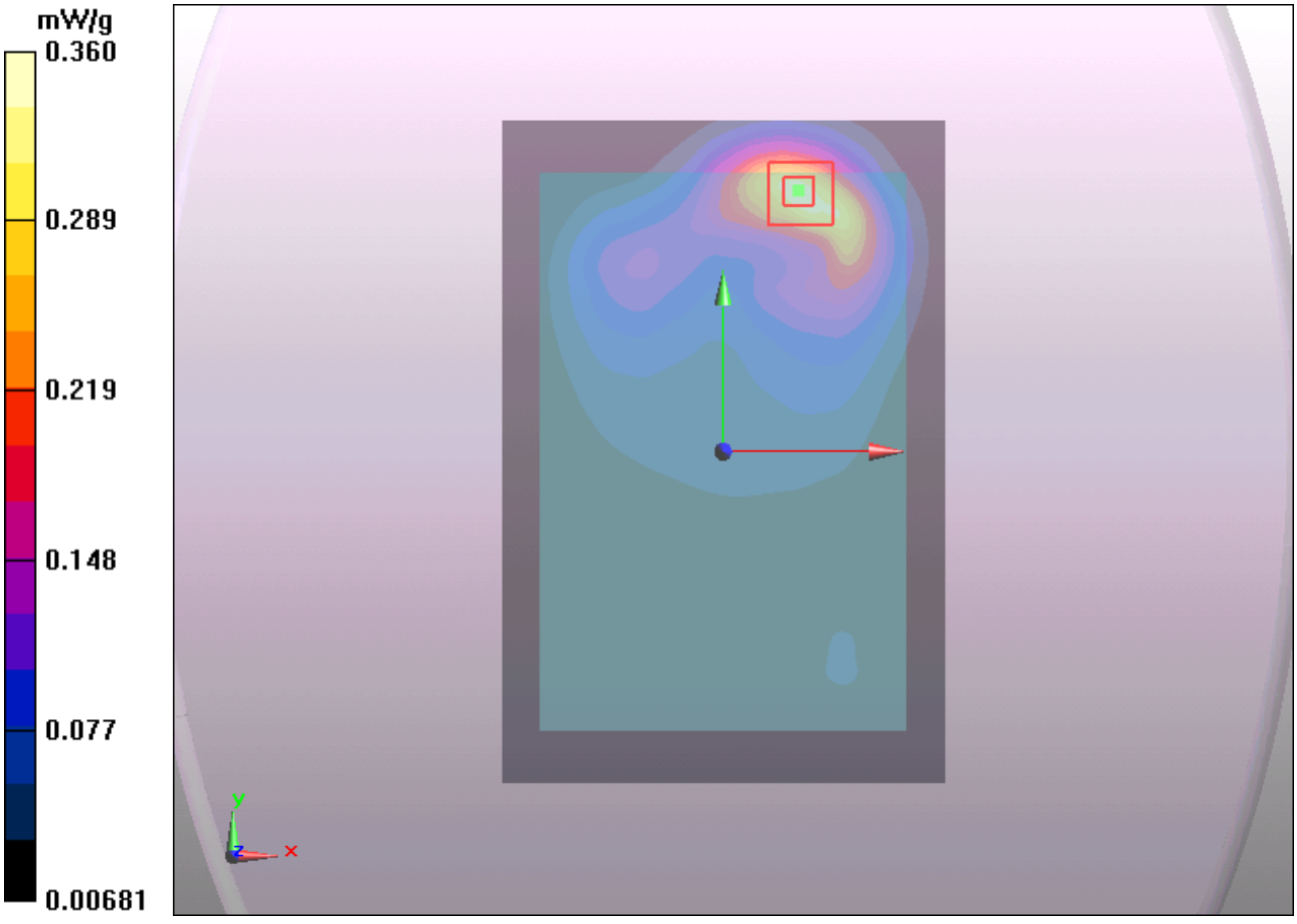


Figure 36 Body, Test Position 1, GSM 1900 GPRS (4Txslots) Channel 661

GSM 1900 GPRS (3Txslots) Test Position 2 Middle (Distance 6mm)

Date/Time: 10/27/2011 5:03:41 PM
Communication System: GPRS 3TX; Frequency: 1880 MHz;Duty Cycle: 1:2.76694
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.744 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.4 V/m; Power Drift = 0.081 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.648 mW/g; SAR(10 g) = 0.319 mW/g
Maximum value of SAR (measured) = 0.742 mW/g

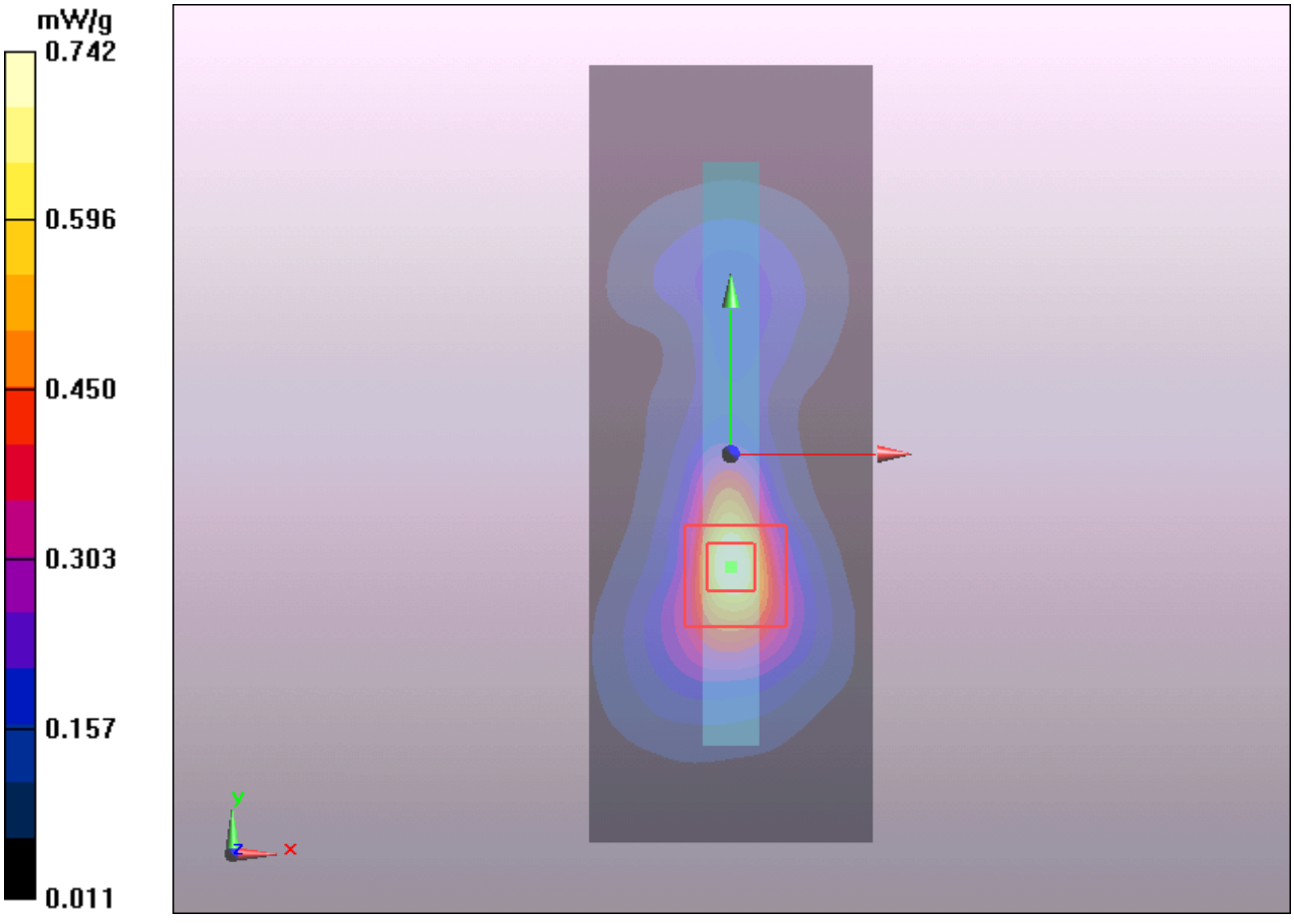


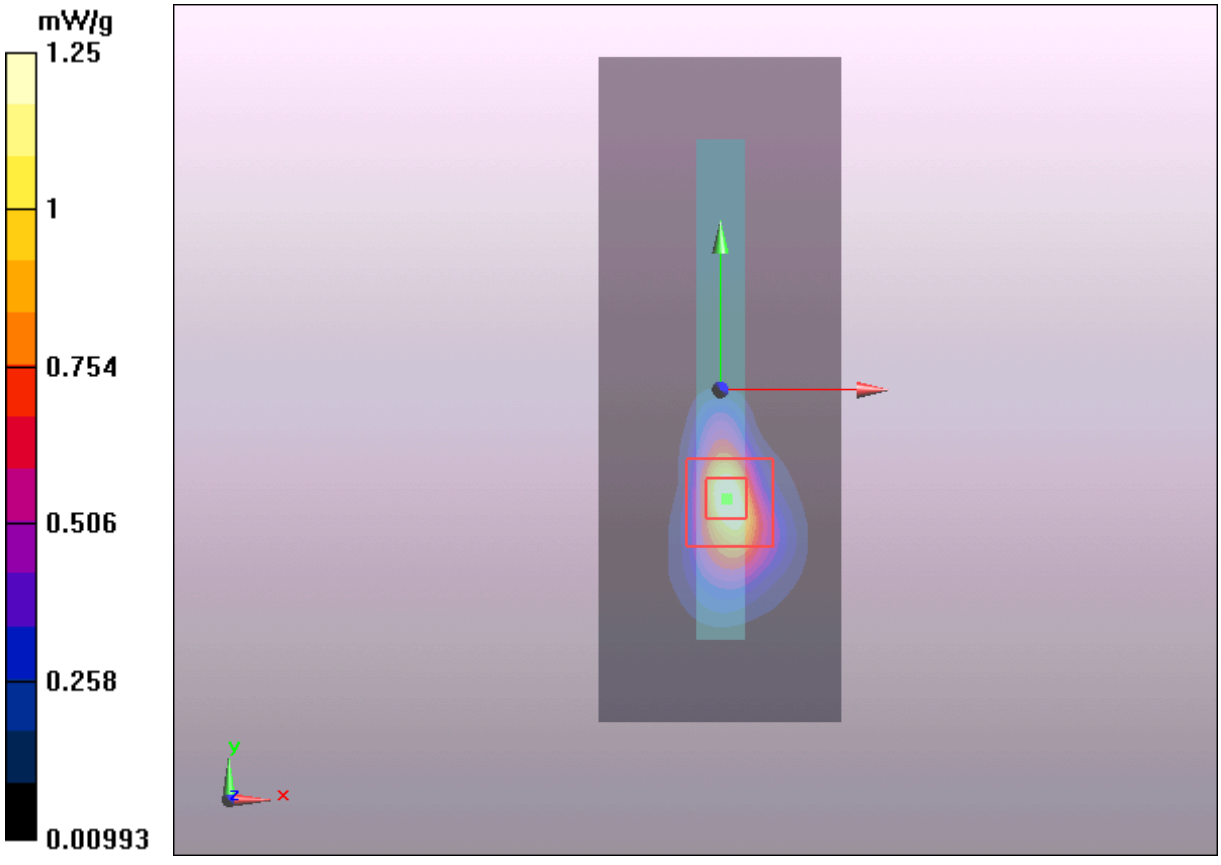
Figure 37 Body, Test Position 2, GSM 1900 GPRS (3Txslots) Channel 661

GSM 1900 EGPRS (2Txslots) Test Position 2 High (Distance 0mm)

Date/Time: 10/27/2011 10:28:30 AM
Communication System: EGPRS 2TX; Frequency: 1909.8 MHz;Duty Cycle: 1:4.14954
Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.34 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.57 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 2.39 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.457 mW/g
Maximum value of SAR (measured) = 1.25 mW/g



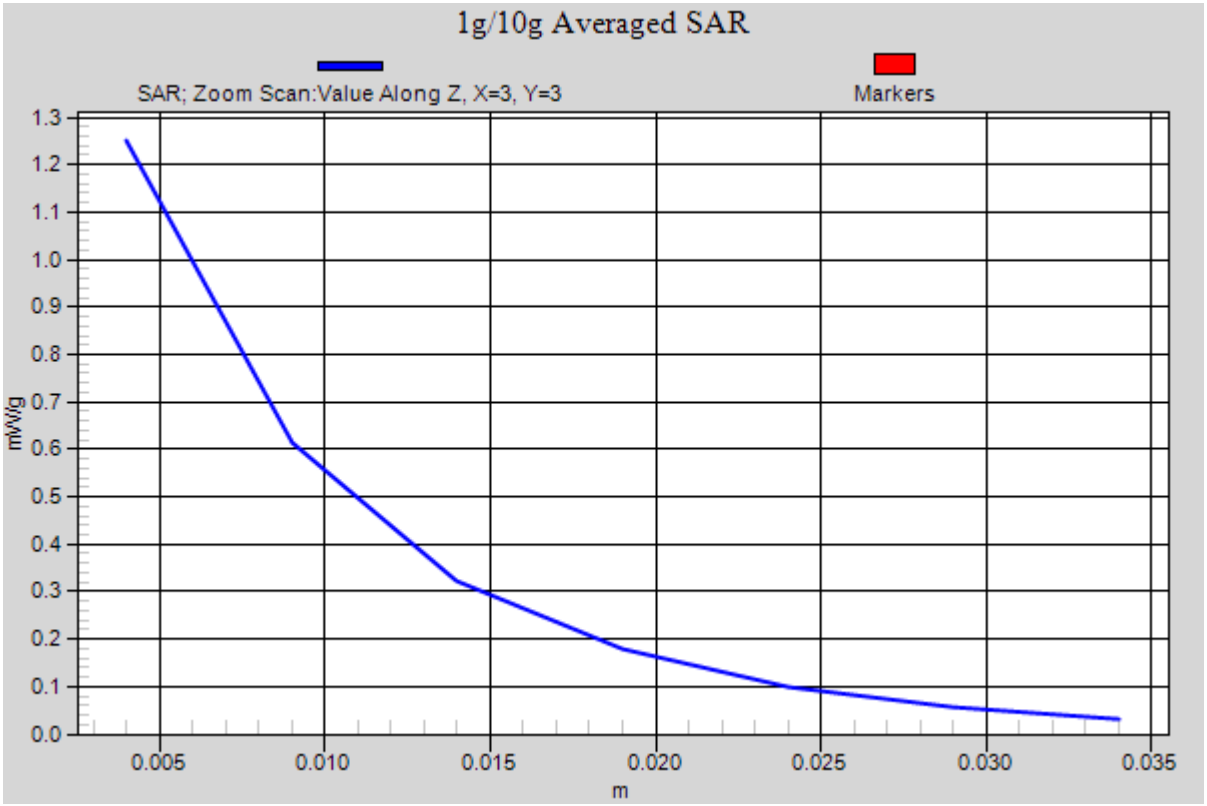


Figure 38 Body, Test Position 2, GSM 1900 EGPRS (2Txslots) Channel 810

WCDMA Band II Test Position 1 Middle (Distance 0mm)

Date/Time: 10/27/2011 7:27:34 PM
Communication System: WCDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.628 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.24 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.280 mW/g
Maximum value of SAR (measured) = 0.662 mW/g

