SAR TEST REPORT

No. 2013SAR00054

For

Sony Mobile Communications AB

GSM 850/900/1800/1900 quad bands and CDMA2000 850/1900 dual bands mobile phone

Type number: PM-0370-BV

Marketing name: M35c

With

Hardware Version: A

Software Version: 12.0.B.1.36 / 12.0.B.2.22 / s_atp_huashan_ct_0_0_24_TA1 (WLAN)

FCC ID: PY7PM-0370

Issued Date: 2013-05-02

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-12123-01-01

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of MIIT

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Revision Version

Report Number	Revision	Date	Memo
2013SAR00054	00	2013-05-02	Initial creation of test report

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
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Postal Code:	100191
Telephone:	+86-10-62304633
Fax:	+86-10-62304793

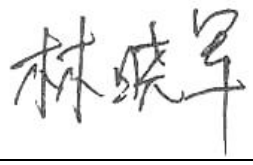
1.2 Testing Environment

Temperature:	18°C~25 °C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

1.3 Project Data

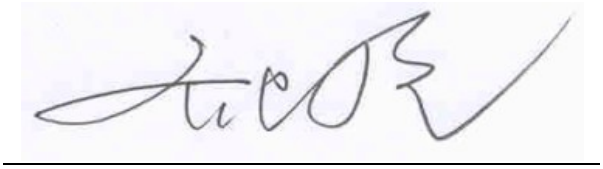
Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	March 26, 2013
Testing End Date:	March 29, 2013

1.4 Signature



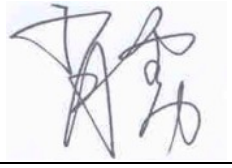
Lin Xiaojun

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Sony Mobile Communications AB GSM 850/900/1800/1900 quad bands and CDMA2000 850/1900 dual bands mobile phone PM-0370-BV / M35c are as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g (W/Kg)	Equipment Class
Head (Separation Distance 0mm)	GSM 850	0.32	PCE
	PCS 1900	0.65	
	CDMA2000 BC0	0.44	
	CDMA2000 BC1	0.34	
	WLAN 2.4 GHz	0.13	DTS
Hotspot (Separation Distance 10mm)	GSM 850	0.52	PCE
	PCS 1900	0.59	
	CDMA2000 BC0	0.71	
	CDMA2000 BC1	0.53	
	WLAN 2.4 GHz	0.09	DTS
Body-worn (Separation Distance 15mm)	GSM 850	0.36	PCE
	PCS 1900	0.52	
	CDMA2000 BC0	0.42	
	CDMA2000 BC1	0.79	
	WLAN 2.4 GHz	/	DTS

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1999.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 10 mm for data and 15mm for speech between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

There are two antennas for licensed transmitters. Main antenna (MSM8960) supports the bands of CDMA2000 BC0&BC1 and GSM850/900/1800/1900, another antenna (QSC1215) supports the bands of GSM900/1800/1900.

The measurement together with the test system set-up is described in annex C of this test report. A detailed description of the equipment under test can be found in chapter 4 of this test report.
The highest reported SAR value is obtained at the case of **(Table 2.1),** and the values are**: 0.79 W/kg (1g).**

Table 2.2: The sum of reported SAR values for MSM8960, QSC1215 and WiFi

	Position	MSM8960	QSC1215	WiFi	Sum
Highest reported value for Head	Left hand, Touch cheek	0.44[1]	0.58[2]	0.13[3]	**1.15**
	Left hand, Tilt 15°	0.43[4]	0.65[5]	0.04[6]	**1.12**
Highest reported SAR value for Body	Rear	0.60[7]	0.59[8]	0.09[9]	**1.28**

Note: the test configuration for SAR values in table2.2 are as follow.

[1] - CDMA BC0, AP OFF, in table 14.7

[2] - GSM1900, AP OFF, in table 14.12

[3] - WiFi 802.11b, AP OFF, in table 14.14

[4] - CDMA BC0, AP OFF, in table 14.7

[5] - GSM1900, AP OFF, in table 14.12

[6] - WiFi 802.11b, AP OFF, in table 14.14

[7] - CDMA BC0, AP OFF, in table 14.8

[8] - GSM1900, AP OFF, in table 14.13

[9] - WiFi 802.11b, AP OFF, in table 14.15

Table 2.3: The sum of reported SAR values for MSM8960, QSC1215 and Bluetooth

	Position	MSM8960	QSC1215	BT*	Sum
Highest reported value for Head	Left hand, Touch cheek	0.44	0.58	0.21	**1.23**
	Left hand, Tilt 15°	0.43	0.65	0.21	**1.29**
Highest reported SAR value for Body	Rear	0.60	0.59	0.21	**1.40**

BT* - Estimated SAR for Bluetooth (see the table 13.3)

According to the above tables, the highest sum of reported SAR values is **1.40 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	Sony Mobile Communications (China) Co. Ltd
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

3.2 Manufacturer Information

Company Name:	Sony Mobile Communications AB
Address /Post:	Nya Vattentornet, 22188 Lund, Sweden
City:	Lund
Postal Code:	22188
Country:	Sweden
Contact Person:	Nordlof, Anders
Telephone:	+46-10-802 3919
Fax:	+46-10-800 2441

4 Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1 About EUT

Description:	GSM 850/900/1800/1900 quad bands and CDMA2000 850/1900 dual bands mobile phone
Type name:	PM-0370-BV
Marketing name:	M35c
Operating mode(s):	GSM 850/900/1800/1900, CDMA2000 BC0/BC1, BT, WiFi (2.4G)
Tested Tx Frequency:	825 – 848.8 MHz (GSM 850)
	1850.2 – 1910 MHz (GSM 1900)
	824.7 – 848.31 MHz (CDMA2000 BC0)
	1851.25 – 1908.75(CDMA2000 BC1)
	2412 – 2462 MHz (WiFi 2.4G)
GPRS/EGPRS Multislot Class:	MSM8960 antenna: 12 QSC1215 antenna: 8
GPRS capability Class:	B
Release Version:	GSM: R8
	GPRS: R8
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Accessories/Body-worn configurations:	Headset
Hotspot mode:	Support simultaneous transmission of hotspot and voice(or data)
Form factor:	13.1cm × 6.7 cm
MSM8960 antenna dimension:	Max length: 44.8 mm
	Max width: 10.4 mm
QSC1215 antenna dimension:	Max length: 34 mm
	Max width: 23.3 mm

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	SN	HW Version	SW Version
EUT1	004402146480656	CB5123NEXK	A	12.0.B.1.36
EUT2	004402146480615	CB5123NEWQ	A	12.0.B.1.36
EUT3	004402146480771	CB5123NEYU	A	12.0.B.1.36
EUT4	004402146471531	CB5123NFEM	A	s_atp_huashan_ct_0_0_24_TA1
EUT5	004402146472570	CB5123NFD7	A	s_atp_huashan_ct_0_0_24_TA1

*EUT ID: is used to identify the test sample in the lab internally.

Note: It is performed to test SAR with the EUT1, 2 and 4, conducted power of main antenna with the EUT3 and conducted power of WLAN antenna with the EUT5. The SW version for power reduction of EVDO is 12.0.B.2.22.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Headset	MH410c	/	Foster

*AE ID: is used to identify the test sample in the lab internally.

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2 Applicable Measurement Standards

IEEE 1528–2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01): Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

KDB447498 D01: General RF Exposure Guidance v05: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB648474 D04 SAR Handsets Multi Xmiter and Ant v01: SAR Evaluation Considerations for Wireless Handsets.

KDB941225 D01: SAR Measurement Procedures for 3G Devices.

KDB941225 D05 SAR for LTE Devices v02: SAR Evaluation Considerations for LTE Devices

KDB941225 D06 Hot Spot SAR v01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB248227: SAR measurement procedures for 802.112abg transmitters

865664 D01 SAR measurement 100 MHz to 6 GHz v01: SAR Measurement Requirements for 100 MHz to 6 GHz

865664 D02 SAR Reporting v01: RF Exposure Compliance Reporting and Documentation Considerations

6 Specific Absorption Rate (SAR)

6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ) . The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

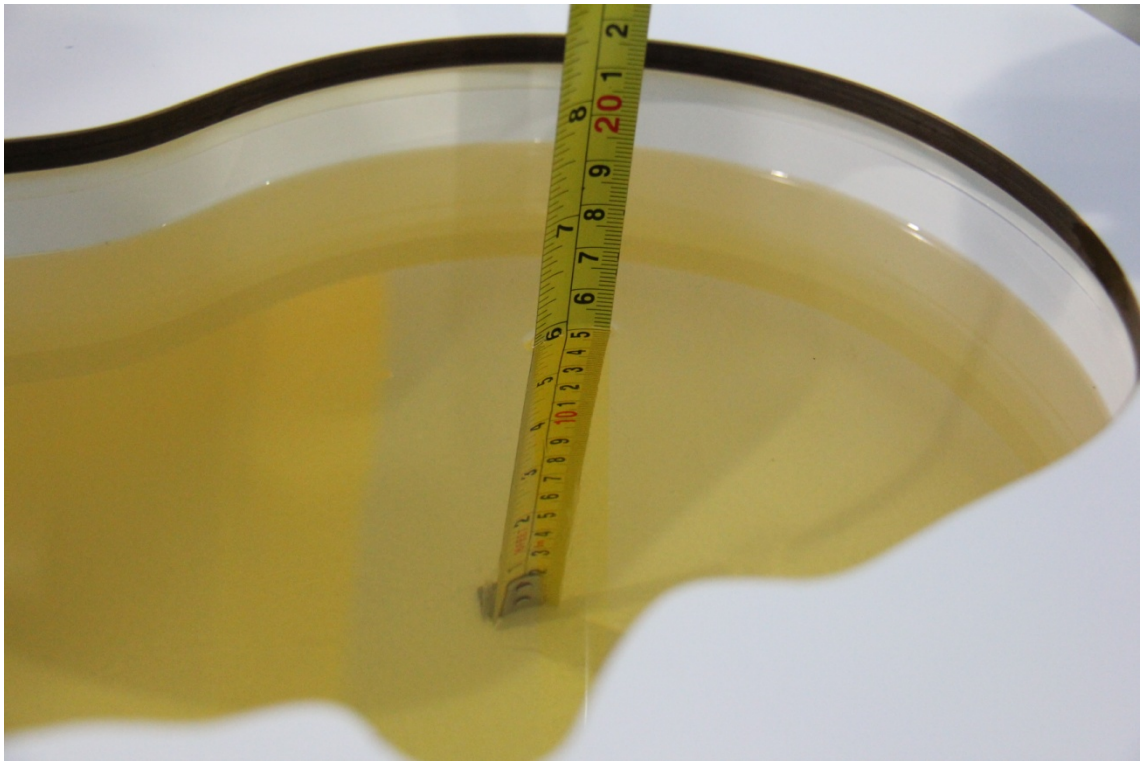
Frequency (MHz)	Liquid Type	Conductivity (σ)	± 5% Range	Permittivity (ε)	± 5% Range
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
835	Body	0.97	0.92～1.02	55.2	52.4～58.0
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Body	1.52	1.44～1.60	53.3	50.6～56.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2450	Body	1.95	1.85～2.05	52.7	50.1～55.3

7.2 Dielectric Performance

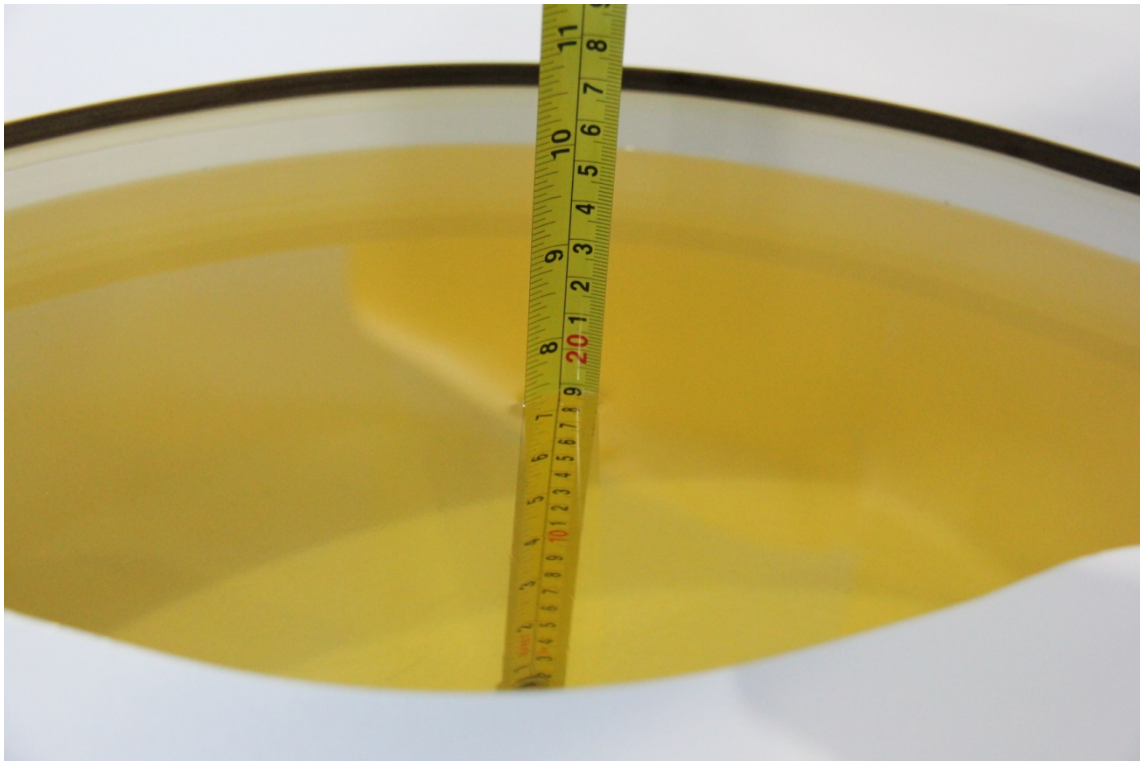
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2013-03-28	Head	835 MHz	40.32	-2.84	0.891	-1.00
	Body	835 MHz	56.11	1.65	0.981	1.13
2013-03-29	Head	1900 MHz	39.24	-1.90	1.418	1.29
	Body	1900 MHz	52.17	-2.12	1.534	0.92
2013-03-26	Head	2450 MHz	39.78	1.48	1.813	0.72
	Body	2450 MHz	51.86	-1.59	1.962	0.62

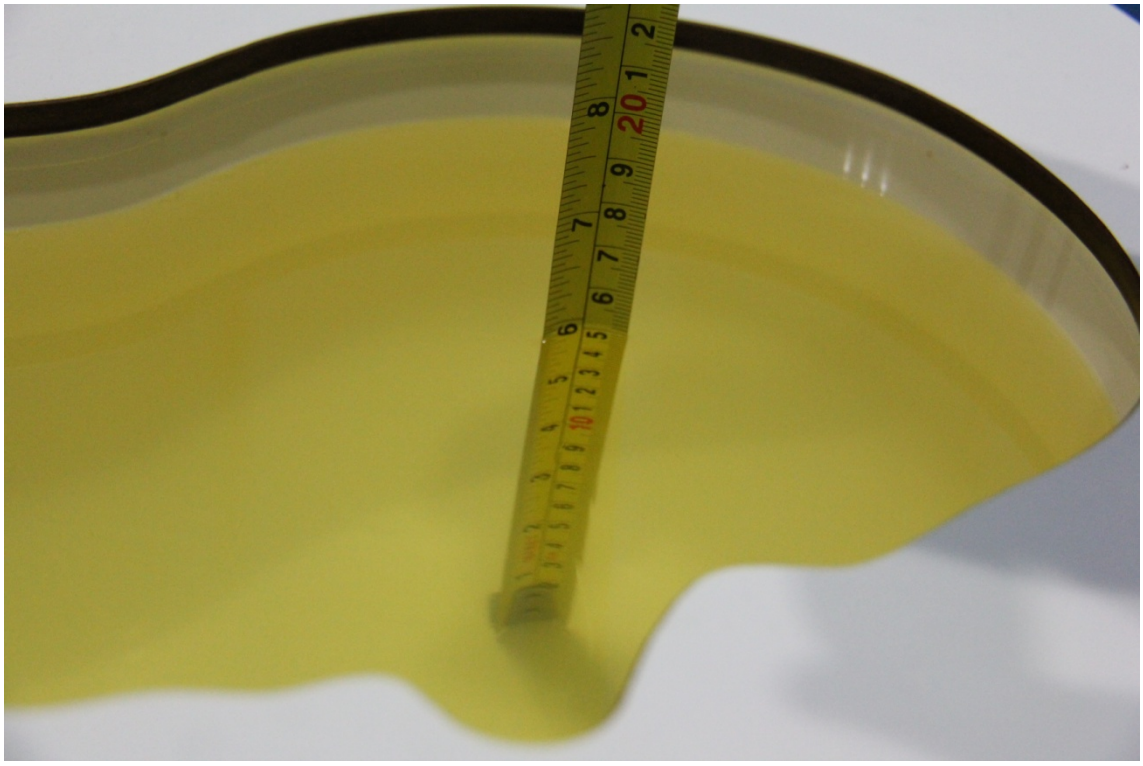
Note: The liquid temperature is 22.0℃



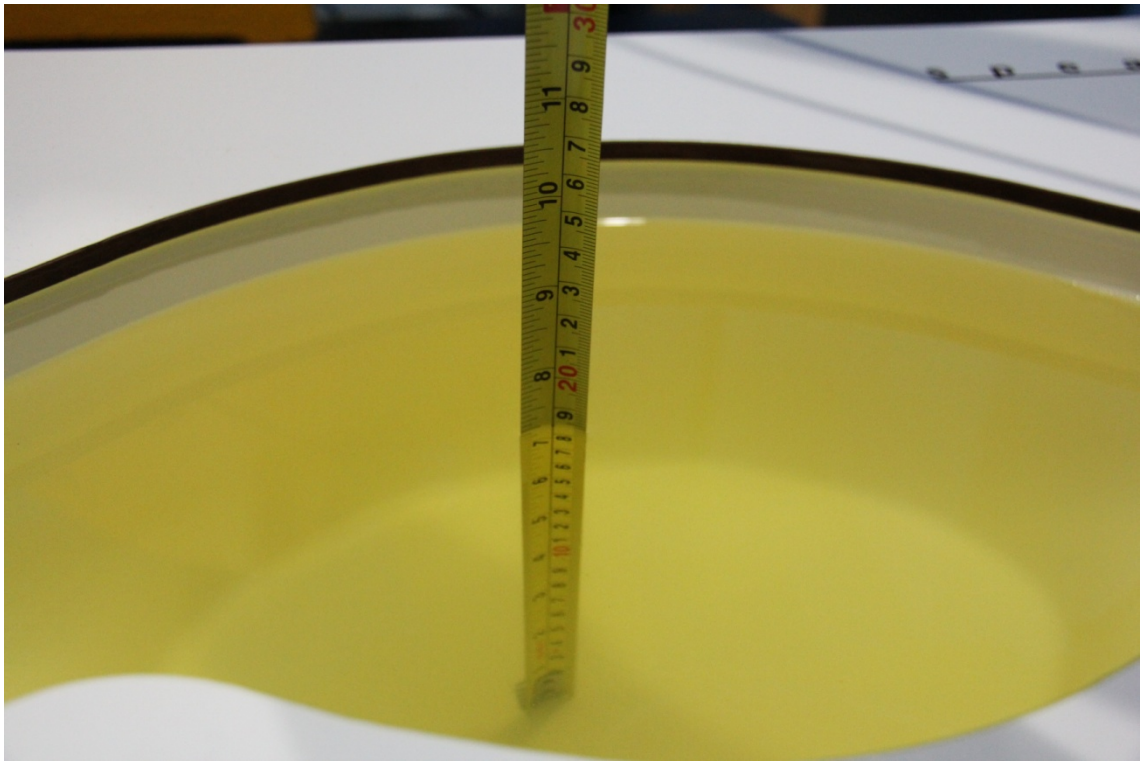
Picture 7-1: Liquid depth in the Head Phantom (835 MHz)



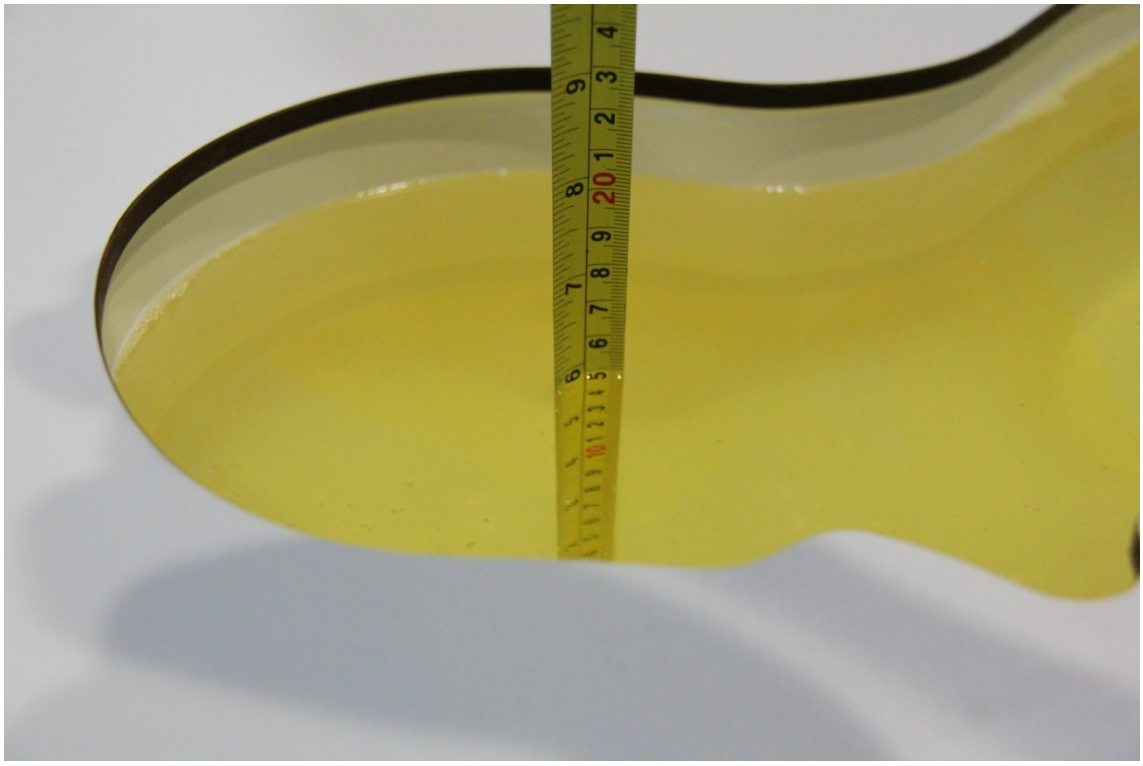
Picture 7-2: Liquid depth in the Flat Phantom (835 MHz)



