

FCC SAR

Measurement and Test Report

For

Swagtek

10205 NW 19th Street, STE101, Miami, FL, 33172, USA

FCC ID: O55552416

Test Standards: FCC Part 2.1093
ANSI / IEEE C95.1 :2005
ANSI / IEEE C95.3 :2002
IEEE 1528 :2013

Product Description: 4G Smart Phone

Tested Model: L5.5E

Report No.: STR16078163H

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1. General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Swagtek
Address of applicant: 10205 NW 19th Street, STE101, Miami, FL, 33172, USA

Manufacturer: Swagtek
Address of manufacturer: 10205 NW 19th Street, STE101, Miami, FL, 33172, USA

General Description of EUT:	
Product Name:	4G Smart Phone
Brand Name:	LOGIC
Model No.:	L5.5E
Adding Model(s):	/
Hardware Version:	S6T050S2_V002 (A570_MB_V4.0)
Software Version:	MRA58K test-keys
Rated Voltage:	DC 3.8V
Battery Capacity:	2950mAh
Device Category:	Portable Device
<i>Note: The test data is gathered from a production sample provided by the manufacturer. T</i>	

Technical Characteristics of EUT:	
2G	
Support Networks:	GSM, GPRS, EDGE
Support Band:	GSM850/PCS1900
Uplink Frequency:	GSM/GPRS/EDGE 850: 824~849MHz GSM/GPRS/EDGE 1900: 1850~1910MHz
Downlink Frequency:	GSM/GPRS/EDGE 850: 869~894MHz GSM/GPRS/EDGE 1900: 1930~1990MHz
Max RF Output Power:	GSM850: 31.78dBm, GSM1900: 28.82dBm
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: -0.49dBi; GSM1900: 0.43dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5, WCDMA Band 4
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz WCDMA Band 4: 1710~1755MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz WCDMA Band 4: 2110~2155MHz
RF Output Power:	WCDMA Band 2: 22.41dBm, WCDMA Band 5: 22.82dBm, WCDMA Band 4: 22.68dBm
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 0.43dBi, WCDMA Band 5: -0.49dBi, WCDMA Band 4: 0.42dBi
4G	
Support Networks:	FDD-LTE
Support Band:	FDD-LTE Band 2, 4, 7, 17
Uplink Frequency:	FDD-LTE Band 2: Tx: 1850-1910MHz, FDD-LTE Band 4: Tx: 1710-1755MHz, FDD-LTE Band 7: Tx: 2500-2570MHz FDD-LTE Band 17: Tx: 704-716MHz
Downlink Frequency:	FDD-LTE Band 2: Rx: 1930-1990MHz, FDD-LTE Band 4: Rx: 2110-2155MHz, FDD-LTE Band 7: Rx: 2620-2690MHz, FDD-LTE Band 17: Tx: 734-746MHz
RF Output Power:	FDD-LTE Band 2: 23.60dBm, FDD-LTE Band 4: 24.65dBm,

	FDD-LTE Band 7: 24.60dBm, FDD-LTE Band 17: 24.90dBm
Type of Modulation:	QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	FDD-LTE Band 2: 0.43dBi, FDD-LTE Band 4: 0.42dBi, FDD-LTE Band 7: 1.03dBi, FDD-LTE Band 17: -0.52dBi,
WIFI	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
RF Output Power:	11.52dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11/7
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	1.14dBi
Bluetooth	
Bluetooth Version:	V4.0
Frequency Range:	2402-2480MHz
RF Output Power:	-0.635dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, Pi/4 QDPSK, 8DPSK
Quantity of Channels:	79/40
Channel Separation:	1MHz/2MHz
Antenna Type:	Integral Antenna
Antenna Gain:	1.14dBi

1.2 Test Standards

The following report is prepared on behalf of the Swagtek in accordance with FCC 47 CFR Part 2.1093, ANSI/IEEE C95.1-2005, ANSI / IEEE C95.3 :2002, IEEE 1528-2013, KDB 447498 D01 v06, KDB 648474 D04 v01r03, KDB 248227 D01 v02r02, KDB 941225 D01 v03r01, KDB 941225 D05 v02r05 ,KDB 941225 D06 v02r01, and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02.

The objective is to determine compliance with FCC Part 2.1093 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02. The public notice KDB 447498 D01 v06 for Mobile and Portable Devices RF Exposure Procedure also.

1.4 Test Facility

- **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

- **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101)

2. Summary of Test Results

The maximum results of Specific Absorption Rate (SAR) have found during testing are as follows:

Frequency Band	Head SAR	Body-worn (10mm Gap)	Hotspot (10mm Gap)	SAR _{1g} Limit (W/kg)
	Maximum SAR _{1g} (W/kg)	Maximum SAR _{1g} (W/kg)	Maximum SAR _{1g} (W/kg)	
GSM	0.176	0.735	0.643	1.6
WCDMA	0.192	0.752	0.752	1.6
FDD-LTE	0.059	0.345	0.345	1.6
WLAN 2.4G	0.025	0.167	0.167	1.6
Simultaneous Transmission	0.229	0.919	0.919	1.6

Remark:

*The highest reported SAR values for head, body-worn accessory, wireless router(hotspot), and simultaneous transmission conditions are **0.192W/kg, 0.752W/kg, 0.752W/kg, and 0.919W/kg** respectively.*

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2.1093 and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedure specified in IEEE 1528-2013 and KDB 865664 D01 v01r04 and KDB 865664 D02 v01r02

3. Specific Absorption Rate (SAR)

3.1 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.

3.2 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:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

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

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

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

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

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

4. SAR Measurement System

4.1 The Measurement System

Comosar is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Comosar system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 10g mass.

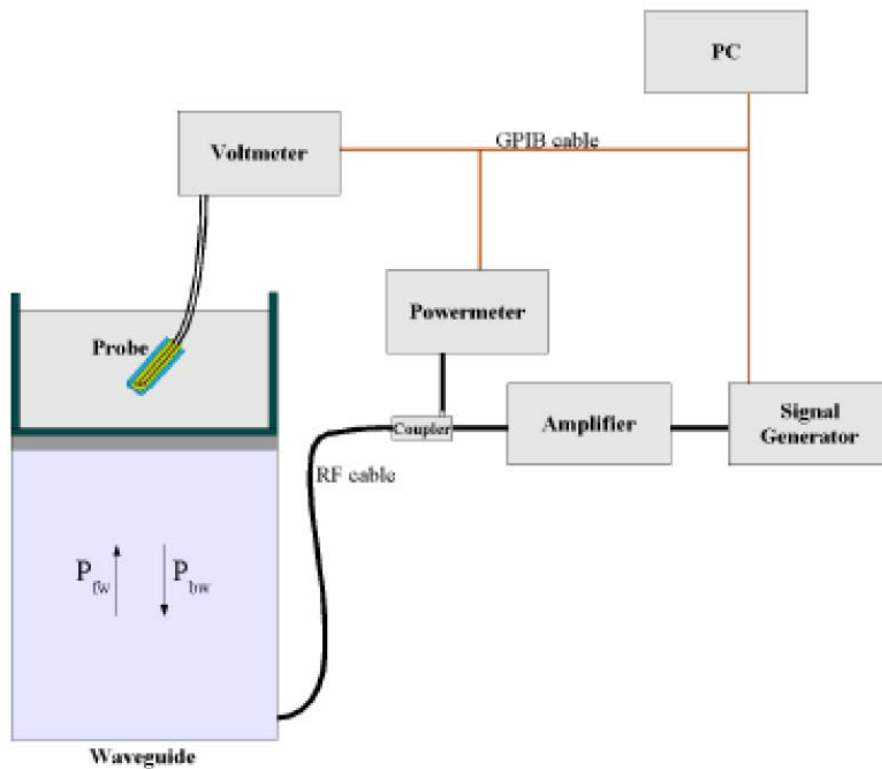
4.2 Probe

For the measurements the Specific Dosimetric E-Field Probe SSE5 SN 09/13 EP168 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Probe Length: 330 mm
- Length of Individual Dipoles: 4.5 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter : 5 mm
- Distance between dipoles / probe extremity: 2.7mm

- Probe linearity: <0.25 dB
 - Axial Isotropy: <0.25 dB
 - Spherical Isotropy: <0.50 dB
 - Calibration range: 700 to 3000MHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

Probe calibration is realized, in compliance with EN 62209-1 and IEEE 1528 STD, with CALISAR, Antenna proprietary calibration system. The calibration is performed with the EN 62209-1 annexe technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-2z/\delta}$$

Where :

P_{fw} = Forward Power

P_{bw} = Backward Power

a and b = Waveguide dimensions

δ = Skin depth

Keithley configuration:

Rate = Medium; Filter = ON; RDGS = 10; Filter type = Moving Average; Range auto after each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

$$CF(N)=SAR(N)/V_{lin}(N) \quad (N=1,2,3)$$

The linearised output voltage $V_{lin}(N)$ is obtained from the displayed output voltage $V(N)$ using

$$V_{lin}(N)=V(N)*(1+V(N)/DCP(N)) \quad (N=1,2,3)$$

where DCP is the diode compression point in mV.

4.3 Probe Calibration Process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm²) using an with CALISAR, Antenna proprietary calibration system.

Free Space Assessment Procedure

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1mW/cm².

Temperature Assessment Procedure

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

Where:

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

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T/\Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

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

Where:

σ = simulated tissue conductivity,

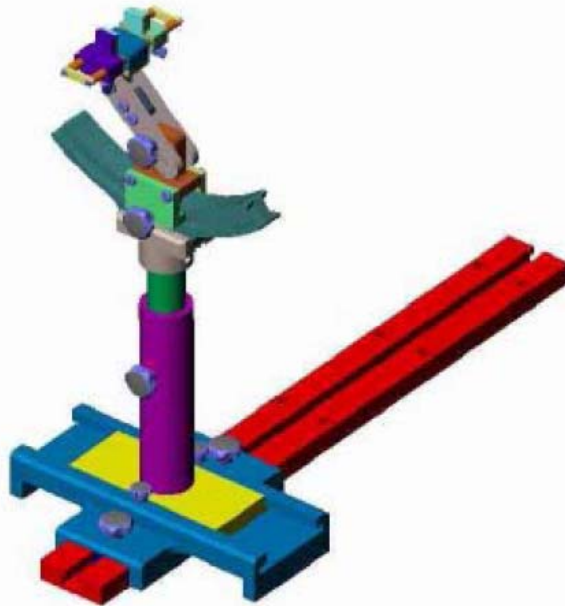
ρ = Tissue density (1.25 g/cm³ for brain tissue)

4.4 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

4.5 Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1°.



System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

4.6 Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
E-Field Probe	SATIMO	SSE5	SN 09/13 EP168	2016-06-01	2017-05-31
750MHz Dipole	SATIMO	SID750	SN 47/12 DIP 0G750-203	2016-03-20	2017-03-19
835MHz Dipole	SATIMO	SID835	SN 47/12 DIP 0G835-204	2016-03-20	2017-03-19
1800MHz Dipole	SATIMO	SID1800	SN 47/12 DIP 1G800-206	2016-03-20	2017-03-19
1900MHz Dipole	SATIMO	SID1900	SN 47/12 DIP 1G900-207	2016-03-20	2017-03-19
2450MHz Dipole	SATIMO	SID2450	SN 13/15 DIP 2G450-364	2016-03-20	2017-03-19
Dielectric Probe Kit	SATIMO	SCLMP	SN 47/12 OCPG49	2016-03-20	2017-03-19
SAM Phantom	SATIMO	SAM	SN/ 47/12 SAM95	N/A	N/A
MULTIMETER	KEITHLEY	Keithley 2000	4006367	2016-06-04	2017-06-03
Signal Generator	Rohde & Schwarz	SMR20	100047	2016-06-04	2017-06-03
Universal Tester	Rohde & Schwarz	CMU200	112012	2016-06-04	2017-06-03
Network Analyzer	HP	8753C	2901A00831	2016-06-04	2017-06-03
Directional Couplers	Agilent	778D	20160	2016-06-04	2017-06-03

5. Tissue Simulating Liquids

5.1 Composition of Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with SMTIMO, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. Please see the following photos for the liquid height.



Liquid Height for Head SAR



Liquid Height for Body SAR

The Composition of Tissue Simulating Liquid

Frequency (MHz)	Water (%)	Salt (%)	Triton (%)	HEC (%)	Preventol (%)	DGBE (%)
Head						
750	34.29	1.05	0.00	0.00	64.66	0.00
835	35.34	0.98	0.00	0.00	63.68	0.00
1800	55.19	0.66	30.35	0.00	0.00	13.80
1900	55.26	0.52	30.40	0.00	0.00	13.82
2450	55.44	0.32	30.50	0.00	0.00	13.74
Body						
750	51.75	1.17	0.00	0.00	47.08	0.00
835	52.87	1.07	0.00	0.00	46.10	0.00
1800	70.81	0.52	20.01	0.00	0.00	8.65
1900	69.99	0.41	20.66	0.00	0.00	8.93
2450	55.44	0.32	30.50	0.00	0.00	13.74

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Target Frequency (MHz)	Head		Body	
	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity (σ)	Permittivity (ϵ_r)
150	0.76	52.3	0.80	61.9
300	0.87	45.3	0.92	58.2
450	0.87	43.5	0.94	56.7
750	0.89	41.9	0.96	55.5
835	0.90	41.5	0.97	55.2
900	0.97	41.5	1.05	55.0
915	0.98	41.5	1.06	55.0
1450	1.20	40.5	1.30	54.0
1610	1.29	40.3	1.40	53.8
1800-2000	1.40	40.0	1.52	53.3
2450	1.80	39.2	1.95	52.7
3000	2.40	38.5	2.73	52.0
5800	5.27	35.3	6.00	48.2

5.3 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using COMOSAR Dielectric Probe Kit and an Agilent Network Analyzer.

Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Head Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
750	21.2	0.86	0.89	-3.37	41.32	41.90	-1.38	±5	2016-08-15
835	21.2	0.87	0.90	-3.33	41.11	41.50	-0.94	±5	2016-08-15
1800	21.3	1.37	1.40	-2.14	39.02	40.0	-2.45	±5	2016-08-15
1900	21.3	1.38	1.40	-1.43	38.56	40.00	-3.60	±5	2016-08-15
2450	21.3	1.74	1.80	-3.33	38.15	39.20	-2.68	±5	2016-08-15

Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ϵ_r)	Target (ϵ_r)	Delta (%)		
750	21.2	0.93	0.96	-3.12	54.96	55.50	-0.97	±5	2016-08-15
835	21.2	0.95	0.97	-2.06	54.85	55.20	-0.63	±5	2016-08-15
1800	21.3	1.46	1.52	-3.95	51.22	53.30	-3.90	±5	2016-08-15
1900	21.3	1.50	1.52	-1.32	52.42	53.30	-1.65	±5	2016-08-15
2450	21.3	1.91	1.95	-2.05	52.01	52.70	-1.31	±5	2016-08-15

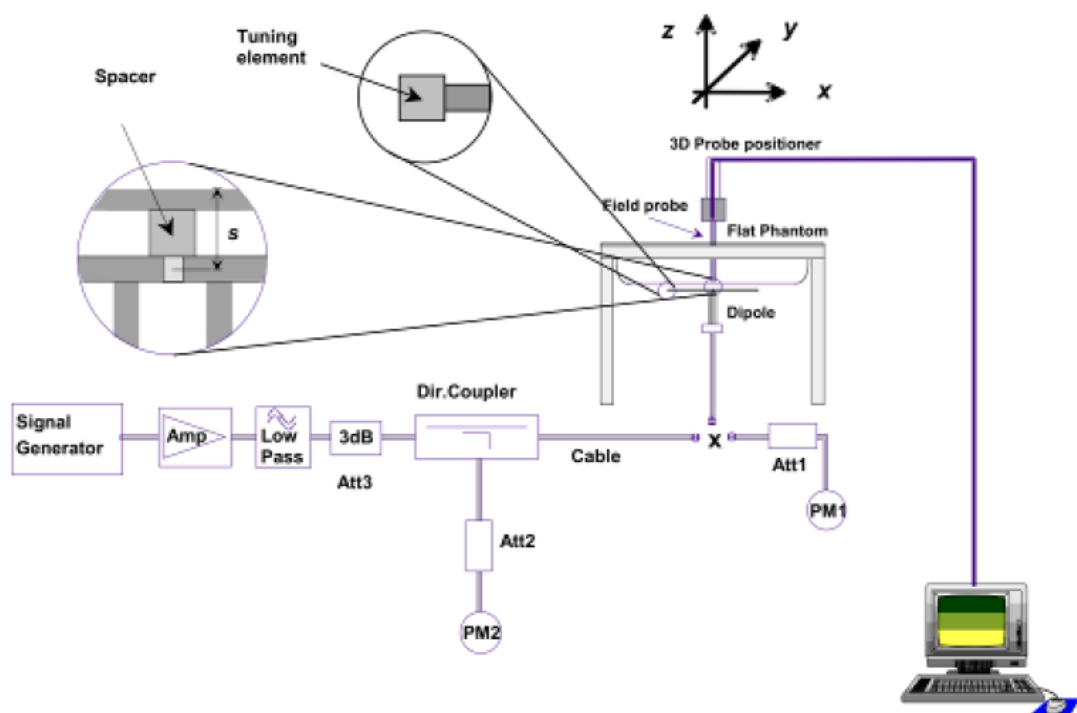
6. SAR Measurement Evaluation

6.1 Purpose of System Performance Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

6.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 835 MHz and 1900 MHz. 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.