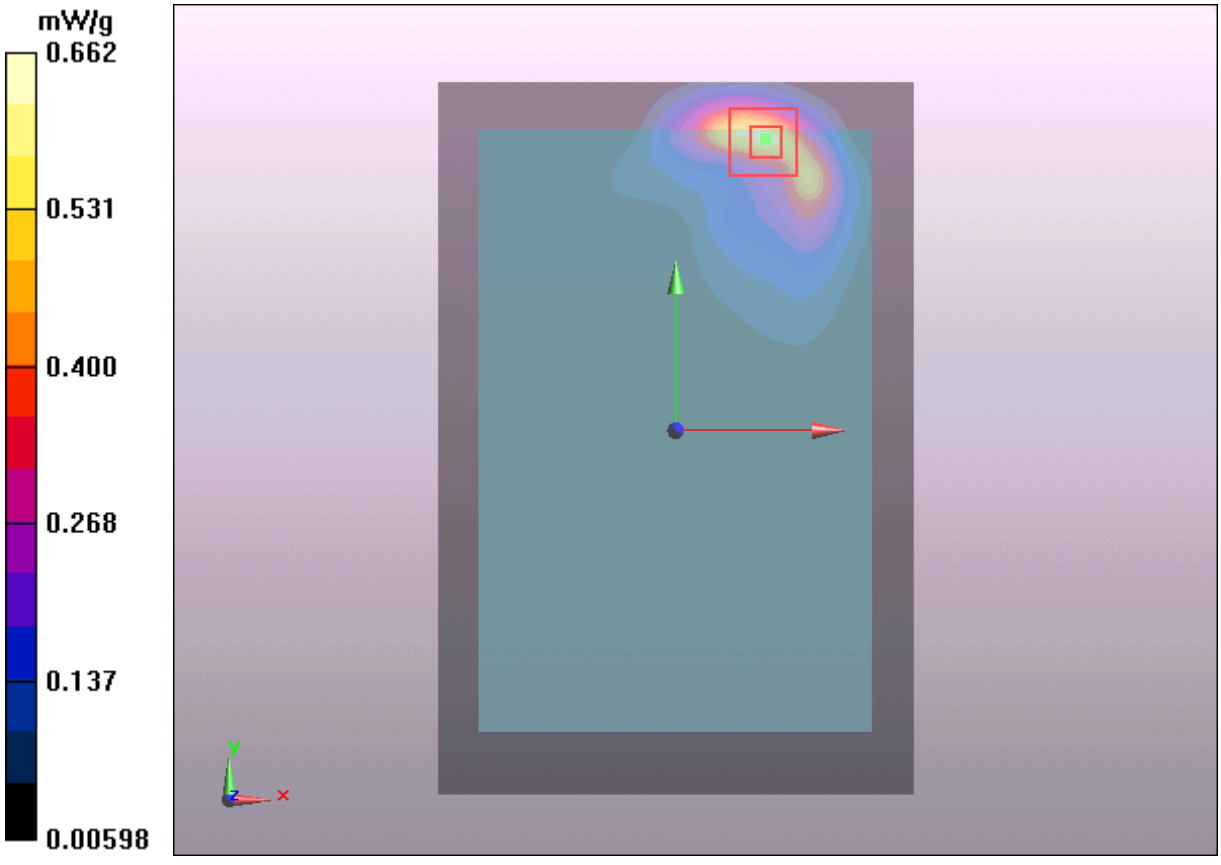


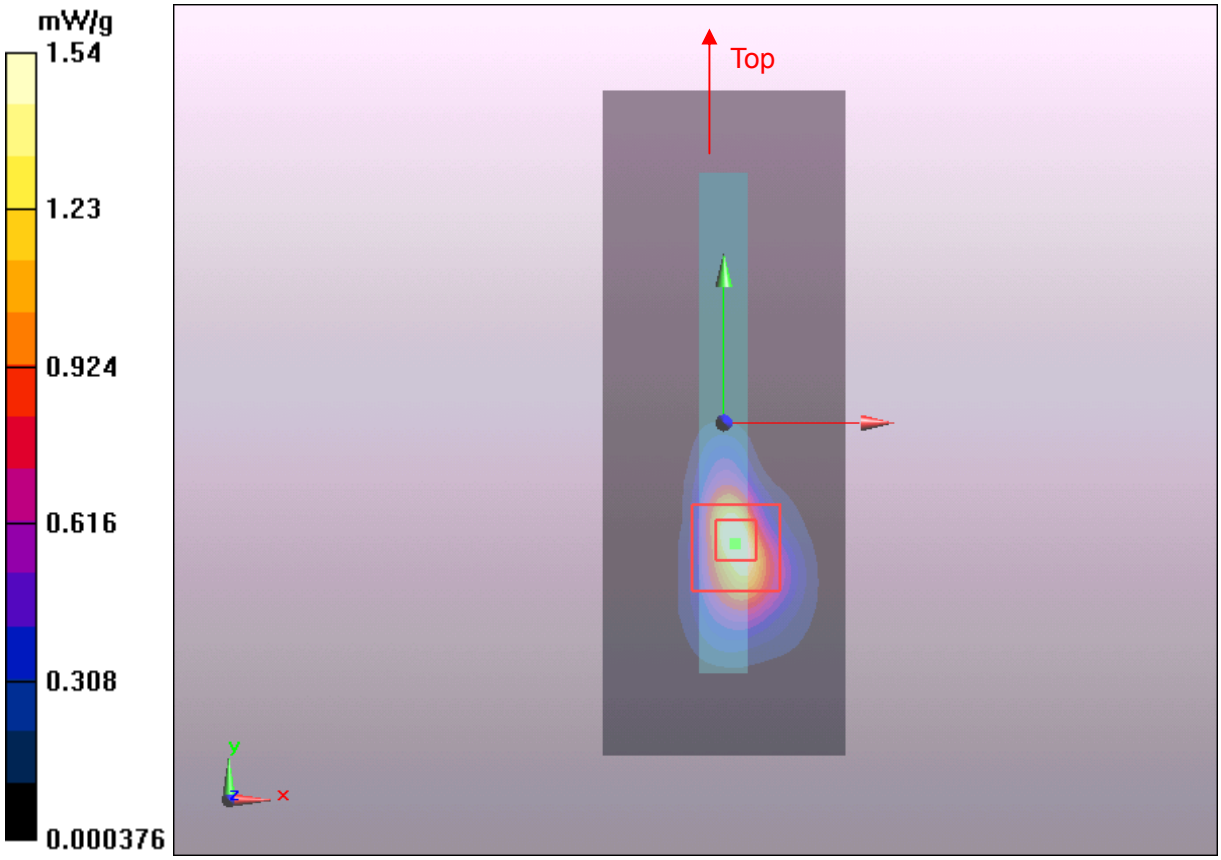
Figure 39 Body, Test Position 1, WCDMA Band II Channel 9400

WCDMA Band II Test Position 2 High (Distance 0mm)

Date/Time: 10/27/2011 7:47:54 PM
Communication System: WCDMA ; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.56 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.69 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.51 V/m; Power Drift = 0.093 dB
Peak SAR (extrapolated) = 2.51 W/kg
SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.562 mW/g
Maximum value of SAR (measured) = 1.54 mW/g



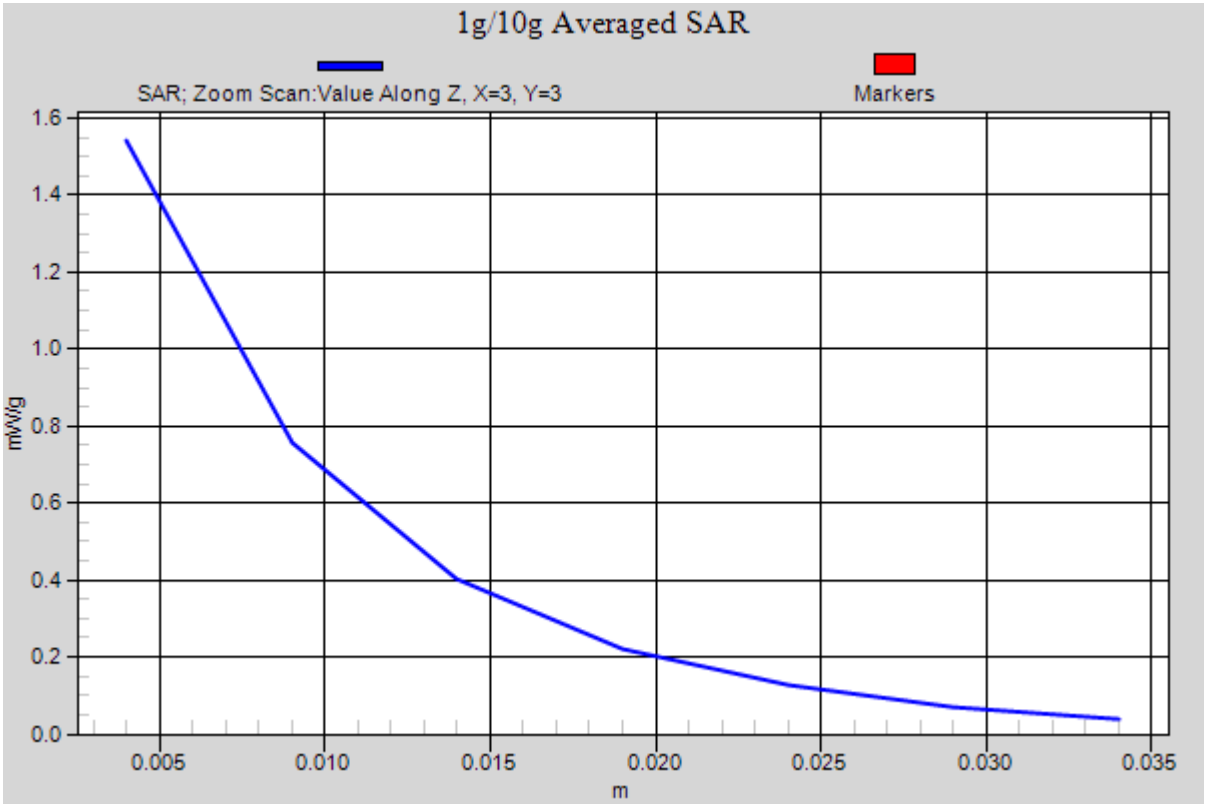


Figure 40 Body, Test Position 2, WCDMA Band II Channel 9538

WCDMA Band II Test Position 2 Middle (Distance 0mm)

Date/Time: 10/27/2011 9:03:18 PM
Communication System: WCDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.59 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.7 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 2.83 W/kg
SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.534 mW/g
Maximum value of SAR (measured) = 1.47 mW/g

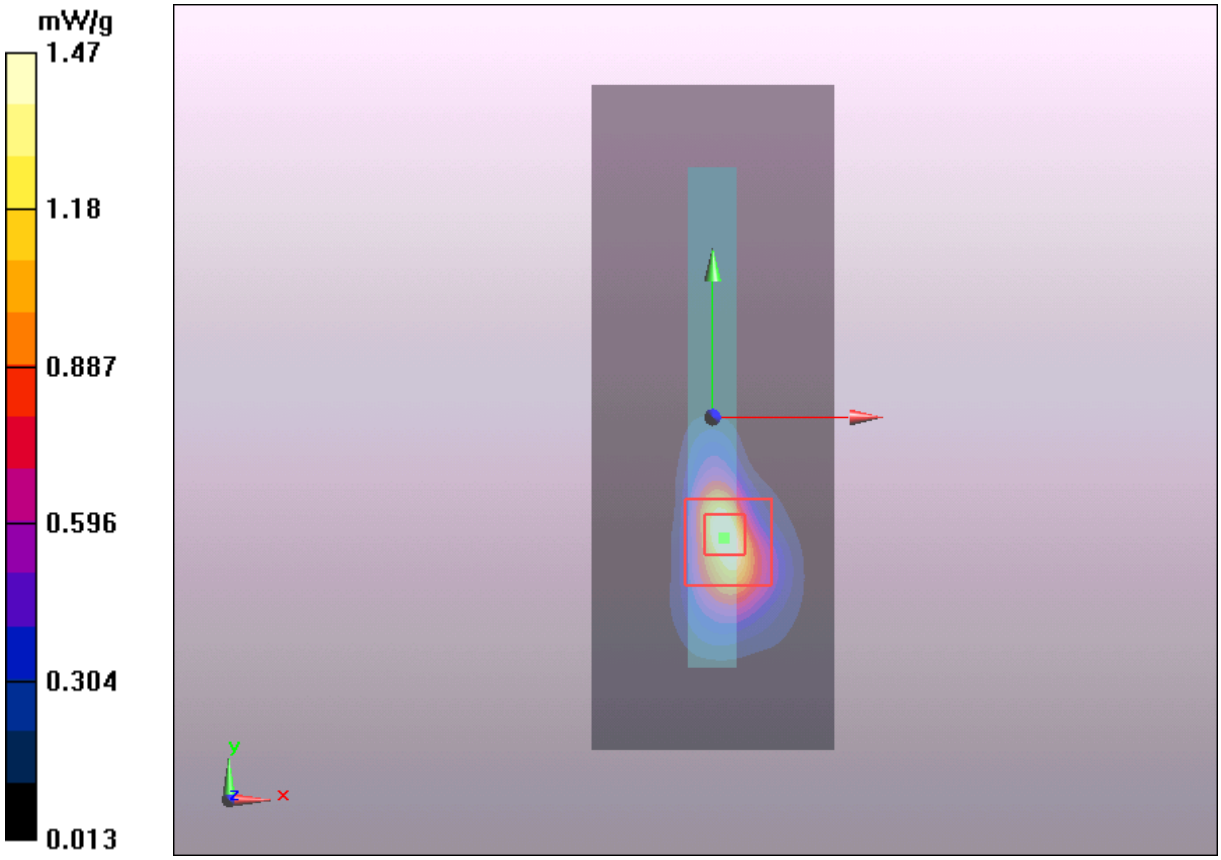


Figure 41 Body, Test Position 2, WCDMA Band II Channel 9400

WCDMA Band II Test Position 2 Low (Distance 0mm)

Date/Time: 10/27/2011 6:06:30 PM
Communication System: WCDMA ; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Low/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.36 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.48 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 2.54 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.457 mW/g
Maximum value of SAR (measured) = 1.3 mW/g

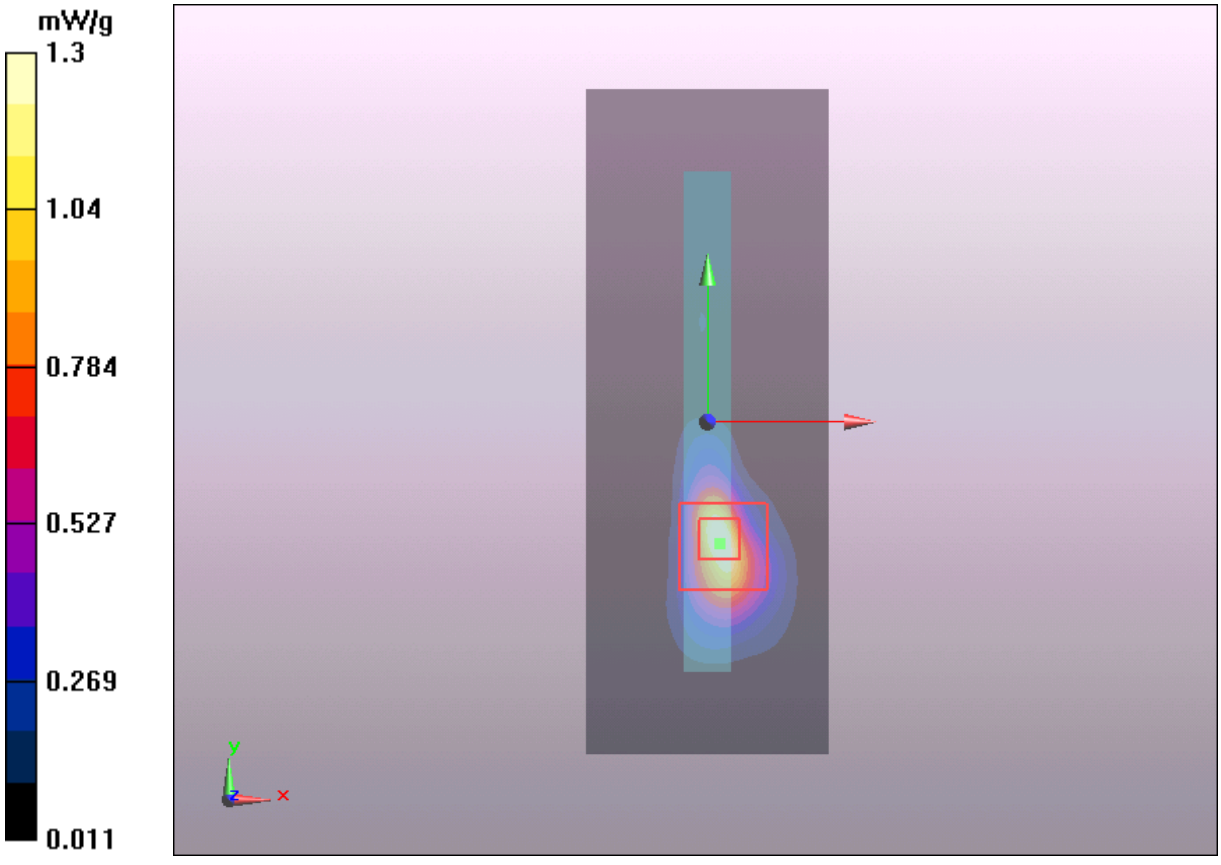


Figure 42 Body, Test Position 2, WCDMA Band II Channel 9262

WCDMA Band II Test Position 6 High (Distance 0mm)

Date/Time: 11/10/2011 5:02:13 PM

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

Medium parameters used: f = 1908 MHz; σ = 1.57 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 High/Area Scan (101x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.839 mW/g

Test Position 6 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.6 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 0.805 mW/g; SAR(10 g) = 0.368 mW/g

Maximum value of SAR (measured) = 0.909 mW/g

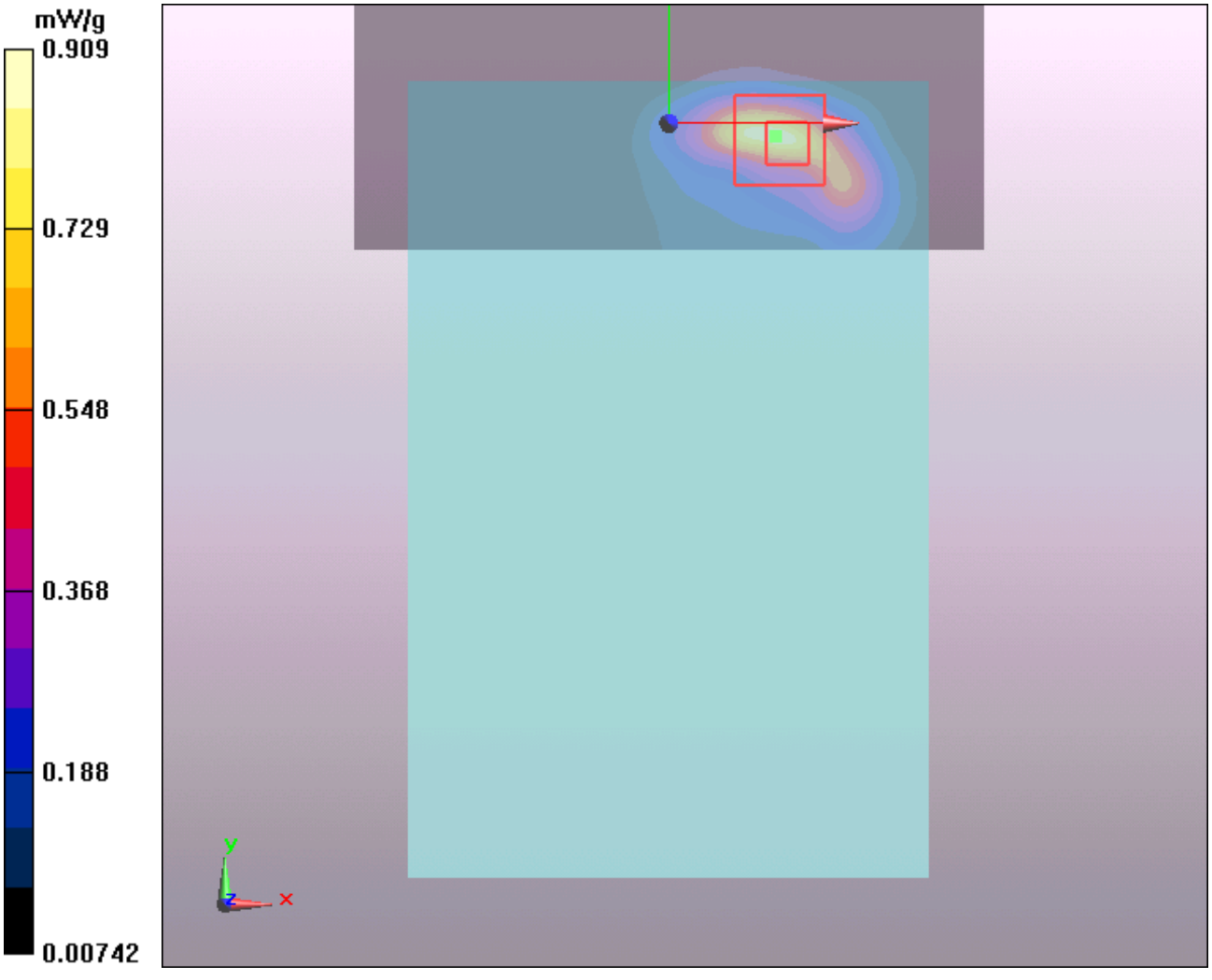


Figure 43 Body, Test Position 6, WCDMA Band II Channel 9538

WCDMA Band II Test Position 6 Middle (Distance 0mm)