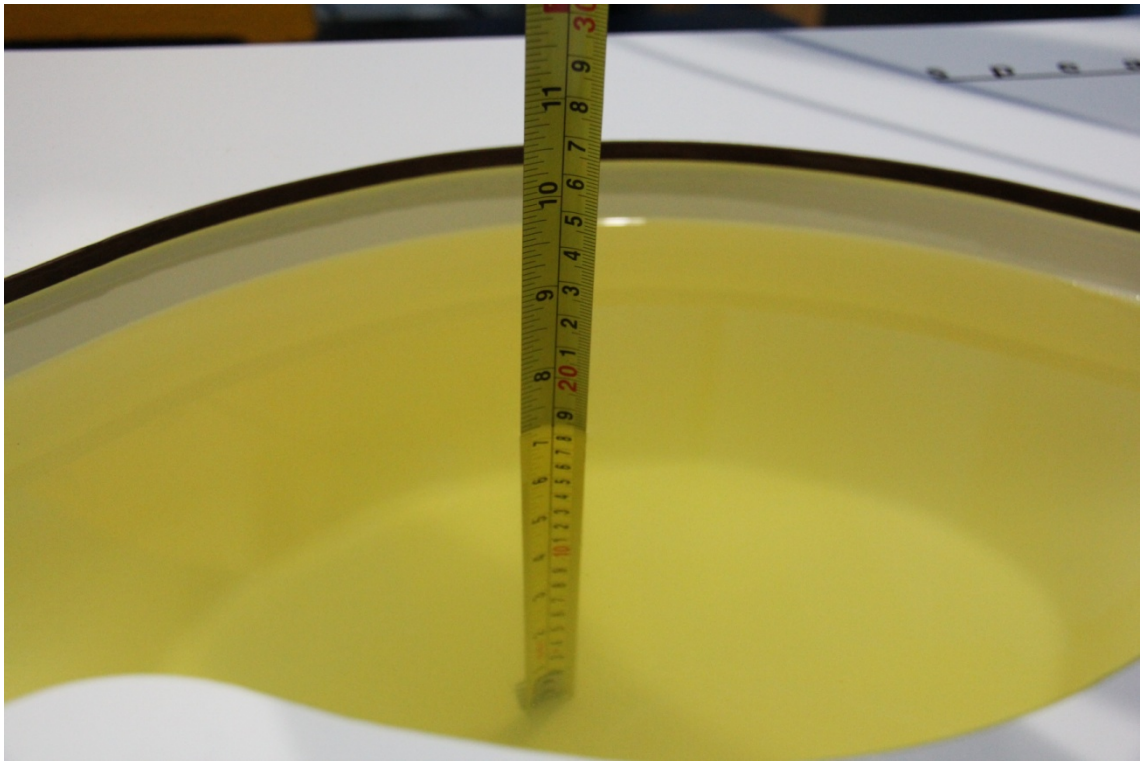
Picture 7-3: Liquid depth in the Head Phantom (1900 MHz)



Picture 7-4 Liquid depth in the Flat Phantom (1900MHz)



Picture 7-5 Liquid depth in the Head Phantom (2450MHz)

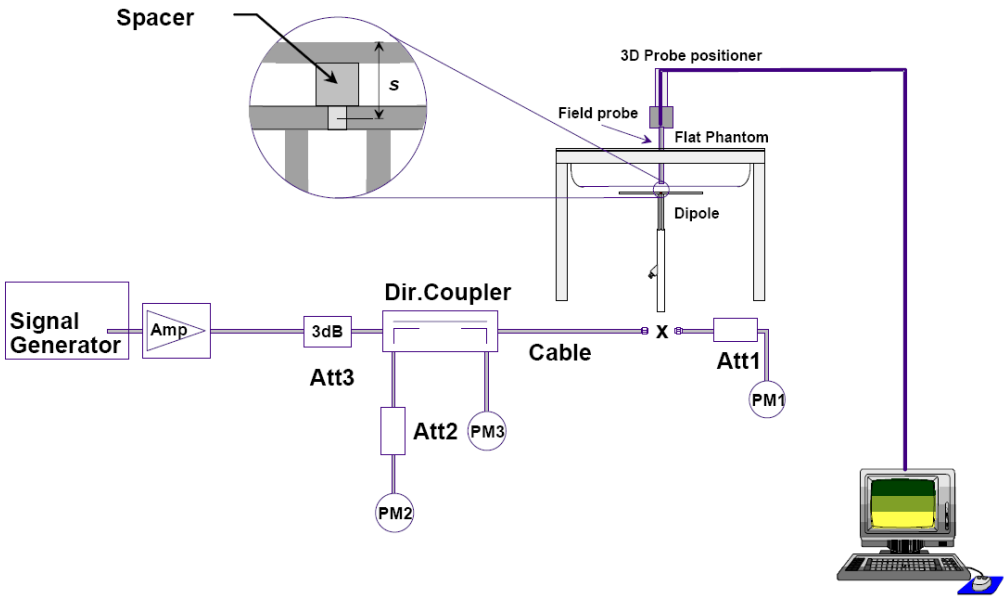


Picture 7-6 Liquid depth in the Flat Phantom (2450MHz)

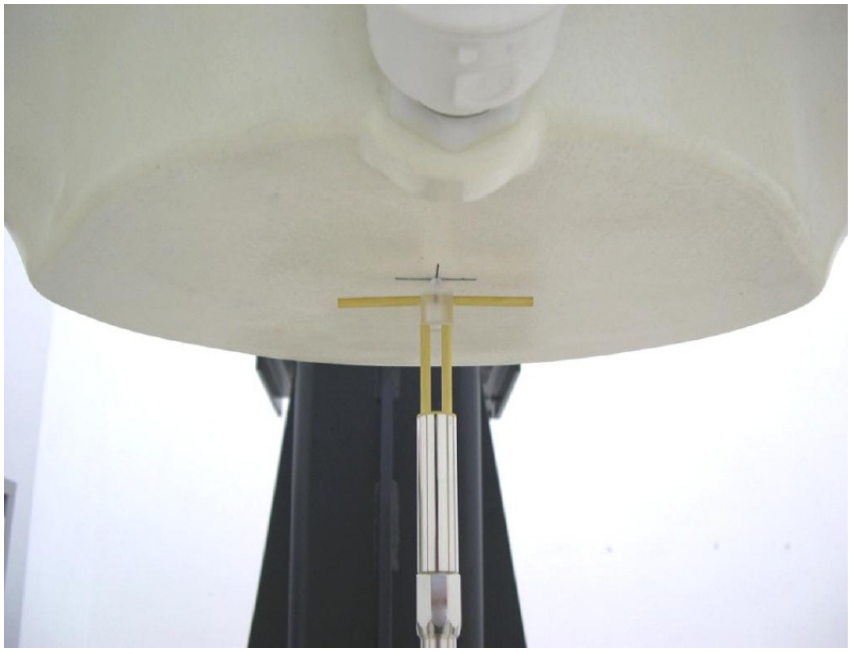
8 System verification

8.1 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

The system verification results are required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR. The details are presented in annex B.

Table 8.1: System Verification of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2013-03-28	835 MHz	6.07	9.30	6.28	9.68	3.46%	4.09%
2013-03-29	1900 MHz	20.6	39.1	20.32	38.64	-1.36%	-1.18%
2013-03-26	2450 MHz	24.4	52.4	23.84	51.20	-2.30%	-2.29%

Table 8.2: System Verification of Body

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value (W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2013-03-28	835 MHz	6.20	9.36	6.32	9.52	1.94%	1.71%
2013-03-29	1900 MHz	21.3	39.9	22.12	41.20	3.85%	3.26%
2013-03-26	2450 MHz	23.6	50.4	24.28	51.60	2.88%	2.38%

9 Measurement Procedures

9.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in picture 9.1.

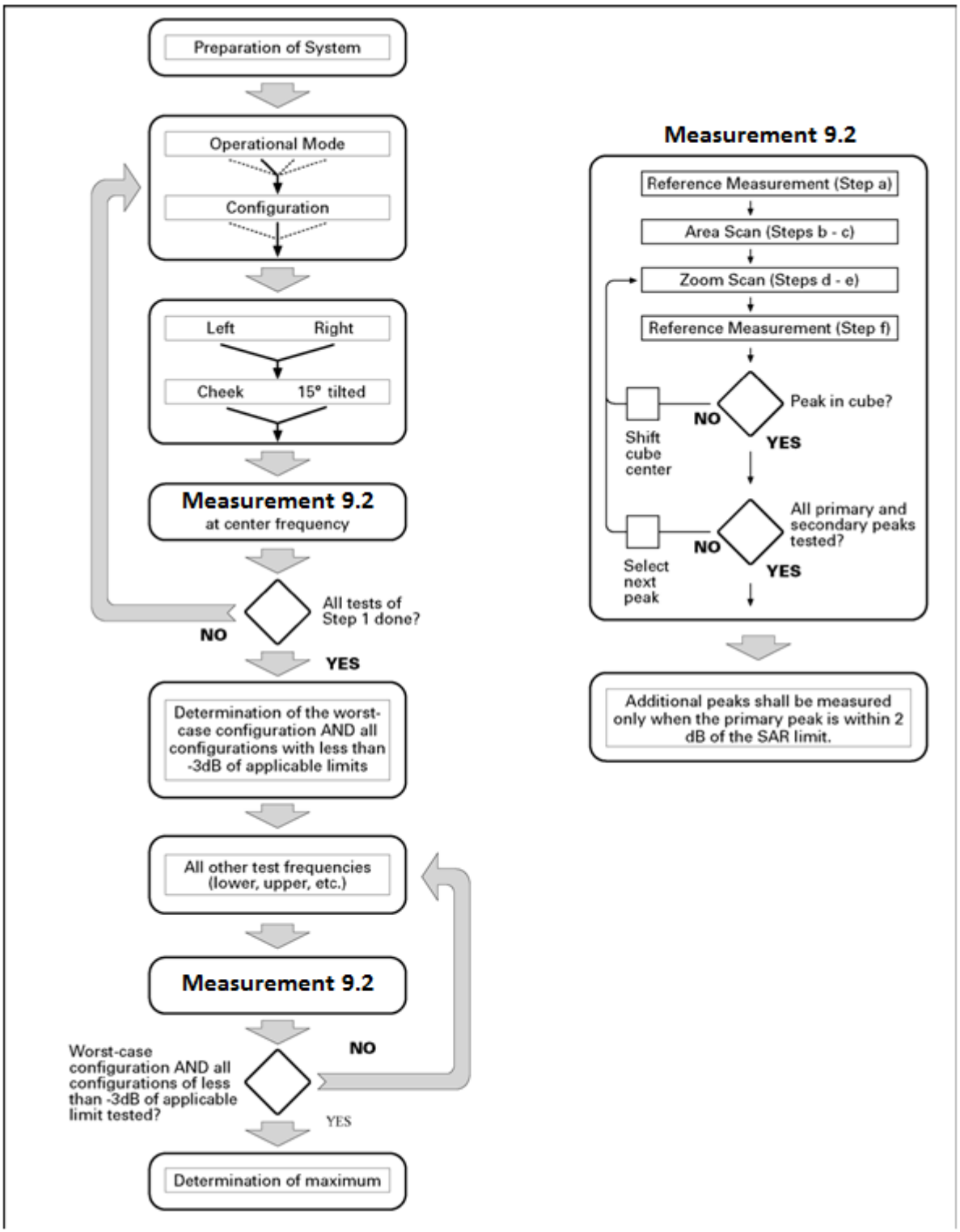
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in annex D),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., N_c > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 9.1 Block diagram of the tests to be performed

9.2 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2003. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

9.3 SAR Measurement for CDMA

The tests of SAR and power are performed with a base station simulator (E5515C) based on the KDB941225 D01. It is performed with maximum output power during SAR testing.

9.4 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.
Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

In order to testing the conducted power of WLAN, the DUT is controlled to transmit WLAN TX as maximum power by the terminal software installed on the PC. The procedure how to control is presented as blew:
1. Connect DUT and PC via the USB cable and check the port is opened.
2. Input the command "WLPU" to power on WLAN.
3. Input the command "WTFD" to firmware download.
4. Input the WBTX command to start transmit (i.e., WBTX=1,0,1,1500,25,0,12).
5. Input the command "WIDL" to stop transmit.
6. Input the command "WLPD" to power off WLAN.

9.5 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 14.2 to Table 14.29 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

According to the KDB447498 D01 v05, when the implementation is based the specific polynomial fit algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007) and the estimated 1-g SAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements, peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. The SAR system verification must also demonstrate that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR (See Annex B). When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

10.2 Fast SAR Algorithms

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empirically determined by analyzing a large number of phones. The MOTOROLA FAST SAR was developed and validated by the MOTOROLA Research Group in Ft. Lauderdale.

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz) and for both 1- and 10-g averaged SAR using a sample of 264 SAR measurements from 55 wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm are 1.2% and 5.8% for 1- and 10-g averaged SAR, respectively. The paper describing the algorithm in detail is expected to be published in August 2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomial fit whereby the frequency validity was extended to cover the range 30-6000MHz. Details of this study can be found in the BEMS 2007 Proceedings.

Both algorithms are implemented in DASY software.

11 Conducted Output Power

When WiFi Hotspot mode is activated (AP ON), in all operating modes, the conducted output power will be reduced for PCS1900 and CDMA2000 BC1. When WiFi Hotspot mode is deactivated (AP OFF), the RF output power level return to their normal RF power level. The power reduction is only applied for MSM8960 antenna.

11.1 Manufacturing tolerance

When the hotspot mode is ON (MSM8960 antenna):

Table 11.1: GPRS and EGPRS for PCS1900

PCS 1900 GPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	28.8	28.8	28.8
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
2 Txslots	Target (dBm)	25.5	25.5	25.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
3Txslots	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
4 Txslots	Target (dBm)	22.5	22.5	22.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	28.8	28.8	28.8
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
2 Txslots	Target (dBm)	25.5	25.5	25.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
3Txslots	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
4 Txslots	Target (dBm)	22.5	22.5	22.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (8PSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
2 Txslots	Target (dBm)	21.5	21.5	21.5
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
3Txslots	Target (dBm)	20.5	20.5	20.5
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
4 Txslots	Target (dBm)	19.5	19.5	19.5
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0

Table 11.2: CDMA2000 BC1

CDMA2000 BC1			
Channel	Channel 1175	Channel 600	Channel 25
Target (dBm)	20.2	20.2	20.2
Tolerance ±(dB)	-0.8 ~ +0.8	-0.8 ~ +0.8	-0.8 ~ +0.8

When the hotspot mode is OFF:

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Table 11.3: GSM Speech

GSM 850			
Channel	Channel 251	Channel 190	Channel 128
Target (dBm)	32.5	32.5	32.5
Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
PCS 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	30	30	30
Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0

Table 11.4: GPRS and EGPRS

GSM 850 GPRS (GMSK)				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	32.5	32.5	32.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
2 Txslots	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
3Txslots	Target (dBm)	27.5	27.5	27.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
4 Txslots	Target (dBm)	26.5	26.5	26.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
GSM 850 EGPRS (GMSK)				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	32.5	32.5	32.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
2 Txslots	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
3Txslots	Target (dBm)	27.5	27.5	27.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5
4 Txslots	Target (dBm)	26.5	26.5	26.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5

GSM 850 EGPRS (8PSK)				
Channel		**251**	**190**	**128**
1 Txslot	Target (dBm)	27	27	27
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
2 Txslots	Target (dBm)	24	24	24
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
3Txslots	Target (dBm)	23	23	23
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
4 Txslots	Target (dBm)	22	22	22
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
PCS 1900 GPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	30	30	30
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
2 Txslots	Target (dBm)	27	27	27
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
3Txslots	Target (dBm)	25	25	25
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
4 Txslots	Target (dBm)	24	24	24
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	30	30	30
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
2 Txslots	Target (dBm)	27	27	27
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
3Txslots	Target (dBm)	25	25	25
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
4 Txslots	Target (dBm)	24	24	24
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (8PSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	26	26	26
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
2 Txslots	Target (dBm)	23	23	23
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
3Txslots	Target (dBm)	22	22	22
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0
4 Txslots	Target (dBm)	21	21	21
	Tolerance ±(dB)	-1.5 ~ +2.0	-1.5 ~ +2.0	-1.5 ~ +2.0

Table 11.5: CDMA2000

CDMA2000 BC0			
Channel	Channel 777	Channel 384	Channel 1013
Target (dBm)	24	24	24
Tolerance ±(dB)	-0.8 ~ +0.8	-0.8 ~ +0.8	-0.8 ~ +0.8
CDMA2000 BC1			
Channel	Channel 1175	Channel 600	Channel 25
Target (dBm)	24	24	24
Tolerance ±(dB)	-0.8 ~ +0.8	-0.8 ~ +0.8	-0.8 ~ +0.8

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Table 11.6: GSM Speech

PCS 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	29.5	29.5	29.5
Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0

Table 11.7: GPRS and EGPRS

PCS 1900 GPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (GMSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	-1.0 ~ +1.0	-1.0 ~ +1.0	-1.0 ~ +1.0
PCS 1900 EGPRS (8PSK)				
Channel		**810**	**661**	**512**
1 Txslot	Target (dBm)	25.5	25.5	25.5
	Tolerance ±(dB)	-1.0 ~ +1.5	-1.0 ~ +1.5	-1.0 ~ +1.5

3. BT&WiFi antenna

Table 11.8: Bluetooth

Bluetooth			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	4	4	4
Tolerance ±(dB)	-4.0 ~ +6.0	-4.0 ~ +6.0	-4.0 ~ +6.0

Table 11.9: WiFi

Mode	Target (dBm)	Tolerance ±(dB)
802.11 b	13	-3.0 ~ +3.0
802.11 g	13	-3.0 ~ +2.0
802.11 n (2.4GHz)	10	-3.0 ~ +3.0

11.2 GSM Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

1. MSM8960 antenna

Table 11.10: The conducted power measurement results for GSM850/1900

GSM 850MHz	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	33.93	33.91	33.94
PCS 1900MHz	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	30.90	30.81	30.73

Table 11.11: The conducted power measurement results for GPRS and EGPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	33.95	33.93	33.96	-9.03dB	**24.92**	**24.90**	**24.93**
2 Txslots	30.45	30.49	30.51	-6.02dB	24.43	24.47	24.49
3Txslots	28.43	28.97	28.83	-4.26dB	24.17	24.71	24.57
4 Txslots	27.38	27.90	27.84	-3.01dB	24.37	24.89	24.83
GSM 850 EGPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	33.95	33.96	33.94	-9.03dB	**24.92**	**24.93**	**24.91**
2 Txslots	30.43	30.49	30.50	-6.02dB	24.41	24.47	24.48
3Txslots	28.40	28.98	28.84	-4.26dB	24.14	24.72	24.58
4 Txslots	27.39	27.93	27.88	-3.01dB	24.38	24.92	24.87
GSM 850 EGPRS (8PSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	27.01	27.03	27.09	-9.03dB	17.98	18.00	18.06
2 Txslots	25.50	25.58	25.66	-6.02dB	19.48	19.56	19.64
3Txslots	24.49	24.56	24.62	-4.26dB	20.23	20.30	20.36
4 Txslots	23.40	23.47	23.55	-3.01dB	**20.39**	**20.46**	**20.54**
PCS1900 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	30.93	30.85	30.80	-9.03dB	**21.90**	**21.82**	**21.77**
2 Txslots	27.69	27.59	27.57	-6.02dB	21.67	21.57	21.55
3Txslots	25.59	25.55	25.44	-4.26dB	21.33	21.29	21.18
4 Txslots	24.32	24.31	24.29	-3.01dB	21.31	21.30	21.28
PCS1900	Measured Power (dBm)			calculation	Averaged Power (dBm)		

EGPRS (GMSK)	**810**	**661**	**512**		**810**	**661**	**512**
1 Txslot	30.90	30.83	30.75	-9.03dB	**21.87**	**21.80**	**21.72**
2 Txslots	27.65	27.53	27.48	-6.02dB	21.63	21.51	21.46
3Txslots	25.50	25.48	25.37	-4.26dB	21.24	21.22	21.11
4 Txslots	24.35	24.33	24.30	-3.01dB	21.34	21.32	21.29
PCS1900	Measured Power (dBm)			calculation	Averaged Power (dBm)		
EGPRS (8PSK)	**810**	**661**	**512**		**810**	**661**	**512**
1 Txslot	26.37	26.36	26.37	-9.03dB	17.34	17.33	17.34
2 Txslots	24.49	24.45	24.47	-6.02dB	18.47	18.43	18.45
3Txslots	23.47	23.40	23.41	-4.26dB	19.21	19.14	19.15
4 Txslots	22.42	22.37	22.39	-3.01dB	**19.41**	**19.36**	**19.38**

NOTES:

1) Division Factors

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

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

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

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

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

According to the conducted power as above, the body measurements are performed with 1Txslots for GPRS and EGPRS.

Note: According to the KDB941225 D03, "when SAR tests for EDGE or EGPRS mode is necessary, GMSK modulation should be used".

2. QSC1215 antenna

3. Table 11.12: The conducted power measurement results for PCS 1900

PCS 1900MHz	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	30.02	30.06	30.05

Table 11.13: The conducted power measurement results for GPRS and EGPRS

PCS1900 GPRS (GMSK)	Measured Power (dBm)		
	810	**661**	**512**
1 Txslot	30.04	30.10	30.08
PCS1900 EGPRS (GMSK)	Measured Power (dBm)		
	810	**661**	**512**
1 Txslot	30.05	30.12	30.10
PCS1900 EGPRS (8PSK)	Measured Power (dBm)		
	810	**661**	**512**
1 Txslot	25.56	25.60	25.54

According to the conducted power as above, the body measurements are performed with 1Txslots for GPRS and EGPRS.

Note: According to the KDB941225 D03, "when SAR tests for EDGE or EGPRS mode is necessary, GMSK modulation should be used".

11.3 CDMA Measurement result

Table 11.14: The conducted power measurement results for CDMA

	Conducted Power (dBm)		
CDMA2000 BC0 SO55/RC3	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	24.73	24.71	24.79
CDMA2000 BC0 SO55/RC1	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	24.70	24.67	24.78
CDMA2000 BC0 SO32/RC3 (FCH)	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	24.69	24.72	24.79
CDMA2000 BC0 SO32/RC3 (FCH+SCH$_0$)	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	24.69	24.68	24.76
CDMA2000 BC0 EVDO Rev.0	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	23.97	24.09	24.16
CDMA2000 BC0 EVDO Rev.A	**Channel 777(848.31MHz)**	**Channel 384(836.52MHz)**	**Channel 1013(824.7MHz)**
	24.02	24.04	24.12
	Conducted Power (dBm)		
CDMA2000 BC1 SO55/RC3	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	24.70	24.68	24.76
CDMA2000 BC1 SO55/RC1	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	24.74	24.74	24.77
CDMA2000 BC1 SO32/RC3 (FCH)	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	24.75	24.72	24.78
CDMA2000 BC1 SO32/RC3 (FCH+SCH$_0$)	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	24.73	24.72	24.79
CDMA2000 BC1 EVDO Rev.0	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	23.86	23.57	23.74
CDMA2000 BC1 EVDO Rev.A	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	23.78	23.42	23.72

According to the KDB 941225 D01 and the conducted power above, the SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. The SAR for body exposure configurations is measured in RC3 with the DUT configured using SO32.