System Verification Setup Block Diagram



Setup Photo of Dipole Antenna

The output power on dipole port must be calibrated to 24 dBm(250 mW) before dipole is connected.

6.3 Validation Results

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %. Table 6.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion.

Frequency	Targeted SAR _{1g}	Measured SAR _{1g}	Normalized SAR _{1g}	Tolerance
MHz	(W/kg)	(W/kg)	(W/kg)	(%)
Head				
750	8.40	2.16	8.64	2.86
835	9.67	2.41	9.64	-0.31
1800	38.51	9.61	38.44	-0.18
1900	39.58	9.91	39.64	0.15
2450	53.69	13.45	53.8	0.20
Body				
750	8.40	2.12	8.48	0.95
835	9.38	2.35	9.4	0.21
1800	38.31	9.58	38.32	0.03
1900	39.10	9.78	39.12	0.05
2450	50.41	12.59	50.36	-0.10

Targeted and Measurement SAR

Please refer to Annex A for the plots of system performance check.

7. EUT Testing Position

7.1 Define Two Imaginary Lines on The Handset

- (a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- (b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

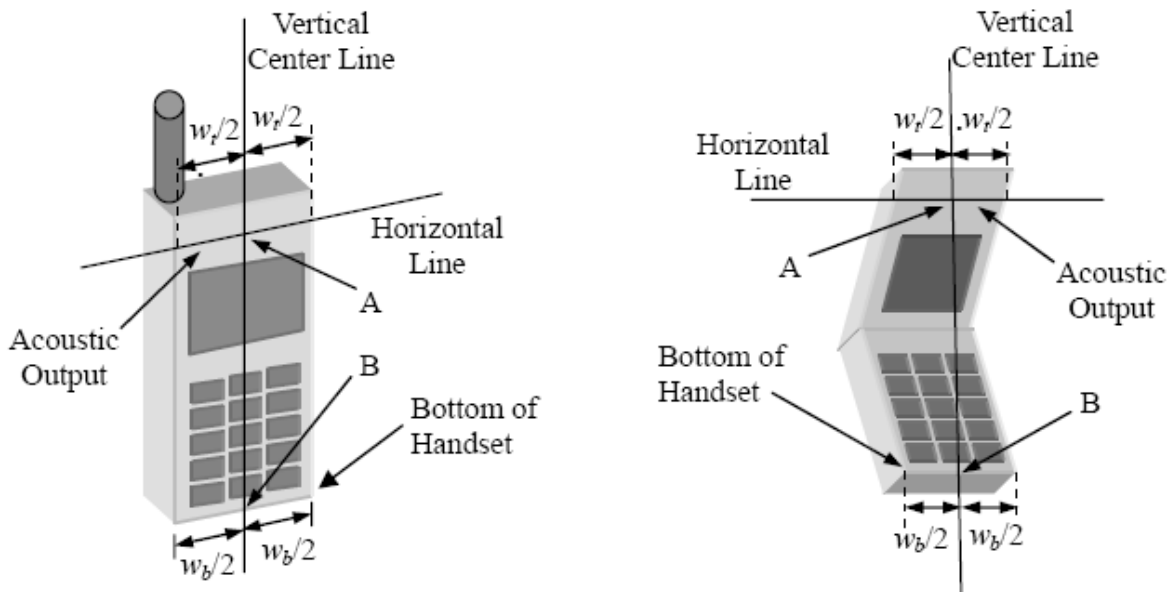


Illustration for Handset Vertical and Horizontal Reference Lines

7.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 7.2).

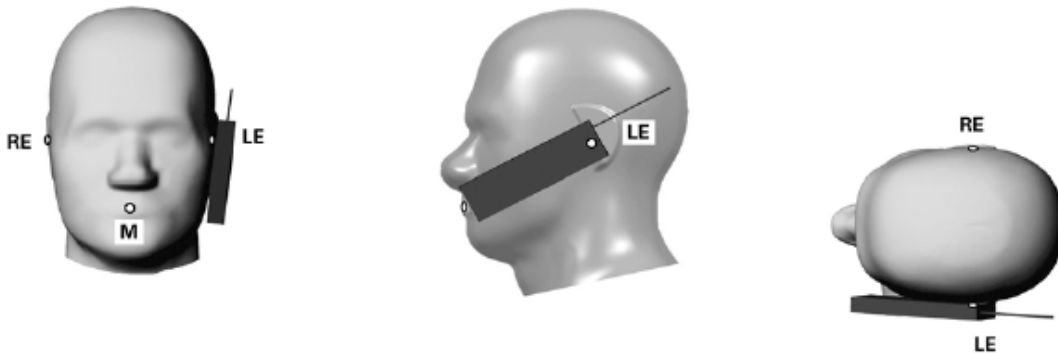


Illustration for Cheek Position

7.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 7.3).

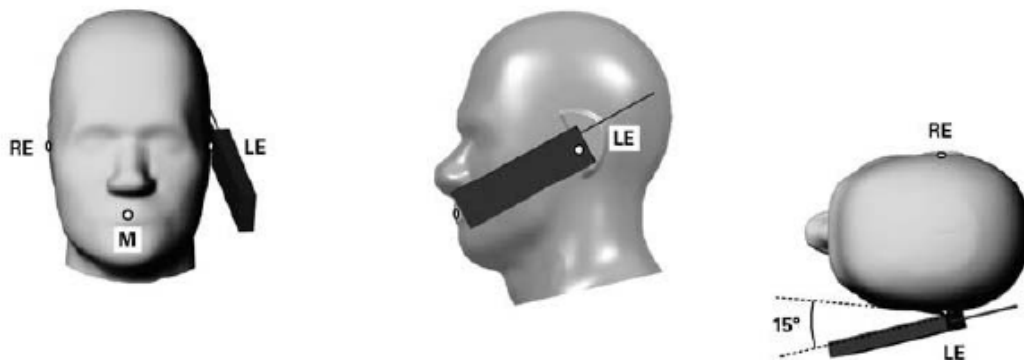


Illustration for Tilted Position

7.4 Body Worn Position

- To position the device parallel to the phantom surface with either keypad up or down.
- To adjust the device parallel to the flat phantom.
- To adjust the distance between the device surface and the flat phantom to 10mm.

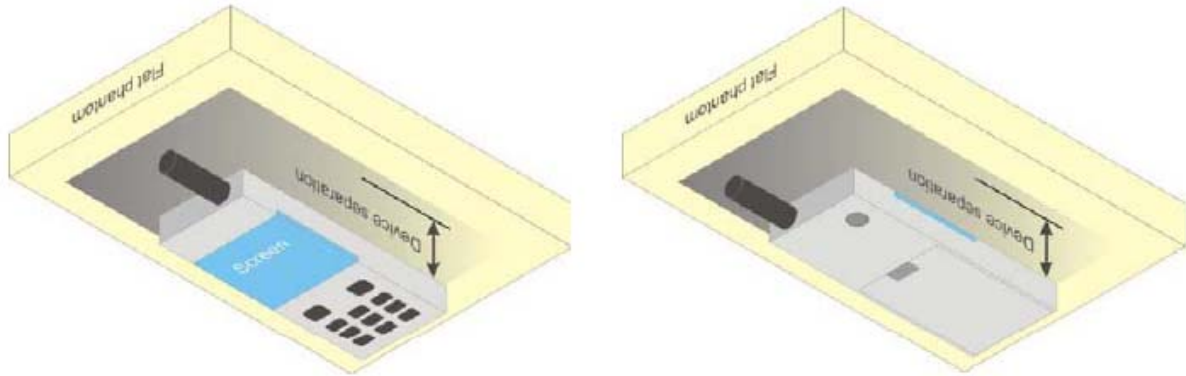
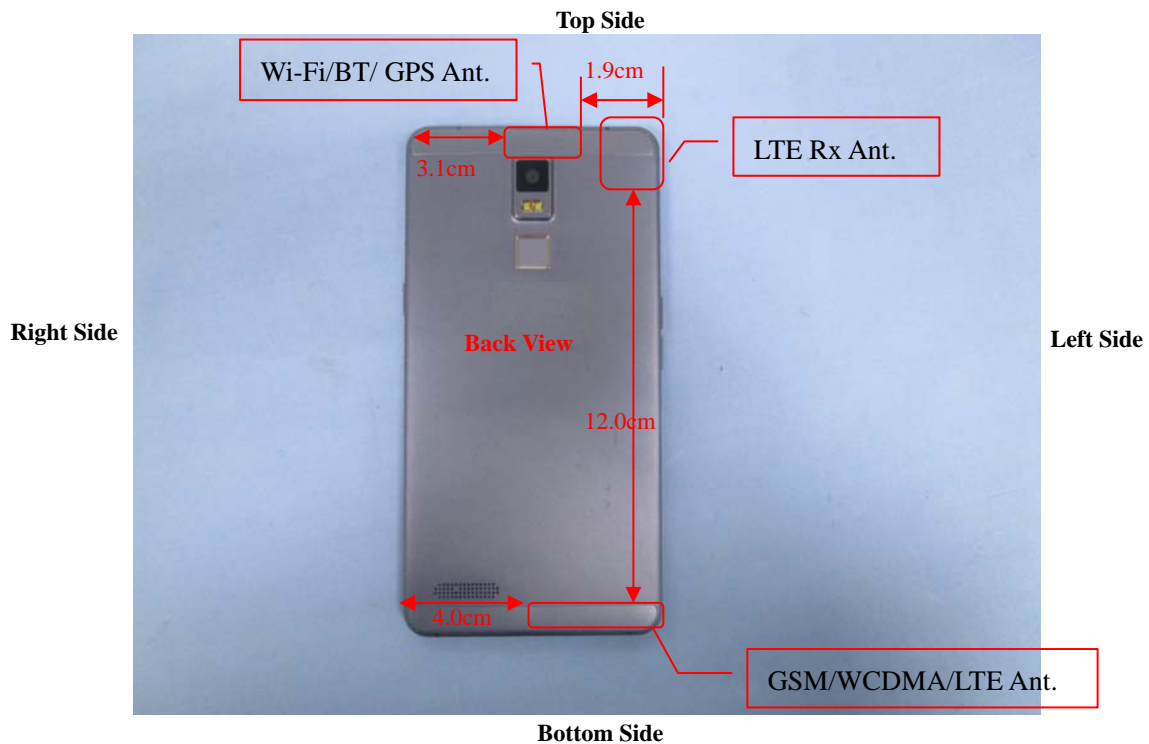


Illustration for Body Worn Position

7.5 EUT Antenna Position



Block Diagram for EUT Antenna Position

7.6 EUT Testing Position

Head/Body-worn/Hotspot mode SAR assessments are required for this device. This EUT was tested in different positions for different SAR test modes, more information as below:

Head SAR tests				
Antennas	Right Cheek	Left Cheek	Right Tilted	Left Tilted
WWAN	Yes	Yes	Yes	Yes
WLAN	Yes	Yes	Yes	Yes

Hotspot SAR tests, Test distance: 10mm						
Antennas	Front	Back	Right Side	Left Side	Top Side	Bottom Side
WWAN	Yes	Yes	No	Yes	No	Yes
WLAN	Yes	Yes	No	Yes	Yes	No

Body-worn SAR tests, Test distance: 10mm		
Antennas	Front	Back
WWAN	Yes	Yes
WLAN	Yes	Yes

Remark:

1. Referring to KDB 941225 D06, when the overall device length and width are $\geq 9\text{cm} \times 5\text{cm}$, the test separation distances is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

Please refer to Annex D for the EUT test setup photos.

8. SAR Measurement Procedures

8.1 Measurement Procedures

The measurement procedures are as follows:

- (a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
- (b) Keep EUT to radiate maximum output power or 100% factor (if applicable)
- (c) Measure output power through RF cable and power meter.
- (d) Place the EUT in the positions as Annex E demonstrates.
- (e) Set scan area, grid size and other setting on the SATIMO software.
- (f) Measure SAR results for the highest power channel on each testing position.
- (g) Find out the largest SAR result on these testing positions of each band
- (h) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

8.2 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The SATIMO software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

8.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

8.4 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.5 SAR Averaged Methods

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10g and 1 g requires a very fine resolution in the three dimensional scanned data array.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In SATIMO measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

9. SAR Test Result

9.1 Conducted RF Output Power

GSM - Burst Average Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880	1909.8
GSM	31.78	31.73	31.72	28.04	28.43	28.82
GPRS (1 slot)	31.75	31.72	31.73	28.01	28.43	28.8
GPRS (2 slots)	31.02	31.03	31	27.24	27.65	28.07
GPRS (3 slots)	29.41	29.34	28.43	25.5	25.96	26.34
GPRS (4 slots)	28.45	28.5	28.5	24.45	24.85	25.26
EDGE (1 slot)	26.41	26.34	26.21	24.15	24.56	25.33
EDGE (2 slots)	25.41	25.31	25.15	22.93	23.38	23.4
EDGE (3 slots)	23.23	23.12	22.98	20.78	21.17	21.17
EDGE (4 slots)	22.01	21.92	21.78	19.85	20.05	20.03

GSM - Source-Based Time-Average Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880	1909.8
GSM	22.78	22.73	22.72	19.04	19.43	19.82
GPRS (1 slot)	22.75	22.72	22.73	19.01	19.43	19.80
GPRS (2 slots)	25.02	25.03	25.00	21.24	21.65	22.07
GPRS (3 slots)	25.16	25.09	24.18	21.25	21.71	22.09
GPRS (4 slots)	25.45	25.50	25.50	21.45	21.85	22.26
EDGE (1 slot)	17.41	17.34	17.21	15.15	15.56	16.33
EDGE (2 slots)	19.41	19.31	19.15	16.93	17.38	17.40
EDGE (3 slots)	18.98	18.87	18.73	16.53	16.92	16.92
EDGE (4 slots)	19.01	18.92	18.78	16.85	17.05	17.03

Note: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below:

Source based time-average power = Burst averaged power - Duty cycle factor in dB

Duty cycle factor = 9 dB for 1 Tx slot, 6 dB for 2 Tx slots, 4.25 dB for 3 Tx slots, 3 dB for 4 Tx slots

Remark:

1. For Head SAR testing, GSM should be evaluated, therefore the EUT was set in GSM for GSM850 and GSM1900 due to its highest source-based time-average power.
2. For Body SAR testing, GPRS should be evaluated, therefore the EUT was set in GPRS (4TX slots) for GSM850 and GSM1900 due to its highest source-based time-average power.
3. Per KDB 447498 D01 v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
4. The DUT do not support DTM function.