Date/Time: 11/10/2011 4:16:49 PM

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

Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 Middle/Area Scan (101x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.938 mW/g

Test Position 6 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.6 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 0.818 mW/g; SAR(10 g) = 0.377 mW/g

Maximum value of SAR (measured) = 0.963 mW/g

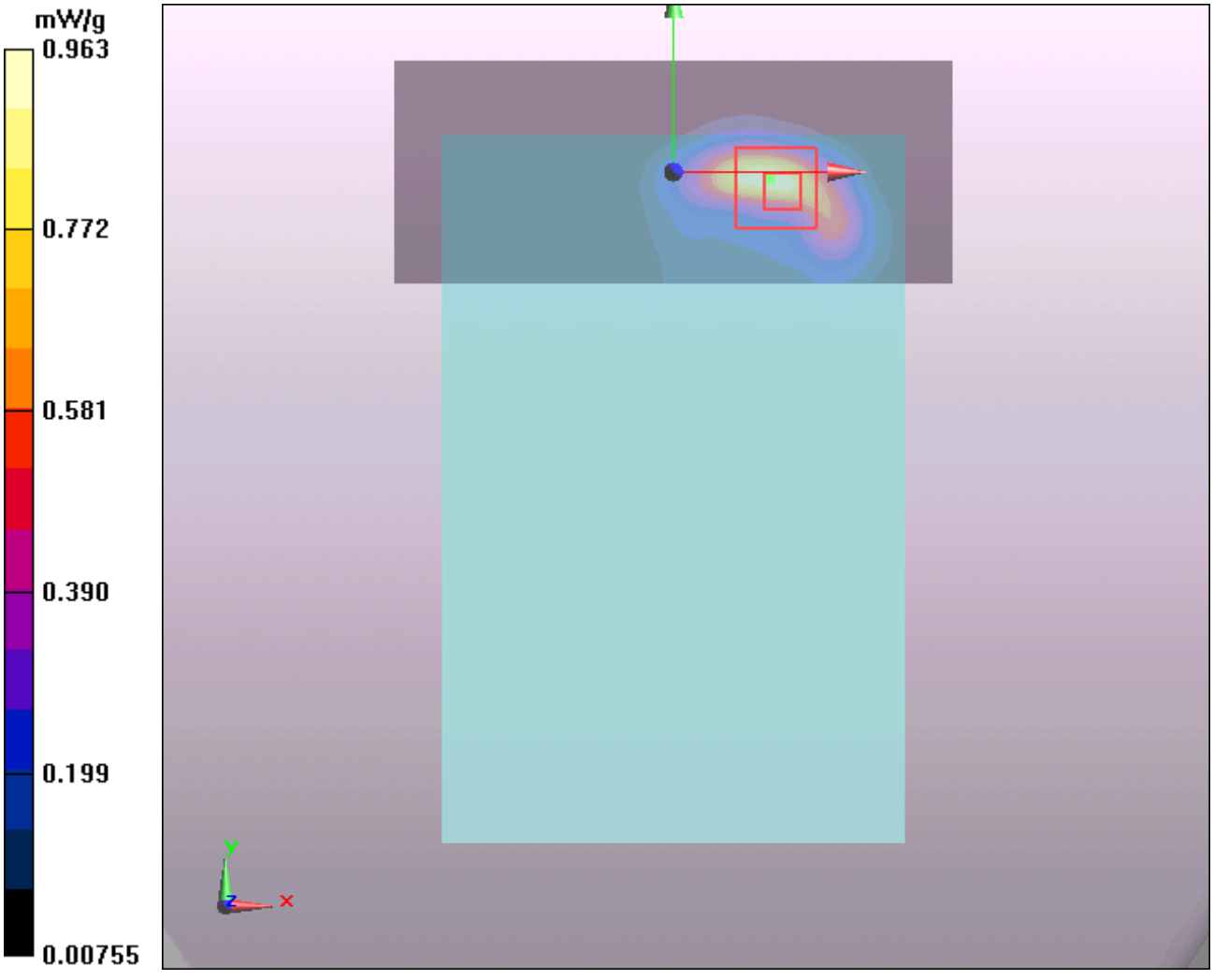


Figure 44 Body, Test Position 6, WCDMA Band II Channel 9400

WCDMA Band II Test Position 6 Low (Distance 0mm)

Date/Time: 11/10/2011 4:40:46 PM

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

Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.51 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 Low/Area Scan (81x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.784 mW/g

Test Position 6 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.3 V/m; Power Drift = -0.085 dB

Peak SAR (extrapolated) = 1.6 W/kg

SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.846 mW/g

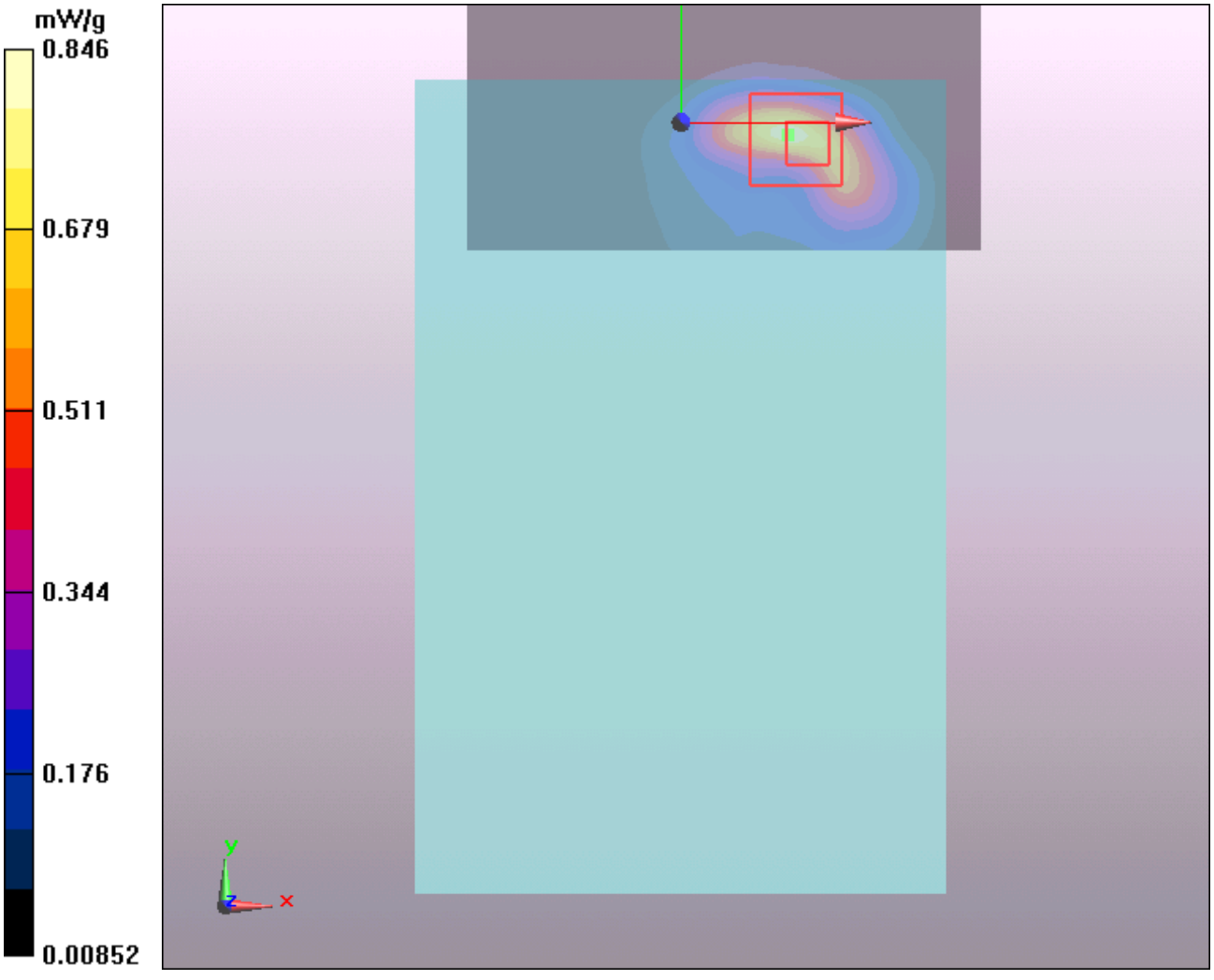


Figure 45 Body, Test Position 6, WCDMA Band II Channel 9262

WCDMA Band II Test Position 5 Middle (Distance 0mm)

Date/Time: 10/27/2011 6:40:24 PM
Communication System: WCDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 5 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.094 mW/g

Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.2 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.231 W/kg
SAR(1 g) = 0.120 mW/g; SAR(10 g) = 0.062 mW/g
Maximum value of SAR (measured) = 0.170 mW/g

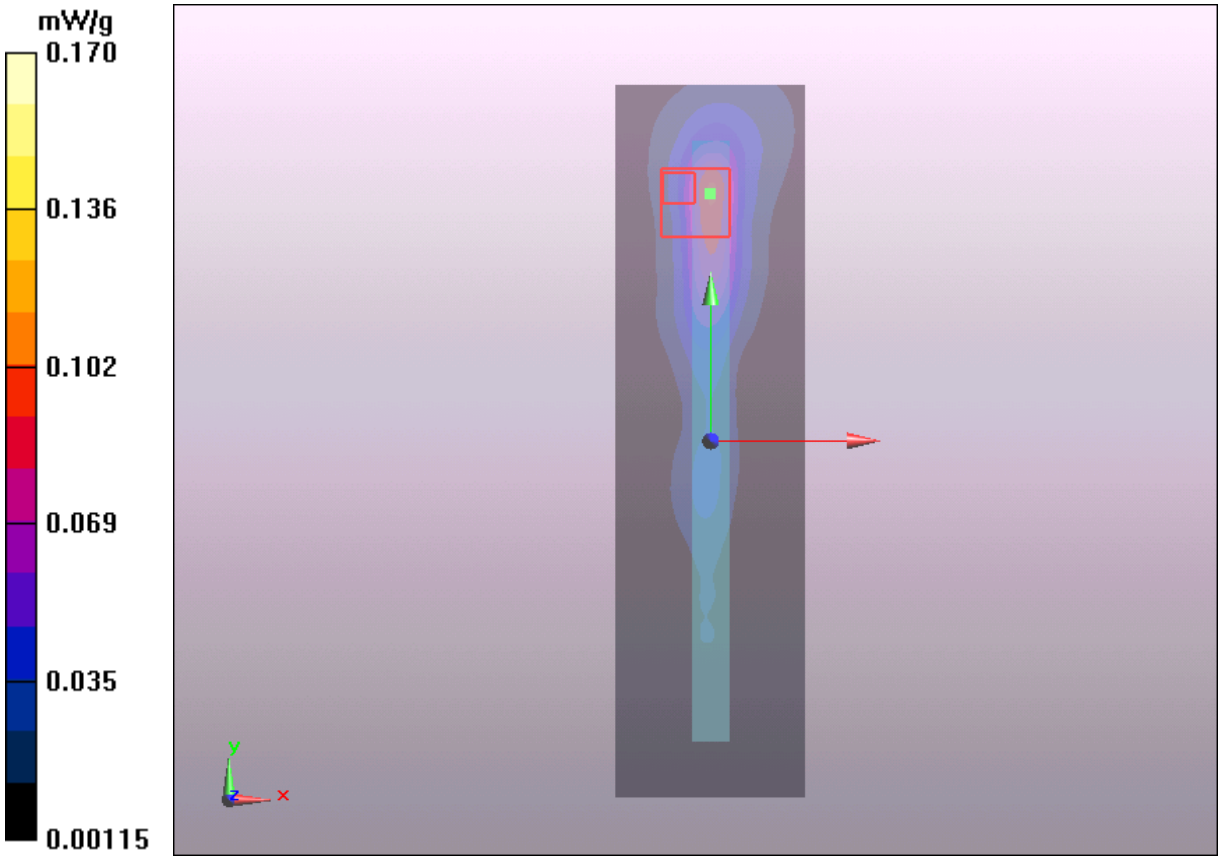


Figure 46 Body, Test Position 5, WCDMA Band II Channel 9400

WCDMA Band II Test Position 1 Middle (Distance 6mm)

Date/Time: 10/27/2011 11:35:35 PM
Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:2.18776
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.589 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.51 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 0.993 W/kg
SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.306 mW/g
Maximum value of SAR (measured) = 0.628 mW/g

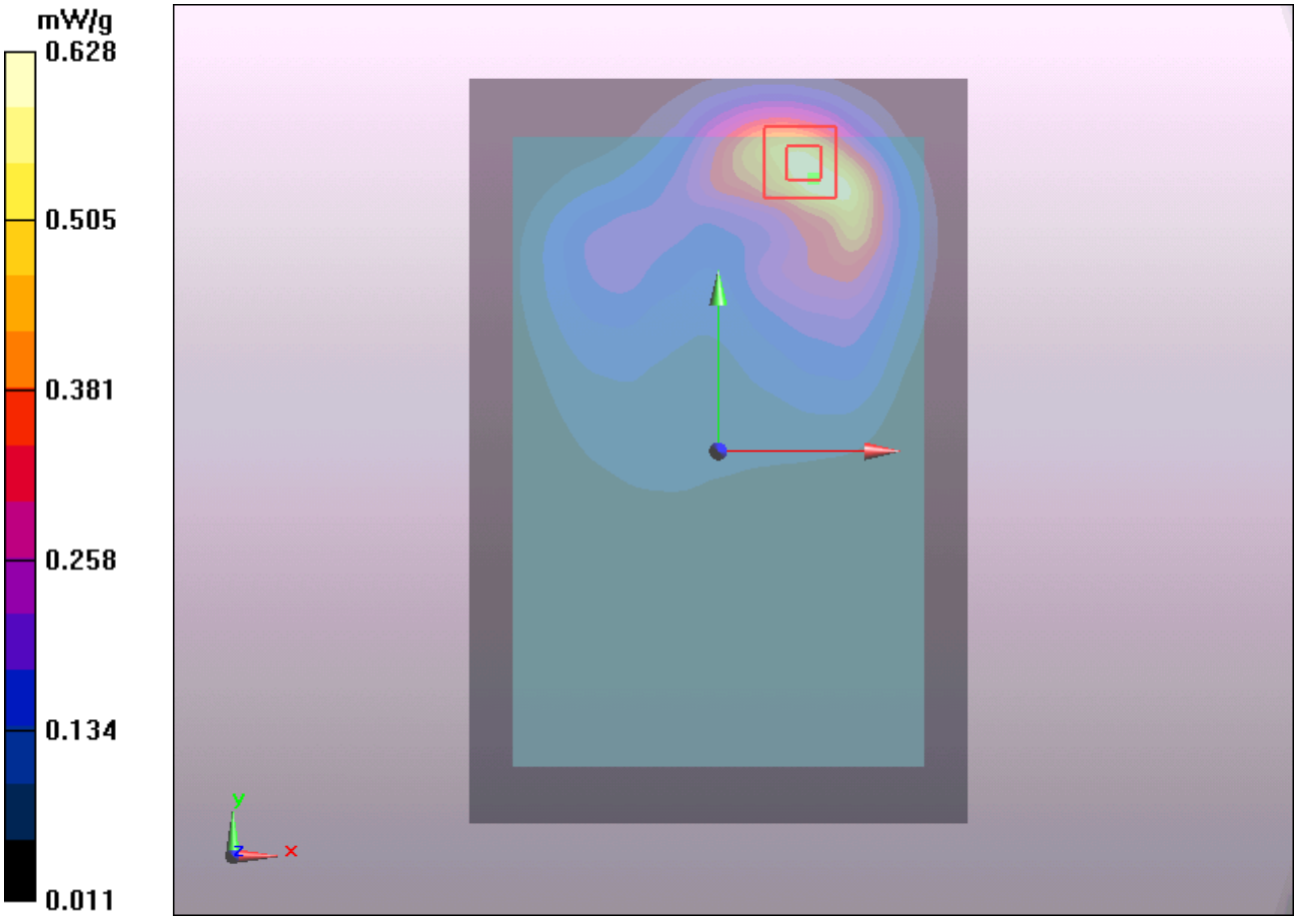


Figure 47 Body, Test Position 1, WCDMA Band II Channel 9400

WCDMA Band II Test Position 2 High (Distance 6mm)

Date/Time: 10/27/2011 11:15:07 PM
Communication System: WCDMA ; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.56 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.12 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.485 mW/g
Maximum value of SAR (measured) = 1.08 mW/g