11.4 Wi-Fi and BT Measurement result

The output power of BT antenna is as following:

Mode	Peak Conducted Power (dBm)		
	Channel 0 (2402MHz)	Channel 39 (2441MHz)	Channel 78 (2480MHz)
GFSK	5.79	6.29	6.50
EDR2M-4_DQPSK	4.37	4.83	5.03
EDR3M-8DPSK	4.36	4.82	5.02

The average conducted power for Wi-Fi is as following:

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	15.37	15.24	14.92	14.47
6	15.77	15.61	15.27	14.83
11	15.85	15.15	15.34	14.36

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	14.34	13.88	13.64	13.24	13.32	12.23	11.73	11.53
6	14.58	14.33	14.10	14.19	13.81	12.70	12.18	12.00
11	14.51	14.36	13.64	13.25	12.85	12.76	12.25	12.07

802.11n（dBm）- HT20 (2.4G)

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	12.26	11.52	11.72	11.44	10.57	10.21	10.02	9.38
6	12.76	12.48	11.70	11.95	11.55	11.18	10.50	10.34
11	13.36	12.60	12.36	12.08	11.67	11.32	10.65	10.98

11.5 Hotspot

There is power reduction enabled for this model for PCS1900 and CDMA BC1 with antenna MSM8960. The power reduction is enabled when the user enables hotspot mode via the manufacturer software. The tables below show the measured powers with hotspot.

Table 11.15: The conducted power measurement results for GPRS and EGPRS

PCS1900 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	29.50	29.40	29.23	-9.03dB	**20.47**	**20.37**	**20.20**
2 Txslots	26.25	26.30	26.21	-6.02dB	20.23	20.28	20.19
3Txslots	24.08	24.12	24.09	-4.26dB	19.82	19.86	19.83
4 Txslots	23.09	23.18	23.13	-3.01dB	20.08	20.17	20.12
PCS1900 EGPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	29.49	29.34	29.20	-9.03dB	**20.46**	**20.31**	**20.17**
2 Txslots	26.20	26.24	26.17	-6.02dB	20.18	20.22	20.15
3Txslots	24.11	24.13	24.07	-4.26dB	19.85	19.87	19.81
4 Txslots	23.08	23.17	23.12	-3.01dB	20.07	20.16	20.11

PCS1900 EGPRS (8PSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	25.31	25.35	25.34	-9.03dB	16.28	16.32	16.31
2 Txslots	23.38	23.39	23.35	-6.02dB	17.36	17.37	17.33
3Txslots	22.30	22.32	22.33	-4.26dB	18.04	18.06	18.07
4 Txslots	21.20	21.38	21.23	-3.01dB	**18.19**	**18.37**	**18.22**

NOTES:

1) Division Factors

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

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

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

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

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

According to the conducted power as above, the body measurements are performed with 1Txslots for GPRS and EGPRS.

Table 11.16: The conducted power measurement results for CDMA BC1

	Conducted Power (dBm)		
CDMA2000 BC1 SO55/RC3	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	20.70	20.59	20.64
CDMA2000 BC1 SO55/RC1	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	20.69	20.62	20.67
CDMA2000 BC1 SO32/RC3 (FCH)	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	20.66	20.54	20.65
CDMA2000 BC1 SO32/RC3 (FCH+SCH$_0$)	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	20.68	20.57	20.64
CDMA2000 BC1 EVDO Rev.0	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	19.73	19.38	19.68
CDMA2000 BC1 EVDO Rev.A	**Channel 1175(1908.75MHz)**	**Channel 600(1880MHz)**	**Channel 25(1851.25MHz)**
	19.69	19.30	19.65

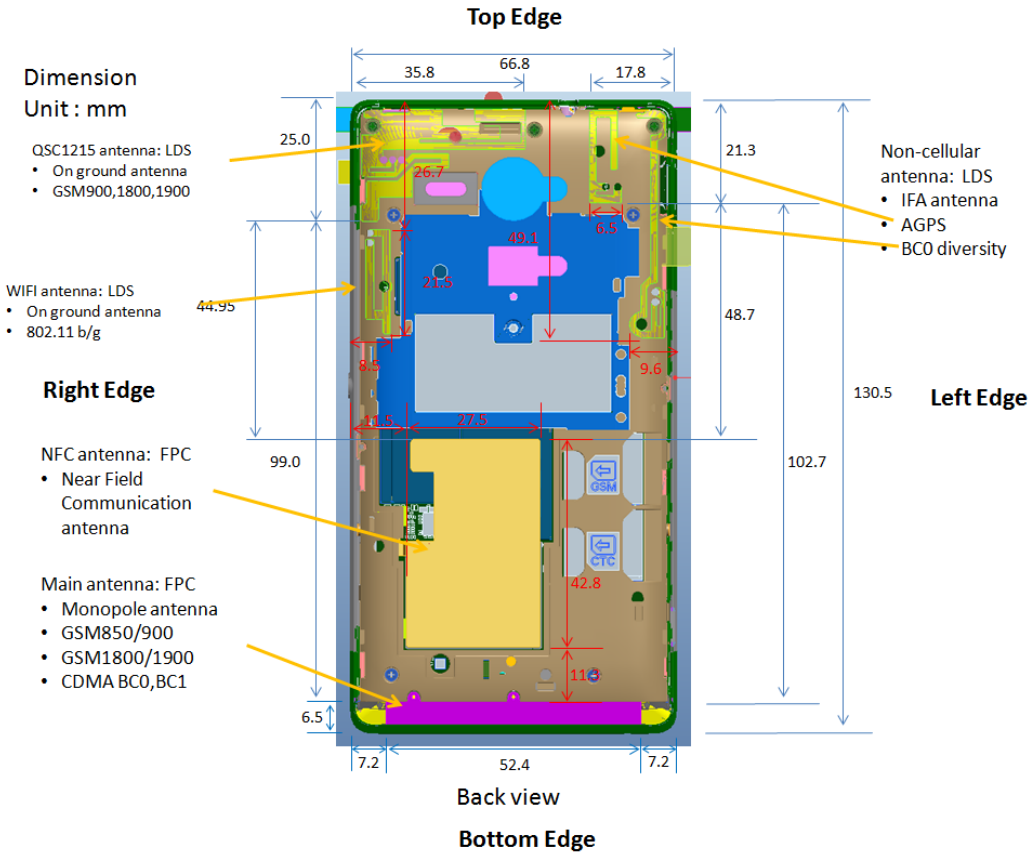
According to the KDB 941225 D01 and the conducted power above, the SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. The SAR for body exposure configurations is measured in RC3 with the DUT configured using SO32.

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

12.3 SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v01, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Antenna MSM8960	Yes	Yes	Yes	Yes	No	Yes
Antenna QSC1215	Yes	Yes	No	Yes	Yes	No
WLAN	Yes	Yes	No	Yes	Yes	No

12.4 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

Picture 12.2 Power Thresholds

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
			dBm	mW	
Bluetooth	2.441	19	6.50	4.47	Yes
2.4GHz WLAN 802.11 b	2.45	19	15.85	38.46	No

13 Evaluation of Simultaneous

It is available to work simultaneously for three antennas. So it is estimated by the sum of reported SAR values for three antennas.

Table 13.1: The sum of reported SAR values for MSM8960, QSC1215 and WiFi

	Position	MSM8960	QSC1215	WiFi	Sum
Highest reported value for Head	Left hand, Touch cheek	0.44	0.58	0.13	**1.15**
	Left hand, Tilt 15°	0.43	0.65	0.04	**1.12**
Highest reported SAR value for Body	Rear	0.60	0.59	0.09	**1.28**

Table 13.2: The sum of reported SAR values for MSM8960, QSC1215 and Bluetooth

	Position	MSM8960	QSC1215	BT*	Sum
Highest reported value for Head	Left hand, Touch cheek	0.44	0.58	0.21	**1.23**
	Left hand, Tilt 15°	0.43	0.65	0.21	**1.29**
Highest reported SAR value for Body	Rear	0.60	0.59	0.21	**1.40**

BT* - Estimated SAR for Bluetooth (see the table 13.3)

Table 13.3: Estimated SAR for Bluetooth

Mode/Band	F (GHz)	Distance (mm)	Upper limit of power *		Estimated$_{1g}$ (W/kg)
			dBm	mW	
Bluetooth	2.441	10	10	10	0.21

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Conclusion:
According to the above tables, the sum of reported SAR values is < 1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 10mm for data and 15mm for speech in all bands except GSM1900/CDMA BC1 and just applied to the condition of body worn accessory. About GSM1900/CDMA BC1, the distance is 10mm for AP ON and 15mm for AP OFF.
It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.
The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target}-P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;
$P_{Measured}$ is the measured power in chapter 11.

Table 14.1: Duty Cycle

AP OFF	**Duty Cycle**
Speech for GSM850/1900	1:8.3
GPRS&EGPRS for GSM850/1900	1:8.3
CDMA BC0/BC1&WiFi	1:1
AP ON	**Duty Cycle**
GPRS&EGPRS for GSM1900	1:8.3
CDMA BC1	1:1

14.1 SAR results for Fast SAR

14.1.1 Antenna MSM8960

Table 14.2: SAR Values (GSM 850 MHz Band - Head) – AP OFF

Ambient Temperature: 22.8 °C					Liquid Temperature: 22.4 °C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
848.8	251	Left	Touch	Fig.1	33.93	0.247	**0.25**	0.314	**0.32**	0.04
836.6	190	Left	Touch	/	33.91	0.202	**0.21**	0.293	**0.30**	0.07
824.2	128	Left	Touch	/	33.94	0.176	**0.18**	0.254	**0.26**	0.09
836.6	190	Left	Tilt	/	33.91	0.179	**0.18**	0.288	**0.29**	0.11
848.8	251	Right	Touch	/	33.93	0.232	**0.24**	0.301	**0.31**	0.10
836.6	190	Right	Touch	/	33.91	0.190	**0.19**	0.274	**0.28**	0.06
824.2	128	Right	Touch	/	33.94	0.168	**0.17**	0.242	**0.25**	0.08
836.6	190	Right	Tilt	/	33.91	0.126	**0.13**	0.180	**0.18**	0.07

Table 14.3: SAR Values (GSM 850 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
848.8	251	GPRS (1)	Front	Fig.2	33.95	0.396	**0.40**	0.513	**0.52**	0.06
836.6	190	GPRS (1)	Front	/	33.93	0.356	**0.36**	0.461	**0.47**	0.04
824.2	128	GPRS (1)	Front	/	33.96	0.380	**0.38**	0.494	**0.50**	-0.08
836.6	190	GPRS (1)	Rear	/	33.93	0.320	**0.33**	0.432	**0.44**	0.00
836.6	190	GPRS (1)	Left	/	33.93	0.313	**0.32**	0.453	**0.46**	-0.02
836.6	190	GPRS (1)	Right	/	33.93	0.232	**0.24**	0.337	**0.34**	0.09
836.6	190	GPRS (1)	Bottom	/	33.93	0.101	**0.10**	0.192	**0.20**	0.11
848.8	251	EGPRS (1)	Front	/	33.95	0.393	**0.40**	0.512	**0.52**	-0.06
848.8	251	Speech	Front (Headset)	/	33.93	0.271	**0.28**	0.353	**0.36**	0.08

Note1: The distance between the EUT and the phantom bottom is 10mm for data and 15mm for speech.
Note2: The type of Headset is MH410c

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Table 14.4: SAR Values (GSM 1900 MHz Band - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1909.8	810	Left	Touch	/	30.90	0.055	**0.06**	0.094	**0.10**	0.13
1880	661	Left	Touch	/	30.81	0.065	**0.07**	0.112	**0.12**	0.17
1850.2	512	Left	Touch	Fig.3	30.73	0.080	**0.09**	0.135	**0.14**	0.11
1880	661	Left	Tilt	/	30.81	0.016	**0.02**	0.029	**0.03**	0.04
1909.8	810	Right	Touch	/	30.90	0.040	**0.04**	0.073	**0.07**	-0.14
1880	661	Right	Touch	/	30.81	0.042	**0.04**	0.078	**0.08**	0.12
1850.2	512	Right	Touch	/	30.73	0.044	**0.05**	0.073	**0.08**	0.11
1880	661	Right	Tilt	/	30.81	0.022	**0.02**	0.039	**0.04**	0.15

Table 14.5: SAR Values (GSM 1900 MHz Band - Body) – AP ON

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	GPRS (1)	Front	/	29.40	0.138	**0.15**	0.260	**0.29**	0.01
1880	661	GPRS (1)	Rear	/	29.40	0.066	**0.07**	0.120	**0.13**	0.02
1880	661	GPRS (1)	Left	/	29.40	0.017	**0.02**	0.029	**0.03**	0.10
1880	661	GPRS (1)	Right	/	29.40	0.00617	**0.01**	0.013	**0.01**	0.03
1909.8	810	GPRS (1)	Bottom	Fig.4	29.50	0.151	**0.16**	0.287	**0.31**	-0.04
1880	661	GPRS (1)	Bottom	/	29.40	0.142	**0.16**	0.268	**0.29**	0.03

1850.2	512	GPRS (1)	Bottom	/	29.23	0.099	**0.11**	0.200	**0.23**	0.03
1909.8	810	EGPRS (1)	Bottom	/	29.49	0.149	**0.16**	0.282	**0.30**	0.01

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.6: SAR Values (GSM 1900 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1909.8	810	GPRS (1)	Front	/	30.93	0.101	**0.10**	0.179	**0.18**	0.10
1880	661	GPRS (1)	Front	/	30.85	0.099	**0.10**	0.171	**0.18**	0.13
1850.2	512	GPRS (1)	Front	/	30.80	0.097	**0.10**	0.169	**0.18**	0.15
1880	661	GPRS (1)	Rear	/	30.85	0.051	**0.05**	0.083	**0.09**	0.18
1909.8	810	EGPRS (1)	Front	/	30.90	0.101	**0.10**	0.178	**0.18**	-0.18
1909.8	810	Speech	Front (Headset)	Fig.5	30.90	0.112	**0.11**	0.192	**0.20**	0.14
1880	661	Speech	Front (Headset)	/	30.81	0.093	**0.10**	0.162	**0.17**	0.16
1850.2	512	Speech	Front (Headset)	/	30.73	0.095	**0.10**	0.165	**0.18**	0.11

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The type of Headset is MH410c

Table 14.7: SAR Values (CDMA BC0 - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
848.31	777	Left	Touch	/	24.73	0.324	**0.33**	0.415	**0.42**	0.08
836.52	384	Left	Touch	Fig.6	24.71	0.338	**0.35**	0.430	**0.44**	-0.15
824.7	1013	Left	Touch	/	24.79	0.222	**0.22**	0.283	**0.28**	0.10
836.52	384	Left	Tilt	Fig.7	24.71	0.292	**0.30**	0.424	**0.43**	0.10
848.31	777	Right	Touch	/	24.73	0.270	**0.27**	0.348	**0.35**	0.12
836.52	384	Right	Touch	/	24.71	0.294	**0.30**	0.376	**0.38**	-0.11
824.7	1013	Right	Touch	/	24.79	0.191	**0.19**	0.245	**0.25**	0.09
836.52	384	Right	Tilt	/	24.71	0.176	**0.18**	0.252	**0.26**	-0.01

Table 14.8: SAR Values (CDMA BC0 - Body) – AP OFF

Ambient Temperature: 22.8 °C		Liquid Temperature: 22.4 °C							
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
848.31	777	Front	/	24.73	0.501	**0.51**	0.648	**0.66**	-0.02
836.52	384	Front	Fig.8	24.71	0.535	**0.55**	0.694	**0.71**	-0.12
824.7	1013	Front	/	24.79	0.363	**0.36**	0.471	**0.47**	0.00
836.52	384	Rear	Fig.9	24.71	0.437	**0.45**	0.585	**0.60**	0.06
836.52	384	Left	/	24.71	0.422	**0.43**	0.609	**0.62**	0.08
836.52	384	Right	/	24.71	0.323	**0.33**	0.471	**0.48**	0.01
836.52	384	Bottom	/	24.71	0.137	**0.14**	0.258	**0.26**	0.06
836.52	384	Front (Headset)	/	24.71	0.316	**0.32**	0.410	**0.42**	0.00

Note1: The distance between the EUT and the phantom bottom is 10mm for data and 15mm for speech.
Note2: The type of Headset is MH410c

Table 14.9: SAR Values (CDMA BC1 - Head) – AP OFF

Ambient Temperature: 22.8 °C		Liquid Temperature: 22.3 °C								
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1908.75	1175	Left	Touch	/	24.70	0.094	**0.10**	0.163	**0.17**	-0.14
1880	600	Left	Touch	Fig.10	24.68	0.206	**0.21**	0.328	**0.34**	0.15
1851.25	25	Left	Touch	/	24.76	0.090	**0.09**	0.151	**0.15**	0.14
1880	600	Left	Tilt	/	24.68	0.074	**0.08**	0.130	**0.13**	-0.07
1908.75	1175	Right	Touch	/	24.70	0.065	**0.07**	0.113	**0.12**	0.17
1880	600	Right	Touch	/	24.68	0.131	**0.13**	0.234	**0.24**	0.17
1851.25	25	Right	Touch	/	24.76	0.060	**0.06**	0.098	**0.10**	0.15
1880	600	Right	Tilt	/	24.68	0.099	**0.10**	0.173	**0.18**	0.19

Table 14.10: SAR Values (CDMA BC1 - Body) – AP ON

Ambient Temperature: 22.8 °C		Liquid Temperature: 22.3 °C							
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	600	Front	/	20.59	0.257	**0.28**	0.472	**0.52**	-0.00
1880	600	Rear	/	20.59	0.133	**0.15**	0.227	**0.25**	0.14
1880	600	Left	/	20.59	0.033	**0.04**	0.055	**0.06**	0.12
1880	600	Right	/	20.59	0.011	**0.01**	0.020	**0.02**	0.11
1908.75	1175	Bottom	/	20.70	0.161	**0.17**	0.317	**0.34**	0.03
1880	600	Bottom	Fig.11	20.59	0.254	**0.28**	0.487	**0.53**	-0.04
1851.25	25	Bottom	/	20.64	0.091	**0.10**	0.184	**0.21**	0.17

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.11: SAR Values (CDMA BC1 - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C									
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1908.75	1175	Front	/	24.70	0.216	**0.22**	0.391	**0.40**	0.09
1880	600	Front	Fig.12	24.68	0.436	**0.45**	0.764	**0.79**	0.13
1851.25	25	Front	/	24.76	0.191	**0.19**	0.339	**0.34**	0.13
1880	600	Rear	/	24.68	0.224	**0.23**	0.366	**0.38**	0.09
1880	600	Front (Headset)	/	24.68	0.409	**0.42**	0.664	**0.68**	-0.11

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The type of Headset1 is MH410c

14.1.2 Antenna QSC1215

Table 14.12: SAR Values (GSM 1900 MHz Band - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	Left	Touch	Fig.13	30.06	0.294	**0.33**	0.525	**0.58**	-0.06
1909.8	810	Left	Tilt	/	30.02	0.323	**0.36**	0.565	**0.63**	0.15
1880	661	Left	Tilt	/	30.06	0.309	**0.34**	0.561	**0.62**	-0.17
1850.2	512	Left	Tilt	Fig.14	30.05	0.334	**0.37**	0.583	**0.65**	0.10
1880	661	Right	Touch	/	30.06	0.201	**0.22**	0.369	**0.41**	-0.14
1909.8	810	Right	Tilt	/	30.02	0.258	**0.29**	0.459	**0.51**	-0.17
1880	661	Right	Tilt	/	30.06	0.269	**0.30**	0.472	**0.52**	0.13
1850.2	512	Right	Tilt	/	30.05	0.298	**0.33**	0.509	**0.56**	0.05

Table 14.13: SAR Values (GSM 1900 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	GPRS (1)	Front	/	30.10	0.100	**0.11**	0.165	**0.18**	0.13
1909.8	810	GPRS (1)	Rear	/	30.04	0.246	**0.27**	0.467	**0.52**	0.01
1880	661	GPRS (1)	Rear	/	30.10	0.252	**0.28**	0.477	**0.52**	-0.06
1850.2	512	GPRS (1)	Rear	/	30.08	0.257	**0.28**	0.480	**0.53**	-0.04
1880	661	GPRS (1)	Right	/	30.10	0.083	**0.09**	0.150	**0.16**	-0.15
1880	661	GPRS (1)	Top	/	30.10	0.131	**0.14**	0.230	**0.25**	0.09
1909.8	810	EGPRS (1)	Rear	/	30.05	0.259	**0.29**	0.490	**0.54**	0.00
1880	661	EGPRS (1)	Rear	/	30.12	0.283	**0.31**	0.531	**0.58**	-0.02

1850.2	512	EGPRS (1)	Rear	Fig.15	30.10	0.291	**0.32**	0.539	**0.59**	0.15
1850.2	512	Rear (Headset)	Rear	/	30.05	0.256	**0.28**	0.473	**0.52**	0.04

Note1: The distance between the EUT and the phantom bottom is 10mm for data and 15mm for speech.
Note2: The type of Headset is MH410c

14.1.3 Antenna WiFi

Table 14.14: SAR Values (Wi-Fi 802.11b - Head) – AP OFF

Ambient Temperature: 22.5 °C Liquid Temperature: 22.0 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
2462	11	Left	Touch	/	15.85	0.038	**0.04**	0.086	**0.09**	-0.16
2437	6	Left	Touch	Fig.16	15.77	0.053	**0.06**	0.119	**0.13**	0.18
2412	1	Left	Touch	/	15.37	0.051	**0.06**	0.116	**0.13**	0.13
2437	6	Left	Tilt	/	15.77	0.020	**0.02**	0.039	**0.04**	-0.12
2437	6	Right	Touch	/	15.77	0.025	**0.03**	0.055	**0.06**	0.01
2437	6	Right	Tilt	/	15.77	0.021	**0.02**	0.054	**0.06**	0.15

Table 14.15: SAR Values (Wi-Fi 802.11b - Body) – AP OFF

Ambient Temperature: 22.5 °C Liquid Temperature: 22.0 °C									
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2437	6	Front	/	15.77	0.00254	**0.00**	0.00909	**0.01**	0.11
2462	11	Rear	/	15.85	0.029	**0.03**	0.067	**0.07**	0.15
2437	6	Rear	Fig.17	15.77	0.038	**0.04**	0.085	**0.09**	0.06
2412	1	Rear	/	15.37	0.020	**0.02**	0.059	**0.07**	-0.13
2437	6	Right	/	15.77	0.019	**0.02**	0.037	**0.04**	0.16
2437	6	Top	/	15.77	0.000405	**0.00**	0.00254	**0.00**	0.00

Note1: The distance between the EUT and the phantom bottom is 10mm.