WCDMA - Average Power (dBm)						
Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4182	4233
Frequency (MHz)	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2k	22.41	22.38	22.29	22.66	22.82	22.42
HSDPA Subtest-1	21.1	21.45	21.02	21.33	21.28	21.23
HSDPA Subtest-2	21.17	21.98	21.67	21.94	21.84	21.08
HSDPA Subtest-3	21.99	21.48	21.64	21.67	21.46	21.12
HSDPA Subtest-4	21.05	21.46	21.49	21.49	21.39	21.41
HSUPA Subtest-1	21.46	21.59	21.53	21.38	21.3	21.24
HSUPA Subtest-2	21.55	21.84	21.74	21.77	21.85	21.5
HSUPA Subtest-3	21.25	21.62	21.37	21.42	21.29	21.12
HSUPA Subtest-4	21.03	21.49	21.17	21.73	21.22	21.18
HSUPA Subtest-5	21.31	21.44	21.55	21.12	21.61	21.49

WCDMA - Average Power (dBm)						
Band	WCDMA Band IV					
Channel	1312	1412	1513			
Frequency (MHz)	1712.4	1732.4	1752.6			
RMC 12.2k	22.61	22.68	22.06			
HSDPA Subtest-1	21.26	21.35	20.94			
HSDPA Subtest-2	21.13	21.39	21.68			
HSDPA Subtest-3	21.95	21.84	21.98			
HSDPA Subtest-4	21.86	21.96	21.71			
HSUPA Subtest-1	21.55	21.49	20.87			
HSUPA Subtest-2	21.93	21.37	21.62			
HSUPA Subtest-3	21.28	21.18	21.13			
HSUPA Subtest-4	21.37	21.51	21.42			
HSUPA Subtest-5	21.52	21.01	21.51			

Remark:

1. For Head SAR, per KDB 941225 D01 v03, RMC 12.2kbps setting is used to evaluate SAR. If AMR 12.2kbps power is < 1/4 dB higher than RMC, SAR tests with AMR 12.2kbps can be excluded.
2. For Body SAR, per KDB 941225 D01 v03, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA subset-1 output power is < 1/4 dB higher than RMC, and SAR with RMC 12.2kbps setting is $\leq 1.2\text{W/kg}$, HSDPA SAR evaluation can be excluded

FDD-LTE Band 2:

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.43	
		1	3	23.17	
		1	5	23.17	
		3	0	22.91	
		3	2	22.87	
		3	3	22.85	
		6	0	22.05	
	MCH	1	0	23.54	
		1	3	23.43	
		1	5	23.52	
		3	0	23.58	
		3	2	23.48	
		3	3	23.51	
		6	0	22.73	
	HCH	1	0	22.74	
		1	3	22.57	
		1	5	22.59	
		3	0	22.62	
		3	2	22.53	
		3	3	22.51	
		6	0	21.83	
16QAM	LCH	1	0	22.50	
		1	3	22.38	
		1	5	22.43	
		3	0	22.18	
		3	2	22.12	
		3	3	22.12	
		6	0	21.19	
	MCH	1	0	23.07	
		1	3	22.97	
		1	5	22.98	
		3	0	22.70	
		3	2	22.64	
		3	3	22.67	
		6	0	21.83	
	HCH	1	0	22.13	
1		3	22.02		

		1	5	22.02	
		3	0	21.87	
		3	2	21.80	
		3	3	21.81	
		6	0	21.15	

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	22.79	
		1	7	22.72	
		1	14	22.74	
		8	0	22.01	
		8	4	21.99	
		8	7	21.99	
		15	0	22.01	
	MCH	1	0	23.48	
		1	7	23.38	
		1	14	23.31	
		8	0	22.78	
		8	4	22.72	
		8	7	22.67	
		15	0	22.75	
	HCH	1	0	22.97	
		1	7	22.75	
		1	14	22.60	
		8	0	22.11	
		8	4	21.99	
		8	7	21.90	
		15	0	21.98	
16QAM	LCH	1	0	22.23	
		1	7	22.17	
		1	14	22.21	
		8	0	21.24	
		8	4	21.25	
		8	7	21.22	
		15	0	21.16	
	MCH	1	0	22.89	
		1	7	22.82	
		1	14	22.77	
		8	0	21.99	
		8	4	21.94	
		8	7	21.87	

	HCH	15	0	21.84	
		1	0	22.46	
		1	7	22.27	
		1	14	22.14	
		8	0	21.31	
		8	4	21.19	
		8	7	21.13	
		15	0	21.18	

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	22.69	
		1	12	22.27	
		1	24	22.64	
		12	0	21.62	
		12	6	21.50	
		12	13	21.59	
		25	0	21.59	
	MCH	1	0	23.46	
		1	12	22.97	
		1	24	23.20	
		12	0	22.42	
		12	6	22.25	
		12	13	22.23	
		25	0	22.31	
	HCH	1	0	23.16	
		1	12	22.55	
		1	24	22.61	
		12	0	21.95	
		12	6	21.74	
		12	13	21.63	
		25	0	21.77	
16QAM	LCH	1	0	22.22	
		1	12	21.82	
		1	24	22.20	
		12	0	20.91	
		12	6	20.81	
		12	13	20.91	
		25	0	20.77	
	MCH	1	0	22.96	
		1	12	22.47	
		1	24	22.74	

		12	0	21.67	
		12	6	21.53	
		12	13	21.54	
		25	0	21.49	
	HCH	1	0	22.30	
		1	12	21.69	
		1	24	21.80	
		12	0	21.16	
		12	6	20.94	
		12	13	20.84	
		25	0	20.96	

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	22.27	
		1	24	22.32	
		1	49	22.38	
		25	0	21.54	
		25	12	21.54	
		25	25	21.62	
		50	0	21.58	
	MCH	1	0	23.09	
		1	24	22.98	
		1	49	22.56	
		25	0	22.39	
		25	12	22.28	
		25	25	22.08	
		50	0	22.28	
	HCH	1	0	23.11	
		1	24	22.83	
		1	49	22.14	
		25	0	22.30	
		25	12	22.07	
		25	25	21.83	
		50	0	22.11	
16QAM	LCH	1	0	21.70	
		1	24	21.76	
		1	49	21.81	
		25	0	20.72	
		25	12	20.73	
		25	25	20.81	
		50	0	20.78	

	MCH	1	0	22.50	
		1	24	22.43	
		1	49	22.01	
		25	0	21.56	
		25	12	21.44	
		25	25	21.28	
		50	0	21.43	
	HCH	1	0	22.60	
		1	24	22.33	
		1	49	21.73	
		25	0	21.46	
		25	12	21.27	
		25	25	21.04	
		50	0	21.28	

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	22.48	
		1	37	22.42	
		1	74	22.89	
		37	0	21.57	
		37	18	21.63	
		37	38	21.84	
		75	0	21.75	
	MCH	1	0	23.28	
		1	37	22.98	
		1	74	22.79	
		37	0	22.45	
		37	18	22.27	
		37	38	22.04	
		75	0	22.26	
	HCH	1	0	23.16	
		1	37	22.98	
		1	74	22.34	
		37	0	22.41	
		37	18	22.27	
		37	38	21.96	
		75	0	22.20	
16QAM	LCH	1	0	21.90	
		1	37	21.85	
		1	74	22.28	
		37	0	20.76	

		37	18	20.82	
		37	38	21.01	
		75	0	20.91	
	MCH	1	0	22.68	
		1	37	22.39	
		1	74	22.25	
		37	0	21.57	
		37	18	21.42	
		37	38	21.23	
		75	0	21.42	
	HCH	1	0	22.55	
		1	37	22.34	
		1	74	21.82	
		37	0	21.57	
37		18	21.43		
37		38	21.13		
75		0	21.33		

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	22.56	
		1	49	22.66	
		1	99	23.01	
		50	0	21.62	
		50	25	21.77	
		50	50	22.06	
		100	0	21.87	
	MCH	1	0	23.60	
		1	49	23.05	
		1	99	22.78	
		50	0	22.43	
		50	25	22.21	
		50	50	22.00	
		100	0	22.24	
	HCH	1	0	22.89	
		1	49	23.17	
		1	99	22.34	
		50	0	22.21	
		50	25	22.25	
		50	50	22.04	
		100	0	22.15	
16QAM	LCH	1	0	21.87	

		1	49	21.91		
		1	99	22.32		
		50	0	20.77		
		50	25	20.92		
		50	50	21.19		
		100	0	21.01		
	MCH	1	0	22.64		
		1	49	22.36		
		1	99	22.10		
		50	0	21.56		
		50	25	21.36		
		50	50	21.15		
	HCH	100	0	21.37		
		1	0	22.35		
		1	49	22.58		
		1	99	21.84		
		50	0	21.39		
		50	25	21.45		
			50	50	21.26	
			100	0	21.31	

FDD-LTE Band 4:

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Average Power [dBm]	Verdict	
		Size	Offset			
QPSK	LCH	1	0	24.20		
		1	3	24.02		
		1	5	24.03		
		3	0	24.48		
		3	2	24.50		
		3	3	24.49		
		6	0	23.50		
	MCH	1	0	24.57		
		1	3	24.48		
		1	5	24.59		
		3	0	24.42		
		3	2	24.40		
		3	3	24.43		
	HCH	6	0	23.58		
		1	0	24.28		
			1	3	24.20	

		1	5	24.28	
		3	0	24.30	
		3	2	24.28	
		3	3	24.29	
		6	0	24.55	
16QAM	LCH	1	0	24.10	
		1	3	24.04	
		1	5	24.08	
		3	0	23.63	
		3	2	23.63	
		3	3	23.64	
		6	0	22.98	
	MCH	1	0	23.96	
		1	3	23.93	
		1	5	23.98	
		3	0	23.48	
		3	2	23.52	
		3	3	23.56	
		6	0	22.71	
	HCH	1	0	24.61	
		1	3	24.59	
		1	5	24.60	
		3	0	24.44	
		3	2	24.44	
		3	3	24.48	
		6	0	23.84	

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.94	
		1	7	23.83	
		1	14	23.97	
		8	0	23.00	
		8	4	23.03	
		8	7	23.09	
		15	0	23.01	
	MCH	1	0	23.97	
		1	7	23.80	
		1	14	23.74	
		8	0	23.14	
		8	4	23.06	
		8	7	23.06	

	HCH	15	0	23.07	
		1	0	24.05	
		1	7	24.00	
		1	14	24.03	
		8	0	24.30	
		8	4	24.32	
		8	7	24.36	
		15	0	24.37	
16QAM	LCH	1	0	23.29	
		1	7	23.20	
		1	14	23.31	
		8	0	22.57	
		8	4	22.62	
		8	7	22.65	
		15	0	22.50	
	MCH	1	0	23.38	
		1	7	23.21	
		1	14	23.14	
		8	0	22.63	
		8	4	22.63	
		8	7	22.62	
		15	0	22.49	
	HCH	1	0	24.41	
		1	7	24.35	
		1	14	24.40	
		8	0	23.60	
		8	4	23.62	
		8	7	23.65	
		15	0	23.51	

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.71	
		1	12	23.32	
		1	24	23.97	
		12	0	22.56	
		12	6	22.50	
		12	13	22.72	
		25	0	22.60	
	MCH	1	0	24.05	
		1	12	23.41	
		1	24	23.58	

		12	0	22.87			
		12	6	22.65			
		12	13	22.63			
		25	0	22.73			
	HCH	1	0	24.05			
		1	12	24.58			
		1	24	24.02			
		12	0	23.79			
		12	6	23.82			
		12	13	24.04			
		25	0	23.95			
		16QAM	LCH	1	0	23.18	
				1	12	22.80	
1	24			23.44			
12	0			22.20			
12	6			22.16			
12	13			22.36			
25	0			22.15			
MCH	1		0	23.51			
	1		12	22.87			
	1		24	23.12			
	12		0	22.47			
	12		6	22.29			
	12		13	22.29			
	25	0	22.26				
HCH	1	0	23.86				
	1	12	23.67				
	1	24	24.13				
	12	0	23.27				
	12	6	23.28				
	12	13	23.44				
	25	0	23.36				

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.20	
		1	24	23.51	
		1	49	23.86	
		25	0	22.59	
		25	12	22.76	
		25	25	22.98	
		50	0	22.85	

	MCH	1	0	23.85	
		1	24	23.48	
		1	49	23.03	
		25	0	22.98	
		25	12	22.70	
		25	25	22.44	
		50	0	22.72	
	HCH	1	0	23.27	
		1	24	24.11	
		1	49	24.50	
		25	0	22.98	
		25	12	23.34	
		25	25	23.79	
		50	0	23.43	
16QAM	LCH	1	0	22.62	
		1	24	22.86	
		1	49	23.24	
		25	0	22.12	
		25	12	22.26	
		25	25	22.48	
		50	0	22.36	
	MCH	1	0	23.21	
		1	24	22.85	
		1	49	22.46	
		25	0	22.40	
		25	12	22.21	
		25	25	21.98	
		50	0	22.24	
	HCH	1	0	22.78	
		1	24	23.57	
		1	49	23.98	
		25	0	22.52	
		25	12	22.86	
		25	25	23.22	
		50	0	22.95	

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.31	
		1	37	23.52	
		1	74	24.07	
		37	0	22.56	

		37	18	22.77	
		37	38	23.15	
		75	0	22.91	
	MCH	1	0	24.02	
		1	37	23.29	
		1	74	22.79	
		37	0	22.90	
		37	18	22.50	
		37	38	22.15	
		75	0	22.53	
	HCH	1	0	22.79	
		1	37	23.46	
		1	74	24.54	
		37	0	22.13	
37		18	22.66		
37		38	23.39		
75		0	22.87		
16QAM	LCH	1	0	22.69	
		1	37	22.90	
		1	74	23.47	
		37	0	22.06	
		37	18	22.25	
		37	38	22.55	
		75	0	22.37	
	MCH	1	0	23.40	
		1	37	22.65	
		1	74	22.27	
		37	0	22.31	
		37	18	21.99	
		37	38	21.73	
		75	0	22.06	
	HCH	1	0	22.27	
		1	37	22.86	
		1	74	23.93	
		37	0	21.75	
		37	18	22.24	
		37	38	22.91	
		75	0	22.40	

Channel Bandwidth: 20 MHz				
Modulation	Channel	RB Configuration		Average Power [dBm]
		Size	Offset	
QPSK	LCH	1	0	24.65

		1	49	23.81		
		1	99	23.92		
		50	0	22.75		
		50	25	23.02		
		50	50	23.25		
		100	0	23.07		
	MCH	1	0	24.30		
		1	49	23.37		
		1	99	22.94		
		50	0	23.06		
		50	25	22.51		
		50	50	22.13		
	HCH	100	0	22.64		
		1	0	23.16		
		1	49	23.03		
		1	99	24.55		
		50	0	21.93		
		50	25	22.28		
	16QAM	LCH	50	50	23.16	
			100	0	22.64	
			1	0	22.78	
1			49	23.11		
1			99	23.23		
50			0	22.25		
MCH		50	25	22.45		
		50	50	22.64		
		100	0	22.50		
		1	0	23.65		
		1	49	22.63		
		1	99	22.27		
HCH		50	0	22.47		
		50	25	22.03		
		50	50	21.71		
		100	0	22.16		
		1	0	22.60		
		1	49	22.48		
			1	99	24.01	
			50	0	21.55	
			50	25	21.89	
	50		50	22.72		
	100		0	22.18		