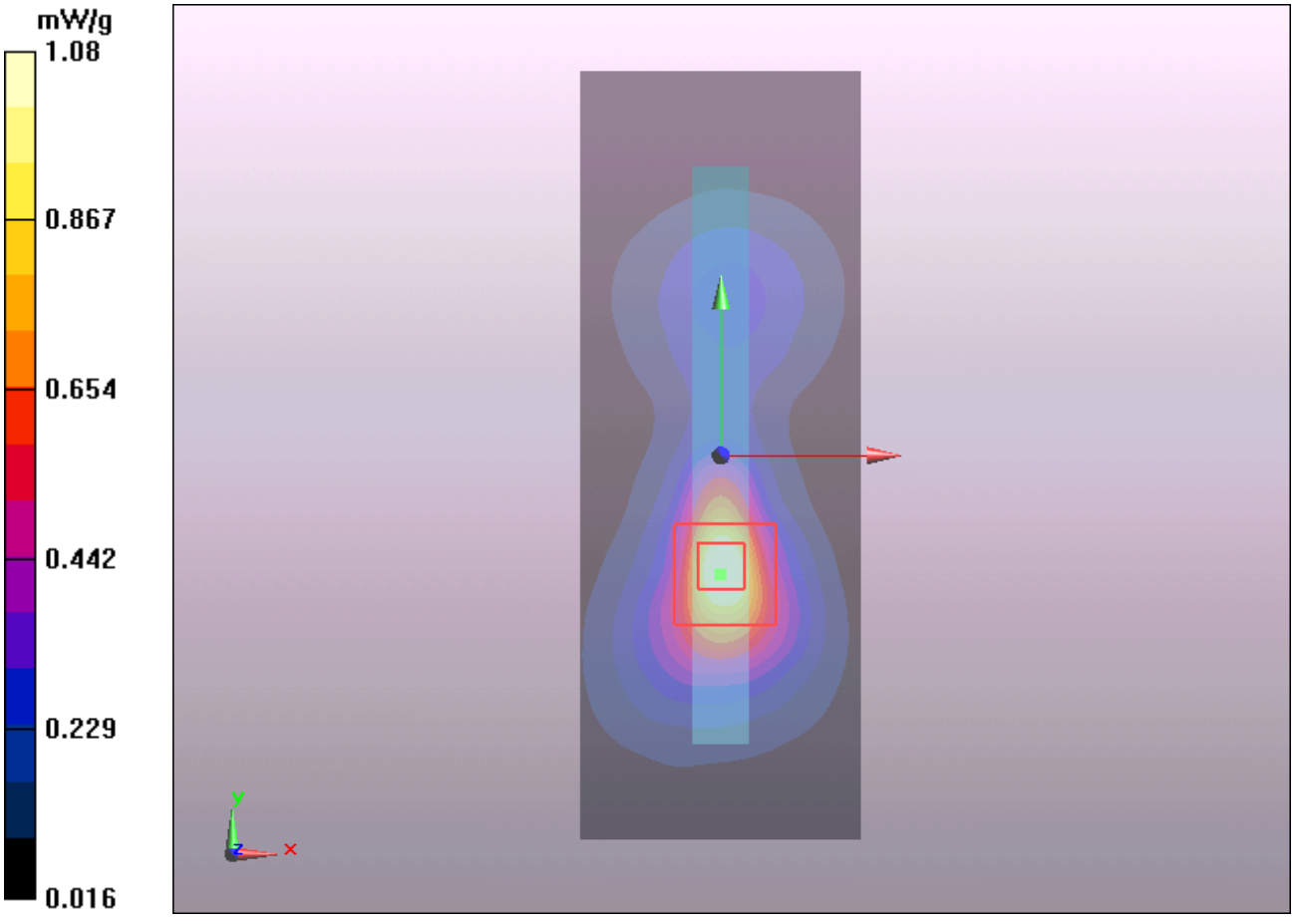


Figure 48 Body, Test Position 2, WCDMA Band II Channel 9538

WCDMA Band II Test Position 2 Middle (Distance 6mm)

Date/Time: 10/27/2011 10:56:13 PM
Communication System: WCDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.131 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 0.980 mW/g; SAR(10 g) = 0.493 mW/g
Maximum value of SAR (measured) = 1.12 mW/g

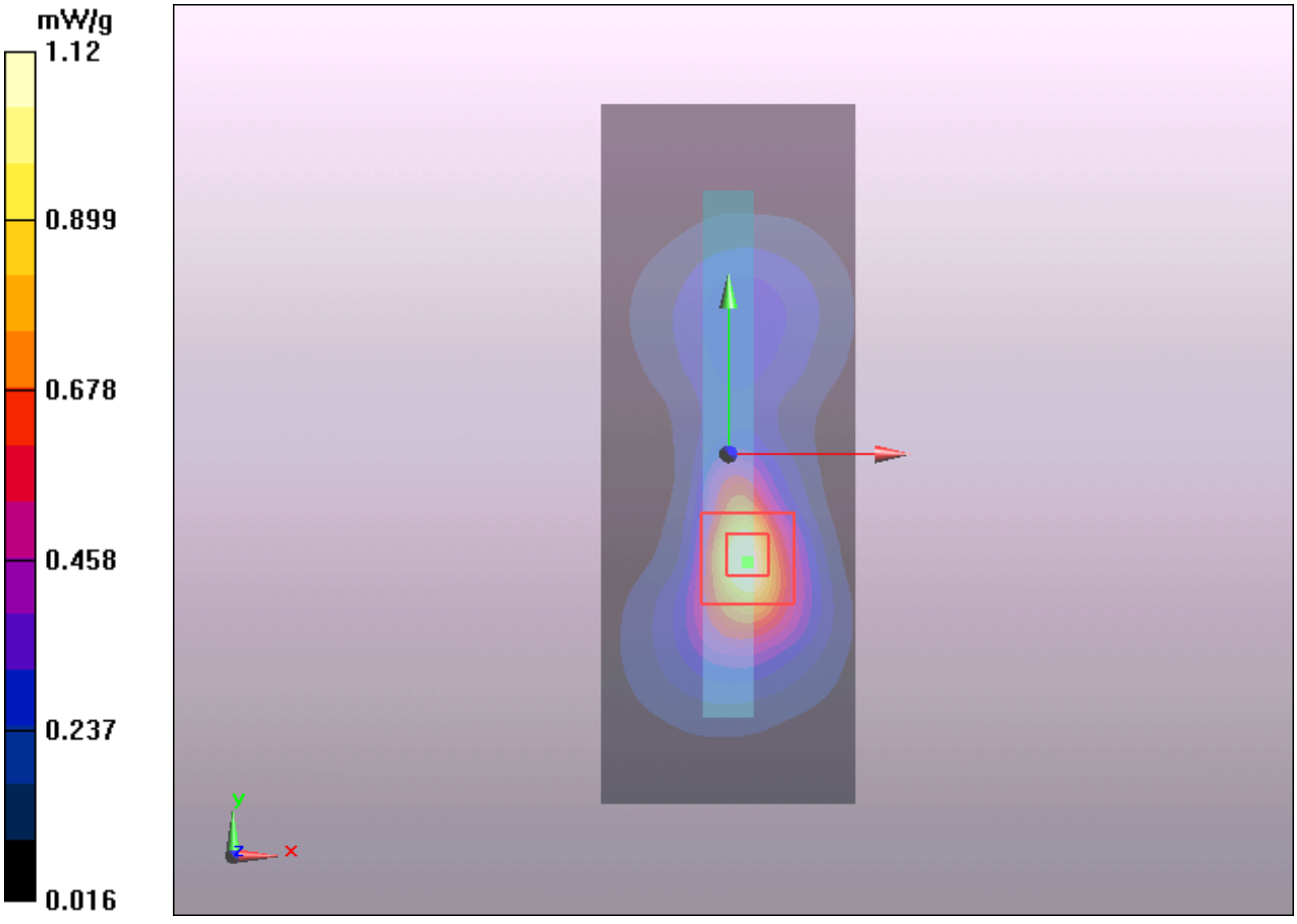


Figure 49 Body, Test Position 2, WCDMA Band II Channel 9400

WCDMA Band II Test Position 2 Low (Distance 6mm)

Date/Time: 10/27/2011 10:00:09 PM
Communication System: WCDMA ; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.51 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Low/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

Test Position 2 Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.094 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.932 mW/g; SAR(10 g) = 0.465 mW/g
Maximum value of SAR (measured) = 1.06 mW/g

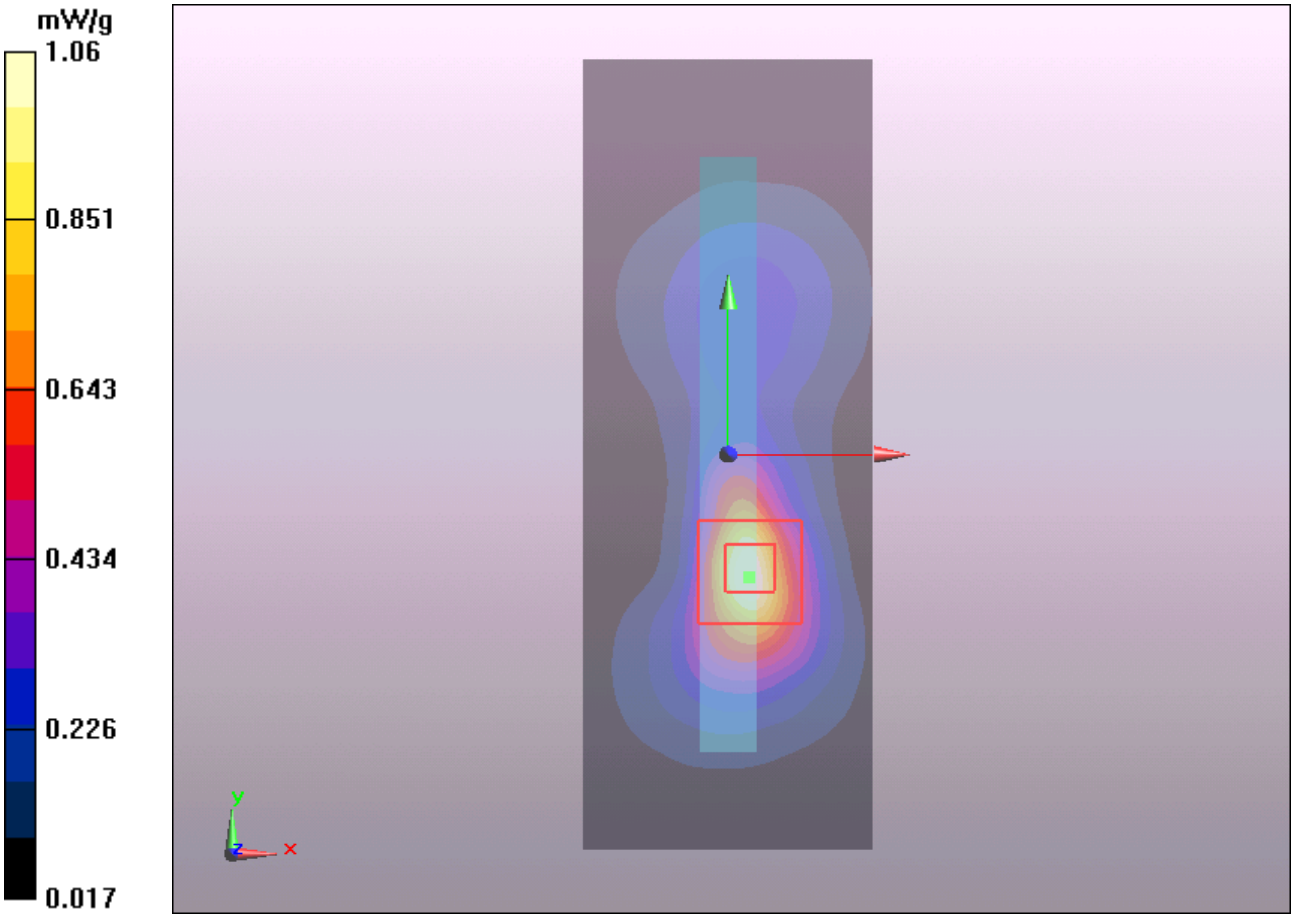


Figure 50 Body, Test Position 2, WCDMA Band II Channel 9262

WCDMA Band II HSDPA Test Position 2 High (Distance 0mm)

Date/Time: 10/27/2011 8:18:58 PM
Communication System: WCDMA ; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 2.08 W/kg
SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.396 mW/g
Maximum value of SAR (measured) = 1.07 mW/g

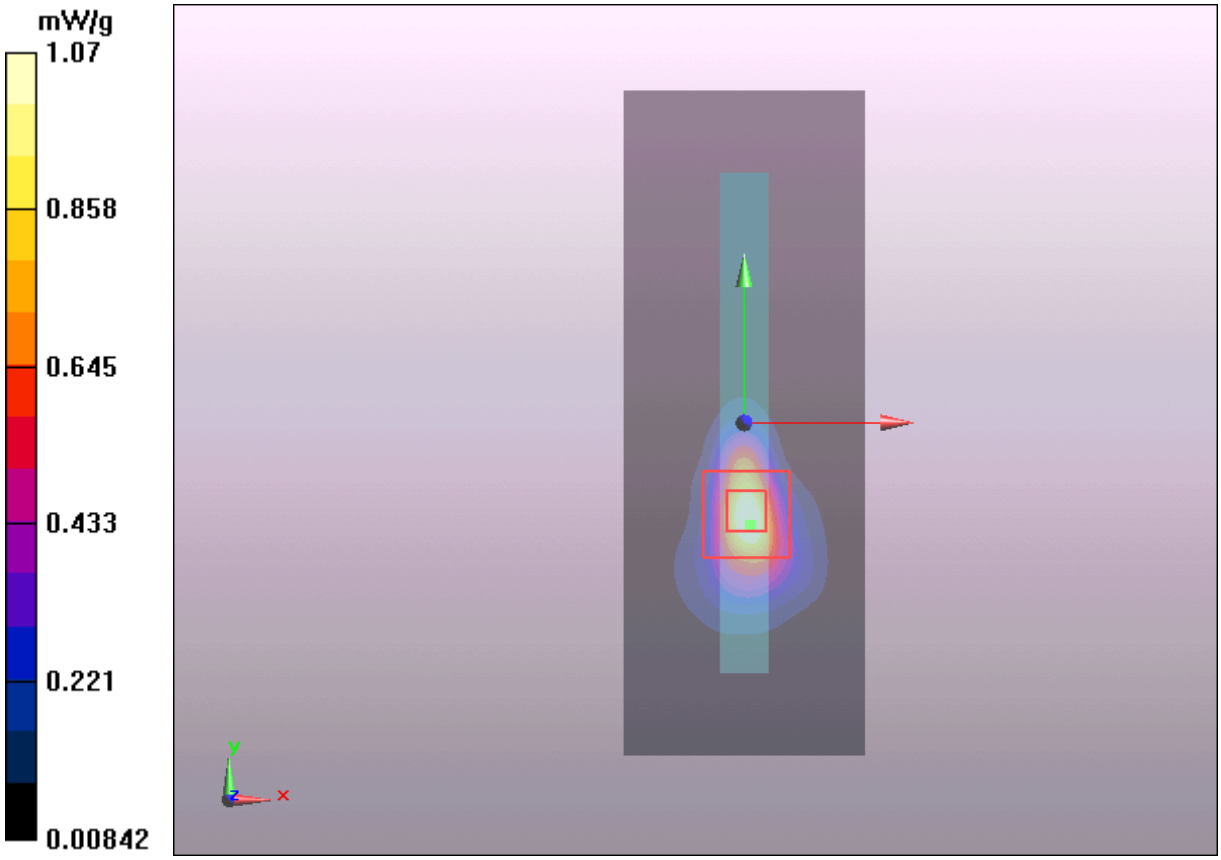


Figure 51 Body, Test Position 2, WCDMA Band II HSDPA Channel 9538

WCDMA Band II HSUPA Test Position 2 High (Distance 0mm)

Date/Time: 10/27/2011 8:43:37 PM
Communication System: WCDMA ; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1908 MHz; σ = 1.56 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(7.77, 7.77, 7.77); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 High/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.923 mW/g

Test Position 2 High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 0.763 mW/g; SAR(10 g) = 0.333 mW/g
Maximum value of SAR (measured) = 0.893 mW/g

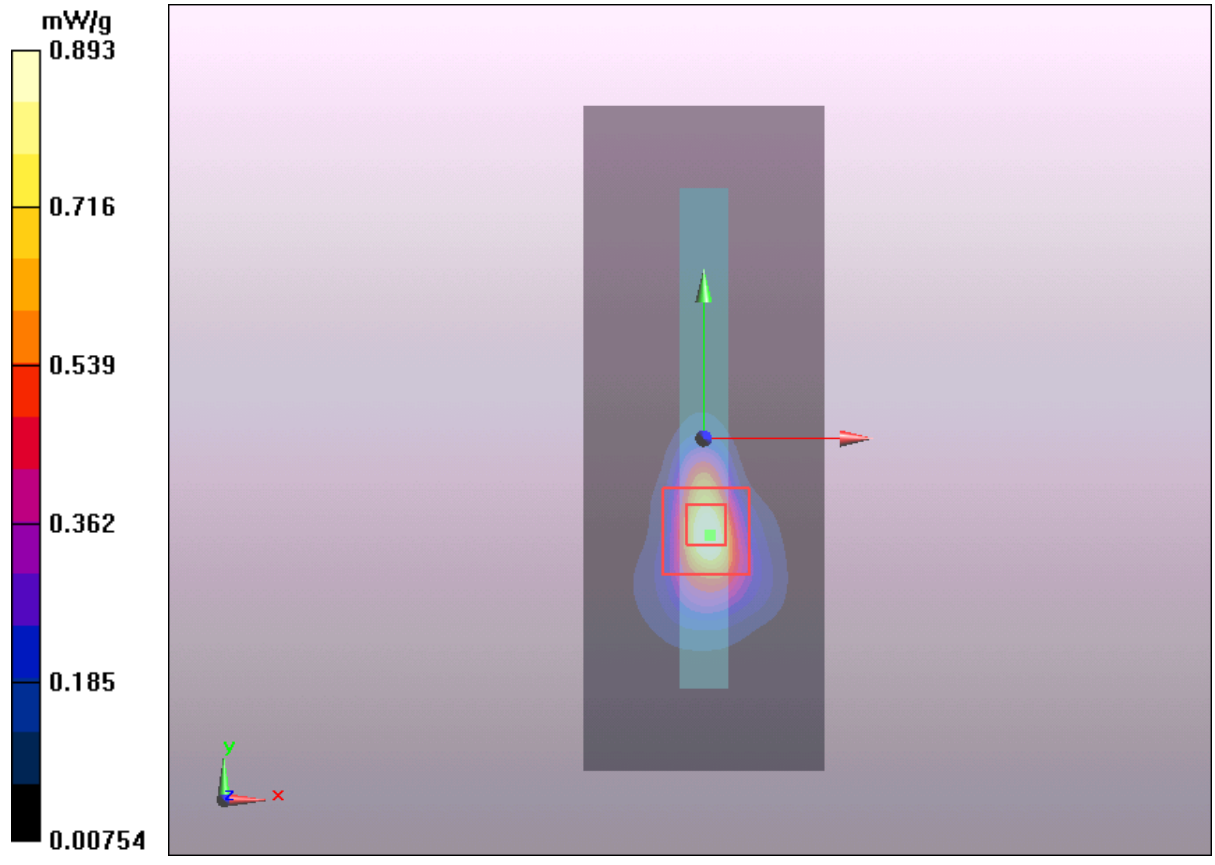


Figure 52 Body, Test Position 2, WCDMA Band II HSUPA Channel 9538

WCDMA Band V Test Position 1 Middle (Distance 0mm)