14.2 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

14.2.1 Antenna MSM8960

Table 14.16: SAR Values (GSM 850 MHz Band - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
848.8	251	Left	Touch	Fig.1	33.93	0.247	**0.25**	0.314	**0.32**	0.04

Table 14.17: SAR Values (GSM 850 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
848.8	251	GPRS (1)	Front	Fig.2	33.95	0.396	**0.40**	0.513	**0.52**	0.06

Note1: The distance between the EUT and the phantom bottom is 10mm.

.**Table 14.18: SAR Values (GSM 1900 MHz Band - Head) – AP OFF**

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1850.2	512	Left	Touch	Fig.3	30.73	0.080	**0.09**	0.135	**0.14**	0.11

Table 14.19: SAR Values (GSM 1900 MHz Band - Body) – AP ON

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1909.8	810	GPRS (1)	Bottom	Fig.4	29.50	0.151	**0.16**	0.287	**0.31**	-0.04

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.20: SAR Values (GSM 1900 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1909.8	810	Speech	Front (Headset)	Fig.5	30.90	0.112	**0.11**	0.192	**0.20**	0.14

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The type of Headset is MH410c

Table 14.21: SAR Values (CDMA BC0 - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
836.52	384	Left	Touch	Fig.6	24.71	0.338	**0.35**	0.430	**0.44**	-0.15
836.52	384	Left	Tilt	Fig.7	24.71	0.292	**0.30**	0.424	**0.43**	0.10

Table 14.22: SAR Values (CDMA BC0 - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.4 °C									
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.52	384	Front	Fig.8	24.71	0.535	**0.55**	0.694	**0.71**	-0.12
836.52	384	Rear	Fig.9	24.71	0.437	**0.45**	0.585	**0.60**	0.06

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.23: SAR Values (CDMA BC1 - Head) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C										
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1880	600	Left	Touch	Fig.10	24.68	0.206	**0.21**	0.328	**0.34**	0.15

Table 14.24: SAR Values (CDMA BC1 - Body) – AP ON

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C									
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	600	Bottom	Fig.11	20.59	0.254	**0.28**	0.487	**0.53**	-0.04

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.25: SAR Values (CDMA BC1 - Body) – AP OFF

Ambient Temperature: 22.8 °C Liquid Temperature: 22.3 °C									
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	600	Front	Fig.12	24.68	0.436	**0.45**	0.764	**0.79**	0.13

Note1: The distance between the EUT and the phantom bottom is 15mm.

14.2.2 Antenna QSC1215

Table 14.26: SAR Values (GSM 1900 MHz Band - Head) – AP OFF

Ambient Temperature: 22.8 °C					Liquid Temperature: 22.3 °C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1880	661	Left	Touch	Fig.13	30.06	0.294	**0.33**	0.525	**0.58**	-0.06
1850.2	512	Left	Tilt	Fig.14	30.05	0.334	**0.37**	0.583	**0.65**	0.10

Table 14.27: SAR Values (GSM 1900 MHz Band - Body) – AP OFF

Ambient Temperature: 22.8 °C					Liquid Temperature: 22.3 °C					
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
1850.2	512	EGPRS (1)	Rear	Fig.15	30.10	0.291	**0.32**	0.539	**0.59**	0.15

Note1: The distance between the EUT and the phantom bottom is 10mm.

14.2.3 Antenna WiFi

Table 14.28: SAR Values (Wi-Fi 802.11b - Head) – AP OFF

Ambient Temperature: 22.5 °C					Liquid Temperature: 22.0 °C					
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Left	Touch	Fig.16	15.77	0.053	**0.06**	0.119	**0.13**	0.18

Table 14.29: SAR Values (Wi-Fi 802.11b - Body) – AP OFF

Ambient Temperature: 22.5 °C					Liquid Temperature: 22.0 °C					
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)	
MHz	Ch.									
2437	6	Rear	Fig.17	15.77	0.038	**0.04**	0.085	**0.09**	0.06	

Note1: The distance between the EUT and the phantom bottom is 10mm.

15 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

16 Measurement Uncertainty

16.1 Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521

Combined standard uncertainty	$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					9.25	9.12	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$					18.5	18.2	

16.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.5	N	1	1	1	6.5	6.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43

20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.8	10.7	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.6	21.4	

16.3 Measurement Uncertainty for Fast SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞

Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.1	9.95	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.2	19.9	

16.4 Measurement Uncertainty for Fast SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.5	N	1	1	1	6.5	6.5	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞

Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.3	13.2	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						26.6	26.4	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	February 15, 2013	One year
02	Power meter	NRVD	102083	September 11, 2012	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49070393	November 13, 2012	One Year
05	Amplifier	VTL5400	0505	No Calibration Requested	
06	BTS	E5515C	MY48363198	July 11, 2012	One year
07	E-field Probe	SPEAG ES3DV3	3149	April 24, 2012	One year
08	DAE	SPEAG DAE4	771	November 20, 2012	One year
09	Dipole Validation Kit	SPEAG D835V2	443	May 03, 2012	One year
10	Dipole Validation Kit	SPEAG D1900V2	541	May 09, 2012	One year
11	Dipole Validation Kit	SPEAG D2450V2	853	May 02, 2012	One year

END OF REPORT BODY

ANNEX A Graph Results

Antenna MSM8960
850 Left Cheek High – AP OFF

Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.903 mho/m; εr = 40.158; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.26, 6.26, 6.26)

Cheek High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.334 W/kg

Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.342 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.380 W/kg
SAR(1 g) = 0.314 W/kg; SAR(10 g) = 0.247 W/kg
Maximum value of SAR (measured) = 0.329 W/kg

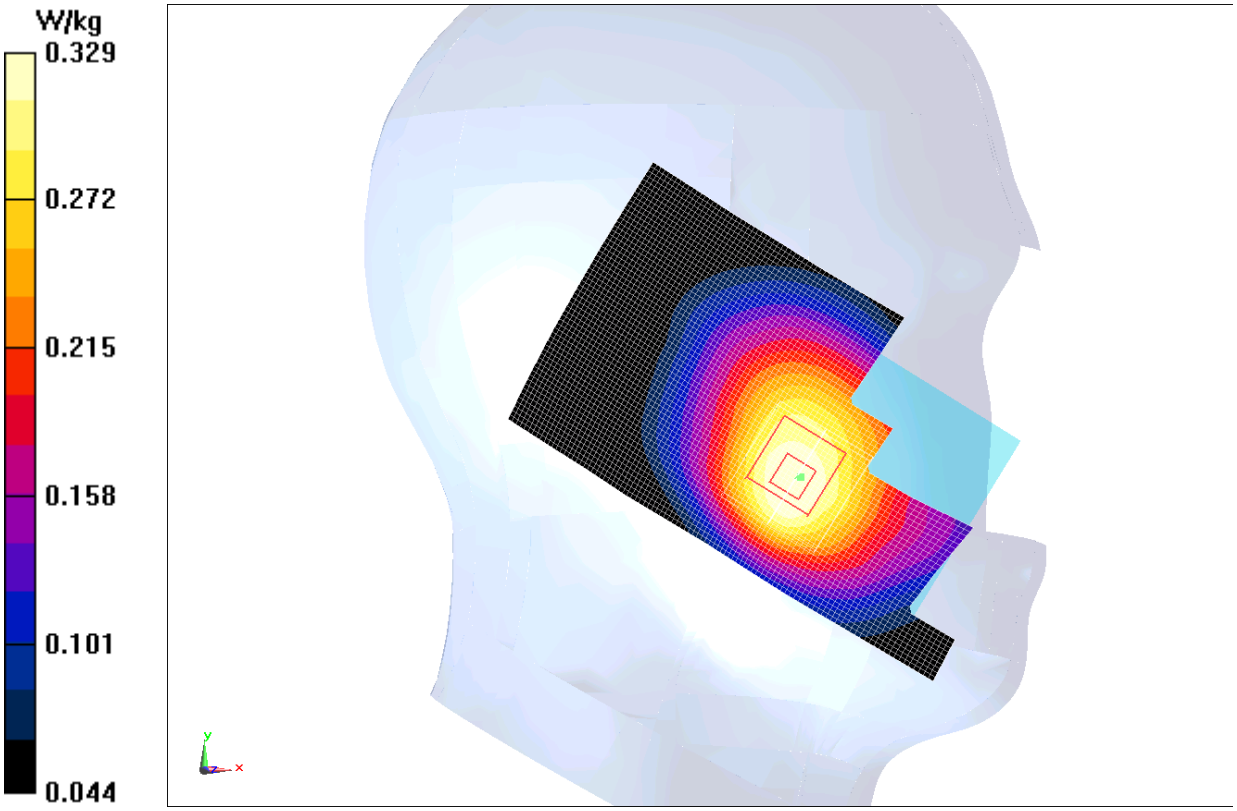

Fig.1 850MHz CH251

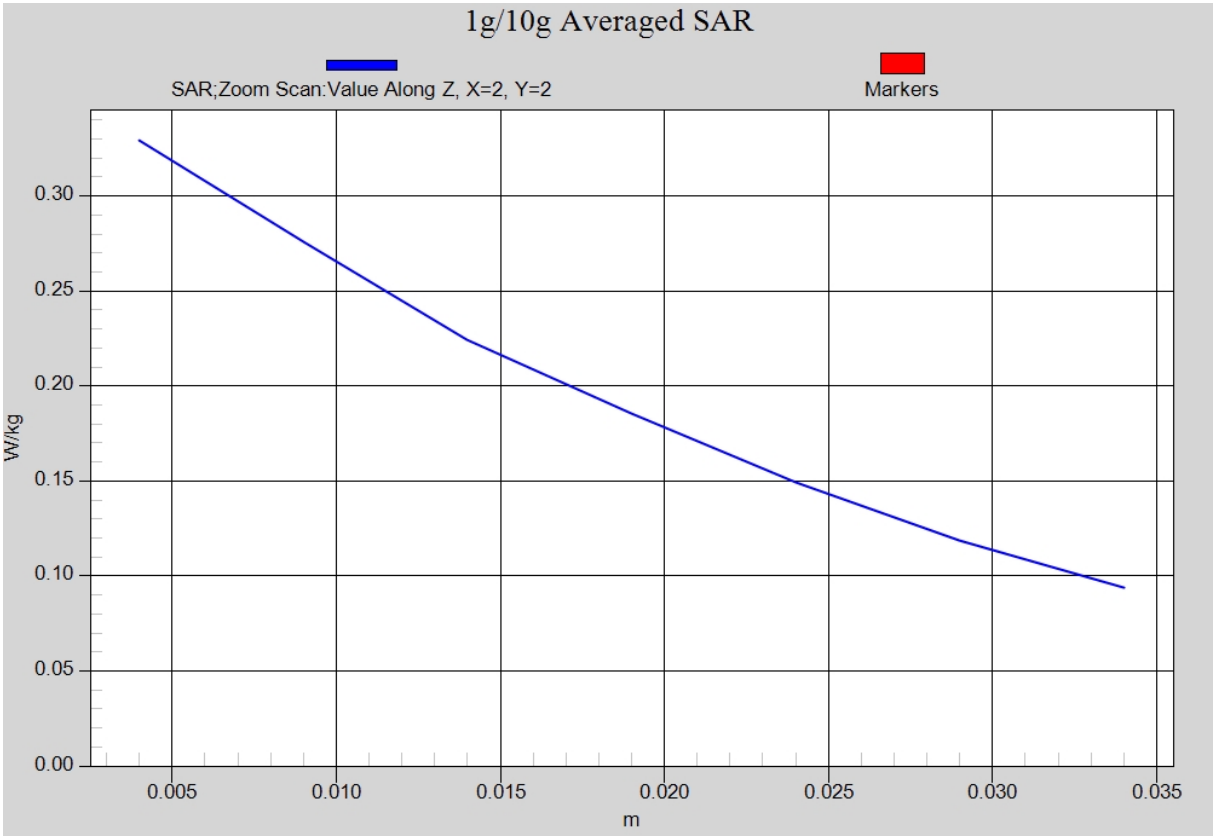

Fig. 1-1 Z-Scan at power reference point (850 MHz CH251)

850 Body Front High – AP OFF

Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.996 mho/m; εr = 55.943; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Front High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.536 W/kg

Front High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.406 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.644 W/kg
SAR(1 g) = 0.513 W/kg; SAR(10 g) = 0.396 W/kg
Maximum value of SAR (measured) = 0.539 W/kg

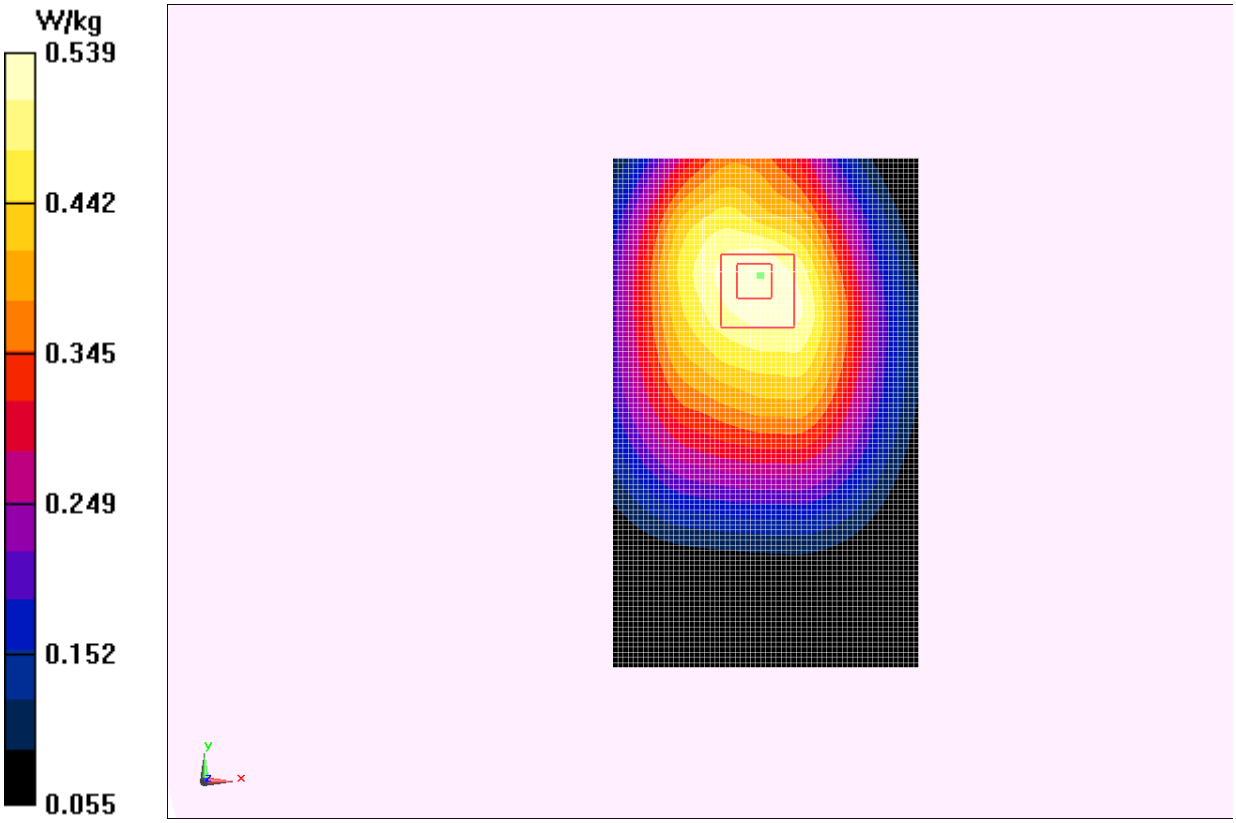

Fig.2 850 MHz CH251

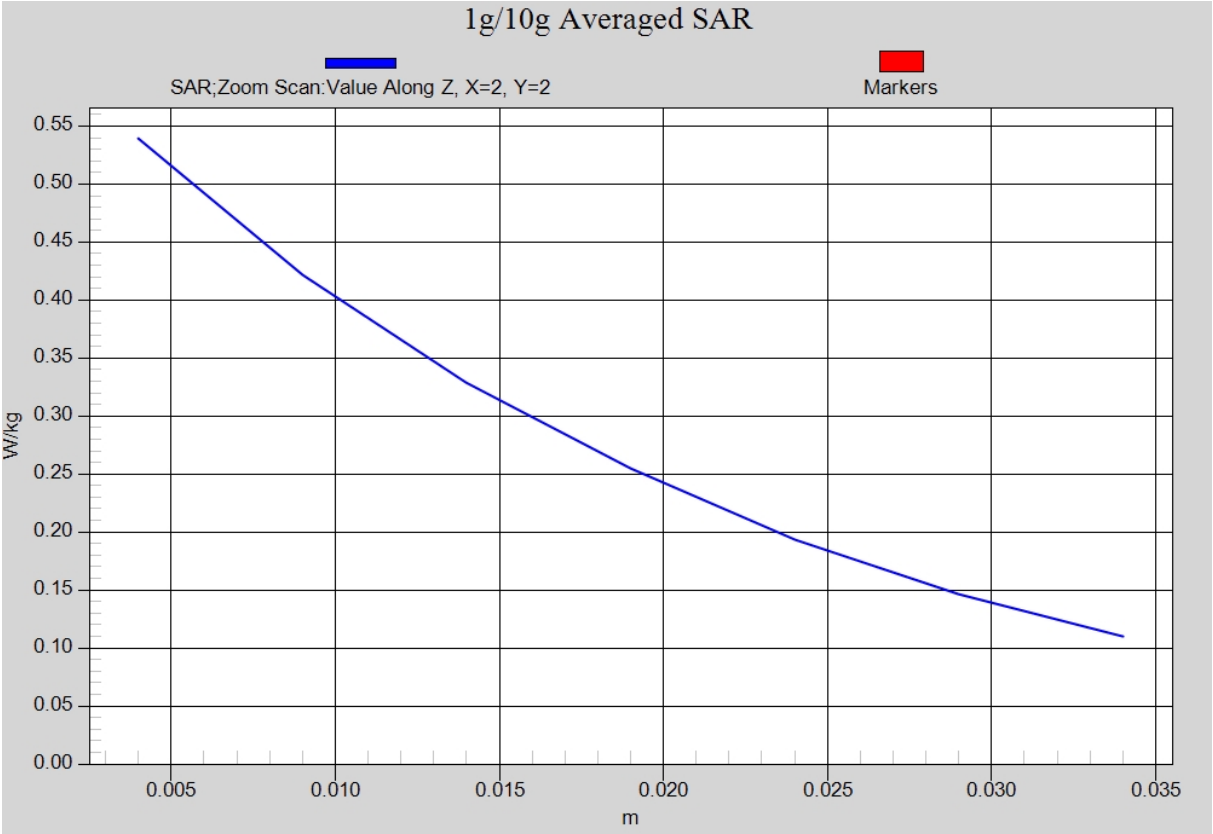

Fig. 2-1 Z-Scan at power reference point (850 MHz CH251)

1900 Left Cheek Low – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.367; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.150 W/kg

Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.022 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.204 W/kg
SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.080 W/kg
Maximum value of SAR (measured) = 0.151 W/kg

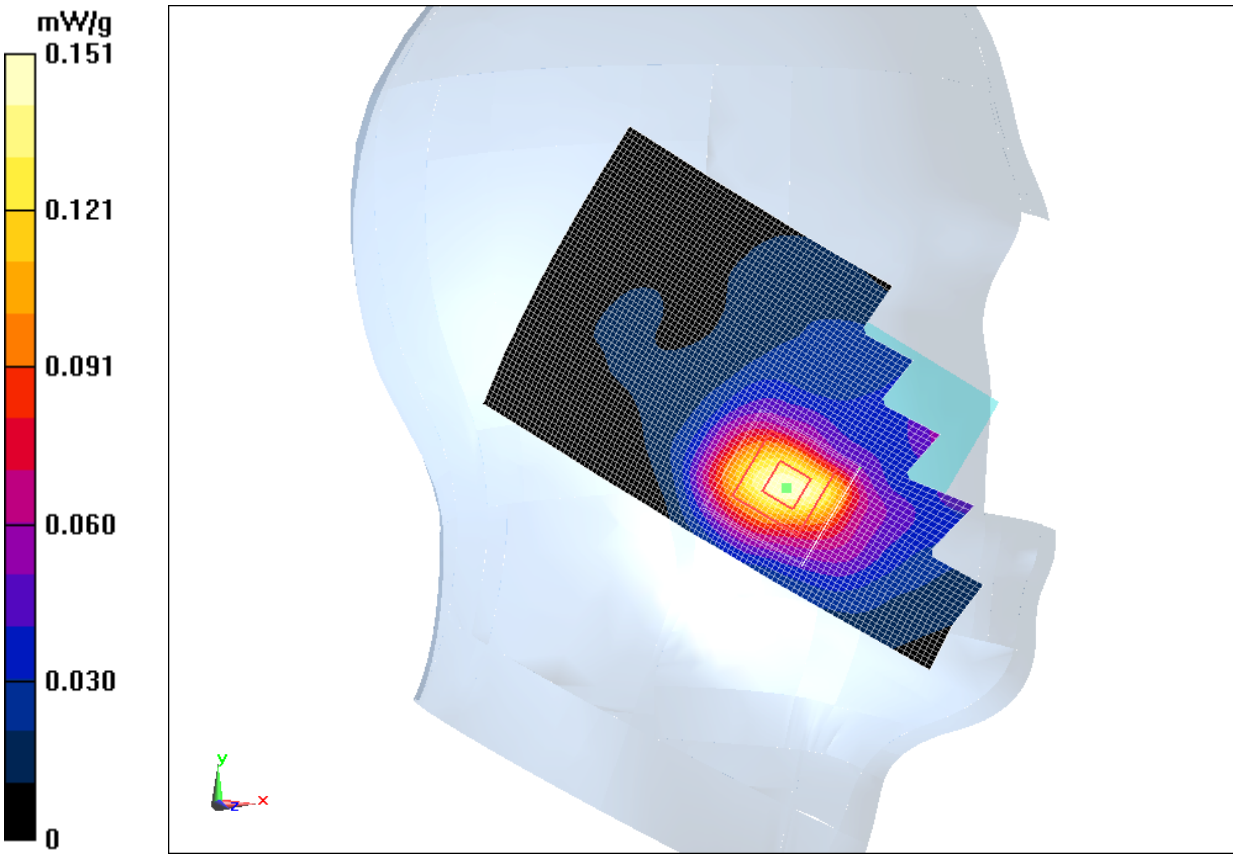

Fig.3 1900 MHz CH512

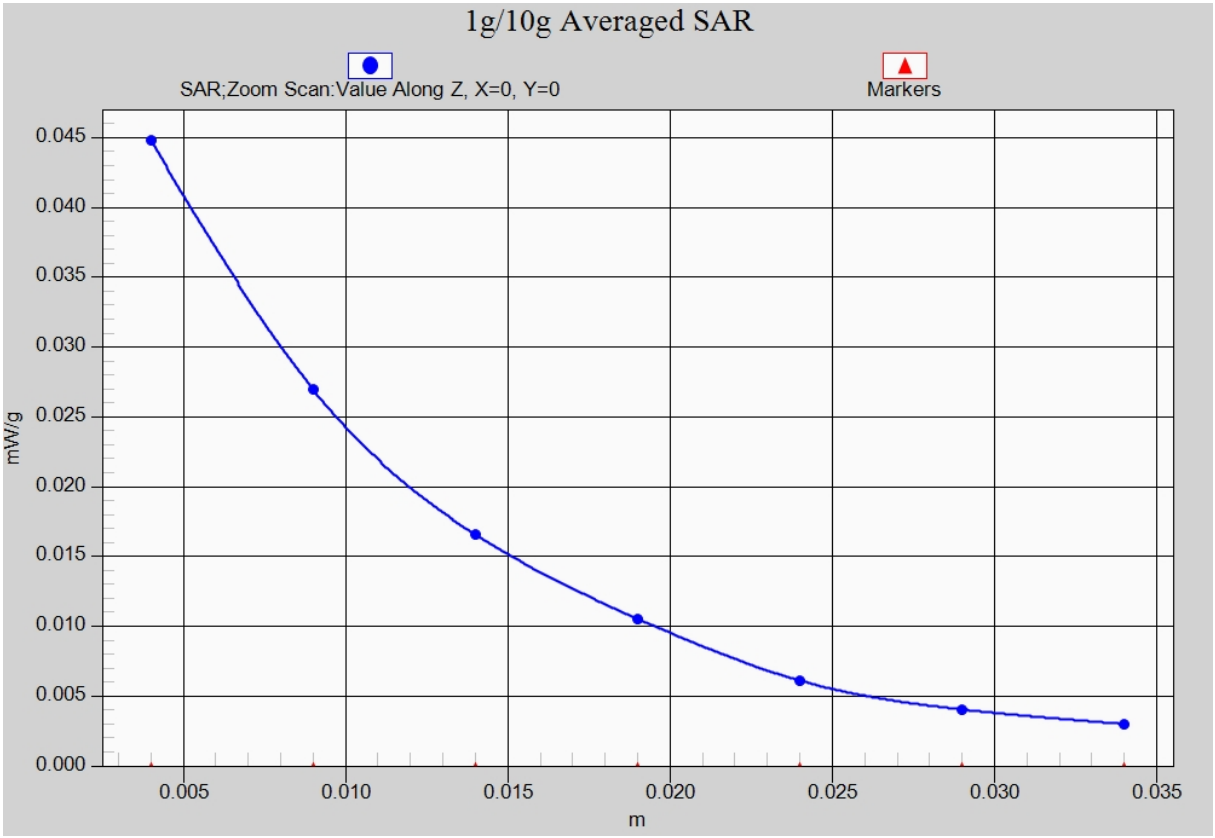

Fig. 3-1 Z-Scan at power reference point (1900 MHz CH512)