FDD-LTE Band 7:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.79	
		1	12	23.98	
		1	24	24.01	
		12	0	22.96	
		12	6	23.02	
		12	13	23.08	
		25	0	22.82	
	MCH	1	0	24.09	
		1	12	23.97	
		1	24	23.53	
		12	0	22.81	
		12	6	22.71	
		12	13	22.78	
		25	0	22.72	
	HCH	1	0	23.32	
		1	12	22.94	
		1	24	23.00	
		12	0	22.36	
		12	6	22.00	
		12	13	21.81	
		25	0	21.94	
16QAM	LCH	1	0	23.23	
		1	12	23.39	
		1	24	23.39	
		12	0	22.14	
		12	6	22.20	
		12	13	22.24	
		25	0	22.05	
	MCH	1	0	22.78	
		1	12	22.62	
		1	24	22.60	
		12	0	21.89	
		12	6	21.75	
		12	13	21.83	
		25	0	21.79	
HCH	1	0	22.39		
	1	12	22.17		

		1	24	22.30	
		12	0	21.46	
		12	6	21.43	
		12	13	21.28	
		25	0	21.42	

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.39	
		1	24	24.02	
		1	49	24.22	
		25	0	23.04	
		25	12	23.11	
		25	25	23.17	
		50	0	23.14	
	MCH	1	0	24.17	
		1	24	23.62	
		1	49	23.42	
		25	0	22.98	
		25	12	22.80	
		25	25	22.87	
		50	0	22.94	
	HCH	1	0	23.60	
		1	24	22.89	
		1	49	21.92	
		25	0	22.49	
		25	12	22.09	
		25	25	21.49	
		50	0	22.14	
16QAM	LCH	1	0	22.80	
		1	24	23.30	
		1	49	23.50	
		25	0	22.07	
		25	12	22.15	
		25	25	22.19	
		50	0	22.20	
	MCH	1	0	23.45	
		1	24	22.93	
		1	49	22.90	
		25	0	22.01	
		25	12	21.85	
		25	25	21.94	

		50	0	21.99	
	HCH	1	0	22.77	
		1	24	22.47	
		1	49	21.58	
		25	0	21.50	
		25	12	21.46	
		25	25	20.97	
		50	0	21.52	

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Average Power [dBm]		
		Size	Offset			
QPSK	LCH	1	0	23.87		
		1	37	24.27		
		1	74	24.42		
		37	0	23.23		
		37	18	23.27		
		37	38	23.45		
		75	0	23.59		
	MCH	1	0	24.49		
		1	37	23.68		
		1	74	23.76		
		37	0	23.03		
		37	18	22.87		
		37	38	22.95		
		75	0	23.05		
	HCH	1	0	23.74		
		1	37	23.61		
		1	74	22.99		
		37	0	22.77		
		37	18	22.68		
		37	38	22.60		
		75	0	22.68		
	16QAM	LCH	1	0	23.24	
			1	37	23.55	
			1	74	23.73	
37			0	22.20		
37			18	22.27		
37			38	22.42		
75			0	22.37		
MCH		1	0	23.73		
		1	37	22.85		
		1	74	23.25		

		37	0	22.18	
		37	18	22.29	
		37	38	21.94	
		75	0	22.03	
	HCH	1	0	22.87	
		1	37	22.69	
		1	74	22.48	
		37	0	21.52	
		37	18	21.53	
		37	38	21.47	
		75	0	21.59	

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	24.07	
		1	49	24.30	
		1	99	24.60	
		50	0	23.15	
		50	25	23.30	
		50	50	23.43	
		100	0	23.30	
	MCH	1	0	24.59	
		1	49	23.66	
		1	99	23.72	
		50	0	23.17	
		50	25	22.86	
		50	50	23.00	
		100	0	23.09	
	HCH	1	0	24.05	
		1	49	23.69	
		1	99	22.96	
		50	0	22.73	
		50	25	22.56	
		50	50	22.48	
		100	0	22.60	
16QAM	LCH	1	0	23.23	
		1	49	23.50	
		1	99	23.76	
		50	0	22.20	
		50	25	22.30	
		50	50	22.42	
		100	0	22.33	

	MCH	1	0	23.74	
		1	49	22.87	
		1	99	23.20	
		50	0	22.22	
		50	25	21.91	
		50	50	22.04	
		100	0	22.14	
	HCH	1	0	23.23	
		1	49	22.83	
		1	99	22.58	
		50	0	21.76	
		50	25	21.61	
		50	50	21.53	
		100	0	21.61	

FDD-LTE Band 17:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	23.79	
		1	12	24.08	
		1	24	24.14	
		12	0	22.40	
		12	6	22.81	
		12	13	23.80	
		25	0	22.99	
	MCH	1	0	24.58	
		1	12	24.80	
		1	24	23.90	
		12	0	24.09	
		12	6	23.96	
		12	13	23.51	
		25	0	23.74	
	HCH	1	0	24.24	
		1	12	22.20	
		1	24	22.38	
		12	0	22.25	
		12	6	21.42	
		12	13	21.14	
		25	0	21.60	
16QAM	LCH	1	0	22.52	
		1	12	22.95	
		1	24	24.09	

		12	0	21.58	
		12	6	22.01	
		12	13	22.94	
		25	0	22.21	
	MCH	1	0	24.15	
		1	12	23.93	
		1	24	23.27	
		12	0	23.12	
		12	6	23.02	
		12	13	22.77	
		25	0	23.01	
	HCH	1	0	23.68	
		1	12	21.72	
		1	24	21.96	
		12	0	21.61	
		12	6	20.84	
		12	13	20.59	
		25	0	20.95	

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	
		Size	Offset		
QPSK	LCH	1	0	21.97	
		1	24	24.90	
		1	49	21.90	
		25	0	22.48	
		25	12	23.07	
		25	25	22.54	
		50	0	22.50	
	MCH	1	0	22.33	
		1	24	23.75	
		1	49	21.44	
		25	0	22.93	
		25	12	22.88	
		25	25	21.76	
		50	0	22.34	
	HCH	1	0	23.07	
		1	24	23.12	
		1	49	21.46	
		25	0	23.05	
		25	12	22.37	
		25	25	21.11	
		50	0	22.21	

16QAM	LCH	1	0	21.48	
		1	24	23.56	
		1	49	21.42	
		25	0	21.73	
		25	12	22.30	
		25	25	21.84	
		50	0	21.78	
	MCH	1	0	21.86	
		1	24	23.22	
		1	49	21.01	
		25	0	22.15	
		25	12	22.15	
		25	25	21.09	
		50	0	21.61	
	HCH	1	0	22.68	
		1	24	22.74	
		1	49	21.17	
		25	0	22.30	
		25	12	21.72	
		25	25	20.52	
		50	0	21.53	

Remark:

- Per KDB941225 D05 v02r05, Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.8 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
- Per KDB941225 D05 v02r05, the procedures required for 1 RB allocation in section 4.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
- Per KDB941225 D05 v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in sections 4.2.1 and 4.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
- Per KDB941225 D05 v02r05, For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 4.2.1, 5.2.2 and 4.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

WLAN - Maximum Average Power				
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)
802.11b	1Mbps	CH 01	2412	8.94
		CH 06	2437	10.73
		CH 11	2462	11.52
802.11g	54Mbps	CH 01	2412	6.96
		CH 06	2437	8.78
		CH 11	2462	8.56
802.11n (20MHz)	MCS7	CH 01	2412	7.02
		CH 06	2437	9.32
		CH 11	2462	8.47
802.11n (40MHz)	MCS7	CH 03	2422	8.03
		CH 06	2437	6.26
		CH 09	2452	6.94

Remark:

1. Per KDB 248227 D01 v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227 D01 v02r02, if 11g and 11n average output power is higher than 1/4 dB higher than 11b mode, SAR will be verified.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate. For 802.11n mode, SAR test according to the highest power channel with correspondence data rates.

Bluetooth - Maximum Average Power		
Test Mode	Data Rate	Average Power(dBm)
GFSK	1Mbps	-0.635
Pi/4 QDPSK	2Mbps	-1.989
8DPSK	3Mbps	-1.962

Bluetooth - Maximum Average Power				
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)
BLE	1Mbps	CH 00	2402	-7.582
		CH 19	2440	-7.562
		CH 39	2480	-9.149

Remark:

Bluetooth maximum output power is -0.635dBm, and Maximum Tune-Up output power is -0.5dBm. Per KDB 447498 D01 V06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,16 where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	Result	Limit
-0.5	0.89	5	2.402	0.28	3

The exclusion thresholds is $0.28 < 3$, therefore, the RF exposure evaluation is not required.

9.2 Test Results for Standalone SAR Test

Head SAR

GSM850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
1.	GSM	Right Cheek	128	824.2	31.78	32.0	1.0520	0.1672	0.1759
2.	GSM	Right Tilted	128	824.2	31.78	32.0	1.0520	0.0972	0.1023
3.	GSM	Left Cheek	128	824.2	31.78	32.0	1.0520	0.1473	0.1550
4.	GSM	Left Tilted	128	824.2	31.78	32.0	1.0520	0.0873	0.0918

GSM1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
5.	GSM	Right Cheek	810	1909.8	28.82	29.0	1.0423	0.0579	0.0604
6.	GSM	Right Tilted	810	1909.8	28.82	29.0	1.0423	0.0198	0.0206
7.	GSM	Left Cheek	810	1909.8	28.82	29.0	1.0423	0.0311	0.0324
8.	GSM	Left Tilted	810	1909.8	28.82	29.0	1.0423	0.0202	0.0211

GPRS850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
9.	GPRS_4TX	Right Cheek	190	836.6	28.5	29.0	1.1220	0.1409	0.1581
10.	GPRS_4TX	Right Tilted	190	836.6	28.5	29.0	1.1220	0.0822	0.0922
11.	GPRS_4TX	Left Cheek	190	836.6	28.5	29.0	1.1220	0.1278	0.1434
12.	GPRS_4TX	Left Tilted	190	836.6	28.5	29.0	1.1220	0.0633	0.0710

GPRS1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
13.	GPRS_4TX	Right Cheek	810	1909.8	25.26	25.5	1.0568	0.0638	0.0674
14.	GPRS_4TX	Right Tilted	810	1909.8	25.26	25.5	1.0568	0.0527	0.0557
15.	GPRS_4TX	Left Cheek	810	1909.8	25.26	25.5	1.0568	0.0979	0.1035
16.	GPRS_4TX	Left Tilted	810	1909.8	25.26	25.5	1.0568	0.0433	0.0458

WCDMA Band 2 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
17.	RMC	Right Cheek	9262	1852.4	22.41	22.5	1.0209	0.1383	0.1412
18.	RMC	Right Tilted	9262	1852.4	22.41	22.5	1.0209	0.0507	0.0518
19.	RMC	Left Cheek	9262	1852.4	22.41	22.5	1.0209	0.1052	0.1074
20.	RMC	Left Tilted	9262	1852.4	22.41	22.5	1.0209	0.0332	0.0339

WCDMA Band 5 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
21.	RMC	Right Cheek	4182	836.6	22.82	23.0	1.0423	0.1844	0.1922
22.	RMC	Right Tilted	4182	836.6	22.82	23.0	1.0423	0.0953	0.0993
23.	RMC	Left Cheek	4182	836.6	22.82	23.0	1.0423	0.1246	0.1299
24.	RMC	Left Tilted	4182	836.6	22.82	23.0	1.0423	0.1018	0.1061

WCDMA Band IV– Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
25.	RMC	Right Cheek	1412	1732.4	22.68	23.0	1.0765	0.0407	0.0438
26.	RMC	Right Tilted	1412	1732.4	22.68	23.0	1.0765	0.0088	0.0095
27.	RMC	Left Cheek	1412	1732.4	22.68	23.0	1.0765	0.0309	0.0333
28.	RMC	Left Tilted	1412	1732.4	22.68	23.0	1.0765	0.0040	0.0043

LTE Band 2– Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)	
	Modulation, Bandwidth, RB								MHz
29.	RMC QPSK 20MHz 1RB	Right Cheek	1880.0	23.60	24.0	1.0965	0.0242	0.0265	
30.	RMC QPSK 20MHz 1RB	Right Tilted	1880.0	23.60	24.0	1.0965	0.0054	0.0059	
31.	RMC QPSK 20MHz 1RB	Left Cheek	1880.0	23.60	24.0	1.0965	0.0232	0.0254	
32.	RMC QPSK 20MHz 1RB	Left Tilted	1880.0	23.60	24.0	1.0965	0.0054	0.0059	
33.	RMC QPSK 20MHz 50%RB	Right Cheek	1880.0	22.43	24.0	1.4355	0.0210	0.0301	
34.	RMC QPSK 20MHz 50%RB	Right Tilted	1880.0	22.43	24.0	1.4355	0.0012	0.0017	
35.	RMC QPSK 20MHz 50%RB	Left Cheek	1880.0	22.43	24.0	1.4355	0.0212	0.0304	
36.	RMC QPSK 20MHz 50%RB	Left Tilted	1880.0	22.43	24.0	1.4355	0.0023	0.0033	

LTE Band 4– Head SAR Test								
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
37.	RMC QPSK 20MHz 1RB	Right Cheek	1720.0	24.65	25.0	1.0839	0.0196	0.0212
38.	RMC QPSK 20MHz 1RB	Right Tilted	1720.0	24.65	25.0	1.0839	0.0057	0.0062
39.	RMC QPSK 20MHz 1RB	Left Cheek	1720.0	24.65	25.0	1.0839	0.0163	0.0177
40.	RMC QPSK 20MHz 1RB	Left Tilted	1720.0	24.65	25.0	1.0839	0.0050	0.0054
41.	RMC QPSK 20MHz 50%RB	Right Cheek	1720.0	23.25	25.0	1.4962	0.0145	0.0217
42.	RMC QPSK 20MHz 50%RB	Right Tilted	1720.0	23.25	25.0	1.4962	0.0038	0.0057
43.	RMC QPSK 20MHz 50%RB	Left Cheek	1720.0	23.25	25.0	1.4962	0.0137	0.0205
44.	RMC QPSK 20MHz 50%RB	Left Tilted	1720.0	23.25	25.0	1.4962	0.0042	0.0063

LTE Band 7– Head SAR Test								
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
45.	RMC QPSK 20MHz 1RB	Right Cheek	2510.0	24.60	25.0	1.0965	0.0536	0.0588
46.	RMC QPSK 20MHz 1RB	Right Tilted	2510.0	24.60	25.0	1.0965	0.0154	0.0169
47.	RMC QPSK 20MHz 1RB	Left Cheek	2510.0	24.60	25.0	1.0965	0.0387	0.0424
48.	RMC QPSK 20MHz 1RB	Left Tilted	2510.0	24.60	25.0	1.0965	0.0103	0.0113
49.	RMC QPSK 20MHz 50%RB	Right Cheek	2510.0	23.43	25.0	1.4355	0.0412	0.0591
50.	RMC QPSK 20MHz 50%RB	Right Tilted	2510.0	23.43	25.0	1.4355	0.0107	0.0154
51.	RMC QPSK 20MHz 50%RB	Left Cheek	2510.0	23.43	25.0	1.4355	0.0381	0.0547
52.	RMC QPSK 20MHz 50%RB	Left Tilted	2510.0	23.43	25.0	1.4355	0.0123	0.0177