Date/Time: 10/29/2011 8:39:00 PM
Communication System: WCDMA ; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.410 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.25 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 0.589 W/kg
SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.237 mW/g
Maximum value of SAR (measured) = 0.399 mW/g

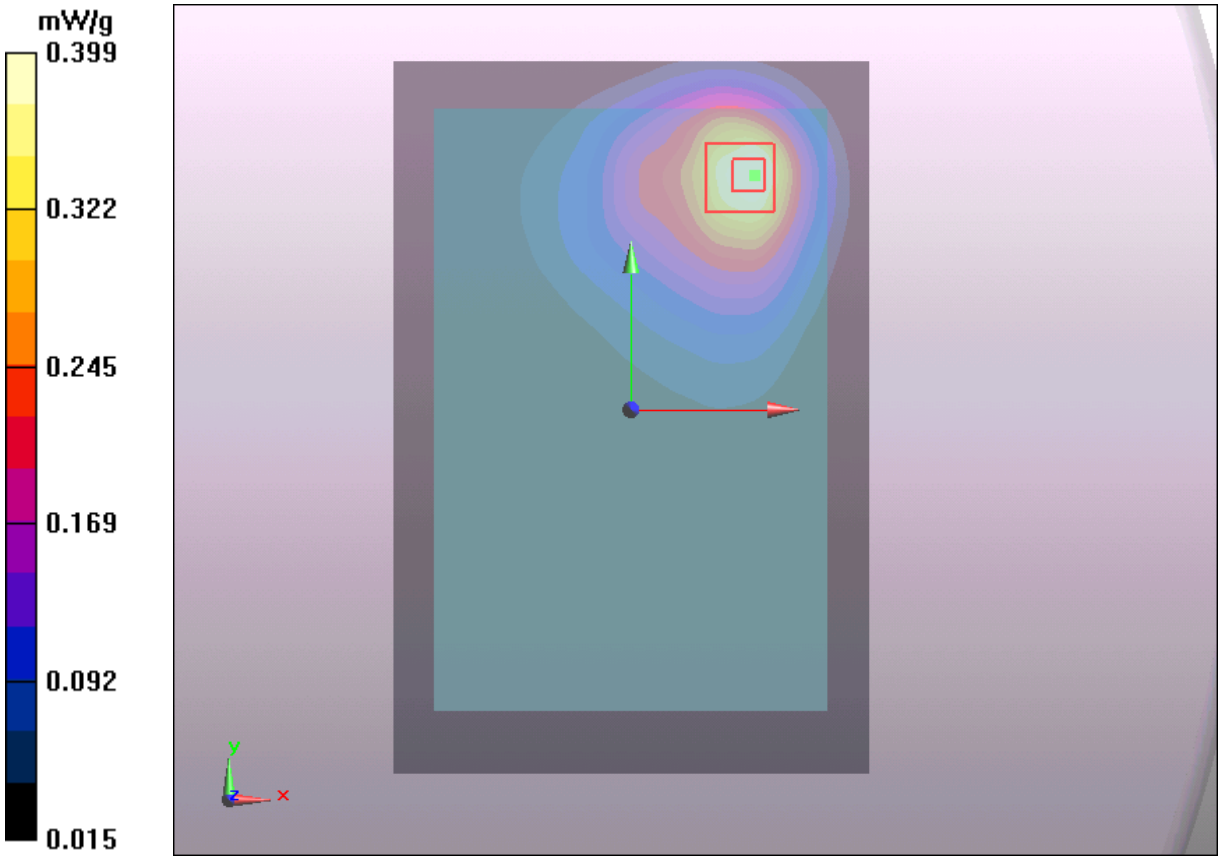


Figure 53 Body, Test Position 1, WCDMA Band V Channel 4183

WCDMA Band V Test Position 2 Middle (Distance 0mm)

Date/Time: 10/29/2011 5:00:51 PM
Communication System: WCDMA ; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.391 mW/g

Test Position 2 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = -0.047 dB
Peak SAR (extrapolated) = 0.695 W/kg
SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.211 mW/g
Maximum value of SAR (measured) = 0.394 mW/g

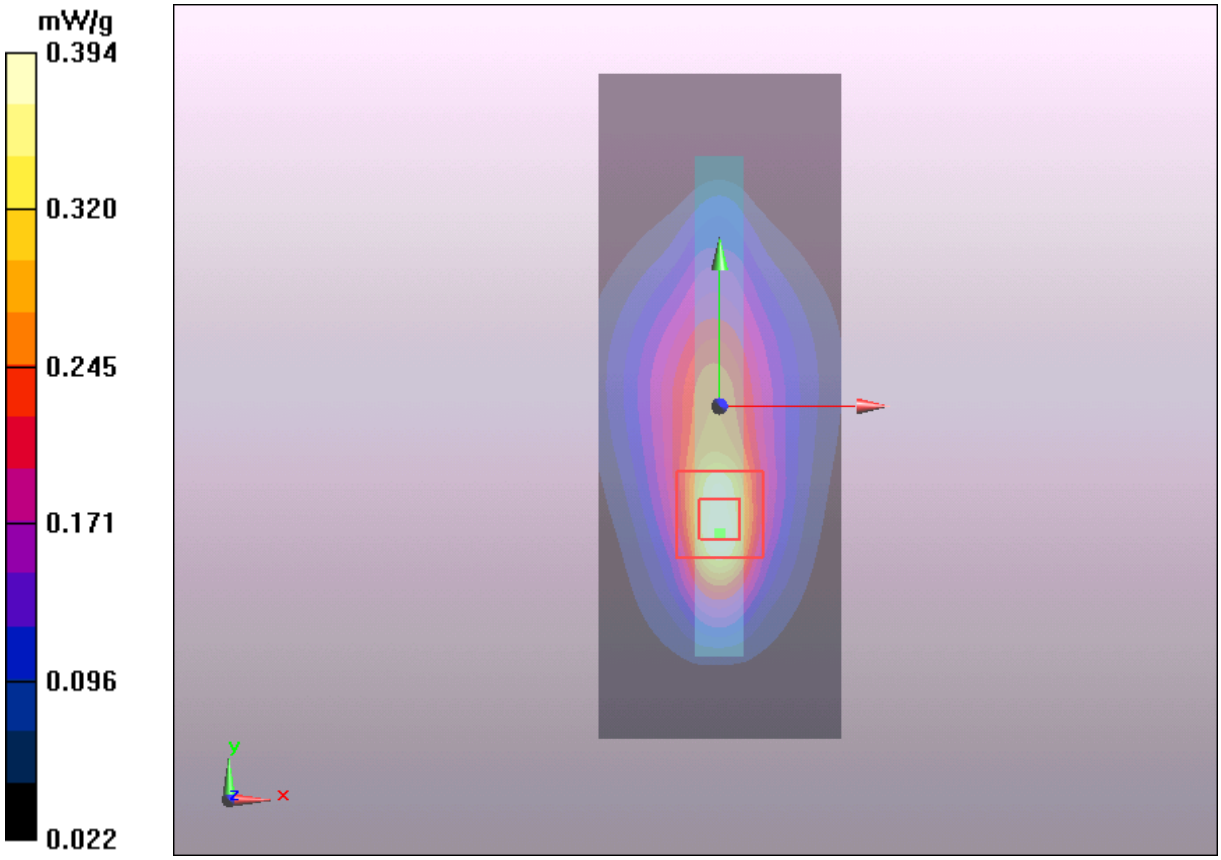


Figure 54 Body, Test Position 2, WCDMA Band V Channel 4183

WCDMA Band V Test Position 6 Middle (Distance 0mm)

Date/Time: 11/10/2011 9:41:44 PM

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

Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 54.74; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 6 Middle/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.517 mW/g

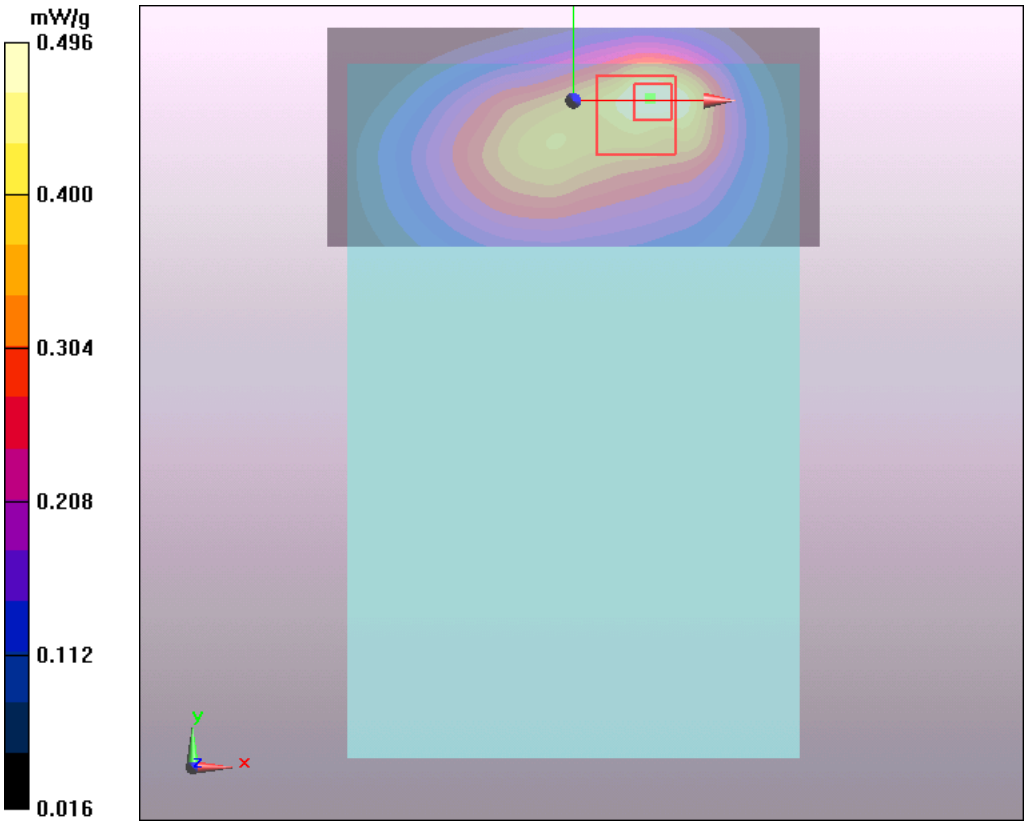
Test Position 6 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.3 V/m; Power Drift = -0.124 dB

Peak SAR (extrapolated) = 0.758 W/kg

SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.282 mW/g

Maximum value of SAR (measured) = 0.496 mW/g



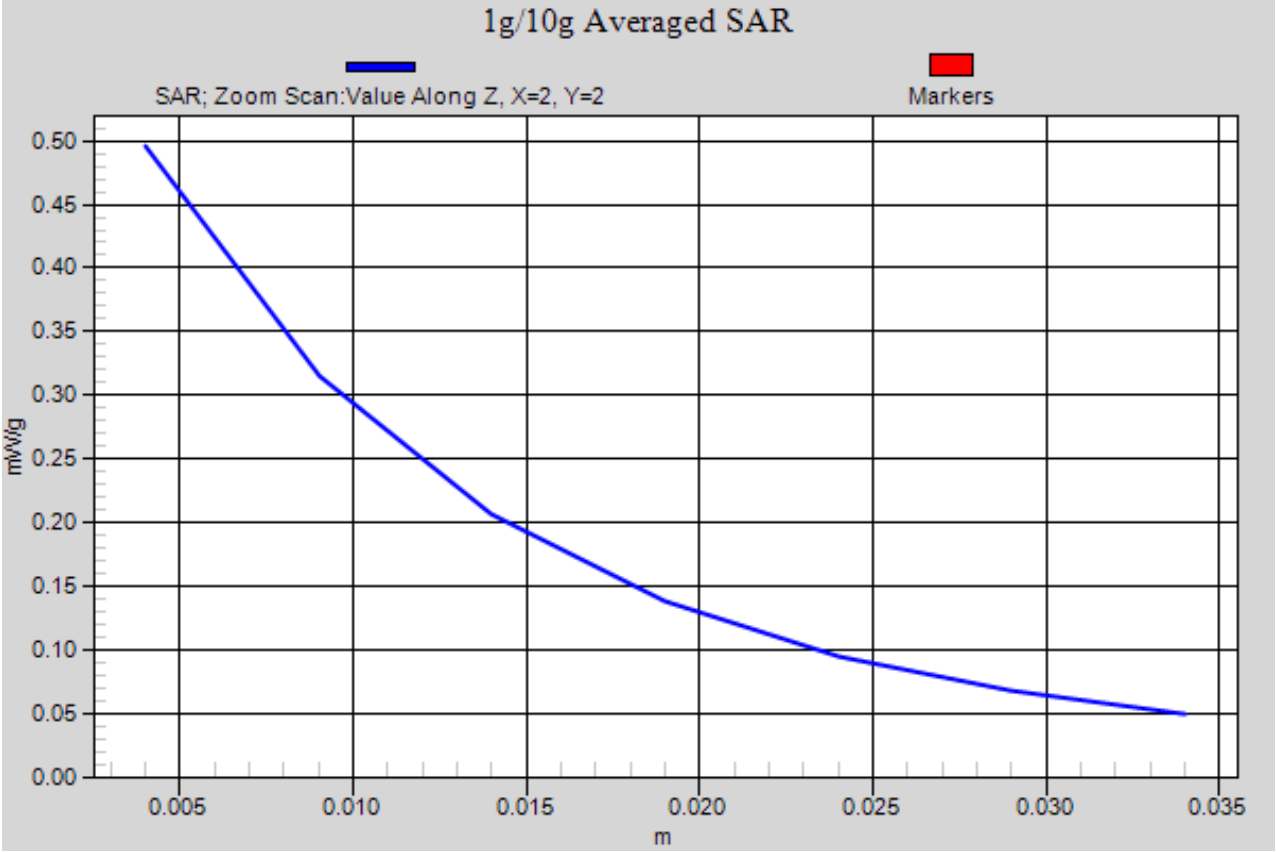


Figure 55 Body, Test Position 6, WCDMA Band V Channel 4183

WCDMA Band V Test Position 5 Middle (Distance 0mm)

Date/Time: 10/29/2011 8:05:26 PM
Communication System: WCDMA ; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 5 Middle/Area Scan (41x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.131 mW/g

Test Position 5 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.15 V/m; Power Drift = 0.062 dB
Peak SAR (extrapolated) = 0.200 W/kg
SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.065 mW/g
Maximum value of SAR (measured) = 0.126 mW/g

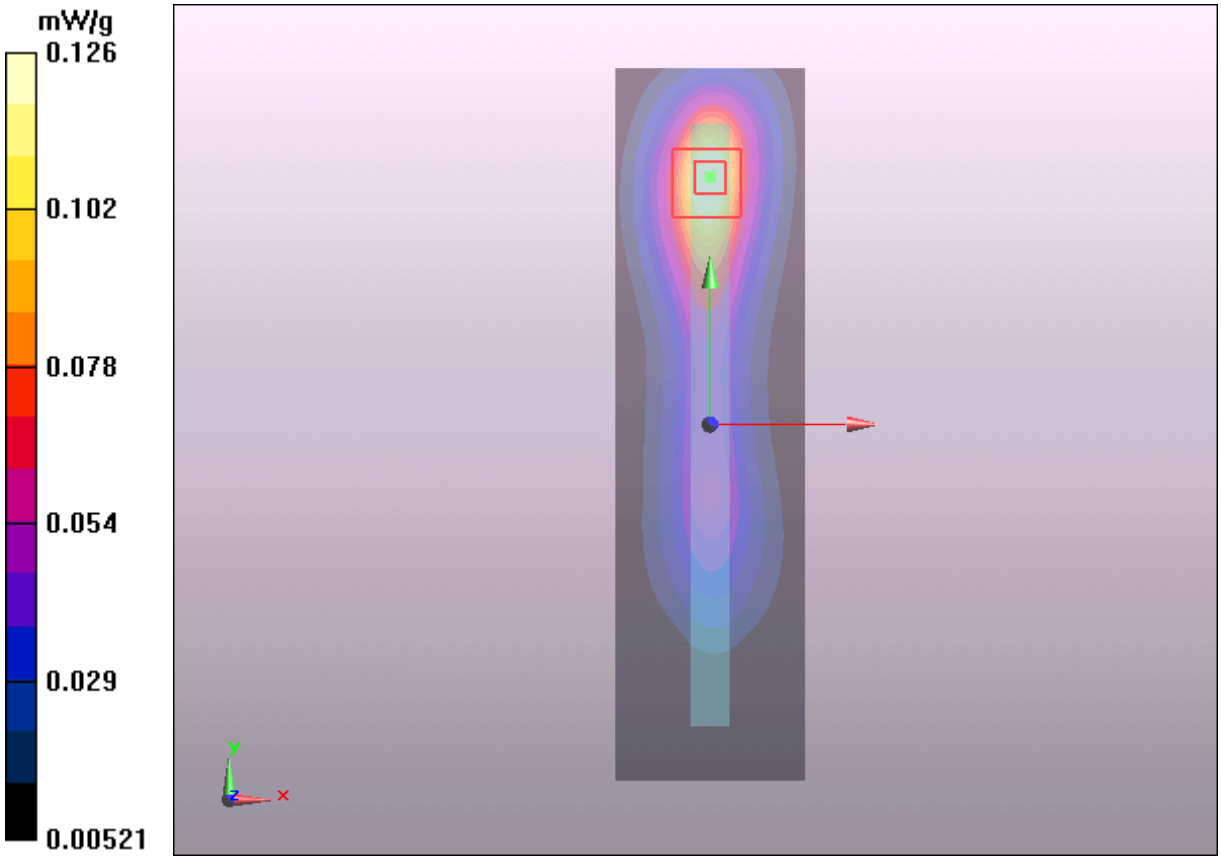


Figure 56 Body, Test Position 5, WCDMA Band V Channel 4183

WCDMA Band V Test Position 1 Middle (Distance 6mm)