1900 Body Bottom Edge High – AP ON
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.547 mho/m; εr = 52.157; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Bottom Edge High/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.323 W/kg

Bottom Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.986 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.495 W/kg
SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.151 W/kg
Maximum value of SAR (measured) = 0.326 W/kg

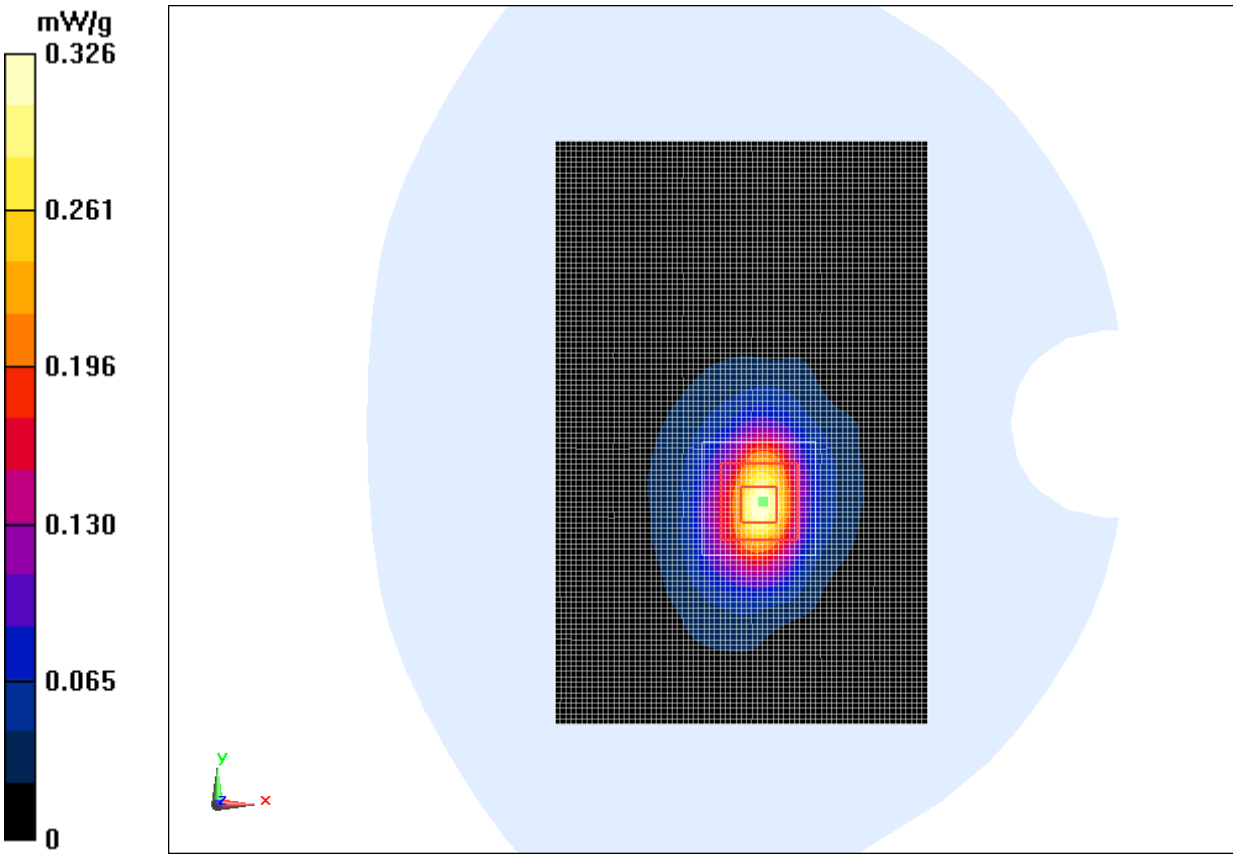

Fig.4 1900 MHz CH810

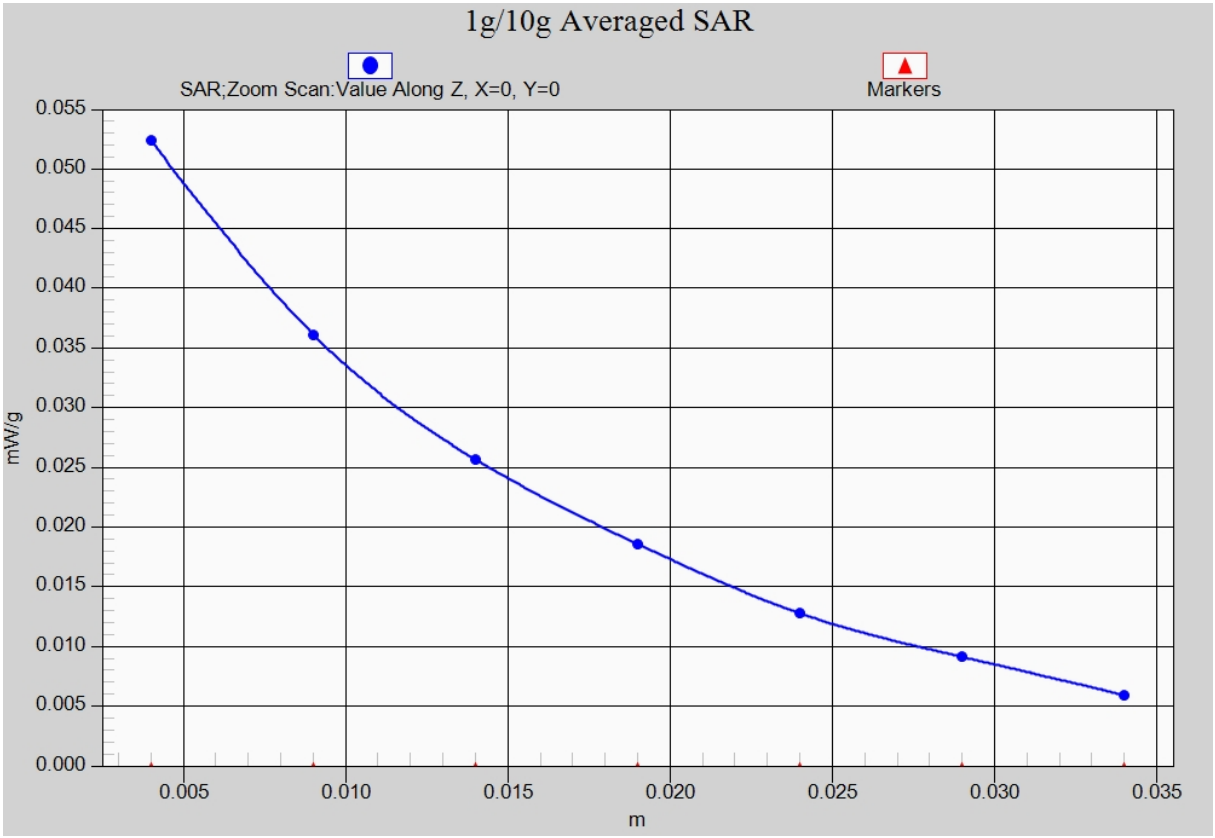

Fig.4-1 Z-Scan at power reference point (1900 MHz CH810)

1900 Body Front High with Headset – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.547 mho/m; εr = 52.157; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Front High/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.211 W/kg

Front High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.862 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.192 W/kg; SAR(10 g) = 0.112 W/kg
Maximum value of SAR (measured) = 0.215 W/kg

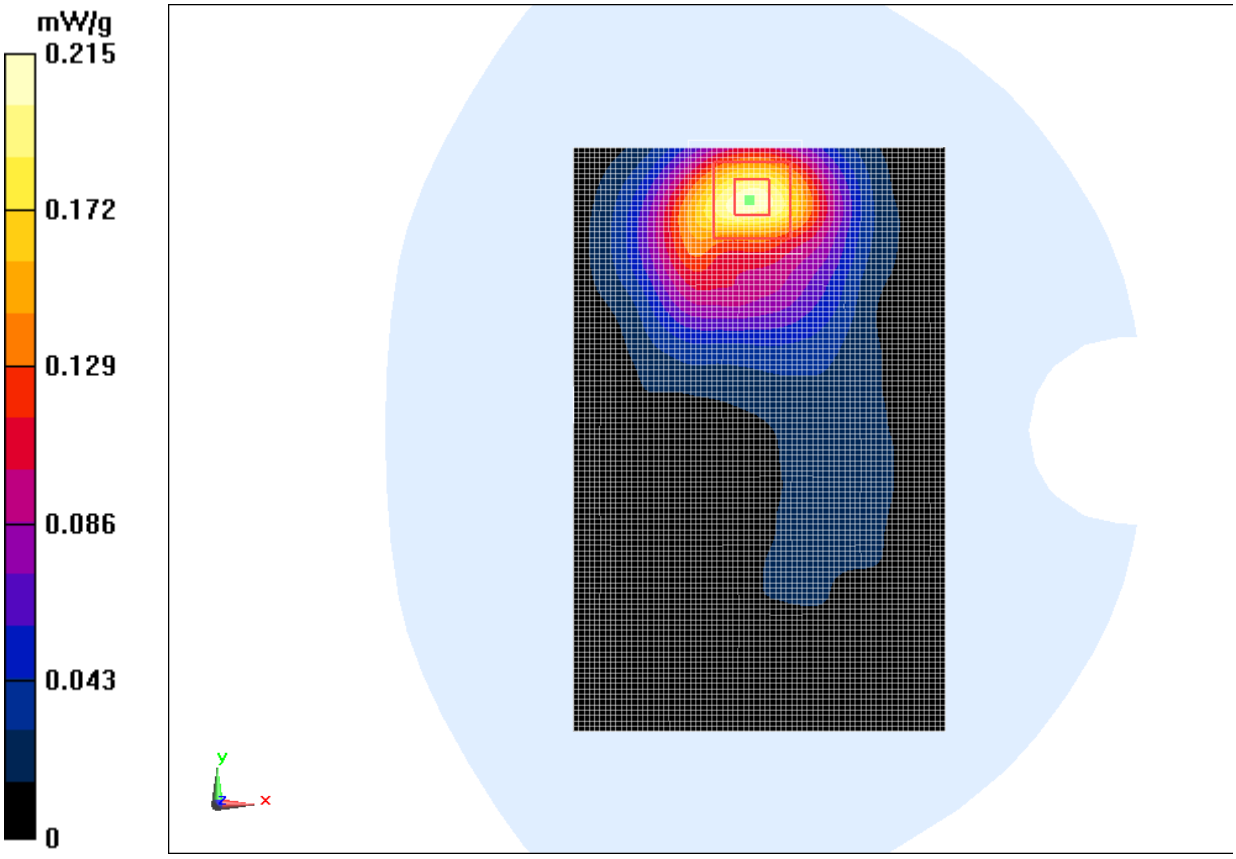

Fig.5 1900 MHz CH810

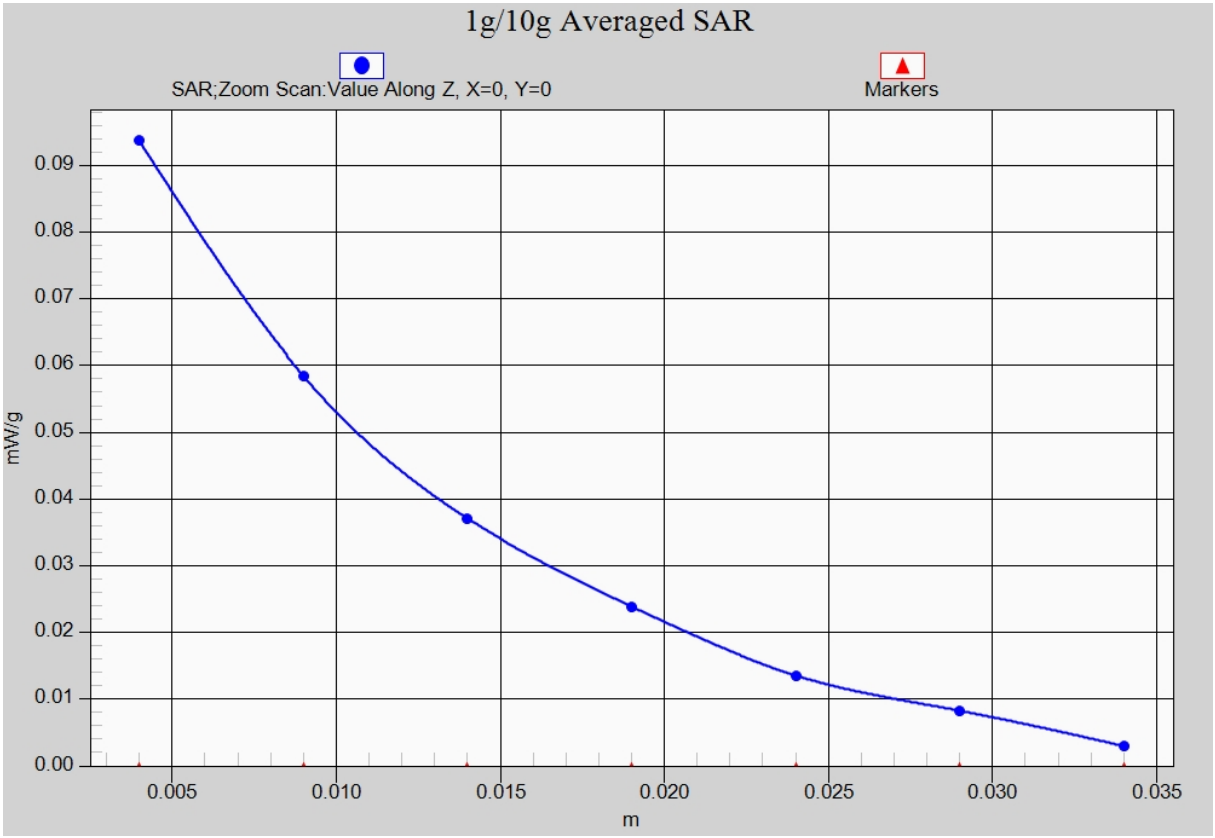

Fig.5-1 Z-Scan at power reference point (1900 MHz CH810)

CDMA BC0 Left Cheek Middle – AP OFF

Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.89 mho/m; εr = 40.327; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: CDMA BC0 Frequency: 836.52 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.26, 6.26, 6.26)

Cheek Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.454 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.079 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.518 W/kg
SAR(1 g) = 0.430 W/kg; SAR(10 g) = 0.338 W/kg
Maximum value of SAR (measured) = 0.447 W/kg

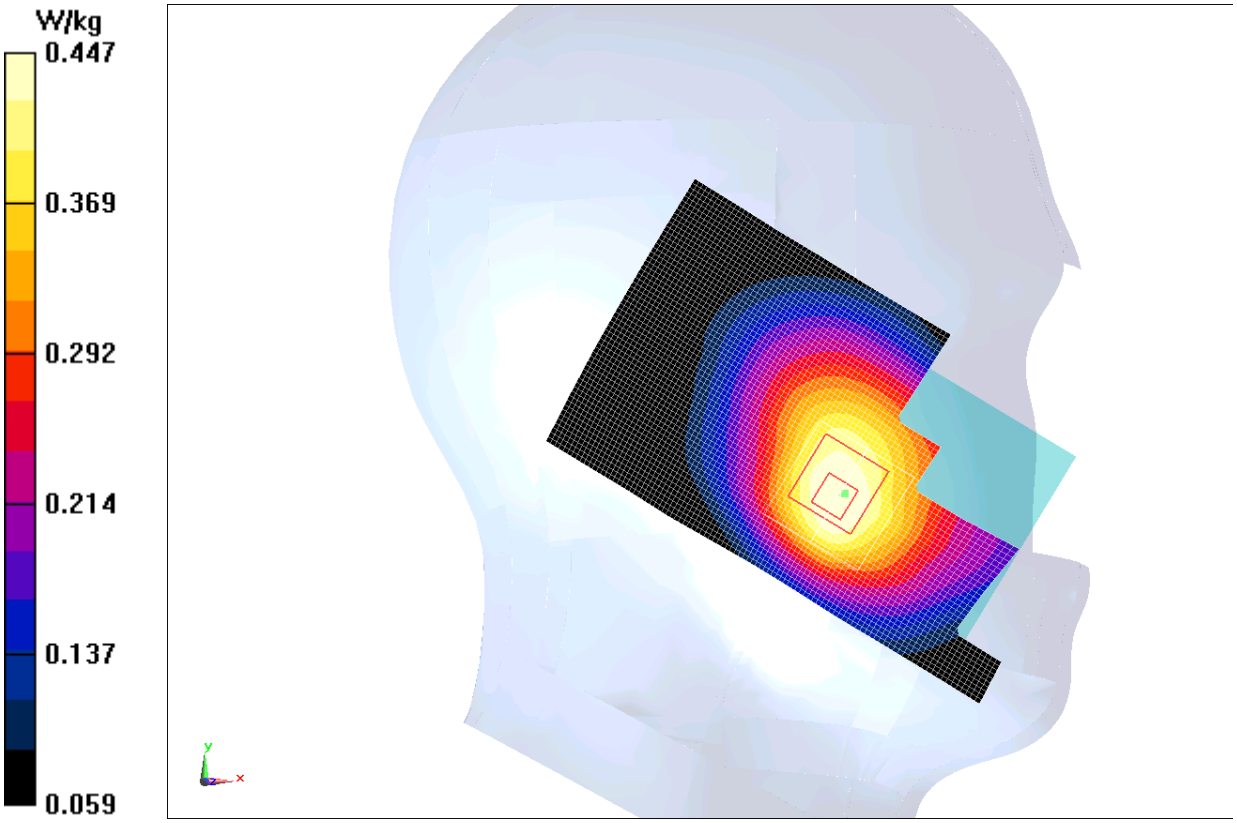

Fig.6 CDMA BC0 CH384

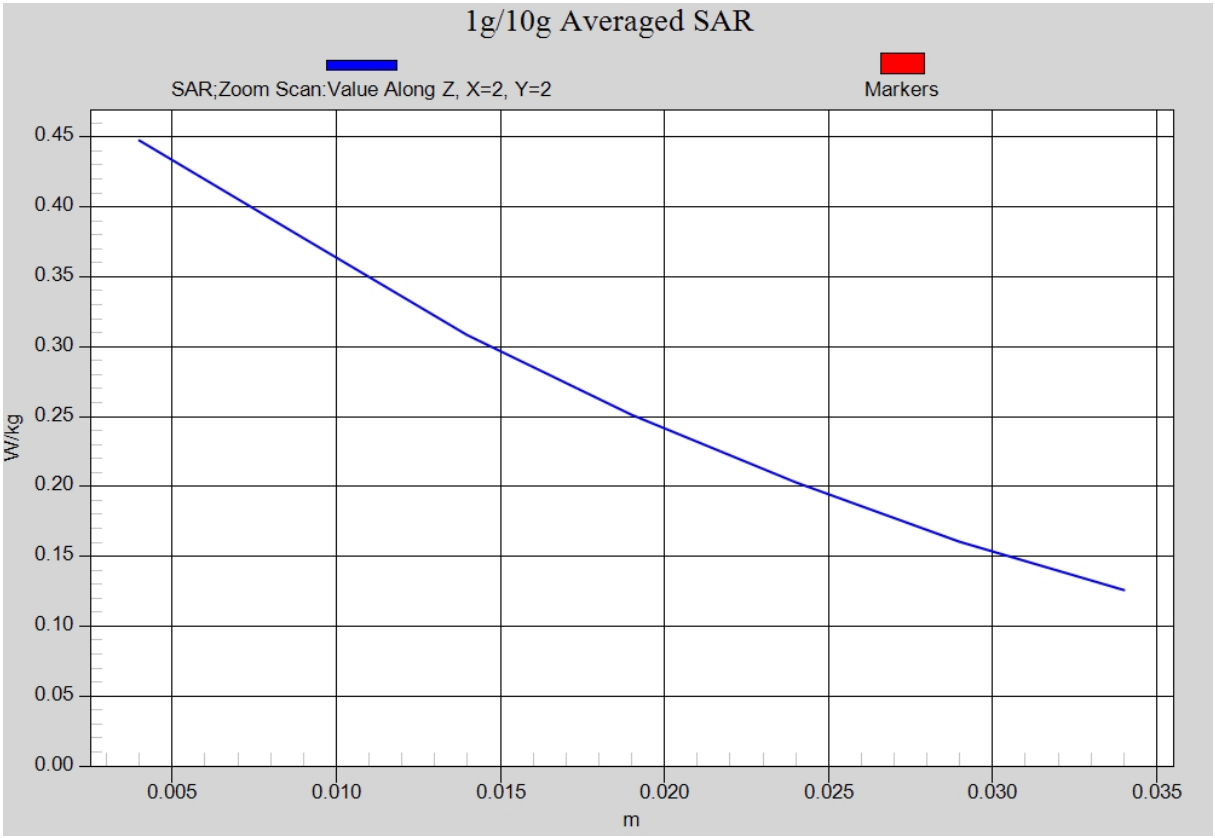

Fig. 6-1 Z-Scan at power reference point (CDMA BC0 CH384)