LTE Band 17– Head SAR Test								
Plot No.	Mode	Test Position Head	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
53.	RMC,QPSK 10MHz 1RB	Right Cheek	709.0	24.90	25.0	1.0233	0.0150	0.0153
54.	RMC,QPSK 10MHz 1RB	Right Tilted	709.0	24.90	25.0	1.0233	0.0105	0.0107
55.	RMC,QPSK 10MHz 1RB	Left Cheek	709.0	24.90	25.0	1.0233	0.0144	0.0147
56.	RMC,QPSK 10MHz 1RB	Left Tilted	709.0	24.90	25.0	1.0233	0.0102	0.0104
57.	RMC,QPSK 10MHz 50%RB	Right Cheek	709.0	23.07	25.0	1.5596	0.0137	0.0214
58.	RMC,QPSK 10MHz 50%RB	Right Tilted	709.0	23.07	25.0	1.5596	0.0023	0.0036
59.	RMC,QPSK 10MHz 50%RB	Left Cheek	709.0	23.07	25.0	1.5596	0.0113	0.0176
60.	RMC,QPSK 10MHz 50%RB	Left Tilted	709.0	23.07	25.0	1.5596	0.0041	0.0064

WLAN 2.4GHz – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
61.	802.11b	Right Cheek	11	2462	11.52	12.0	1.1169	0.0222	0.0248
62.	802.11b	Right Tilted	11	2462	11.52	12.0	1.1169	0.0102	0.0114
63.	802.11b	Left Cheek	11	2462	11.52	12.0	1.1169	0.0218	0.0243
64.	802.11b	Left Tilted	11	2462	11.52	12.0	1.1169	0.0145	0.0162

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

Body-worn SAR

GSM850 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
65.	GSM	Back	128	824.2	31.78	32.0	1.0520	0.2402	0.2527
66.	GSM	Front	128	824.2	31.78	32.0	1.0520	0.1720	0.1809

GSM1900 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
67.	GSM	Back	810	1909.8	28.82	29.0	1.0423	0.7055	0.7354
68.	GSM	Front	810	1909.8	28.82	29.0	1.0423	0.4553	0.4746

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
77	RMC 12.2k	Back Side	9262	1852.4	22.41	22.5	1.0209	0.7363	0.7517
78	RMC 12.2k	Front Side	9262	1852.4	22.41	22.5	1.0209	0.4922	0.5025

WCDMA Band 5 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
81	RMC 12.2k	Back Side	4182	836.6	22.82	23.0	1.0423	0.2874	0.2996
82	RMC 12.2k	Front Side	4182	836.6	22.82	23.0	1.0423	0.2281	0.2378

WCDMA Band IV– Head SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
85	RMC 12.2k	Back	1412	1732.4	22.68	23.0	1.0765	0.6273	0.6753
86	RMC 12.2k	Front Side	1412	1732.4	22.68	23.0	1.0765	0.4042	0.4351

LTE Band 2–Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Freque	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)	
	Modulation, Bandwidth, RB		ncy						MHz
89	RMC QPSK 20MHz 1RB	Back Side	1880.0	23.60	24.0	1.0965	0.1938	0.2125	

90	RMC QPSK 20MHz 1RB	Front Side	1880.0	23.60	24.0	1.0965	0.1178	0.1292
93	RMC QPSK 20MHz 50%RB	Back Side	1880.0	22.43	24.0	1.4355	0.1622	0.2328
94	RMC QPSK 20MHz 50%RB	Front Side	1880.0	22.43	24.0	1.4355	0.0826	0.1186

LTE Band 4–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
97	RMC QPSK 20MHz 1RB	Back Side	1720.0	24.65	25.0	1.0839	0.1801	0.1952
98	RMC QPSK 20MHz 1RB	Front Side	1720.0	24.65	25.0	1.0839	0.2036	0.2207
101	RMC QPSK 20MHz 50%RB	Back Side	1720.0	23.25	25.0	1.4962	0.1443	0.2159
102	RMC QPSK 20MHz 50%RB	Front Side	1720.0	23.25	25.0	1.4962	0.1753	0.2623

LTE Band 7–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
105	RMC QPSK 20MHz 1RB	Back Side	2510.0	24.60	25.0	1.0965	0.3149	0.3453
106	RMC QPSK 20MHz 1RB	Front Side	2510.0	24.60	25.0	1.0965	0.1467	0.1609
109	RMC QPSK 20MHz 50%RB	Back Side	2510.0	23.43	25.0	1.4355	0.1004	0.1441
110	RMC QPSK 20MHz 50%RB	Front Side	2510.0	23.43	25.0	1.4355	0.2156	0.3095

LTE Band 17–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
113	RMC,QPSK 10MHz 1RB	Back Side	709.0	24.90	25.0	1.0233	0.1066	0.1091
114	RMC,QPSK 10MHz 1RB	Front Side	709.0	24.90	25.0	1.0233	0.0915	0.0936
117	RMC,QPSK 10MHz 50%RB	Back Side	709.0	23.07	25.0	1.5596	0.0867	0.1352
118	RMC,QPSK 10MHz 50%RB	Front Side	709.0	23.07	25.0	1.5596	0.0687	0.1071

WLAN 2.4GHz –Body SAR Test

Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
121	802.11b	Back Side	11	2462	11.52	12.0	1.1169	0.1497	0.1672
122	802.11b	Front Side	11	2462	11.52	12.0	1.1169	0.0950	0.1061

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

Hotspot SAR

GSM850 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
69.	GPRS_4TX	Back Side	190	836.6	28.5	29.0	1.1220	0.3791	0.4254
70.	GPRS_4TX	Front Side	190	836.6	28.5	29.0	1.1220	0.2268	0.2545
71.	GPRS_4TX	Bottom side	190	836.6	28.5	29.0	1.1220	0.1679	0.1884
72.	GPRS_4TX	Left side	190	836.6	28.5	29.0	1.1220	0.1384	0.1553

GSM1900 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
73.	GPRS_4TX	Back Side	810	1909.8	25.26	25.5	1.0568	0.6088	0.6434
74.	GPRS_4TX	Front Side	810	1909.8	25.26	25.5	1.0568	0.4254	0.4496
75.	GPRS_4TX	Bottom side	810	1909.8	25.26	25.5	1.0568	0.4525	0.4782
76.	GPRS_4TX	Left side	810	1909.8	25.26	25.5	1.0568	0.3236	0.3420

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
77.	RMC 12.2k	Back Side	9262	1852.4	22.41	22.5	1.0209	0.7363	0.7517
78.	RMC 12.2k	Front Side	9262	1852.4	22.41	22.5	1.0209	0.4922	0.5025
79.	RMC 12.2k	Bottom side	9262	1852.4	22.41	22.5	1.0209	0.3778	0.3857
80.	RMC 12.2k	Left side	9262	1852.4	22.41	22.5	1.0209	0.3496	0.3569

WCDMA Band 5 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
81.	RMC 12.2k	Back Side	4182	836.6	22.82	23.0	1.0423	0.2874	0.2996
82.	RMC 12.2k	Front Side	4182	836.6	22.82	23.0	1.0423	0.2281	0.2378
83.	RMC 12.2k	Bottom side	4182	836.6	22.82	23.0	1.0423	0.1782	0.1857
84.	RMC 12.2k	Left side	4182	836.6	22.82	23.0	1.0423	0.0508	0.0529

WCDMA Band IV – Head SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					

85.	RMC 12.2k	Back Side	1412	1732.4	22.68	23.0	1.0765	0.6273	0.6753
86.	RMC 12.2k	Front Side	1412	1732.4	22.68	23.0	1.0765	0.4042	0.4351
87.	RMC 12.2k	Bottom side	1412	1732.4	22.68	23.0	1.0765	0.4615	0.4968
88.	RMC 12.2k	Left side	1412	1732.4	22.68	23.0	1.0765	0.5312	0.5718

LTE Band 2–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
89.	RMC QPSK 20MHz 1RB	Back Side	1880.0	23.60	24.0	1.0965	0.1938	0.2125
90.	RMC QPSK 20MHz 1RB	Front Side	1880.0	23.60	24.0	1.0965	0.1178	0.1292
91.	RMC QPSK 20MHz 1RB	Bottom side	1880.0	23.60	24.0	1.0965	0.2761	0.3027
92.	RMC QPSK 20MHz 1RB	Left side	1880.0	23.60	24.0	1.0965	0.0431	0.0473
93.	RMC QPSK 20MHz 50%RB	Back Side	1880.0	22.43	24.0	1.4355	0.1622	0.2328
94.	RMC QPSK 20MHz 50%RB	Front Side	1880.0	22.43	24.0	1.4355	0.0826	0.1186
95.	RMC QPSK 20MHz 50%RB	Bottom side	1880.0	22.43	24.0	1.4355	0.1289	0.1850
96.	RMC QPSK 20MHz 50%RB	Left side	1880.0	22.43	24.0	1.4355	0.0322	0.0462

LTE Band 4–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
97.	RMC QPSK 20MHz 1RB	Back Side	1720.0	24.65	25.0	1.0839	0.1801	0.1952
98.	RMC QPSK 20MHz 1RB	Front Side	1720.0	24.65	25.0	1.0839	0.2036	0.2207
99.	RMC QPSK 20MHz 1RB	Bottom side	1720.0	24.65	25.0	1.0839	0.2508	0.2718
100.	RMC QPSK 20MHz 1RB	Left side	1720.0	24.65	25.0	1.0839	0.0447	0.0485
101.	RMC QPSK 20MHz 50%RB	Back Side	1720.0	23.25	25.0	1.4962	0.1443	0.2159
102.	RMC QPSK 20MHz 50%RB	Front Side	1720.0	23.25	25.0	1.4962	0.1753	0.2623
103.	RMC QPSK 20MHz 50%RB	Bottom side	1720.0	23.25	25.0	1.4962	0.2154	0.3223
104.	RMC QPSK 20MHz 50%RB	Left side	1720.0	23.25	25.0	1.4962	0.0212	0.0317

LTE Band 7–Body SAR Test (Gap: 10mm)

Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB		MHz					
105.	RMC QPSK 20MHz 1RB	Back Side	2510.0	24.60	25.0	1.0965	0.3149	0.3453
106.	RMC QPSK 20MHz 1RB	Front Side	2510.0	24.60	25.0	1.0965	0.1467	0.1609
107.	RMC QPSK 20MHz 1RB	Bottom side	2510.0	24.60	25.0	1.0965	0.1263	0.1385
108.	RMC QPSK 20MHz 1RB	Left side	2510.0	24.60	25.0	1.0965	0.0937	0.1027
109.	RMC QPSK 20MHz 50%RB	Back Side	2510.0	23.43	25.0	1.4355	0.1004	0.1441
110.	RMC QPSK 20MHz 50%RB	Front Side	2510.0	23.43	25.0	1.4355	0.2156	0.3095
111.	RMC QPSK 20MHz 50%RB	Bottom side	2510.0	23.43	25.0	1.4355	0.1865	0.2677
112.	RMC QPSK 20MHz 50%RB	Left side	2510.0	23.43	25.0	1.4355	0.0769	0.1104

LTE Band 17–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth		MHz					
113.	RMC,QPSK 10MHz 1RB	Back Side	709.0	24.90	25.0	1.0233	0.1066	0.1091
114.	RMC,QPSK 10MHz 1RB	Front Side	709.0	24.90	25.0	1.0233	0.0915	0.0936
115.	RMC,QPSK 10MHz 1RB	Bottom side	709.0	24.90	25.0	1.0233	0.0405	0.0414
116.	RMC,QPSK 10MHz 1RB	Left side	709.0	24.90	25.0	1.0233	0.0638	0.0653
117.	RMC,QPSK 10MHz 50%RB	Back Side	709.0	23.07	25.0	1.5596	0.0867	0.1352
118.	RMC,QPSK 10MHz 50%RB	Front Side	709.0	23.07	25.0	1.5596	0.0687	0.1071
119.	RMC,QPSK 10MHz 50%RB	Bottom side	709.0	23.07	25.0	1.5596	0.0272	0.0424
120.	RMC,QPSK 10MHz 50%RB	Left side	709.0	23.07	25.0	1.5596	0.0334	0.0521

WLAN 2.4GHz –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
121.	802.11b	Back Side	11	2462	11.52	12.0	1.1169	0.1497	0.1672
122.	802.11b	Front Side	11	2462	11.52	12.0	1.1169	0.0950	0.1061
123.	802.11b	Left side	11	2462	11.52	12.0	1.1169	0.0158	0.0176
124.	802.11b	Top Side	11	2462	11.52	12.0	1.1169	0.0171	0.0191

Remark: Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

9.3 Simultaneous Multi-band Transmission SAR Analysis

List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Head SAR	Body-worn SAR	Hotspot SAR
1	GSM(Voice) + WLAN(Data)	Yes	Yes	-
2	GPRS/ EDGE(Data) + WLAN(Data)	-	-	Yes
3	WCDMA (Voice)+ WLAN(Data)	Yes	Yes	-
4	HSDPA(Data) + WLAN(Data)	-	-	Yes
5	HSUPA(Data) + WLAN(Data)	-	-	Yes
6	LTE(Data) + WLAN(Data)	-	-	Yes
7	GSM(Voice) + Bluetooth(Data)	Yes	Yes	-
8	GPRS/ EDGE(Data) + Bluetooth(Data)	-	-	Yes
9	WCDMA(Voice) + Bluetooth(Data)	Yes	Yes	-
10	HSDPA(Data)+ Bluetooth(Data)	-	-	Yes
11	HSUPA(Data) + Bluetooth(Data)	-	-	Yes
12	LTE(Data) + Bluetooth(Data)	-	-	Yes

Remark:

- GSM and WCDMA share the same antenna, and cannot transmit simultaneously.
- WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
- According to the KDB 447498 D01 v06, 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:
 $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$;
 where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

For simultaneous transmission analysis, Bluetooth/ WIFI(5G) SAR is estimated per KDB 447498 D01 v06 as below:

Bluetooth:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	X	SAR(1g) 5mm	SAR(1g) 10mm
-0.5	0.89	5/10	2.402	7.5	0.0368	0.0184

- The maximum SAR summation is calculated based on the same configuration and test position.