Date/Time: 10/29/2011 6:53:25 PM
Communication System: WCDMA ; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃
Phantom section: Flat Section
DASY5 Configuration:
Probe: EX3DV4 - SN3677; ConvF(10.33, 10.33, 10.33); Calibrated: 11/24/2010
Electronics: DAE4 Sn871; Calibrated: 11/18/2010
Phantom: ELI 4.0; Type: QDOVA001BA
Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 1 Middle/Area Scan (101x151x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.308 mW/g

Test Position 1 Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.5 V/m; Power Drift = 0.165 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.204 mW/g
Maximum value of SAR (measured) = 0.311 mW/g

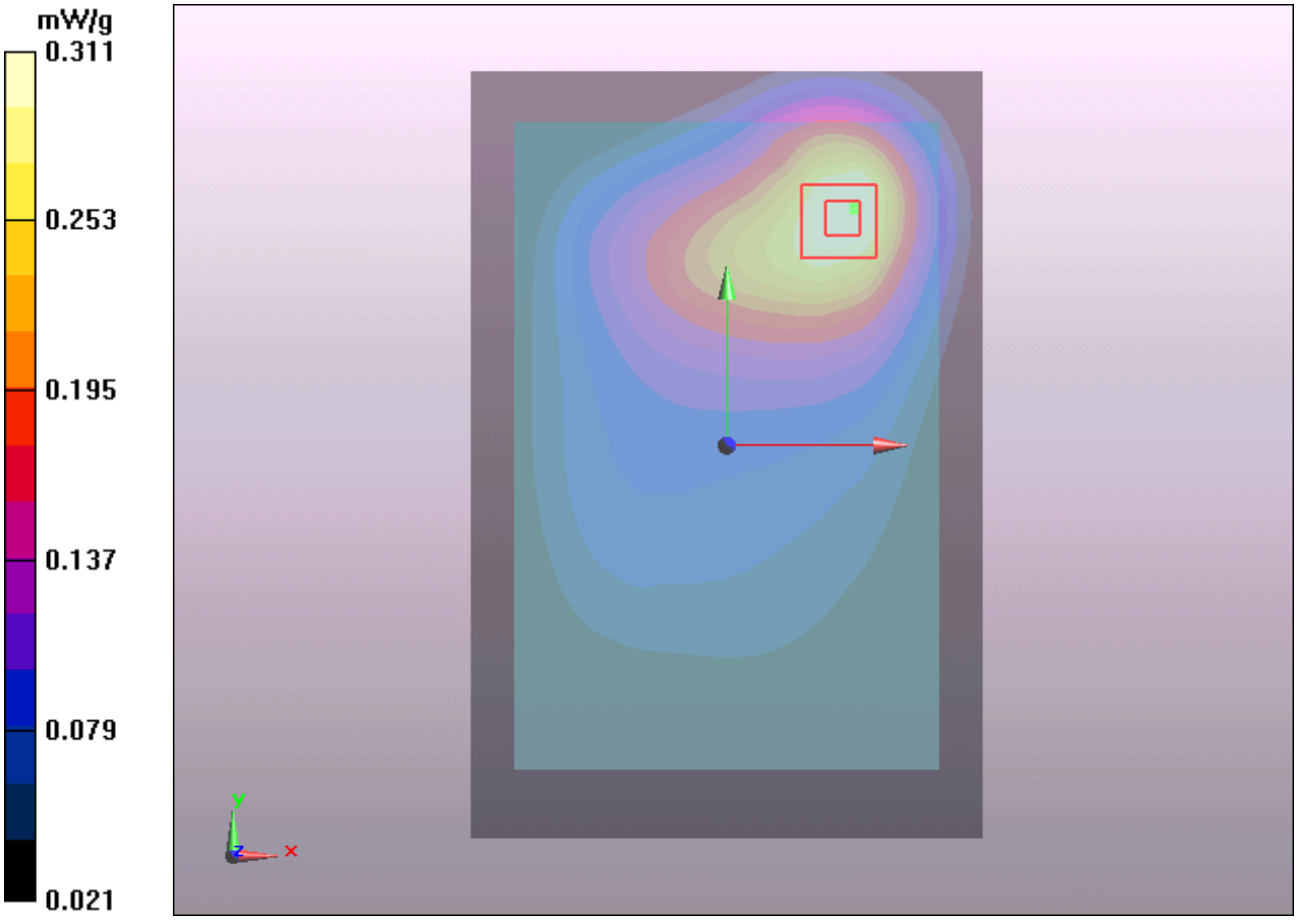


Figure 57 Body, Test Position 1, WCDMA Band V Channel 4183

WCDMA Band V Test Position 2 Middle (Distance 6mm)

Date/Time: 10/29/2011 5:57:05 PM

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

Medium parameters used (interpolated): f = 837 MHz; σ = 1 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

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

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

Phantom: ELI 4.0; Type: QDOVA001BA

Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 59

Test Position 2 Middle/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.386 mW/g

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

Reference Value = 18.5 V/m; Power Drift = 0.094 dB

Peak SAR (extrapolated) = 0.553 W/kg

SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.225 mW/g

Maximum value of SAR (measured) = 0.378 mW/g

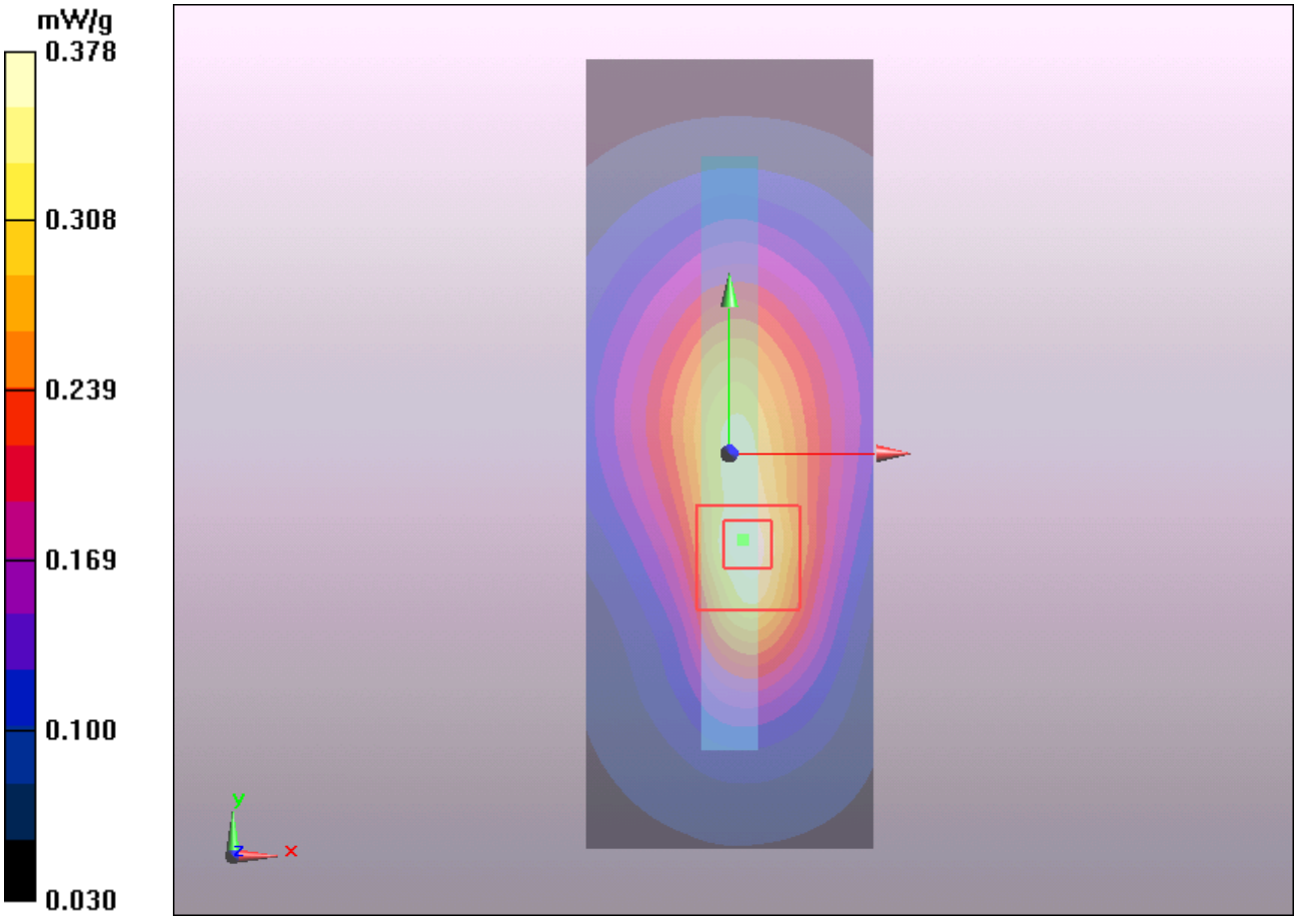


Figure 58 Body, Test Position 2, WCDMA Band V Channel 4183

ANNEX D: Probe Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client TA-SH (Auden) **Certificate No: EX3-3677_Nov10**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3677
Calibration procedure(s)	QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	November 24, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: November 25, 2010

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3677

Manufactured:	September 9, 2008
Last calibrated:	September 23, 2009
Recalibrated:	November 24, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

EX3DV4 SN:3677 November 24, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3677

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.41	0.47	0.39	± 10.1%
DCP (mV)[B]	96.8	98.9	98.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	143.2	± 2.4 %
			Y	0.00	0.00	1.00	140.9	
			Z	0.00	0.00	1.00	135.8	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4 SN:3677 November 24, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3677

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	10.04	10.04	10.04	0.09	1.00 ± 13.3%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	9.50	9.50	9.50	0.72	0.64 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	8.22	8.22	8.22	0.72	0.59 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.94	7.94	7.94	0.81	0.57 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.32	7.32	7.32	0.47	0.75 ± 11.0%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

EX3DV4 SN:3677 November 24, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3677

Calibration Parameter Determined in Body Tissue Simulating Media

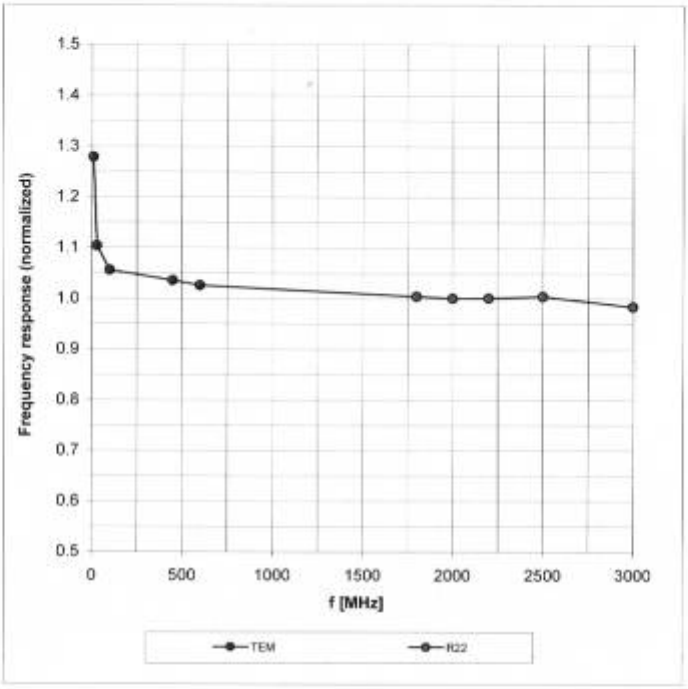
f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	10.62	10.62	10.62	0.02	1.00 ± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	10.14	10.14	10.14	0.59	0.72 ± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	10.33	10.33	10.33	0.20	2.06 ± 11.0%
1450	± 50 / ± 100	54.0 ± 5%	1.30 ± 5%	8.47	8.47	8.47	0.99	0.53 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	8.02	8.02	8.02	0.63	0.67 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.77	7.77	7.77	0.69	0.67 ± 11.0%
2100	± 50 / ± 100	53.2 ± 5%	1.62 ± 5%	8.04	8.04	8.04	0.16	1.44 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.46	7.46	7.46	0.99	0.49 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	6.61	6.61	6.61	0.28	1.40 ± 13.1%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

EX3DV4 SN:3677 November 24, 2010

Frequency Response of E-Field

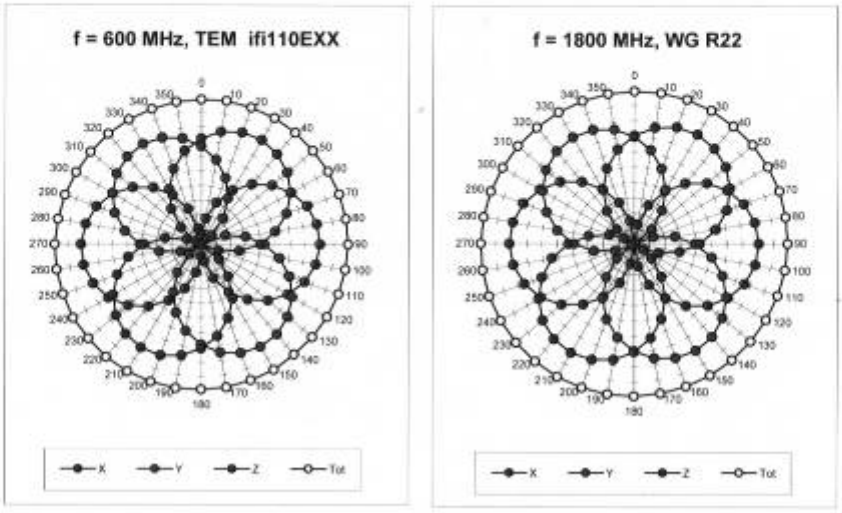
(TEM-Cell:ifi110 EXX, Waveguide: R22)

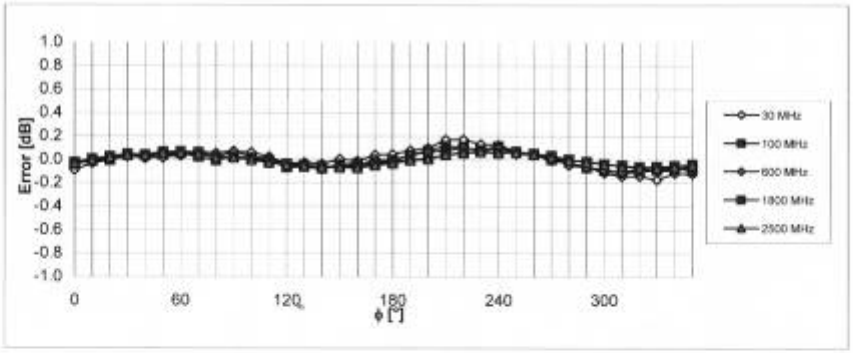


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

EX3DV4 SN:3677 November 24, 2010

Receiving Pattern (ϕ), ϑ = 0°



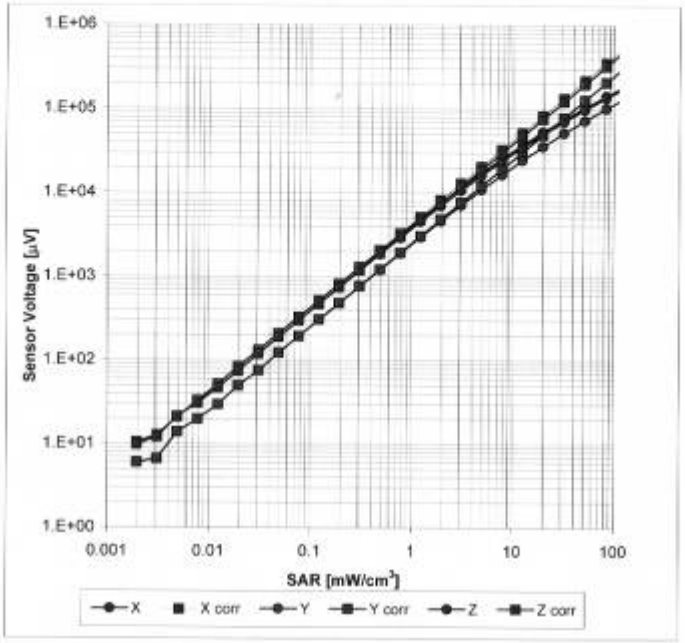


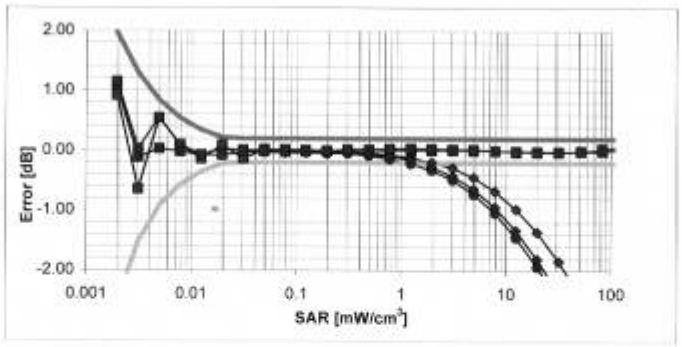
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4 SN:3677 November 24, 2010