CDMA BC0 Left Tilt Middle – AP OFF
Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.89 mho/m; εr = 40.327; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: CDMA BC0 Frequency: 836.52 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.26, 6.26, 6.26)

Tilt Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.457 W/kg

Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.834 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.522 W/kg
SAR(1 g) = 0.424 W/kg; SAR(10 g) = 0.292 W/kg
Maximum value of SAR (measured) = 0.451 W/kg

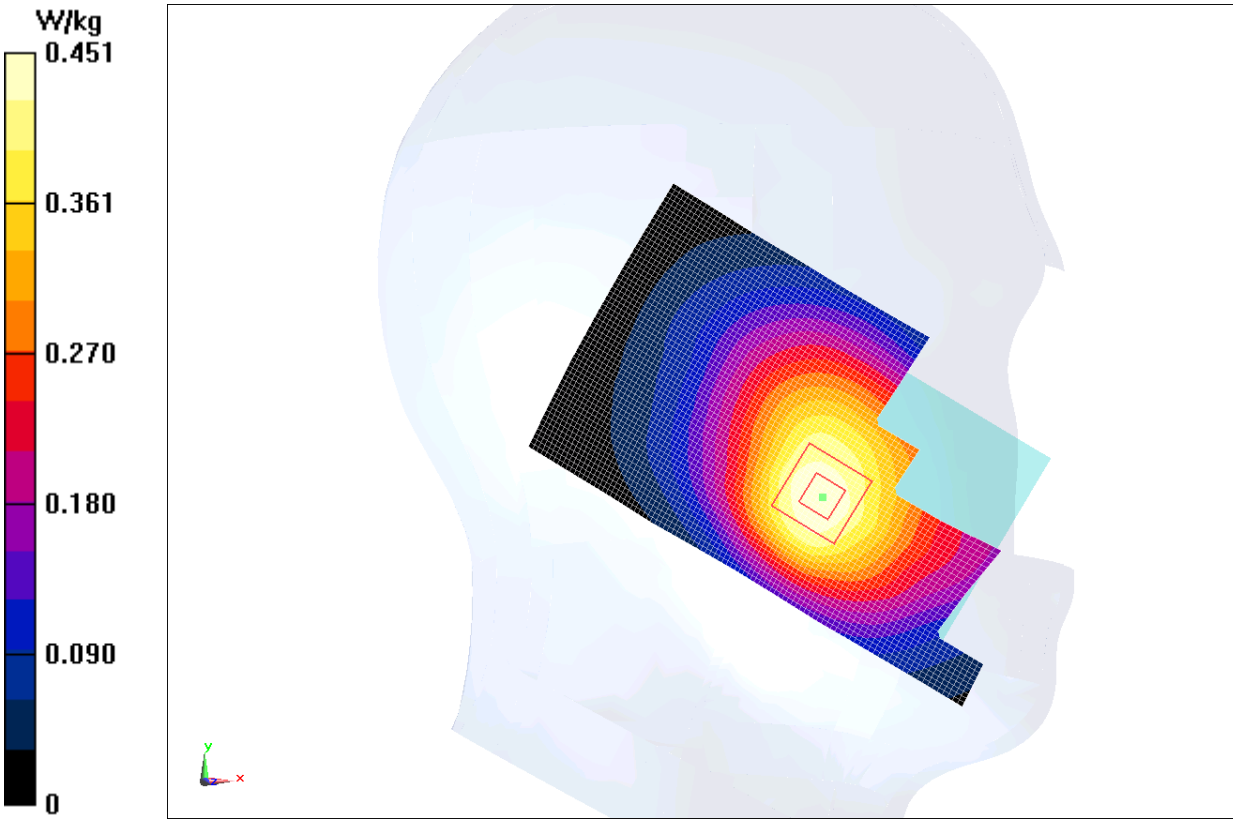

Fig.7 CDMA BC0 CH384

CDMA BC0 Body Front Middle – AP OFF
Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.984 mho/m; εr = 56.094; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: CDMA BC0 Frequency: 836.52 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Front Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.728 W/kg

Front Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.103 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.694 W/kg; SAR(10 g) = 0.535 W/kg
Maximum value of SAR (measured) = 0.721 W/kg

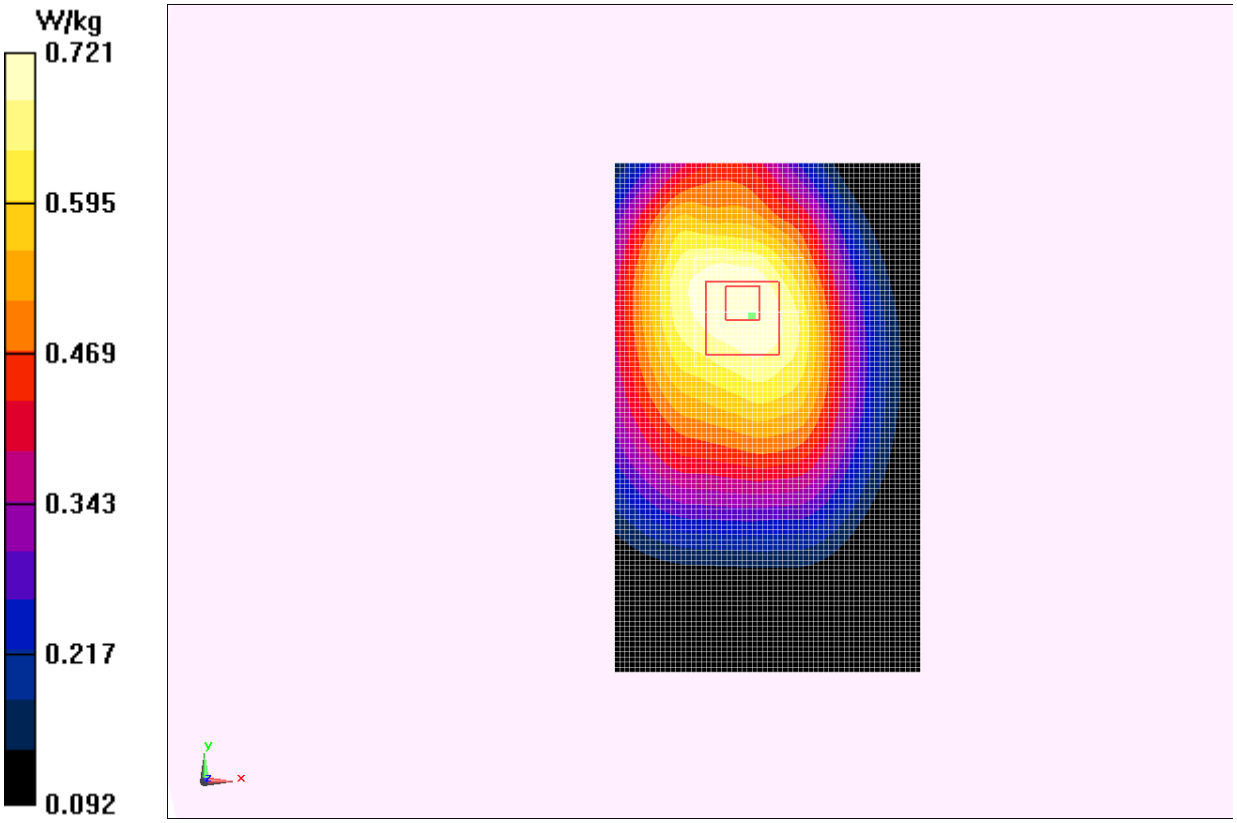

Fig.8 CDMA BC0 CH384

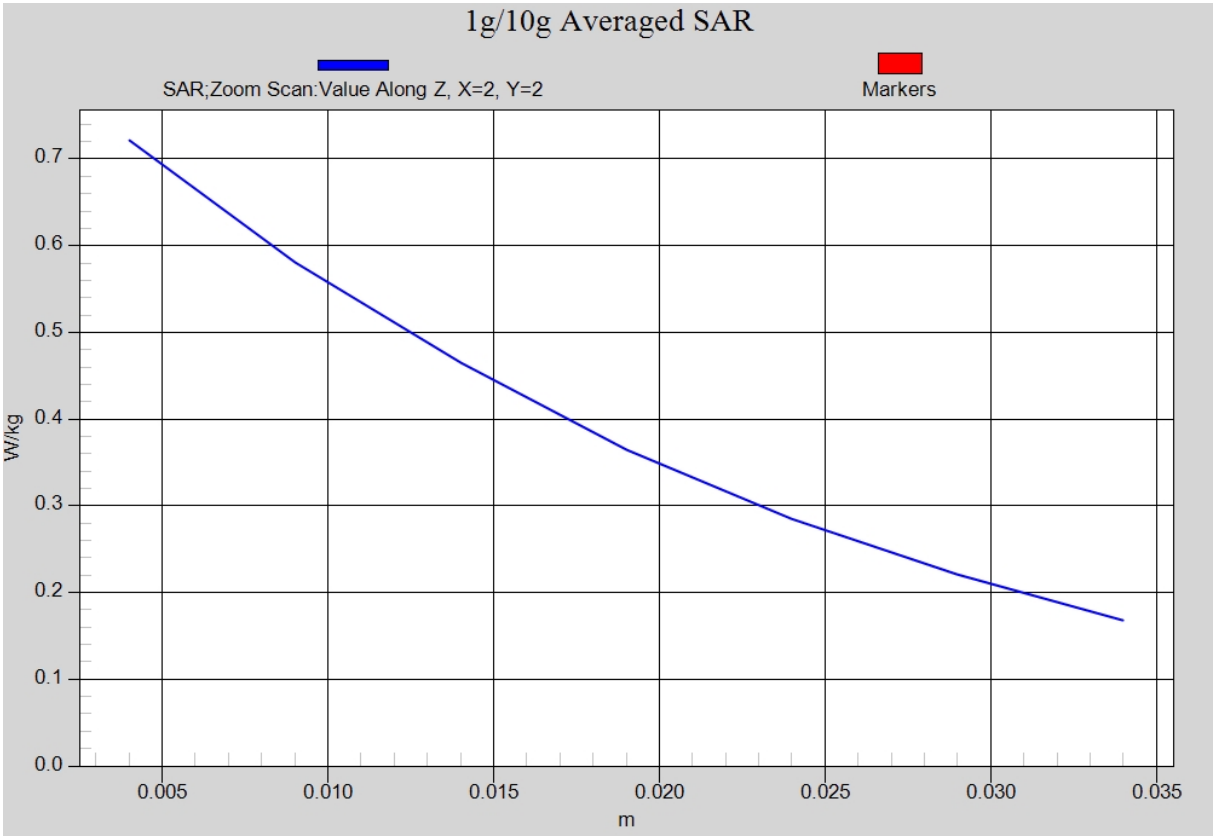

Fig. 8-1 Z-Scan at power reference point (CDMA BC0 CH384)

CDMA BC0 Body Rear Middle – AP OFF
Date: 2013-3-28
Electronics: DAE4 Sn771
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.984 mho/m; εr = 56.094; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C
Communication System: CDMA BC0 Frequency: 836.52 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Rear Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.620 W/kg

Rear Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.605 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.784 W/kg
SAR(1 g) = 0.585 W/kg; SAR(10 g) = 0.437 W/kg
Maximum value of SAR (measured) = 0.615 W/kg

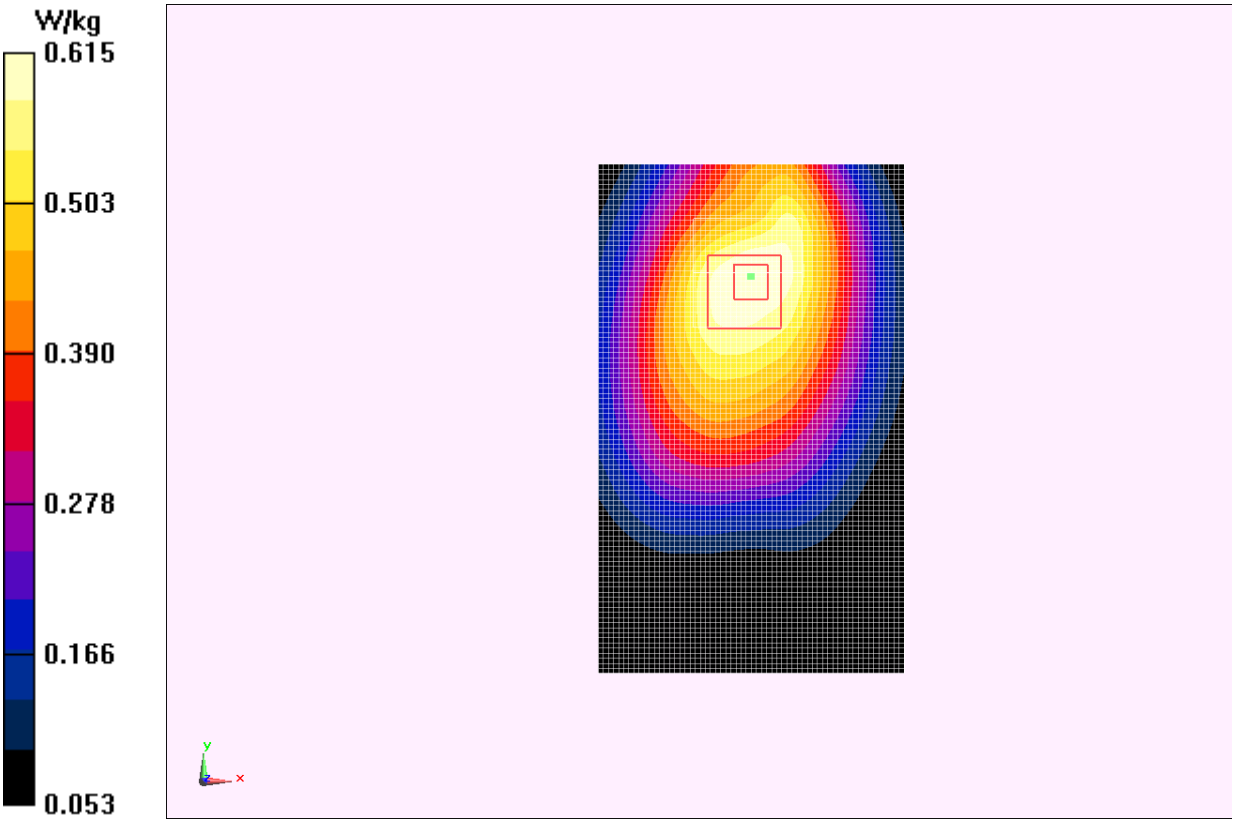

Fig.9 CDMA BC0 CH384

CDMA BC1 Left Cheek Middle – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.402 mho/m; εr = 39.248; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: CDMA BC1 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.367 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.399 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.328 W/kg; SAR(10 g) = 0.206 W/kg
Maximum value of SAR (measured) = 0.354 W/kg

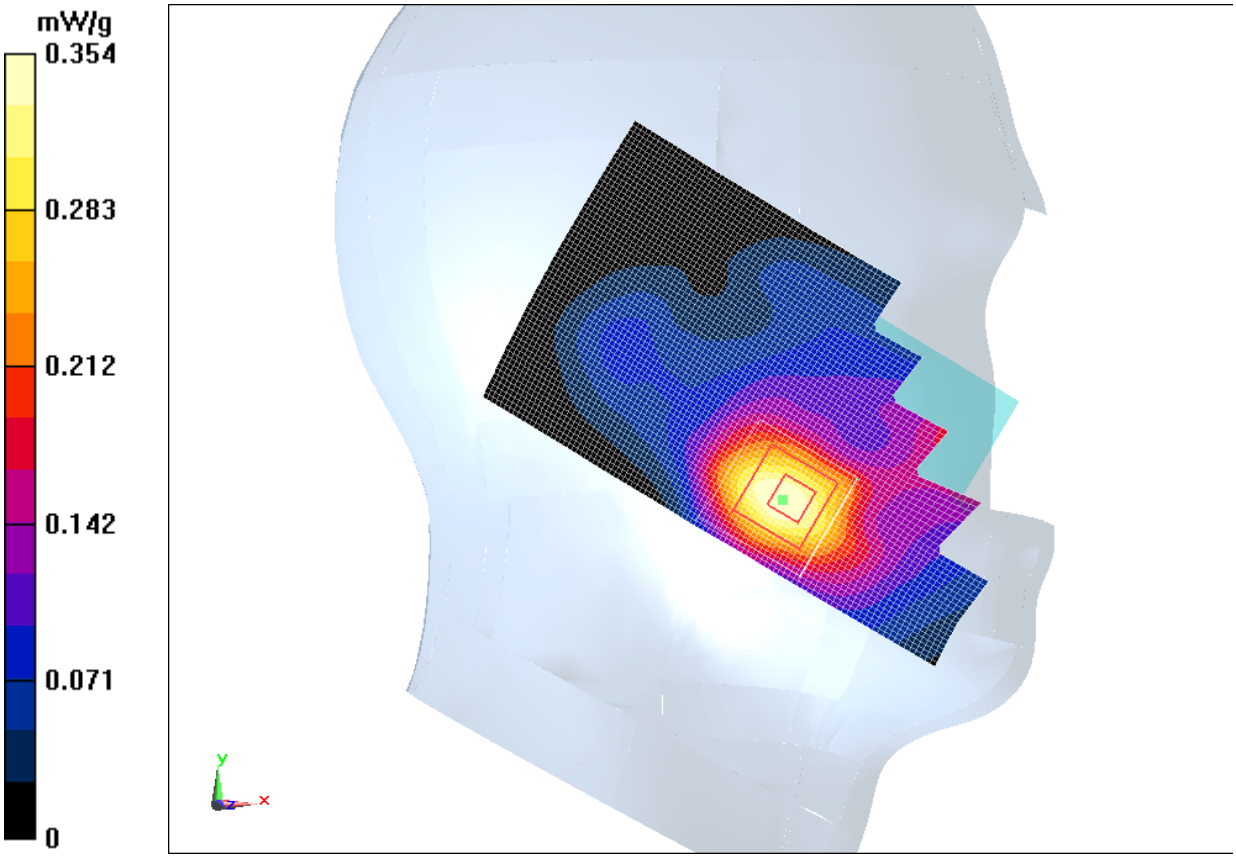

Fig.10 CDMA BC1 CH600

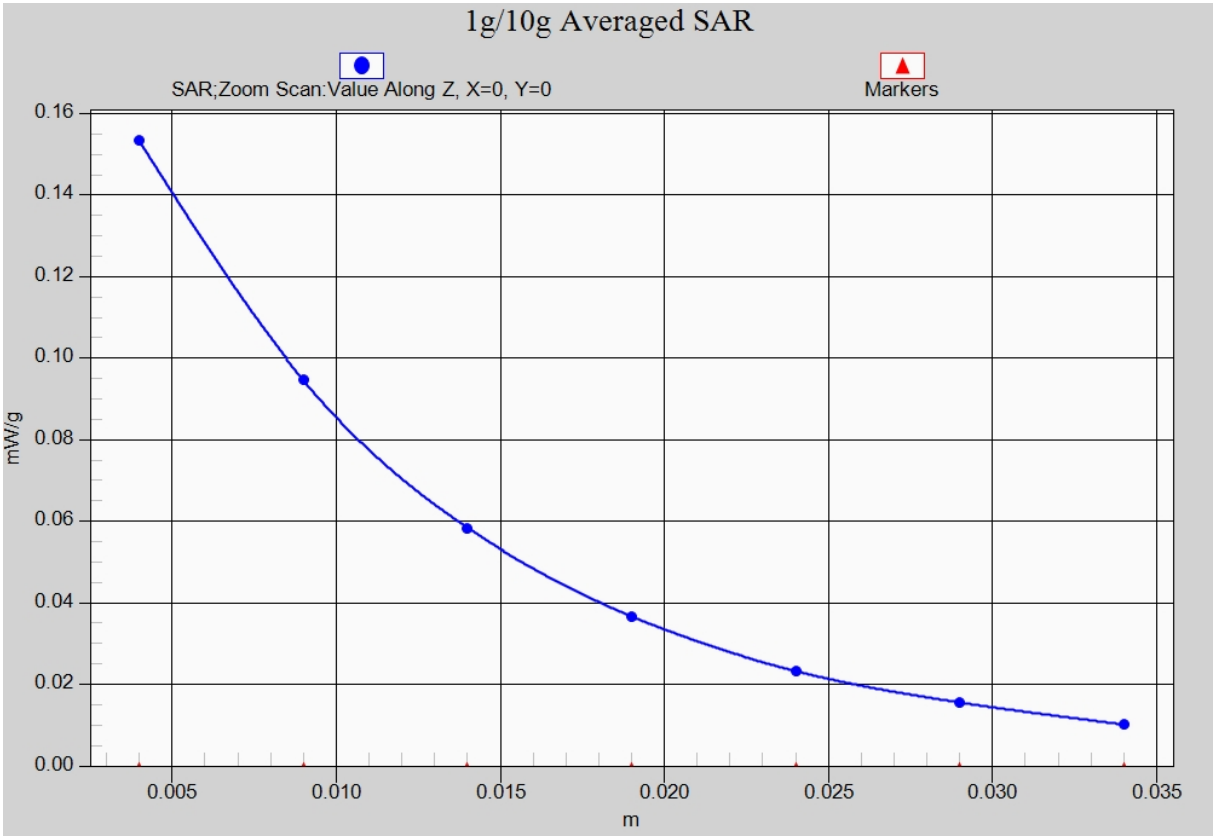

Fig. 10-1 Z-Scan at power reference point (CDMA BC1 CH600)

CDMA BC1 Body Bottom Edge Middle – AP ON

Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.509 mho/m; εr = 52.213; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: CDMA BC1 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Bottom Edge Middle/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.531 W/kg

Bottom Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.729 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.832 W/kg
SAR(1 g) = 0.487 W/kg; SAR(10 g) = 0.254 W/kg
Maximum value of SAR (measured) = 0.546 W/kg