Head SAR
WWAN and WLAN

Position	WWAN		WLAN	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Right Cheek	GSM850	0.1759	0.0248	0.2007
Right Tilted	GSM850	0.1023	0.0114	0.1137
Left Cheek	GSM850	0.1550	0.0243	0.1793
Left Tilted	GSM850	0.0918	0.0162	0.108
Right Cheek	GSM1900	0.0604	0.0248	0.0852
Right Tilted	GSM1900	0.0206	0.0114	0.032
Left Cheek	GSM1900	0.0324	0.0243	0.0567
Left Tilted	GSM1900	0.0211	0.0162	0.0373
Right Cheek	GPRS850	0.1581	0.0248	0.1829
Right Tilted	GPRS850	0.0922	0.0114	0.1036
Left Cheek	GPRS850	0.1434	0.0243	0.1677
Left Tilted	GPRS850	0.0710	0.0162	0.0872
Right Cheek	GPRS1900	0.0674	0.0248	0.0922
Right Tilted	GPRS1900	0.0557	0.0114	0.0671
Left Cheek	GPRS1900	0.1035	0.0243	0.1278
Left Tilted	GPRS1900	0.0458	0.0162	0.062
Right Cheek	WCDMA Band 2	0.1412	0.0248	0.166
Right Tilted	WCDMA Band 2	0.0518	0.0114	0.0632
Left Cheek	WCDMA Band 2	0.1074	0.0243	0.1317
Left Tilted	WCDMA Band 2	0.0339	0.0162	0.0501
Right Cheek	WCDMA Band 5	0.1922	0.0248	0.217
Right Tilted	WCDMA Band 5	0.0993	0.0114	0.1107
Left Cheek	WCDMA Band 5	0.1299	0.0243	0.1542
Left Tilted	WCDMA Band 5	0.1061	0.0162	0.1223
Right Cheek	WCDMA Band 4	0.0438	0.0248	0.0686
Right Tilted	WCDMA Band 4	0.0095	0.0114	0.0209
Left Cheek	WCDMA Band 4	0.0333	0.0243	0.0576
Left Tilted	WCDMA Band 4	0.0043	0.0162	0.0205
Right Cheek	LTE Band 2	0.0301	0.0248	0.0549
Right Tilted	LTE Band 2	0.0017	0.0114	0.0131
Left Cheek	LTE Band 2	0.0304	0.0243	0.0547
Left Tilted	LTE Band 2	0.0033	0.0162	0.0195
Right Cheek	LTE Band 4	0.0217	0.0248	0.0465
Right Tilted	LTE Band 4	0.0057	0.0114	0.0171
Left Cheek	LTE Band 4	0.0205	0.0243	0.0448
Left Tilted	LTE Band 4	0.0063	0.0162	0.0225
Right Cheek	LTE Band 7	0.0591	0.0248	0.0839

Right Tilted	LTE Band 7	0.0154	0.0114	0.0268
Left Cheek	LTE Band 7	0.0547	0.0243	0.079
Left Tilted	LTE Band 7	0.0177	0.0162	0.0339
Right Cheek	LTE Band 17	0.0214	0.0248	0.0462
Right Tilted	LTE Band 17	0.0036	0.0114	0.015
Left Cheek	LTE Band 17	0.0176	0.0243	0.0419
Left Tilted	LTE Band 17	0.0064	0.0162	0.0226

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Right Cheek	GSM850	0.1759	0.0368	0.2127
Right Tilted	GSM850	0.1023	0.0368	0.1391
Left Cheek	GSM850	0.1550	0.0368	0.1918
Left Tilted	GSM850	0.0918	0.0368	0.1286
Right Cheek	GSM1900	0.0604	0.0368	0.0972
Right Tilted	GSM1900	0.0206	0.0368	0.0574
Left Cheek	GSM1900	0.0324	0.0368	0.0692
Left Tilted	GSM1900	0.0211	0.0368	0.0579
Right Cheek	GPRS850	0.1581	0.0368	0.1949
Right Tilted	GPRS850	0.0922	0.0368	0.129
Left Cheek	GPRS850	0.1434	0.0368	0.1802
Left Tilted	GPRS850	0.0710	0.0368	0.1078
Right Cheek	GPRS1900	0.0674	0.0368	0.1042
Right Tilted	GPRS1900	0.0557	0.0368	0.0925
Left Cheek	GPRS1900	0.1035	0.0368	0.1403
Left Tilted	GPRS1900	0.0458	0.0368	0.0826
Right Cheek	WCDMA Band 2	0.1412	0.0368	0.178
Right Tilted	WCDMA Band 2	0.0518	0.0368	0.0886
Left Cheek	WCDMA Band 2	0.1074	0.0368	0.1442
Left Tilted	WCDMA Band 2	0.0339	0.0368	0.0707
Right Cheek	WCDMA Band 5	0.1922	0.0368	0.229
Right Tilted	WCDMA Band 5	0.0993	0.0368	0.1361
Left Cheek	WCDMA Band 5	0.1299	0.0368	0.1667
Left Tilted	WCDMA Band 5	0.1061	0.0368	0.1429
Right Cheek	WCDMA Band 4	0.0438	0.0368	0.0806
Right Tilted	WCDMA Band 4	0.0095	0.0368	0.0463
Left Cheek	WCDMA Band 4	0.0333	0.0368	0.0701
Left Tilted	WCDMA Band 4	0.0043	0.0368	0.0411
Right Cheek	LTE Band 2	0.0301	0.0368	0.0669
Right Tilted	LTE Band 2	0.0017	0.0368	0.0385
Left Cheek	LTE Band 2	0.0304	0.0368	0.0672
Left Tilted	LTE Band 2	0.0033	0.0368	0.0401
Right Cheek	LTE Band 4	0.0217	0.0368	0.0585
Right Tilted	LTE Band 4	0.0057	0.0368	0.0425
Left Cheek	LTE Band 4	0.0205	0.0368	0.0573
Left Tilted	LTE Band 4	0.0063	0.0368	0.0431
Right Cheek	LTE Band 7	0.0591	0.0368	0.0959
Right Tilted	LTE Band 7	0.0154	0.0368	0.0522

Left Cheek	LTE Band 7	0.0547	0.0368	0.0915
Left Tilted	LTE Band 7	0.0177	0.0368	0.0545
Right Cheek	LTE Band 17	0.0214	0.0368	0.0582
Right Tilted	LTE Band 17	0.0036	0.0368	0.0404
Left Cheek	LTE Band 17	0.0176	0.0368	0.0544
Left Tilted	LTE Band 17	0.0064	0.0368	0.0432

Body-worn SAR
WWAN and WLAN

Position	WWAN		WLAN	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM850	0.2527	0.1672	0.4199
Front	GSM850	0.1809	0.1061	0.287
Back	GSM1900	0.7354	0.1672	0.9026
Front	GSM1900	0.4746	0.1061	0.5807
Back	WCDMA Band 2	0.7517	0.1672	0.9189
Front	WCDMA Band 2	0.5025	0.1061	0.6086
Back	WCDMA Band 5	0.2996	0.1672	0.4668
Front	WCDMA Band 5	0.2378	0.1061	0.3439
Back	WCDMA Band 4	0.6753	0.1672	0.8425
Front	WCDMA Band 4	0.4351	0.1061	0.5412
Back	LTE Band 2	0.2328	0.1672	0.4
Front	LTE Band 2	0.1186	0.1061	0.2247
Back	LTE Band 4	0.2159	0.1672	0.3831
Front	LTE Band 4	0.2623	0.1061	0.3684
Back	LTE Band 7	0.3453	0.1672	0.5125
Front	LTE Band 7	0.1609	0.1061	0.267
Back	LTE Band 17	0.1352	0.1672	0.3024
Front	LTE Band 17	0.1071	0.1061	0.2132

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM850	0.2527	0.0184	0.2711
Front	GSM850	0.1809	0.0184	0.1993
Back	GSM1900	0.7354	0.0184	0.7538
Front	GSM1900	0.4746	0.0184	0.493
Back	WCDMA Band 2	0.7517	0.0184	0.7701
Front	WCDMA Band 2	0.5025	0.0184	0.5209
Back	WCDMA Band 5	0.2996	0.0184	0.318
Front	WCDMA Band 5	0.2378	0.0184	0.2562
Back	WCDMA Band 4	0.6753	0.0184	0.6937
Front	WCDMA Band 4	0.4351	0.0184	0.4535
Back	LTE Band 2	0.2328	0.0184	0.2512
Front	LTE Band 2	0.1186	0.0184	0.137
Back	LTE Band 4	0.2159	0.0184	0.2343
Front	LTE Band 4	0.2623	0.0184	0.2807
Back	LTE Band 7	0.3453	0.0184	0.3637
Front	LTE Band 7	0.1609	0.0184	0.1793
Back	LTE Band 17	0.1352	0.0184	0.1536
Front	LTE Band 17	0.1071	0.0184	0.1255

Hotspot SAR
WWAN and WLAN

Position	WWAN		WLAN	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM850	0.4254	0.1672	0.5926
Front	GSM850	0.2545	0.1061	0.3606
Top side	GSM850	--	0.0191	0.0191
Bottom side	GSM850	0.1884	--	0.1884
Right side	GSM850	--	--	--
Left side	GSM850	0.1553	0.0176	0.1729
Back	GSM1900	0.6434	0.1672	0.8106
Front	GSM1900	0.4496	0.1061	0.5557
Top side	GSM1900	--	0.0191	0.0191
Bottom side	GSM1900	0.4782	--	0.4782
Right side	GSM1900	--	--	--
Left side	GSM1900	0.3420	0.0176	0.3596
Back	WCDMA Band 2	0.7517	0.1672	0.9189
Front	WCDMA Band 2	0.5025	0.1061	0.6086
Top side	WCDMA Band 2	--	0.0191	0.0191
Bottom side	WCDMA Band 2	0.3857	--	0.3857
Right side	WCDMA Band 2	--	--	--
Left side	WCDMA Band 2	0.3569	0.0176	0.3745
Back	WCDMA Band 5	0.2996	0.1672	0.4668
Front	WCDMA Band 5	0.2378	0.1061	0.3439
Top side	WCDMA Band 5	--	0.0191	0.0191
Bottom side	WCDMA Band 5	0.1857	--	0.1857
Right side	WCDMA Band 5	--	--	--
Left side	WCDMA Band 5	0.0529	0.0176	0.0705
Back	WCDMA Band 4	0.6753	0.1672	0.8425
Front	WCDMA Band 4	0.4351	0.1061	0.5412
Top side	WCDMA Band 4	--	0.0191	0.0191
Bottom side	WCDMA Band 4	0.4968	--	0.4968
Right side	WCDMA Band 4	--	--	--
Left side	WCDMA Band 4	0.5718	0.0176	0.5894
Back	LTE Band 2	0.2125	0.1672	0.3797
Front	LTE Band 2	0.1292	0.1061	0.2353
Top side	LTE Band 2	--	0.0191	0.0191
Bottom side	LTE Band 2	0.3027	--	0.3027
Right side	LTE Band 2	--	--	--
Left side	LTE Band 2	0.0473	0.0176	0.0649
Back	LTE Band 4	0.2159	0.1672	0.3831

Front	LTE Band 4	0.2623	0.1061	0.3684
Top side	LTE Band 4	--	0.0191	0.0191
Bottom side	LTE Band 4	0.3223	--	0.3223
Right side	LTE Band 4	--	--	--
Left side	LTE Band 4	0.0317	0.0176	0.0493
Back	LTE Band 7	0.3453	0.1672	0.5125
Front	LTE Band 7	0.1609	0.1061	0.267
Top side	LTE Band 7	--	0.0191	0.0191
Bottom side	LTE Band 7	0.1385	--	0.1385
Right side	LTE Band 7	--	--	--
Left side	LTE Band 7	0.1027	0.0176	0.1203
Back	LTE Band 17	0.1352	0.1672	0.3024
Front	LTE Band 17	0.1071	0.1061	0.2132
Top side	LTE Band 17	--	0.0191	0.0191
Bottom side	LTE Band 17	0.0424	--	0.0424
Right side	LTE Band 17	--	--	--
Left side	LTE Band 17	0.0521	0.0176	0.0697

WWAN and Bluetooth

Position	WWAN		Bluetooth	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	GSM850	0.4254	0.0184	0.4438
Front	GSM850	0.2545	0.0184	0.2729
Top side	GSM850	--	0.0184	0.0184
Bottom side	GSM850	0.1884	--	0.1884
Right side	GSM850	--	--	--
Left side	GSM850	0.1553	0.0184	0.1737
Back	GSM1900	0.6434	0.0184	0.6618
Front	GSM1900	0.4496	0.0184	0.468
Top side	GSM1900	--	0.0184	0.0184
Bottom side	GSM1900	0.4782	--	0.4782
Right side	GSM1900	--	--	--
Left side	GSM1900	0.3420	0.0184	0.3604
Back	WCDMA Band 2	0.7517	0.0184	0.7701
Front	WCDMA Band 2	0.5025	0.0184	0.5209
Top side	WCDMA Band 2	--	0.0184	0.0184
Bottom side	WCDMA Band 2	0.3857	--	0.3857
Right side	WCDMA Band 2	--	--	--
Left side	WCDMA Band 2	0.3569	0.0184	0.3753
Back	WCDMA Band 5	0.2996	0.0184	0.318
Front	WCDMA Band 5	0.2378	0.0184	0.2562

Top side	WCDMA Band 5	--	0.0184	0.0184
Bottom side	WCDMA Band 5	0.1857	--	0.1857
Right side	WCDMA Band 5	--	--	--
Left side	WCDMA Band 5	0.0529	0.0184	0.0713
Back	WCDMA Band 4	0.6753	0.0184	0.6937
Front	WCDMA Band 4	0.4351	0.0184	0.4535
Top side	WCDMA Band 4	--	0.0184	0.0184
Bottom side	WCDMA Band 4	0.4968	--	0.4968
Right side	WCDMA Band 4	--	--	--
Left side	WCDMA Band 4	0.5718	0.0184	0.5902
Back	LTE Band 2	0.2125	0.0184	0.2309
Front	LTE Band 2	0.1292	0.0184	0.1476
Top side	LTE Band 2	--	0.0184	0.0184
Bottom side	LTE Band 2	0.3027	--	0.3027
Right side	LTE Band 2	--	--	--
Left side	LTE Band 2	0.0473	0.0184	0.0657
Back	LTE Band 4	0.2159	0.0184	0.2343
Front	LTE Band 4	0.2623	0.0184	0.2807
Top side	LTE Band 4	--	0.0184	0.0184
Bottom side	LTE Band 4	0.3223	--	0.3223
Right side	LTE Band 4	--	--	--
Left side	LTE Band 4	0.0317	0.0184	0.0501
Back	LTE Band 7	0.3453	0.0184	0.3637
Front	LTE Band 7	0.1609	0.0184	0.1793
Top side	LTE Band 7	--	0.0184	0.0184
Bottom side	LTE Band 7	0.1385	--	0.1385
Right side	LTE Band 7	--	--	--
Left side	LTE Band 7	0.1027	0.0184	0.1211
Back	LTE Band 17	0.1352	0.0184	0.1536
Front	LTE Band 17	0.1071	0.0184	0.1255
Top side	LTE Band 17	--	0.0184	0.0184
Bottom side	LTE Band 17	0.0424	--	0.0424
Right side	LTE Band 17	--	--	--
Left side	LTE Band 17	0.0521	0.0184	0.0705

10. Measurement Uncertainty

10.1 Uncertainty for EUT SAR Test

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+- %)	10g Ui (+- %)	Vi
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1_{Cp})^{1/2}$	$(1_{Cp})^{1/2}$	1.02	1.02	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$(Cp)^{1/2}$	$(Cp)^{1/2}$	1.63	1.63	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
RF ambient Conditions – Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	E.5	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Test Sample Related									
Test sample positioning	E.4.2	0.03	N	1	1	1	0.03	0.03	N-1
Device Holder Uncertainty	E.4.1	5.00	N	1	1	1	5.00	5.00	
Output power Variation - SAR drift measurement	E.2.9	12.02	R	$\sqrt{3}$	1	1	6.94	6.94	∞
SAR scaling	E6.5	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	1.9	R	$\sqrt{3}$	1	0.84	1.10	0.90	∞
Liquid conductivity - deviation	E.3.2	5.00	R	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞

from target value										
Liquid conductivity measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	∞	
Liquid permittivity - deviation from target value	E.3.2	0.37	R	$\sqrt{3}$	0.6	0.49	0.13	0.10	∞	
Liquid permittivity measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	∞	
Combined Standard Uncertainty			RSS				12.98	12.53		
Expanded Uncertainty (95% Confidence interval)			K=2				25.32	24.43		

10.2 Uncertainty for System Performance Check

a	b	c	d	e= f(d,k)	f	g	h= c*f/e	i= c*g/e	k
Uncertainty Component	Sec.	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+- %)	10g Ui (+- %)	Vi
Measurement System									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	∞
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1_{Cp})^{1/2}$	$(1_{Cp})^{1/2}$	1.02	1.02	∞
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$(Cp)^{1/2}$	$(Cp)^{1/2}$	1.63	1.63	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	E.2.5	0	R	$\sqrt{3}$	0	0	0.0	0.0	∞
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	∞
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
RF ambient Conditions – Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Extrapolation, interpolation and integration Algorithms for Max.	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞

SAR Evaluation									
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	$\sqrt{3}$	1	1	0.58	0.58	N-1
Input power and SAR drift measurement	8,6.6.2	12.02	R	$\sqrt{3}$	1	1	6.94	6.94	∞
Deviation of experimental dipole from numerical dipole	E.6.4	5.5	R	$\sqrt{3}$	1	1	3.20	3.20	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	2.0	R	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid conductivity - deviation from target value	E.3.2	5.00	R	$\sqrt{3}$	0.64	0.43	1.85	1.24	
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	
Liquid permittivity - deviation from target value	E.3.2	0.37	R	$\sqrt{3}$	0.6	0.49	0.13	0.10	
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	M
Combined Standard Uncertainty			RSS				12.00	11.50	
Expanded Uncertainty (95% Confidence interval)			K=2				23.39	22.43	

Annex A. Plots of System Performance Check

MEASUREMENT 1

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 7 minutes 21 seconds

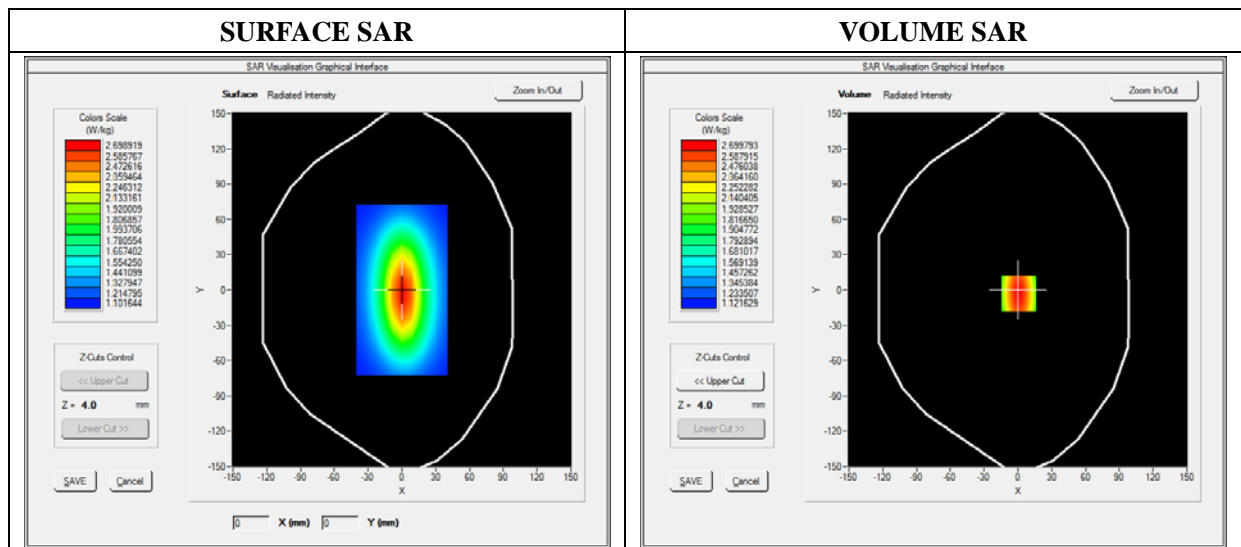
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW750
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative Permittivity (real part)	41.320574
Conductivity (S/m)	0.862373
Power Variation (%)	0.038363
Ambient Temperature	21.1
Liquid Temperature	21.3

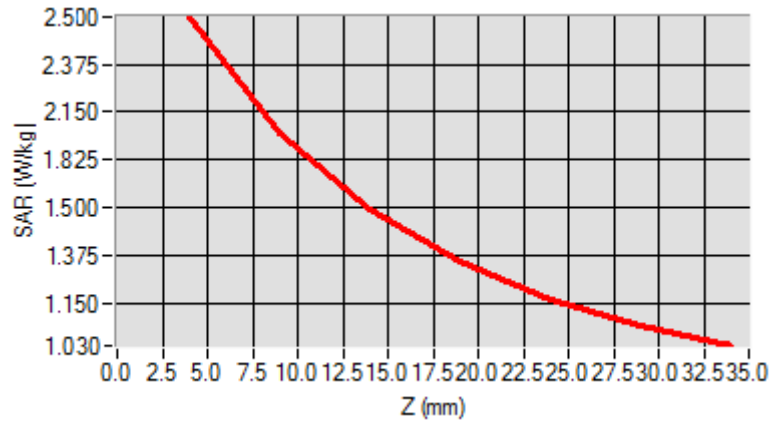


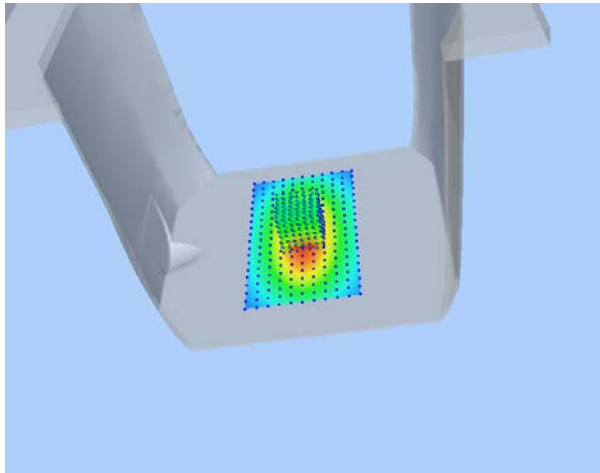
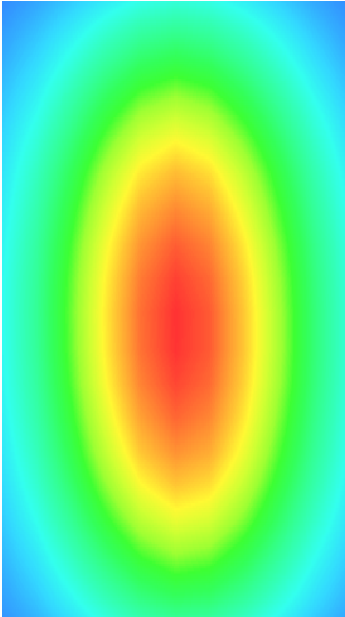
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.042744
SAR 1g (W/Kg)	2.164534

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.3634	1.8023	1.4523	1.2514	1.1005	1.0245



3D screen shot	Hot spot position
	

MEASUREMENT 2

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 7 minutes 21 seconds

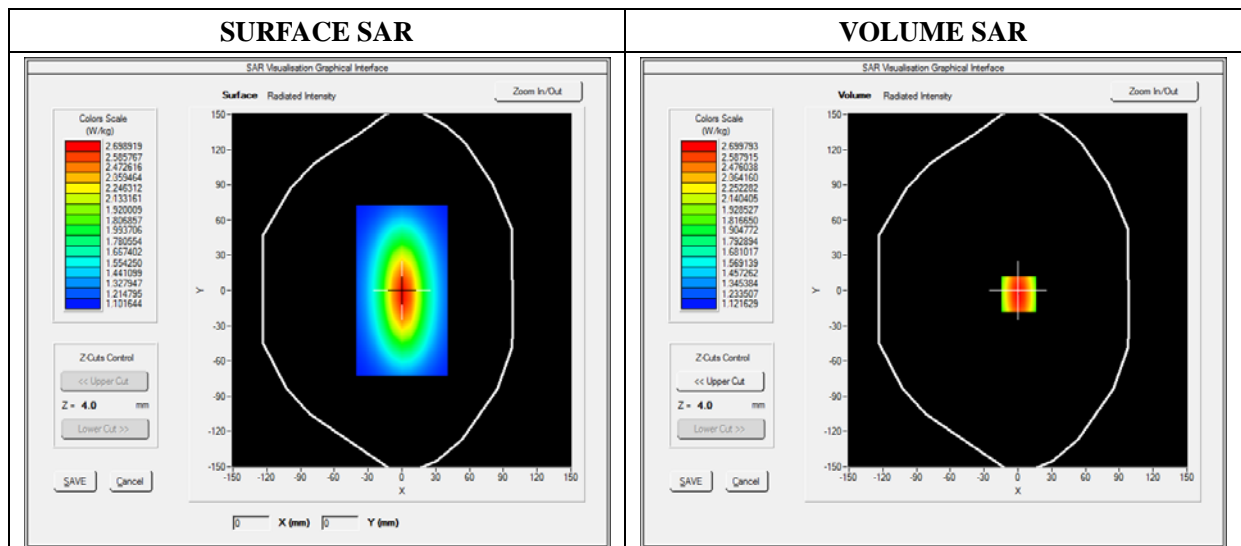
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	0.038437
Ambient Temperature	21.1
Liquid Temperature	21.3

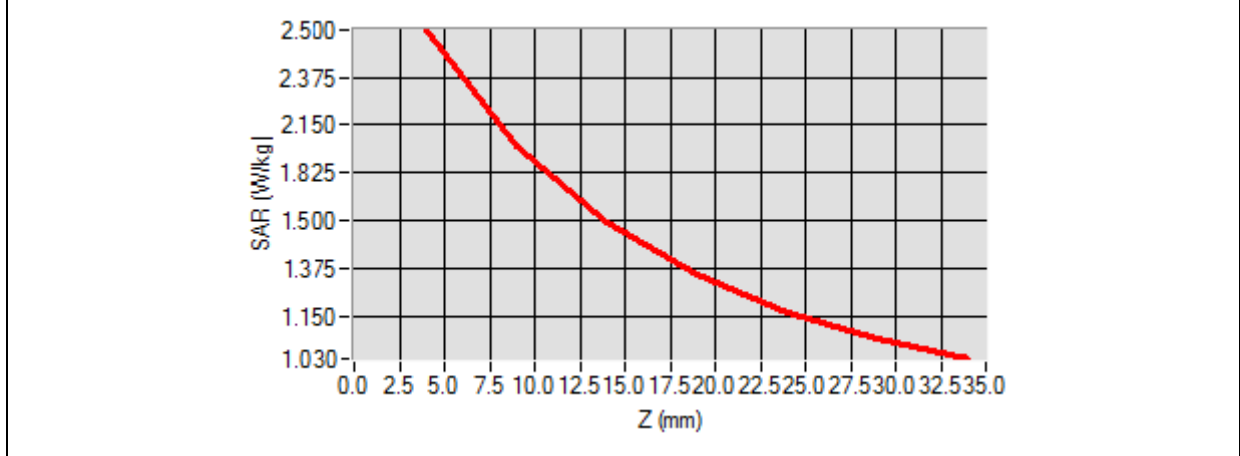


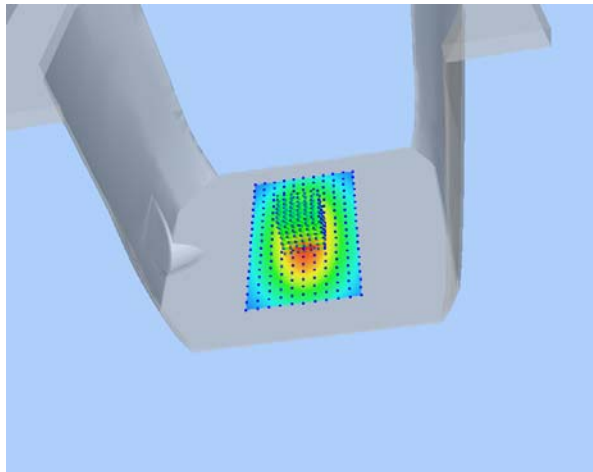
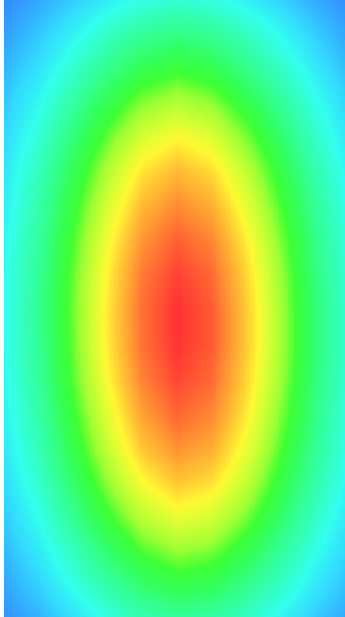
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.129489
SAR 1g (W/Kg)	2.411253

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.4900	1.8942	1.4811	1.3541	1.1123	1.0539



3D screen shot	Hot spot position
	

MEASUREMENT 3

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

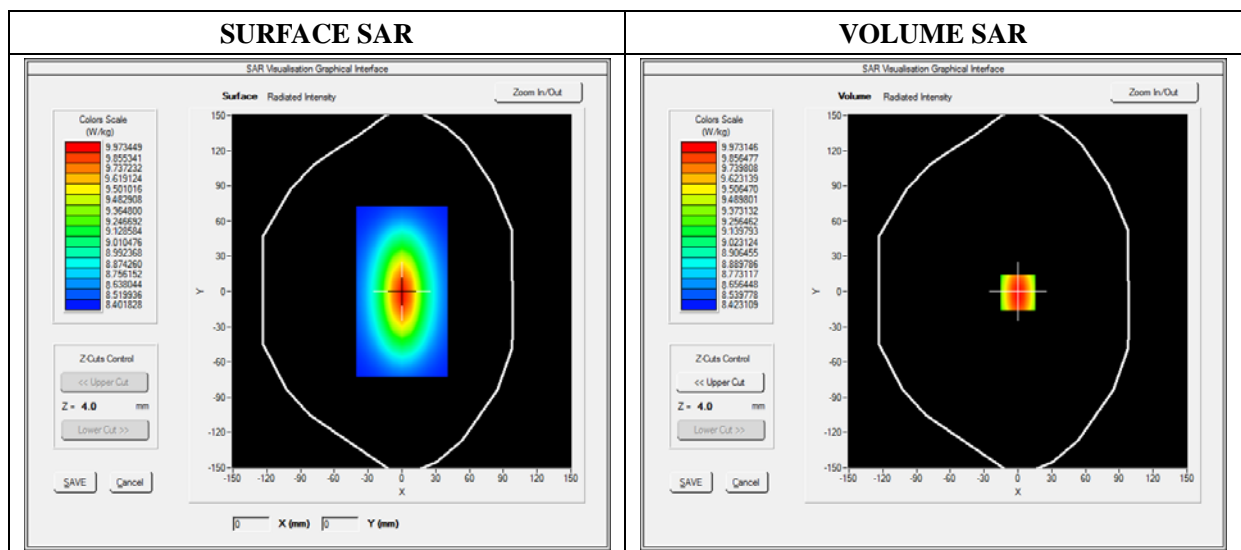
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative Permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	1.401232
Ambient Temperature	21.1
Liquid Temperature	21.2