Dynamic Range f(SAR_{head})

(TEM cell, f = 900 MHz)

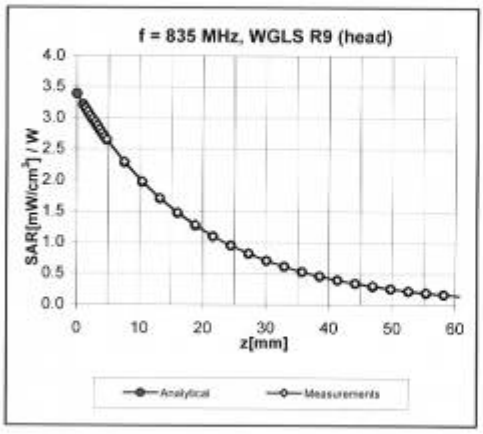


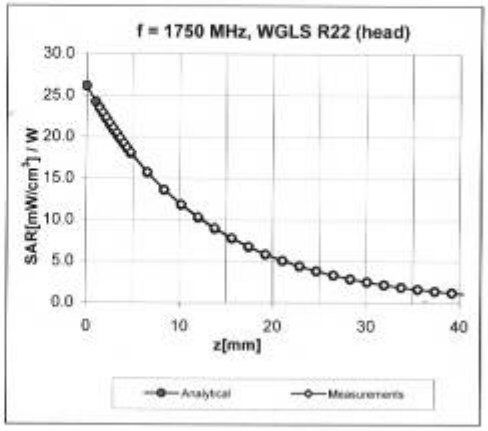


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

EX3DV4 SN:3677 November 24, 2010

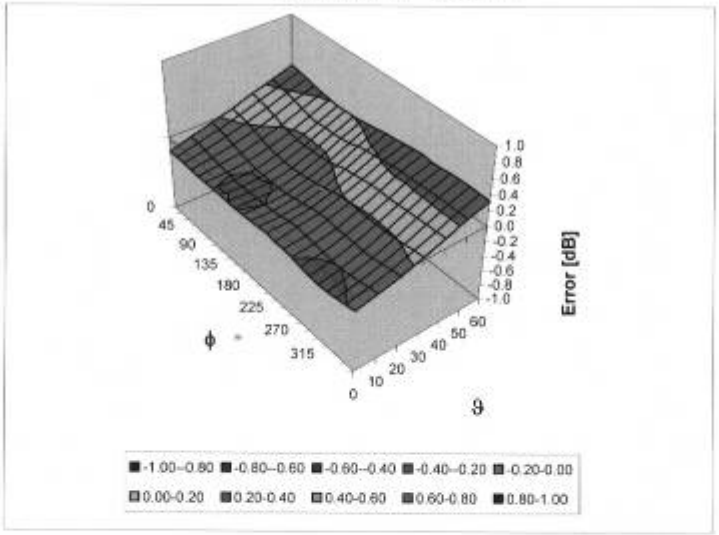
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

EX3DV4 SN:3677 November 24, 2010

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

ANNEX E: D835V2 Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client TA-Shanghai (Auden) **Certificate No: D835V2-4d020_Aug11**

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d020

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: August 26, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 26, 2011

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.34 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.11 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.42 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.46 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.26 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.9 Ω - 3.1 jΩ
Return Loss	- 27.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7 Ω - 5.4 jΩ
Return Loss	- 25.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 22, 2004

DASY5 Validation Report for Head TSL

Date: 25.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

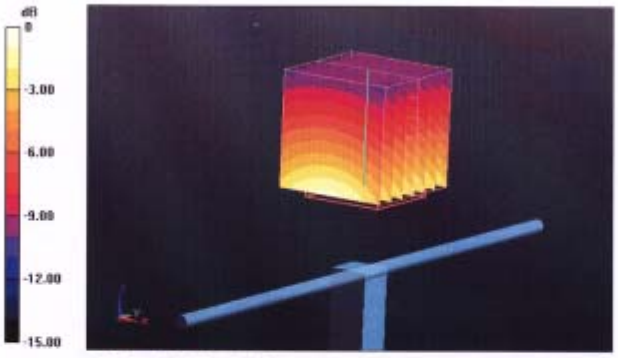
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

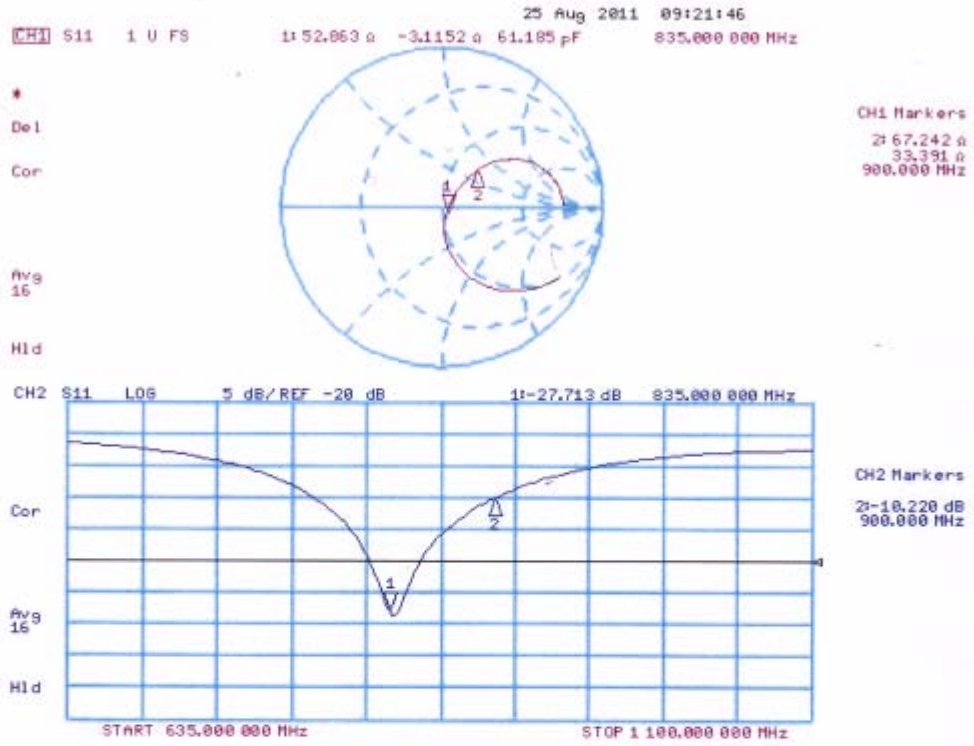
- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.930 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.421 W/kg
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.708 mW/g



0 dB = 2.710mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 26.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

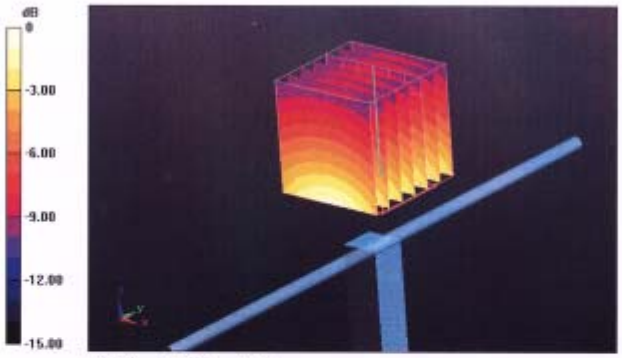
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

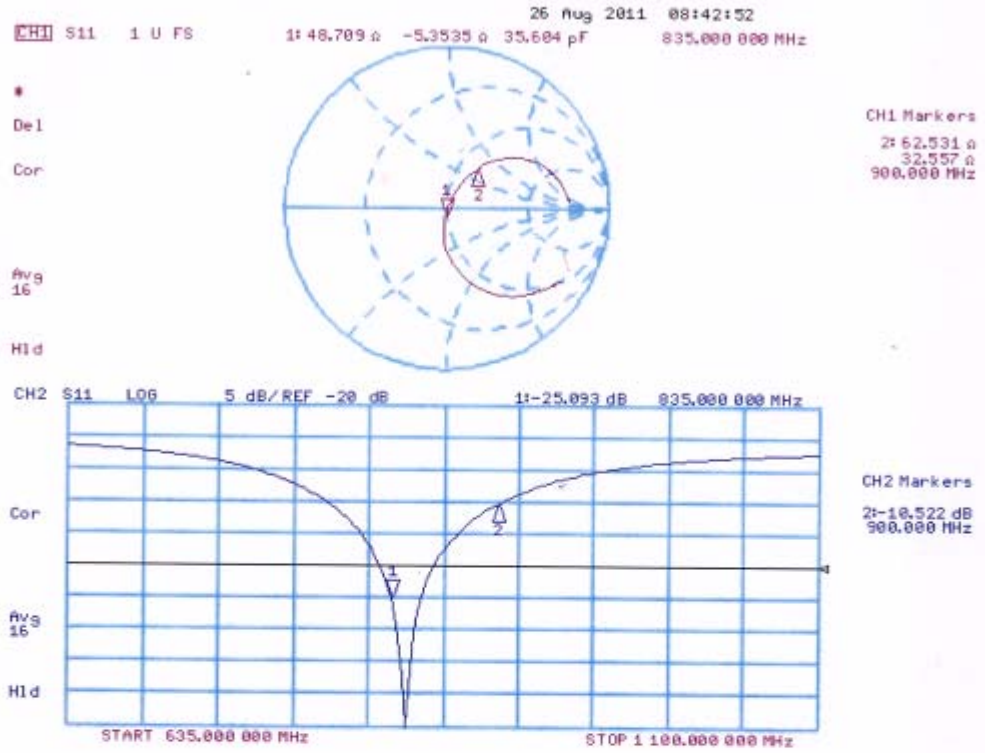
- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.406 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.509 W/kg
SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g
Maximum value of SAR (measured) = 2.827 mW/g



0 dB = 2.830mW/g

Impedance Measurement Plot for Body TSL



ANNEX F: D1900V2 Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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Accreditation No.: SCS 108

Client **TA-Shanghai (Auden)** Certificate No: **D1900V2-5d060_Aug11**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d060
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	August 31, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 31, 2011

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.42 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**40.3 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.30 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**21.1 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.9 ± 6 %	1.57 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**41.7 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.55 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.0 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6 Ω + 7.5 jΩ
Return Loss	- 22.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω + 7.9 jΩ
Return Loss	- 21.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 10, 2004

DASY5 Validation Report for Head TSL

Date: 30.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

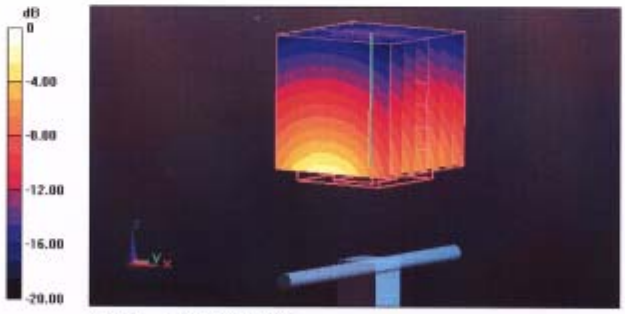
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.42 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

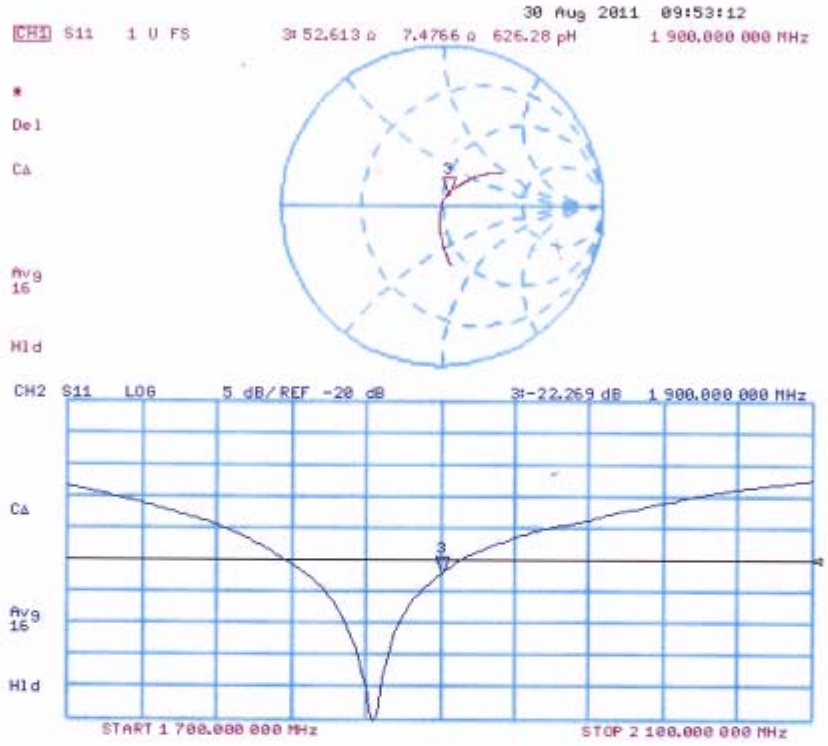
- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.636 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 18.535 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.3 mW/g
Maximum value of SAR (measured) = 12.600 mW/g



0 dB = 12.600mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 31.08.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

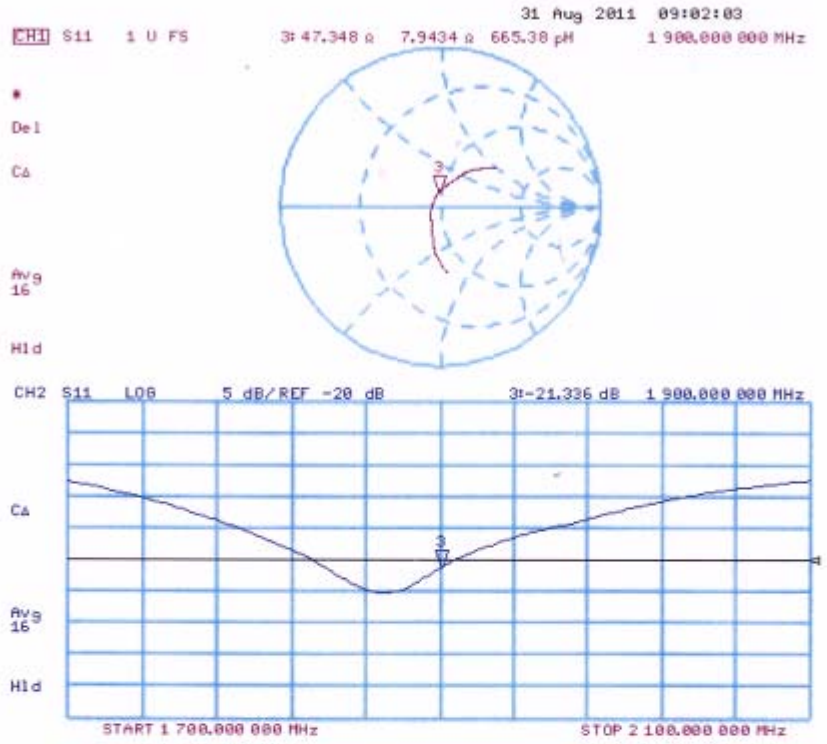
DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.435 V/m; Power Drift = -0.0099 dB
Peak SAR (extrapolated) = 18.663 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.55 mW/g
Maximum value of SAR (measured) = 13.397 mW/g

0 dB = 13.400mW/g

Impedance Measurement Plot for Body TSL



ANNEX G: DAE4 Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 108

Client **TA – SH (Auden)**

Certificate No: **DAE4-871_Nov10**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 871
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	November 18, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: November 18, 2010

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
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Accreditation No.: SCS 108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.757 ± 0.1% (k=2)	404.740 ± 0.1% (k=2)	405.181 ± 0.1% (k=2)
Low Range	3.98219 ± 0.7% (k=2)	3.93489 ± 0.7% (k=2)	3.96831 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	90.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200001.2	-1.56	-0.00
Channel X	+ Input	20000.71	0.71	0.00
Channel X	- Input	-19997.87	1.63	-0.01
Channel Y	+ Input	199994.3	1.99	0.00
Channel Y	+ Input	19998.92	-1.08	-0.01
Channel Y	- Input	-20000.26	-0.76	0.00
Channel Z	+ Input	200009.2	-1.04	-0.00
Channel Z	+ Input	19998.70	-1.10	-0.01
Channel Z	- Input	-20000.16	-0.76	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.1	0.16	0.01
Channel X	+ Input	199.58	-0.52	-0.26
Channel X	- Input	-200.79	-0.89	0.45
Channel Y	+ Input	1999.9	-0.03	-0.00
Channel Y	+ Input	199.45	-0.55	-0.27
Channel Y	- Input	-200.31	-0.41	0.21
Channel Z	+ Input	2000.1	0.33	0.02
Channel Z	+ Input	199.13	-0.77	-0.38
Channel Z	- Input	-201.47	-1.37	0.69

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	14.25	12.86
	- 200	-12.68	-14.21
Channel Y	200	-10.04	-10.39
	- 200	9.20	9.17
Channel Z	200	-0.85	-1.40
	- 200	-0.34	-0.31

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	2.85	0.69
Channel Y	200	2.41	-	2.73
Channel Z	200	2.54	0.73	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15920	15517
Channel Y	16171	16732
Channel Z	15803	16474

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.03	-2.35	0.86	0.43
Channel Y	-0.50	-1.49	-0.49	0.38
Channel Z	-0.92	-2.21	0.14	0.44