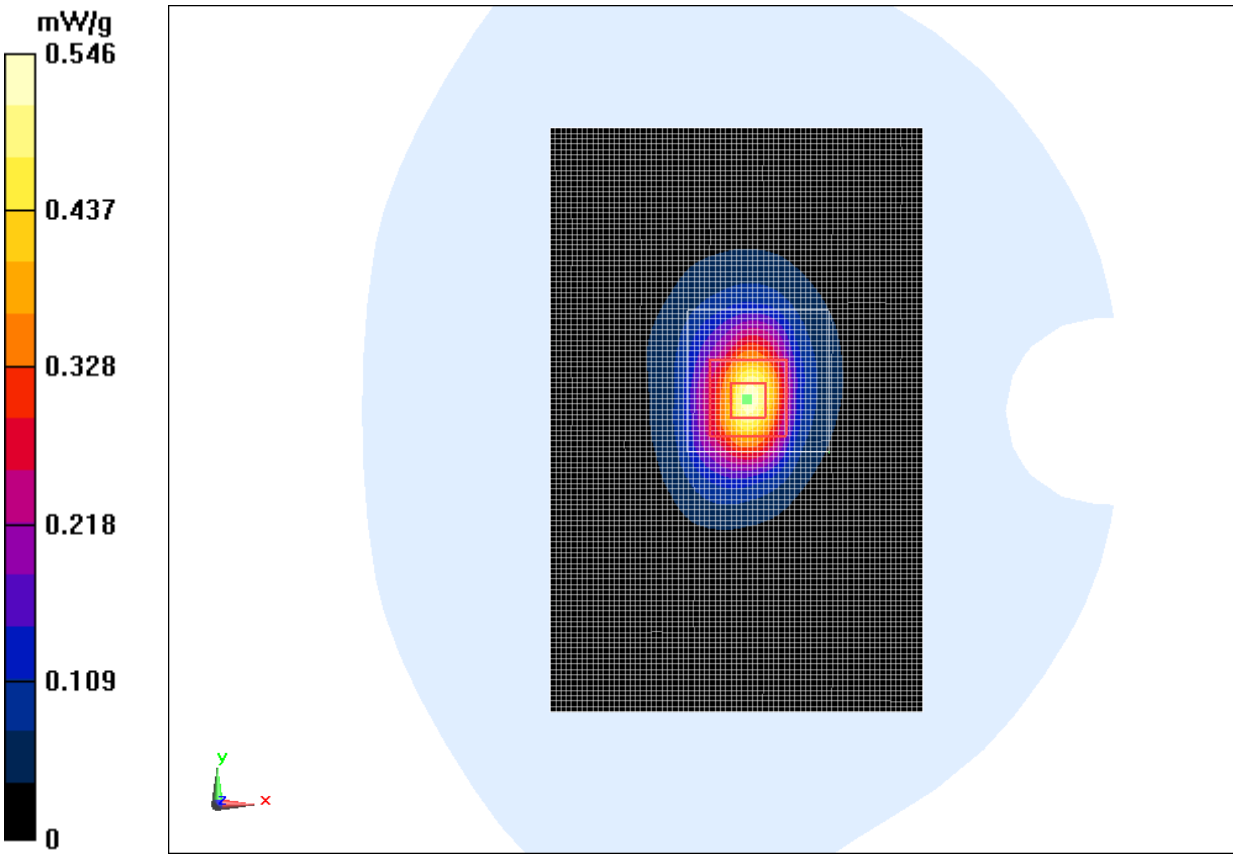

Fig.11 CDMA BC1 CH600

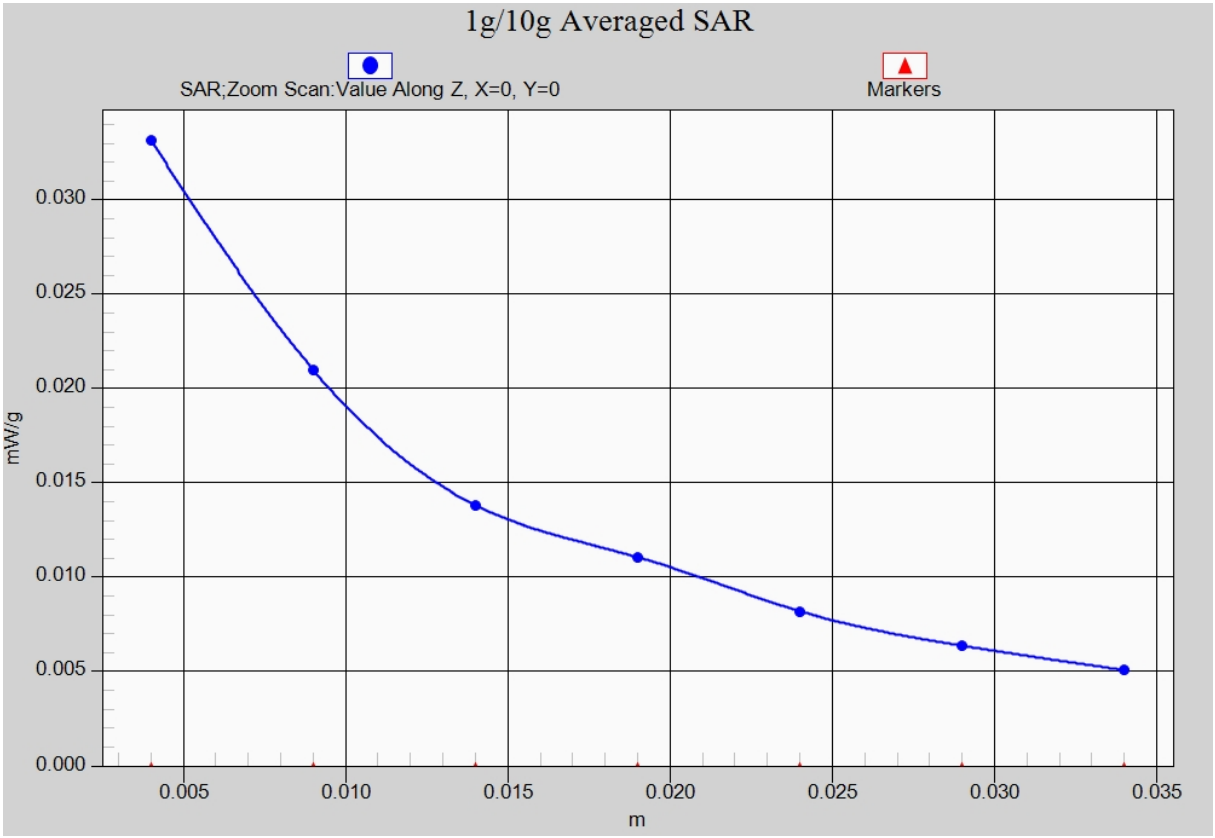

Fig.11-1 Z-Scan at power reference point (CDMA BC1 CH600)

CDMA BC1 Body Front Middle – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.509 mho/m; εr = 52.213; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: CDMA BC1 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Front Middle/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.862 W/kg

Front Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.773 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.228 W/kg
SAR(1 g) = 0.764 W/kg; SAR(10 g) = 0.436 W/kg
Maximum value of SAR (measured) = 0.846 W/kg

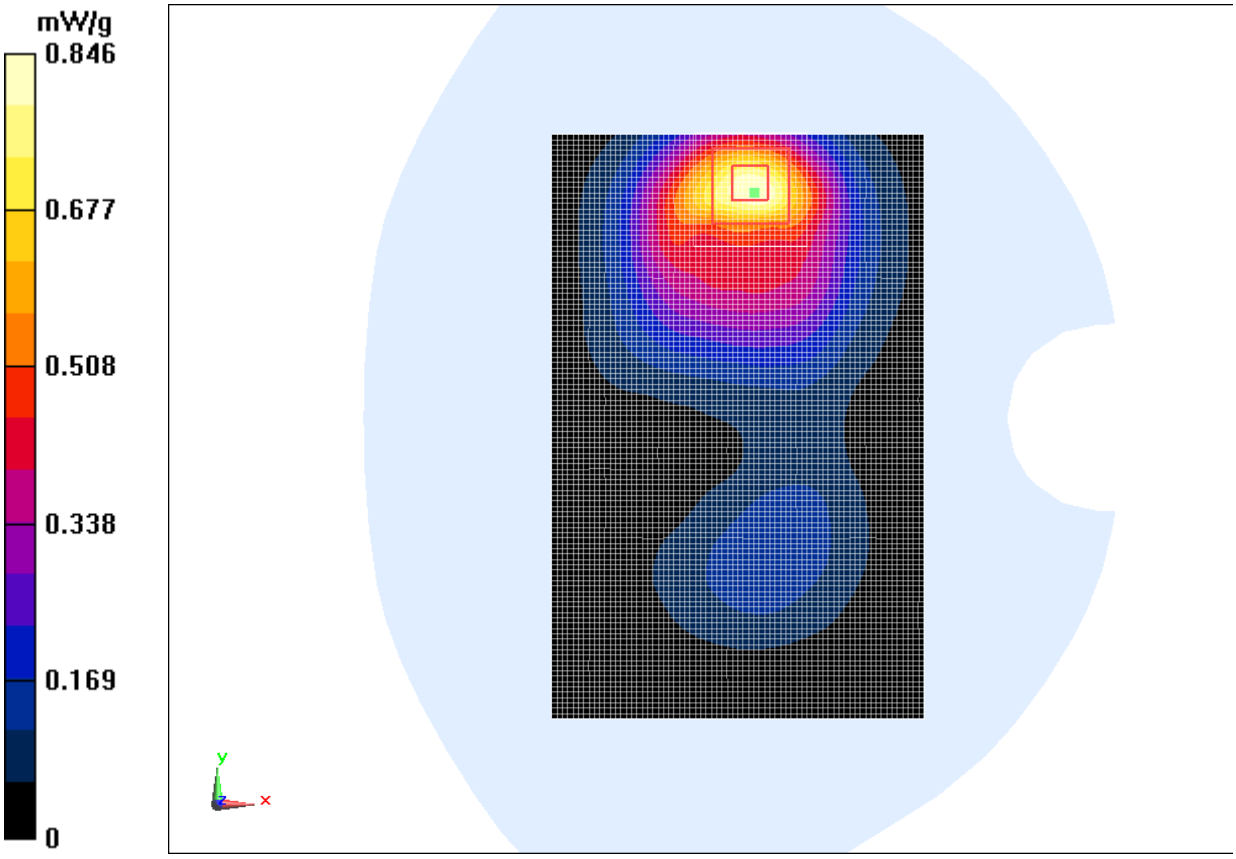

Fig.12 CDMA BC1 CH600

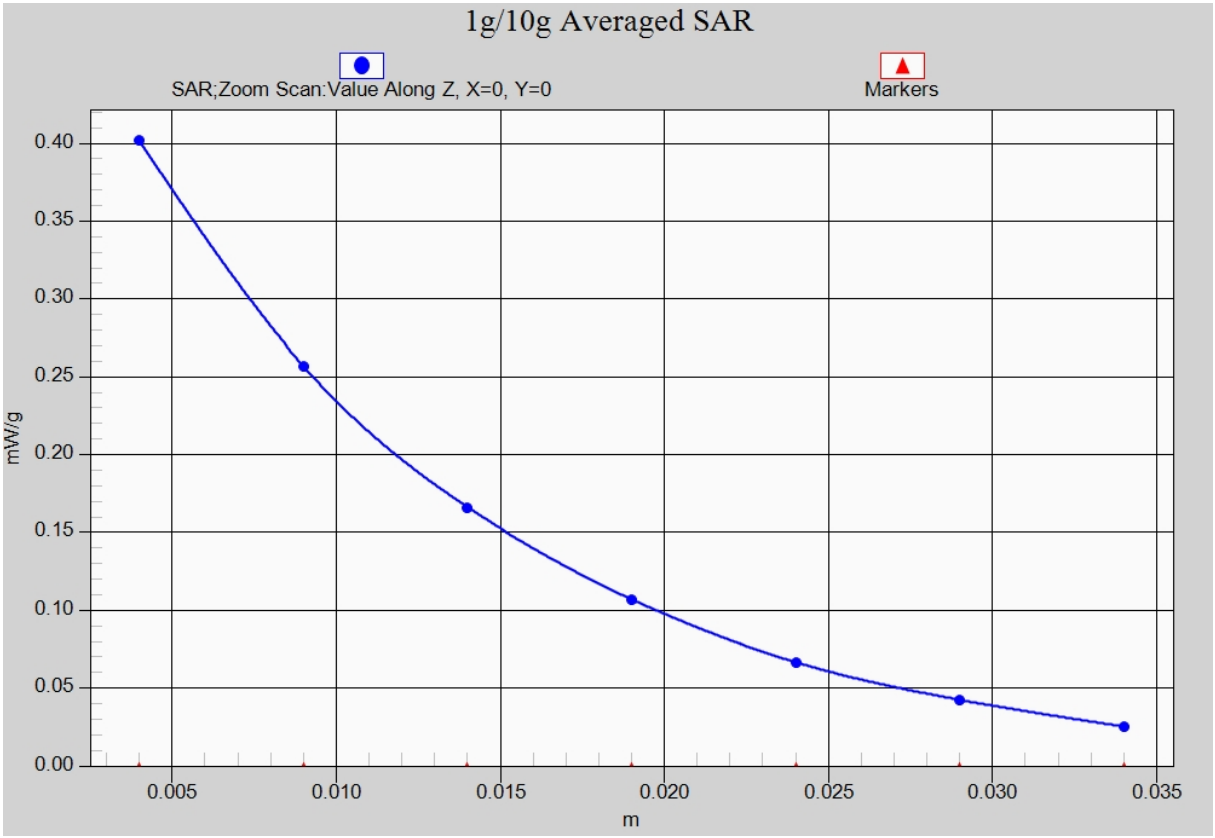

Fig.12-1 Z-Scan at power reference point (CDMA BC1 CH600)

Antenna QSC1215
1900 Left Cheek Middle – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.402 mho/m; εr = 39.248; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.664 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.382 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.895 W/kg
SAR(1 g) = 0.525 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 0.602 W/kg

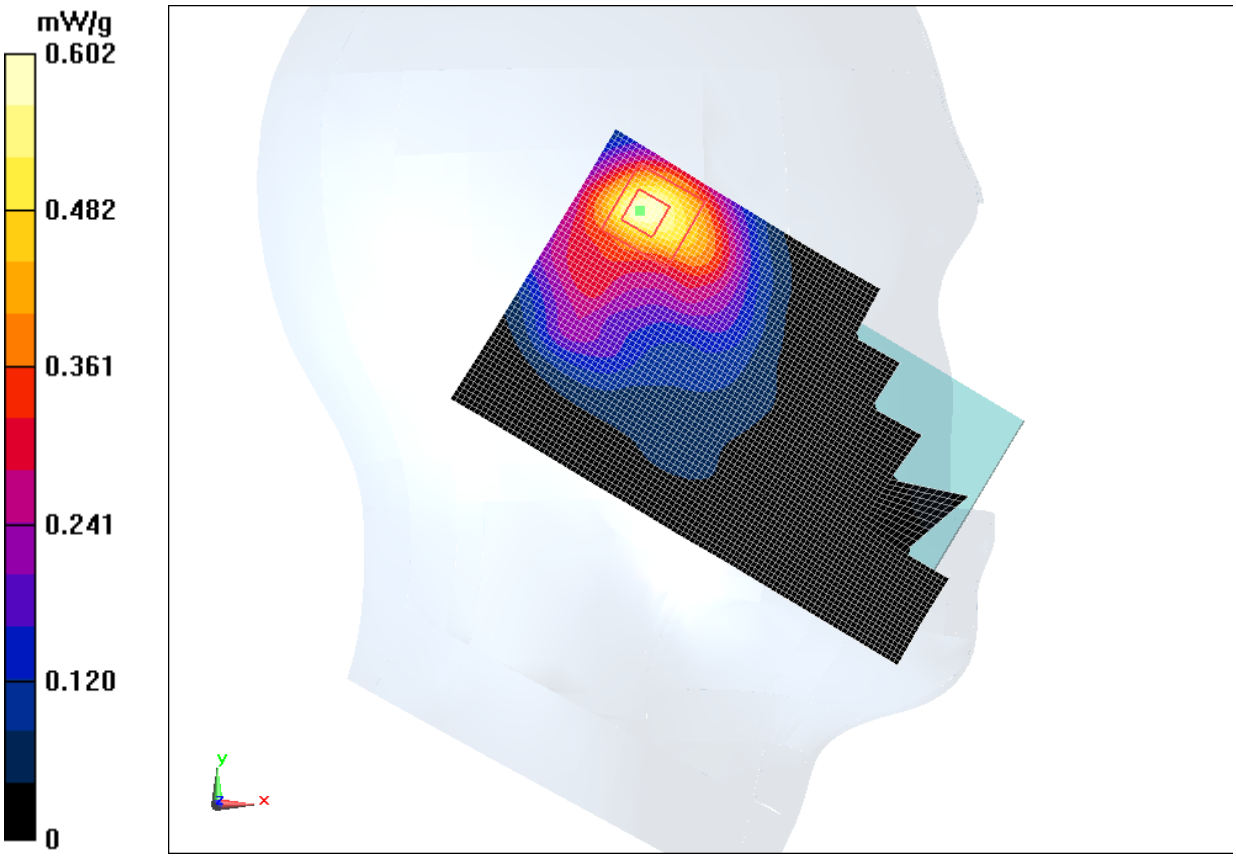

Fig.13 1900 MHz CH661

1900 Left Tilt Low – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.37 mho/m; εr = 39.367; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.718 W/kg

Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.398 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.018 W/kg
SAR(1 g) = 0.583 W/kg; SAR(10 g) = 0.334 W/kg
Maximum value of SAR (measured) = 0.632 W/kg

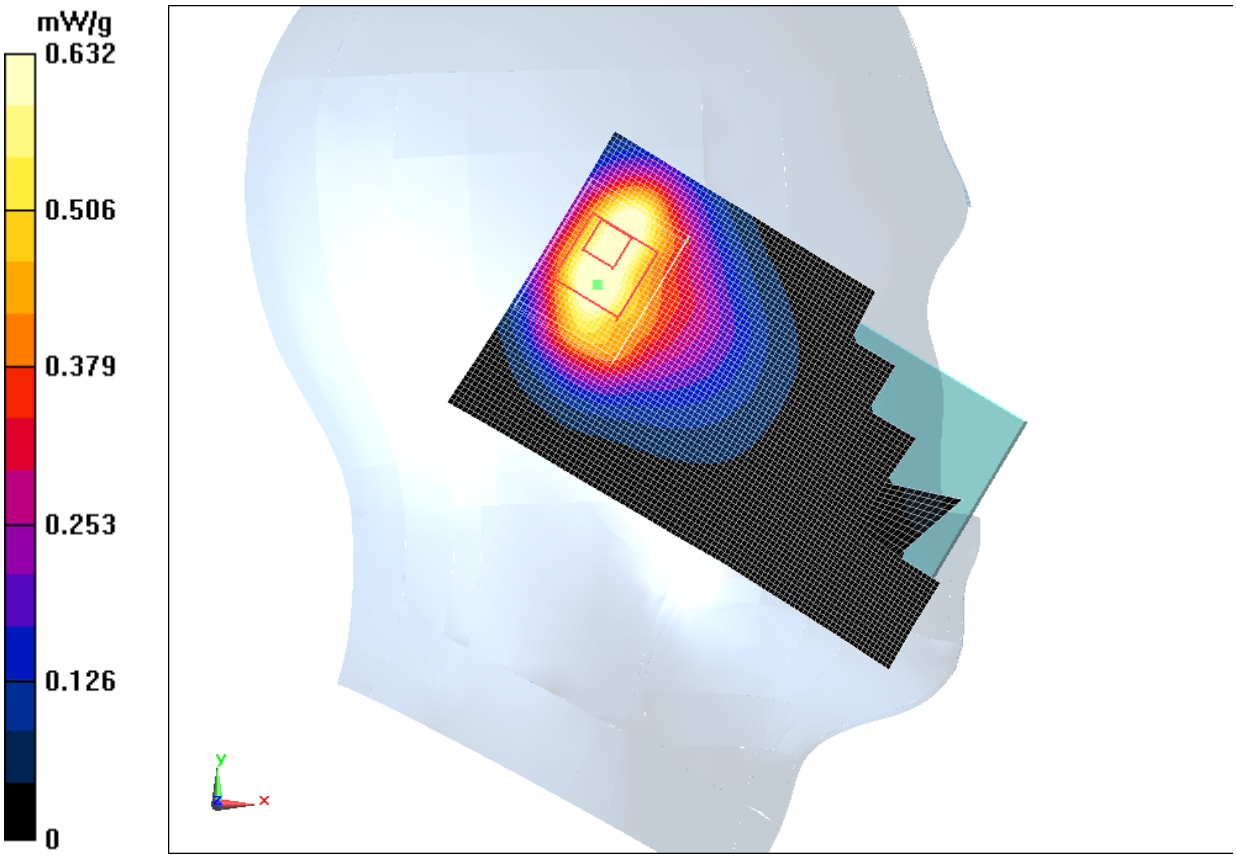

Fig.14 1900 MHz CH512

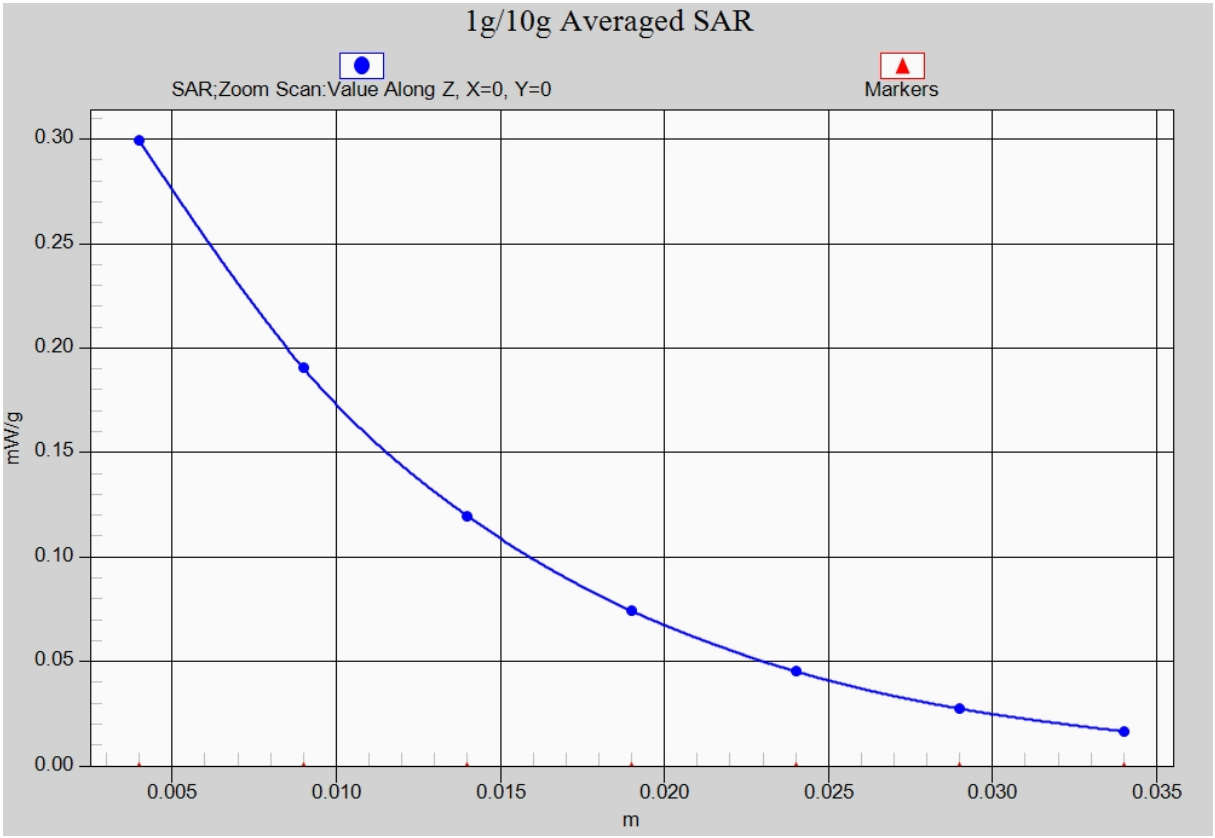

Fig. 14-1 Z-Scan at power reference point (1900 MHz CH512)

1900 Body Rear Low with EGPRS – AP OFF
Date: 2013-3-29
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.486 mho/m; εr = 52.381; ρ = 1000 kg/m^3
Ambient Temperature: 22.8°C Liquid Temperature: 22.3°C
Communication System: GSM 1900MHz EGPRS Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Rear Low/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.608 W/kg

Rear Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.256 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.949 W/kg
SAR(1 g) = 0.539 W/kg; SAR(10 g) = 0.291 W/kg
Maximum value of SAR (measured) = 0.580 W/kg

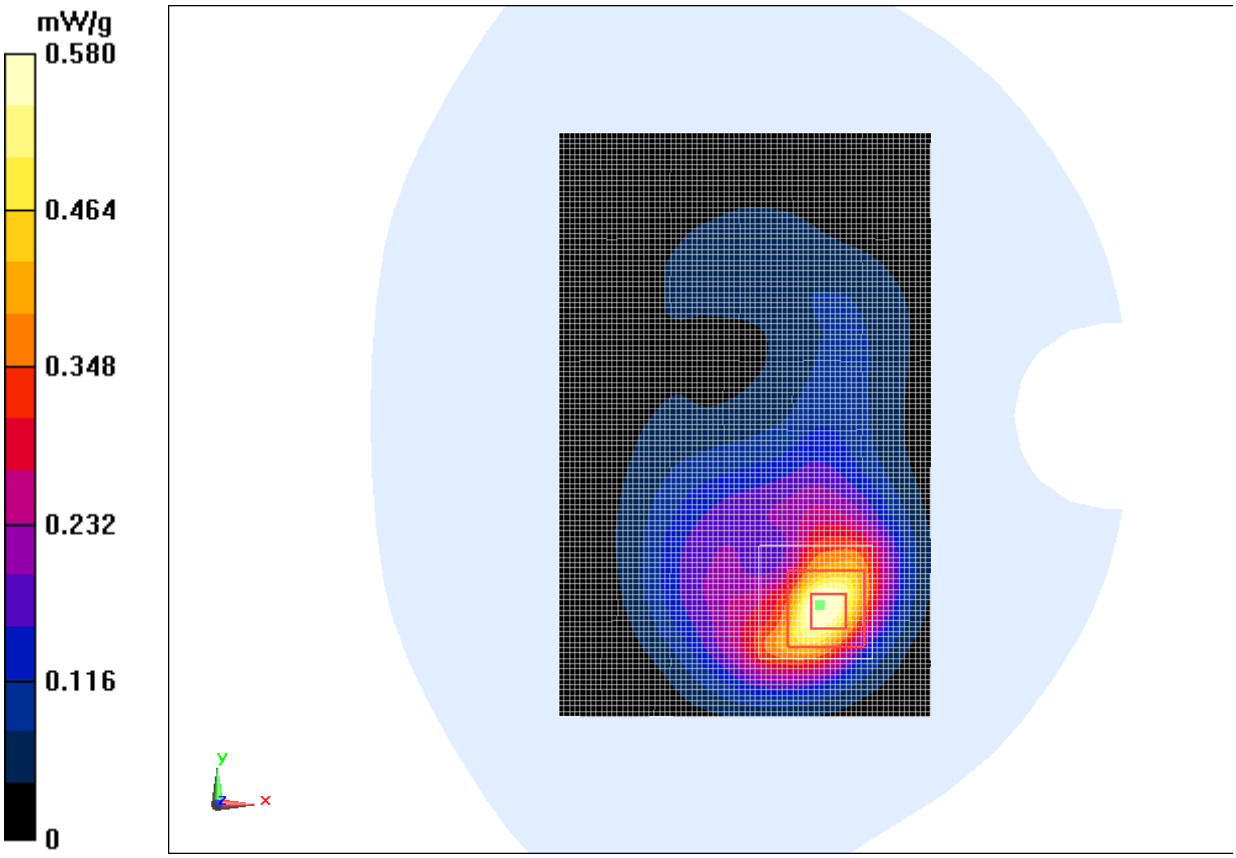

Fig.15 1900 MHz CH512

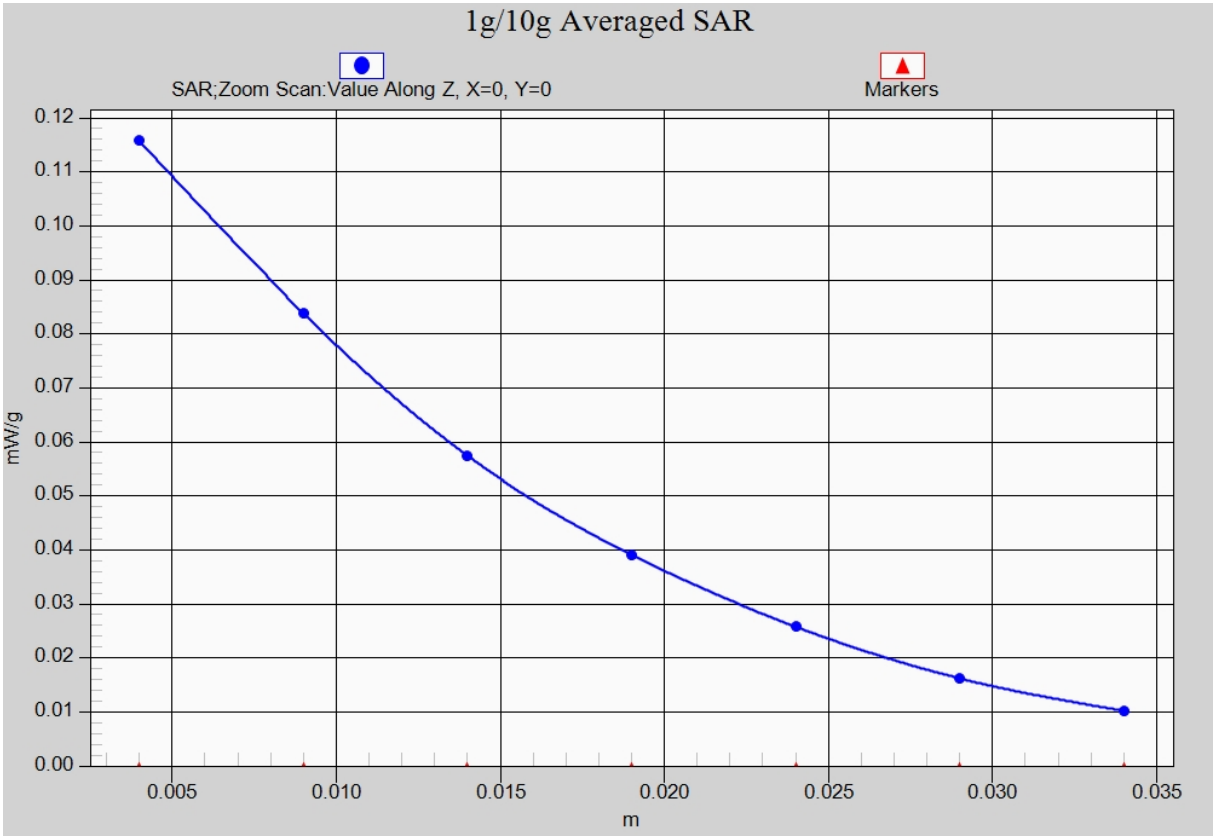

Fig.15-1 Z-Scan at power reference point (1900 MHz CH512)

Wifi 802.11b Left Cheek Channel 6 – AP OFF
Date: 2013-3-26
Electronics: DAE4 Sn771
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.8 mho/m; ε_r = 39.842; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C
Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.49, 4.49, 4.49)

Cheek Middle/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.127 W/kg

Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.106 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.311 W/kg
SAR(1 g) = 0.119 W/kg; SAR(10 g) = 0.053 W/kg
Maximum value of SAR (measured) = 0.137 W/kg

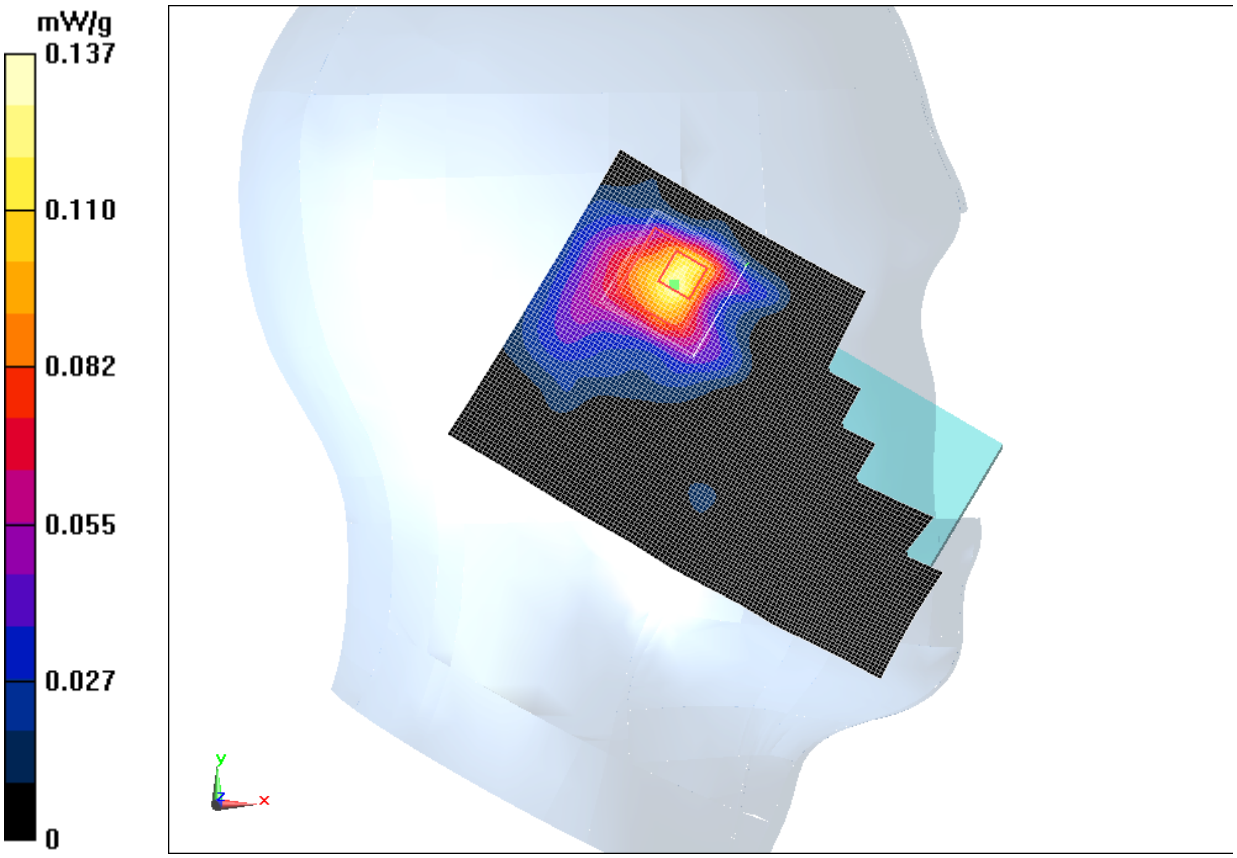

Fig.16 2450 MHz CH6

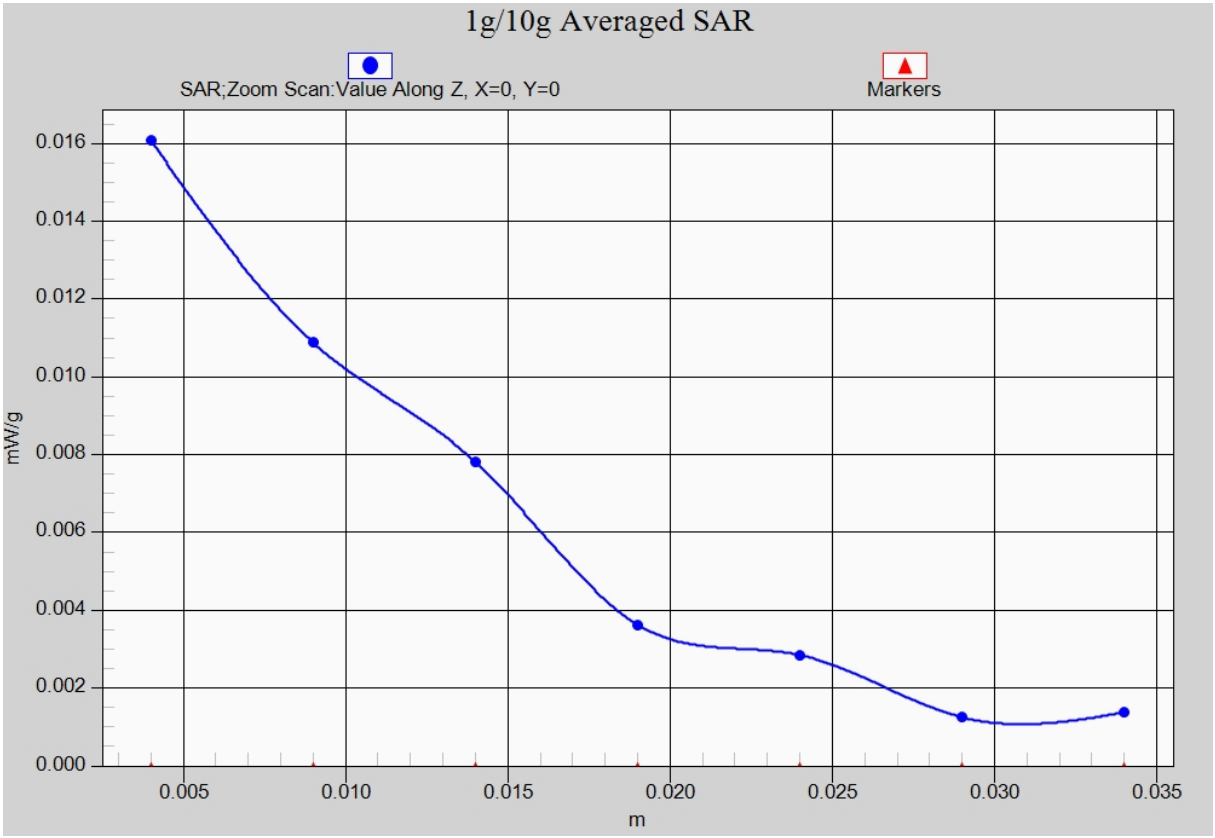

Fig. 16-1 Z-Scan at power reference point (2450 MHz CH6)

Wifi 802.11b Body Rear Channel 6 – AP OFF
Date: 2013-3-26
Electronics: DAE4 Sn771
Medium: Body 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.948 mho/m; ε_r = 51.907; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C
Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(4.15, 4.15, 4.15)

Rear Middle/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.104 W/kg

Rear Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.454 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.170 W/kg
SAR(1 g) = 0.085 W/kg; SAR(10 g) = 0.038 W/kg
Maximum value of SAR (measured) = 0.105 W/kg

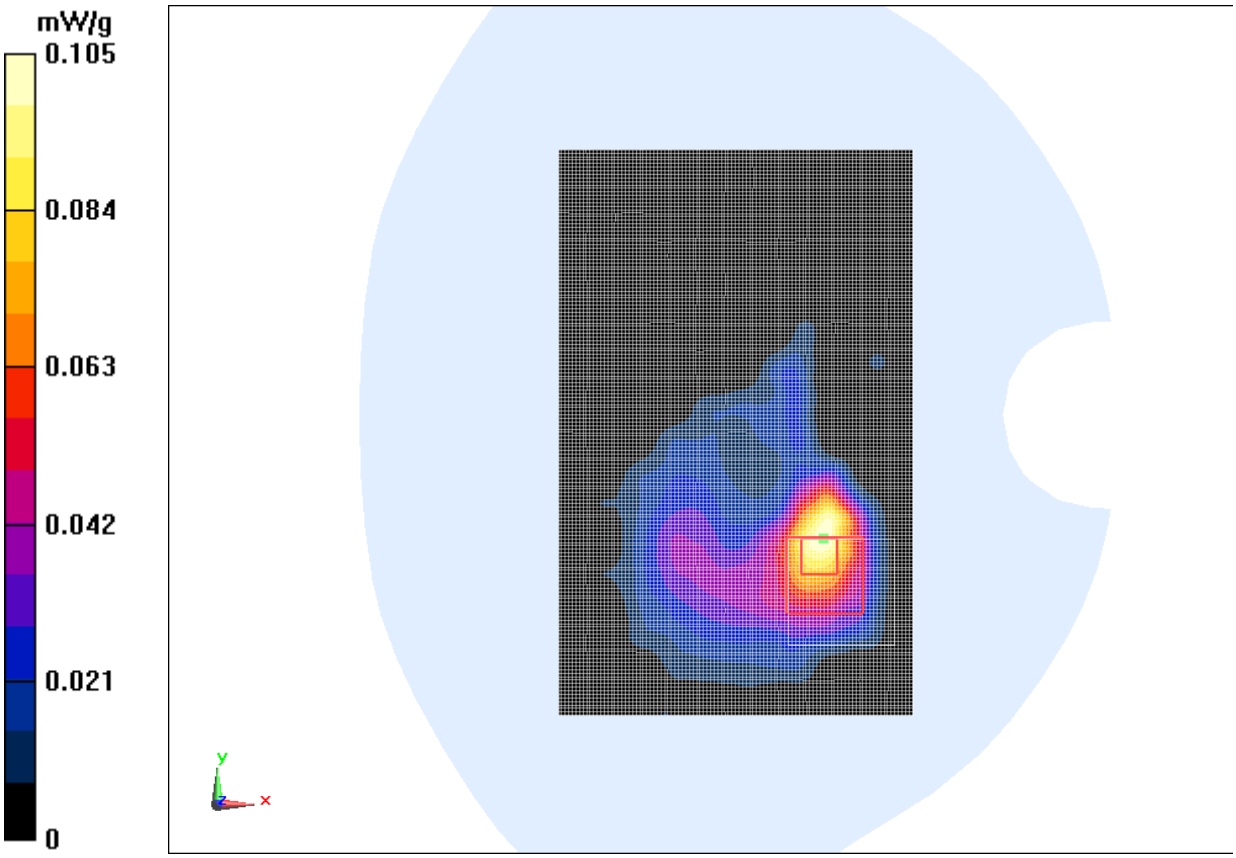

Fig.17 2450 MHz CH6

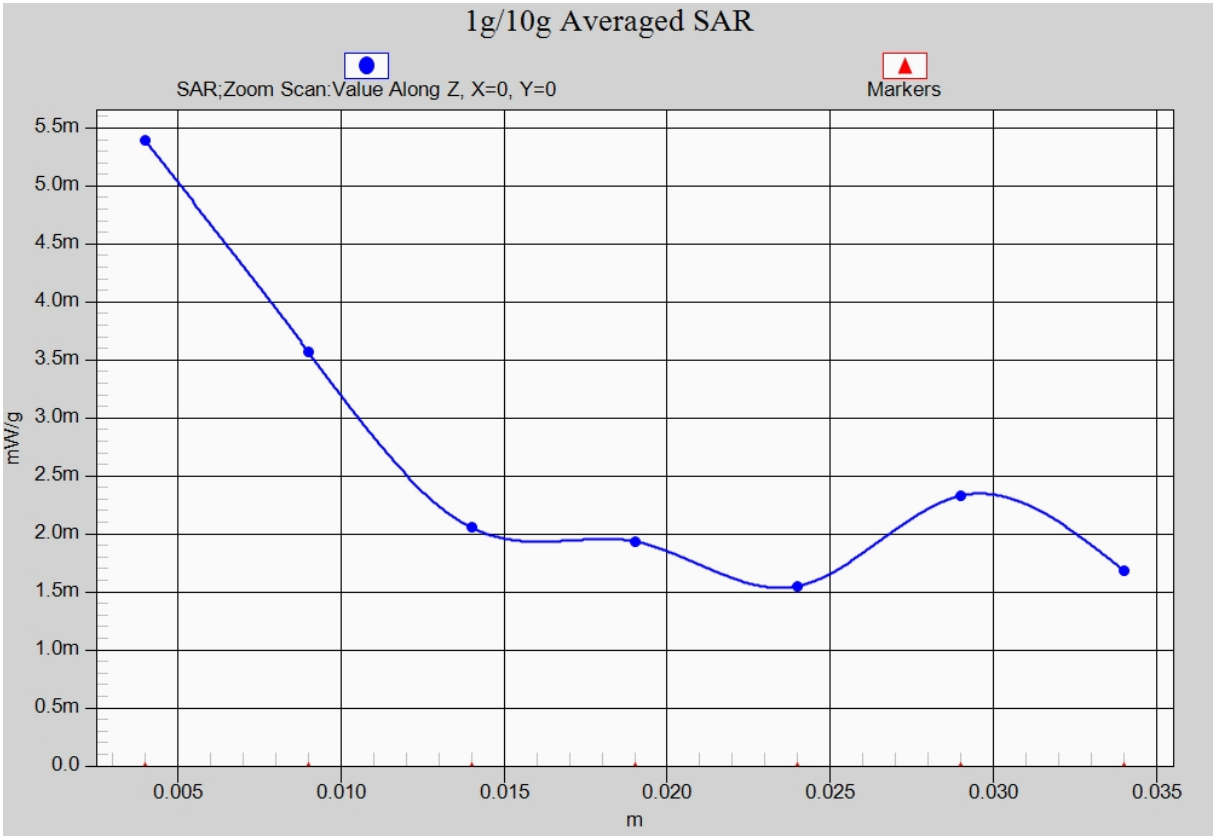

Fig. 17-1 Z-Scan at power reference point (2450 MHz CH6)