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

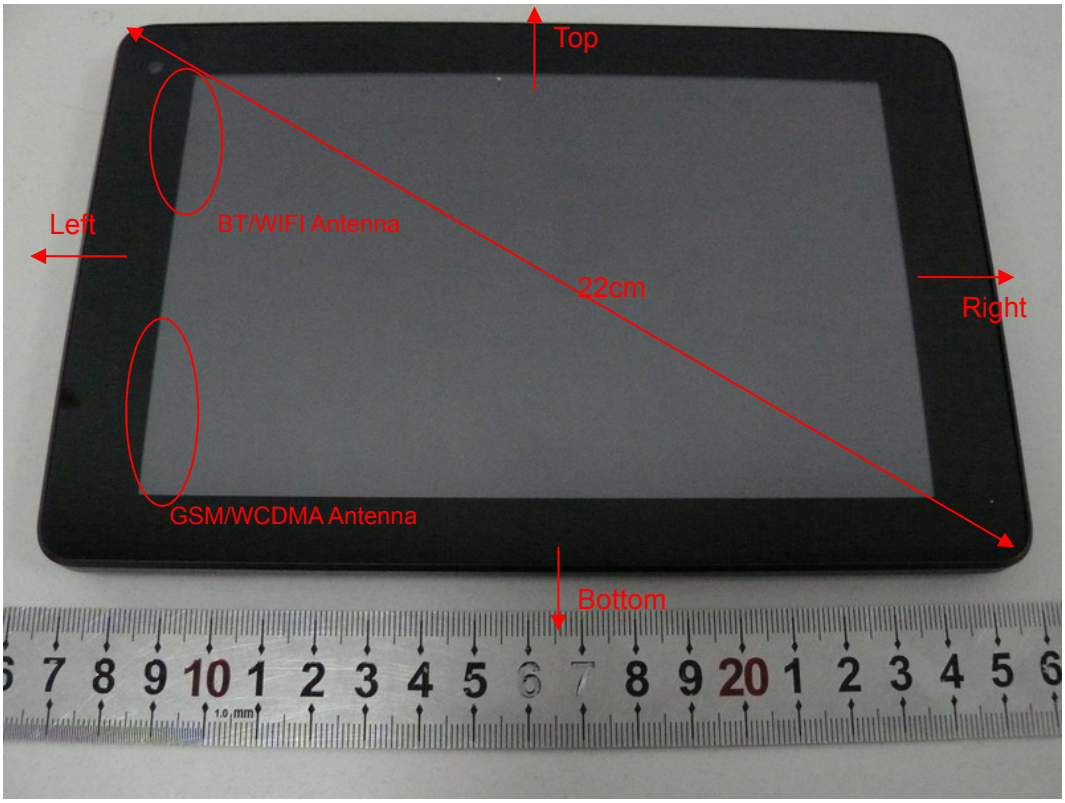
8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

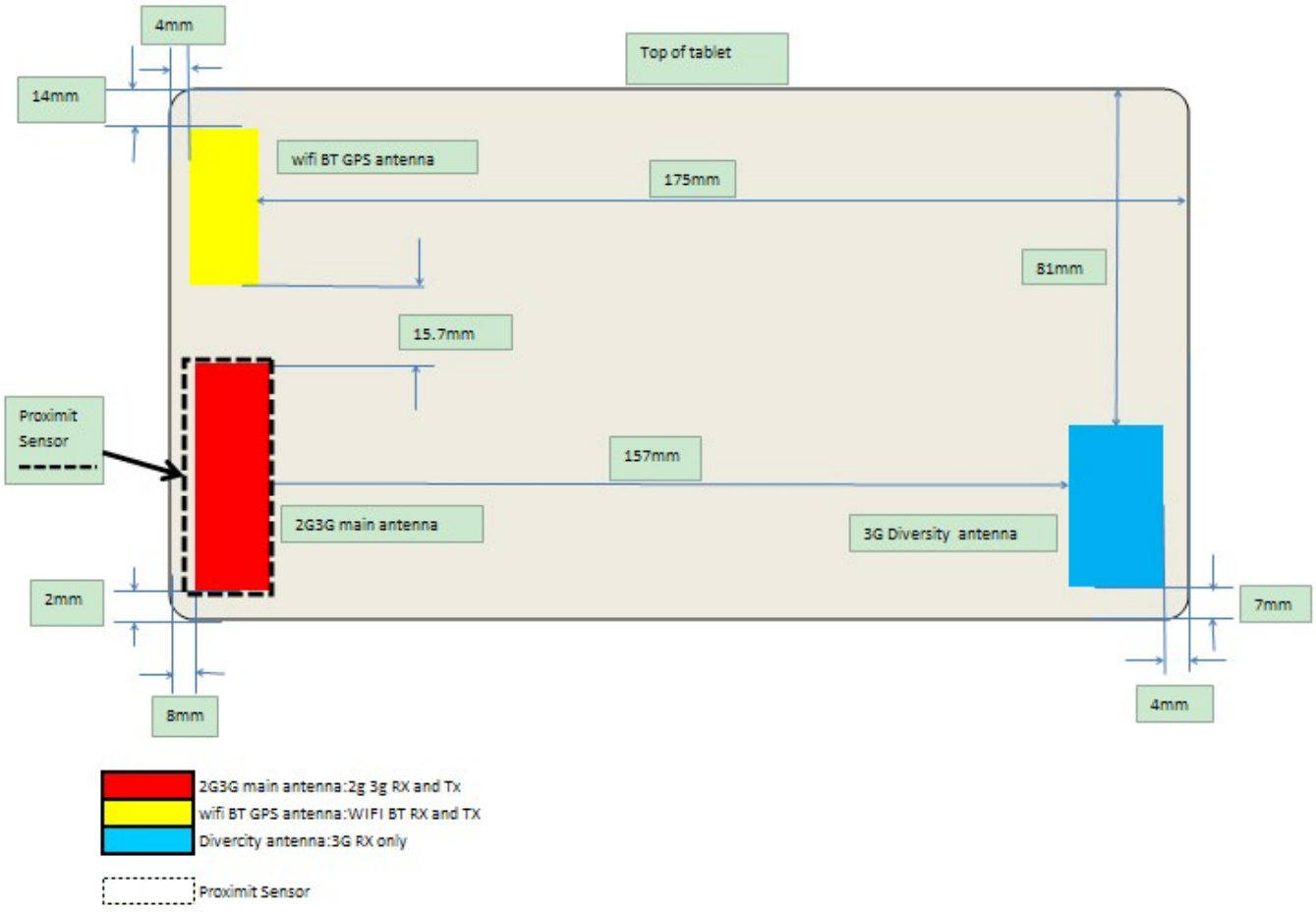
9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

ANNEX H: The EUT Appearances and Test Configuration



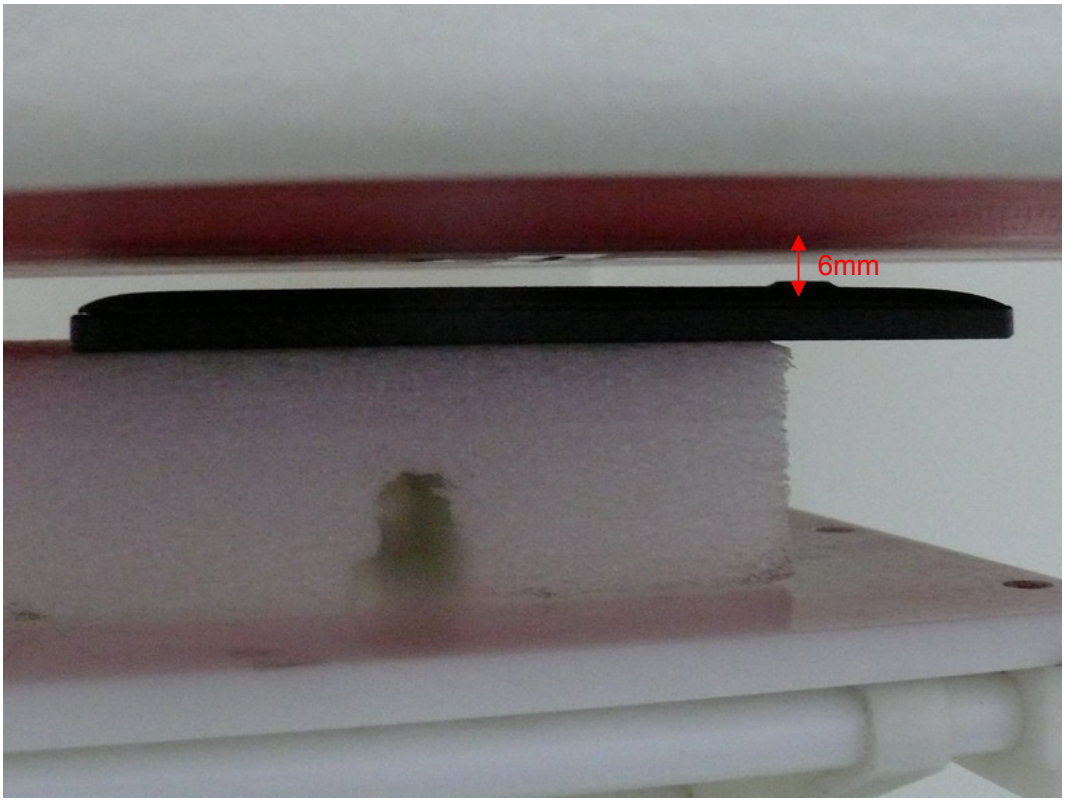
a: Front side



b: Antenna schemes

Picture 4: Constituents of EUT

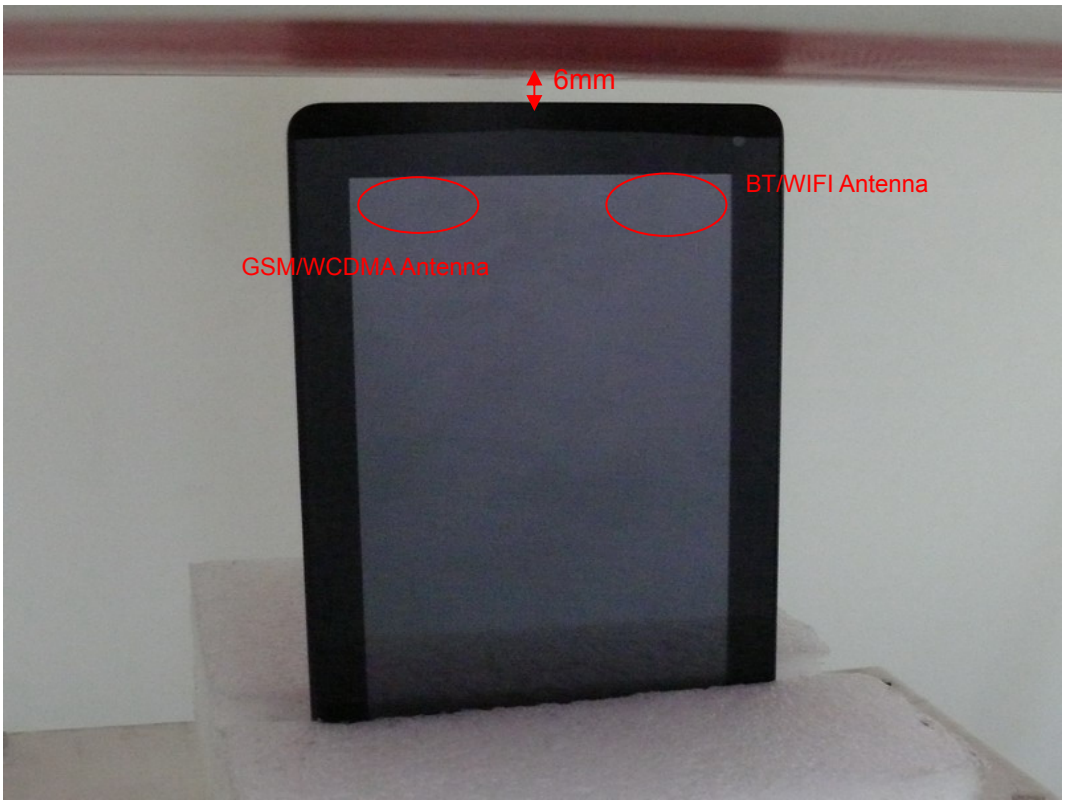
The distance from the back side of the EUT to the bottom of the Phantom is 0mm
The distance from the antenna of the EUT to the bottom of the Phantom is 5mm



The distance from the camera of the EUT to the bottom of the Phantom is 6mm

Picture 5: Test Position 1

The distance from the left side of the EUT to the bottom of the Phantom is 0mm



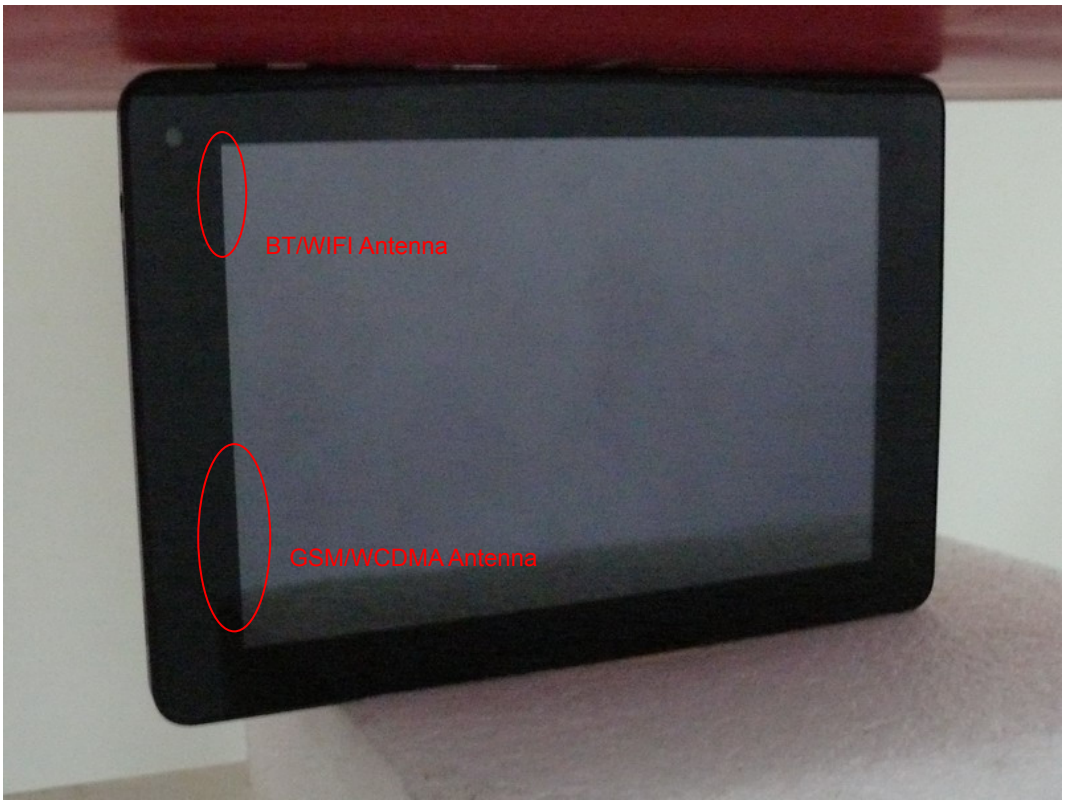
The distance from the left side of the EUT to the bottom of the Phantom is 6mm

Picture 6: Test Position 2

The distance from the right side of the EUT to the bottom of the Phantom is 0mm

Picture 7: Test Position 3

(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)

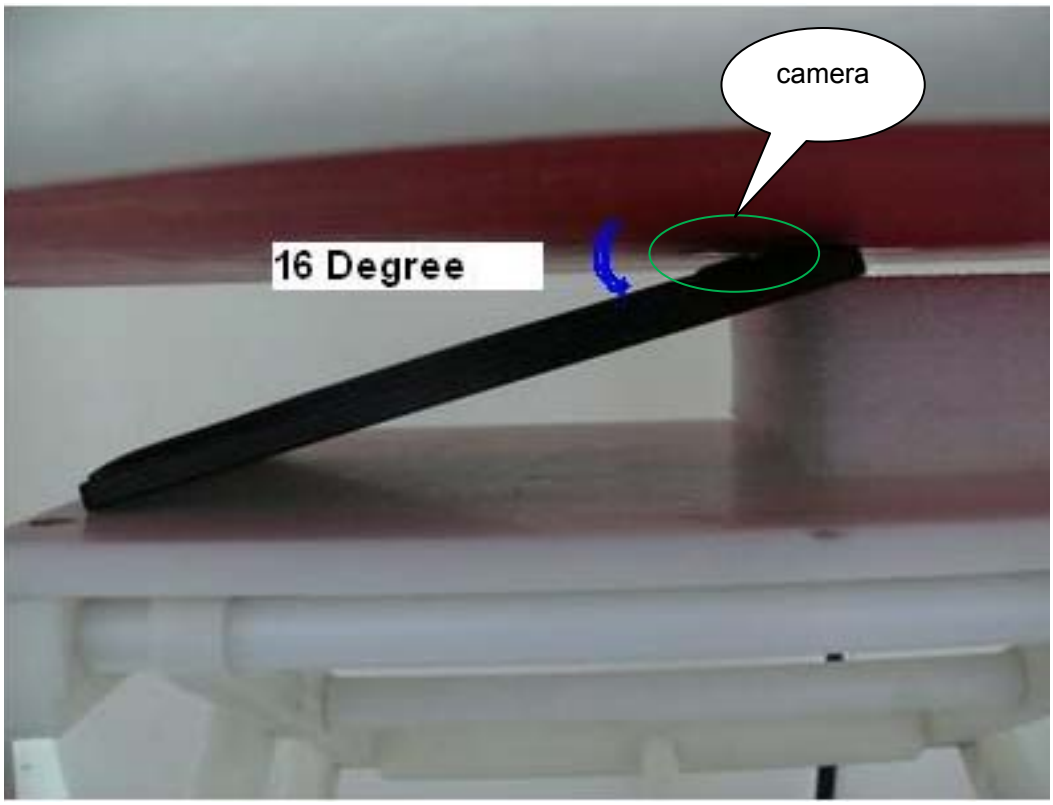


The distance from the top side of the EUT to the bottom of the Phantom is 0mm

Picture 8: Test Position 4

The distance from the bottom side of the EUT to the bottom of the Phantom is 0mm

Picture 9: Test Position 5



The distance from the antenna of the EUT to the bottom of the Phantom is 0mm

Picture 10: Test Position 6