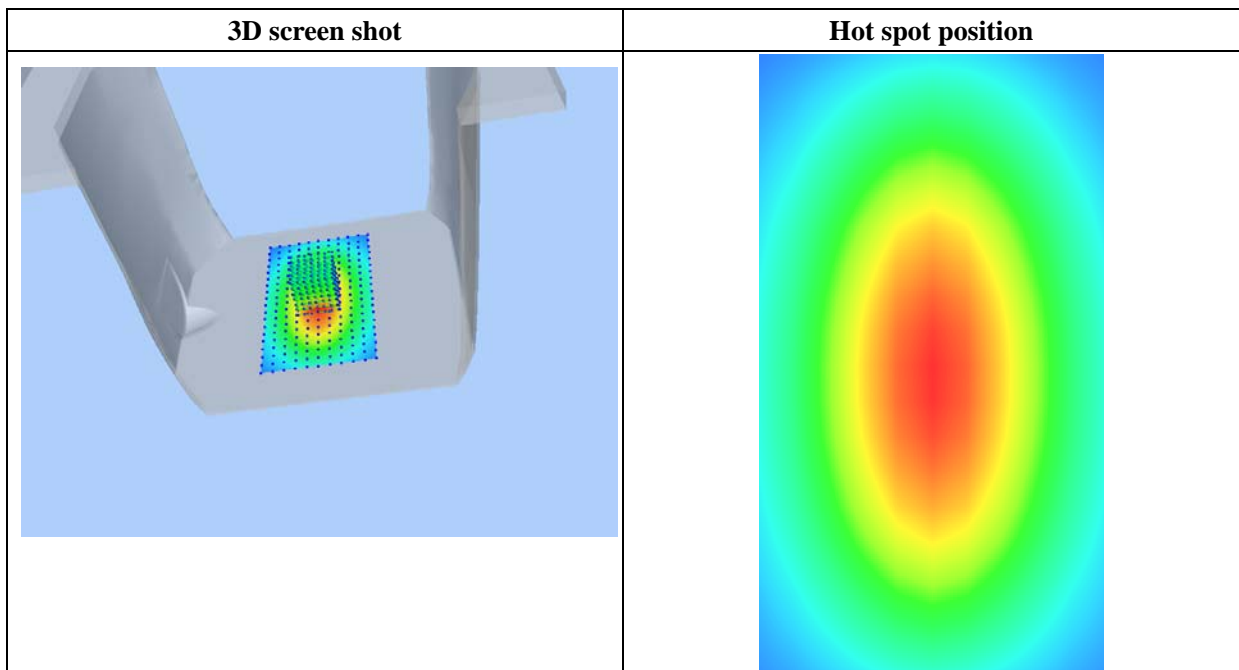
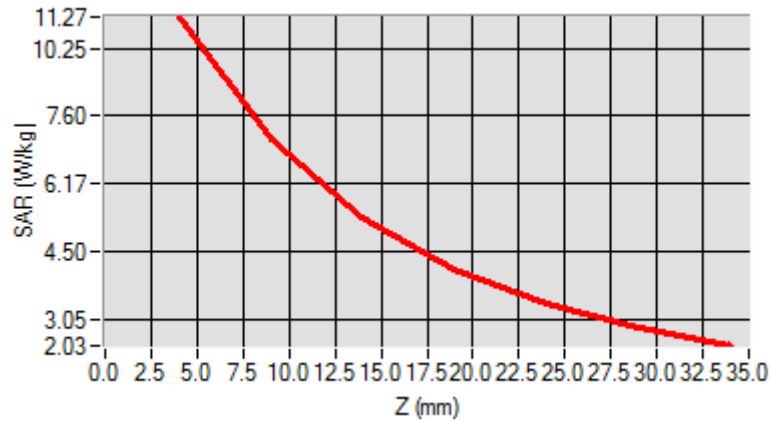


Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.171252
SAR 1g (W/Kg)	9.611250

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.3455	7.1125	5.1026	3.425	3.0242	2.1125



MEASUREMENT 4

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

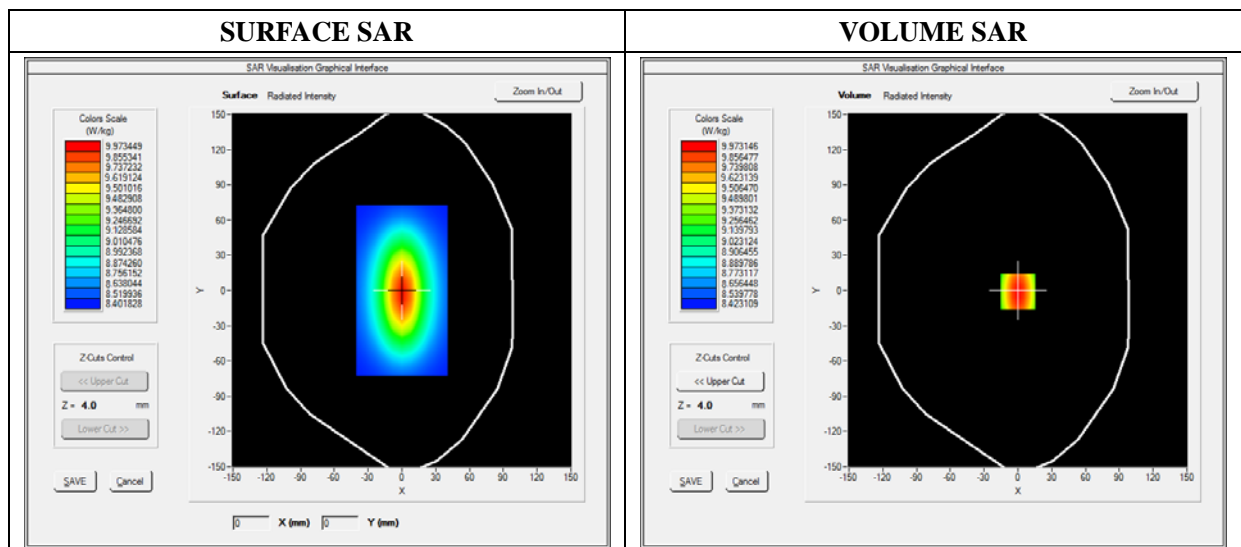
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.022540
Ambient Temperature	21.1
Liquid Temperature	21.3

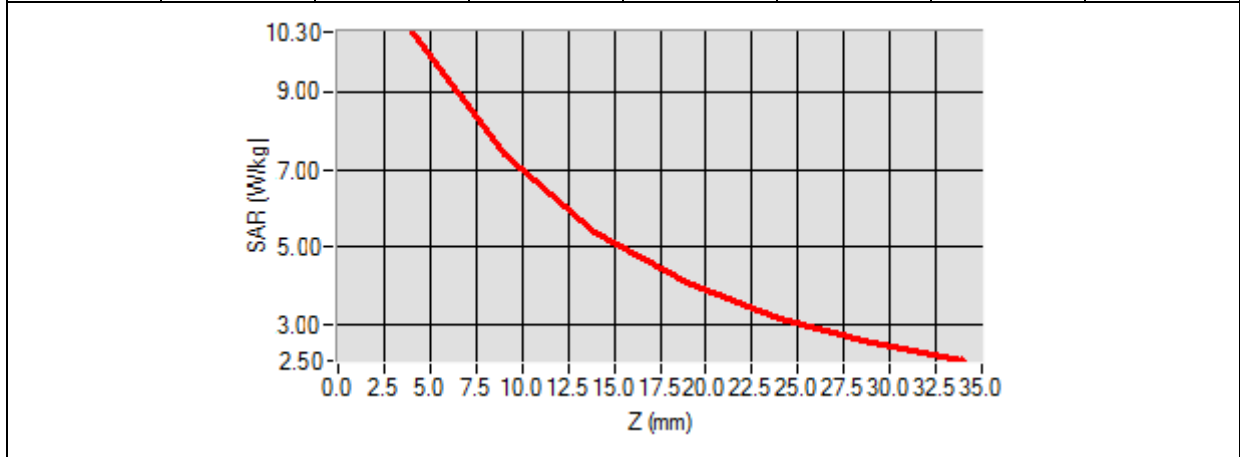


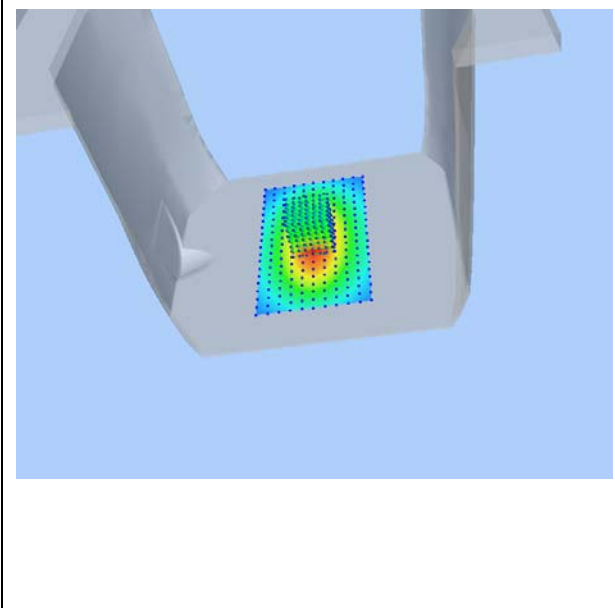
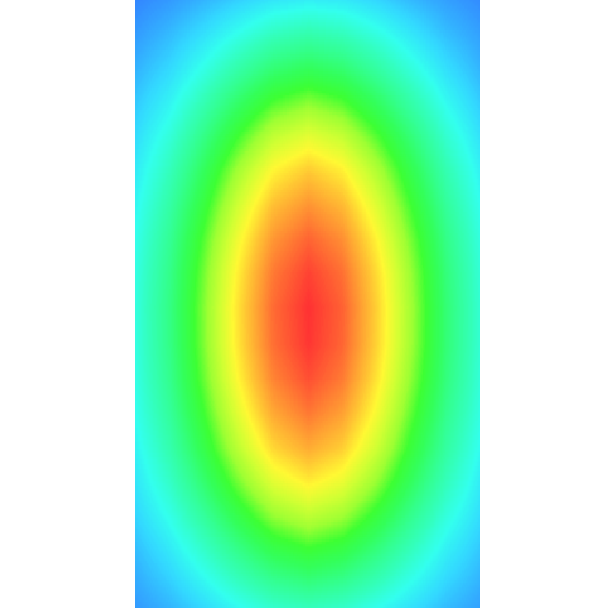
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	7.174526
SAR 1g (W/Kg)	9.913214

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.2354	6.8400	5.0121	4.1189	3.0522	2.8424



3D screen shot	Hot spot position
	

MEASUREMENT 5

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

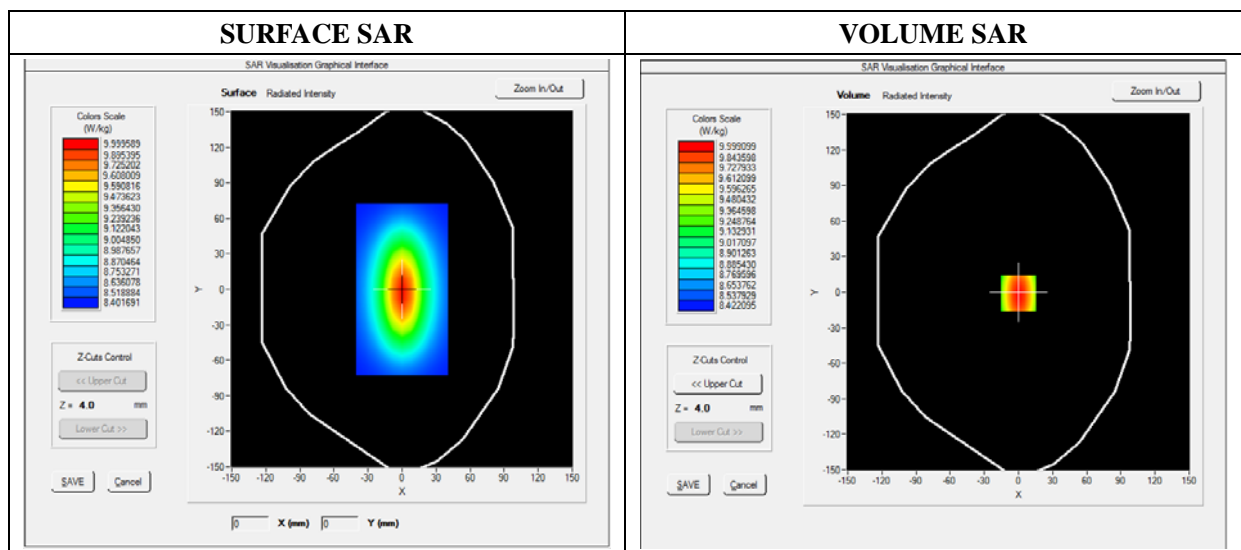
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative Permittivity (real part)	38.153660
Conductivity (S/m)	1.740236
Power Variation (%)	1.141452
Ambient Temperature	21.1
Liquid Temperature	21.2

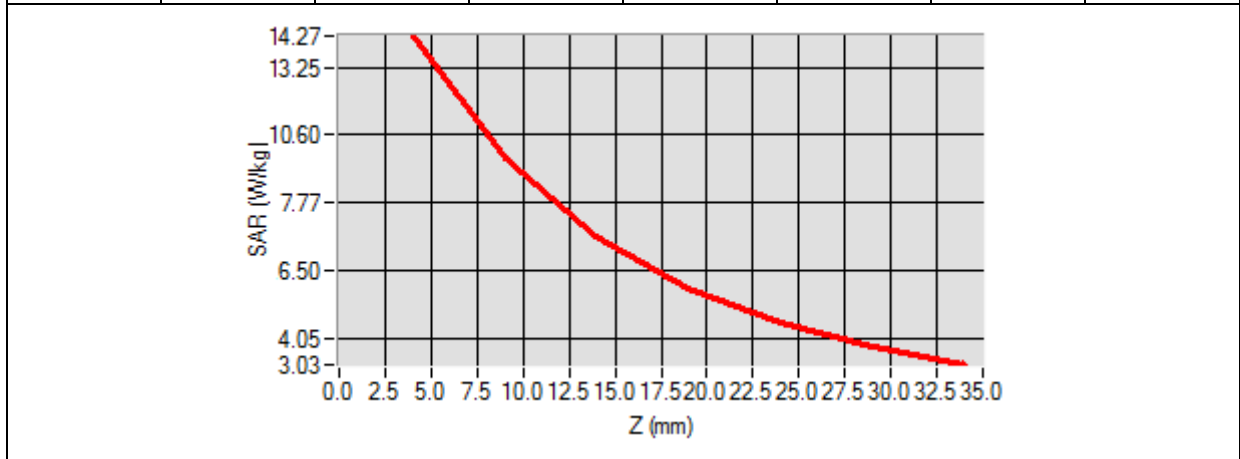


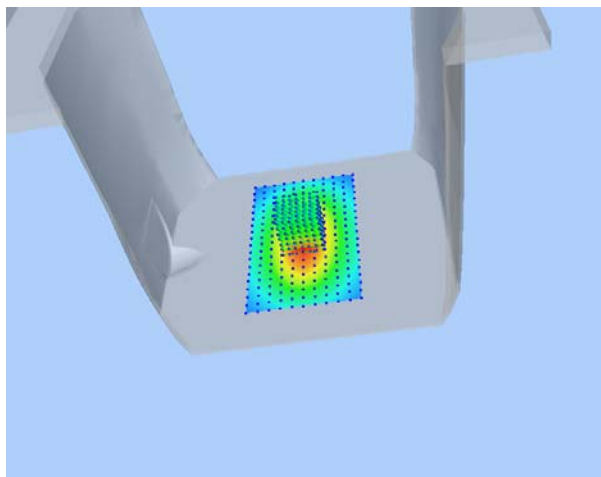
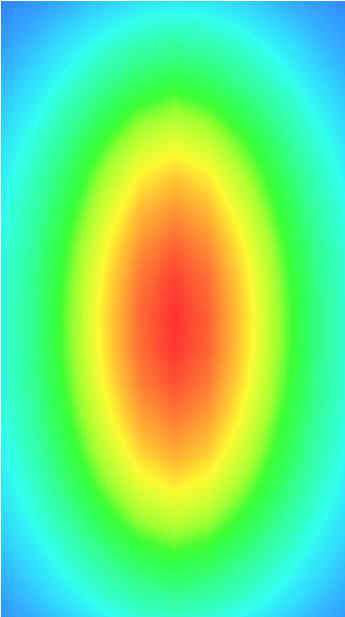
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	8.020427
SAR 1g (W/Kg)	13.452457

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	14.1034	12.0012	10.2624	7.4715	5.9022	4.5114



3D screen shot	Hot spot position
	

MEASUREMENT 6

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

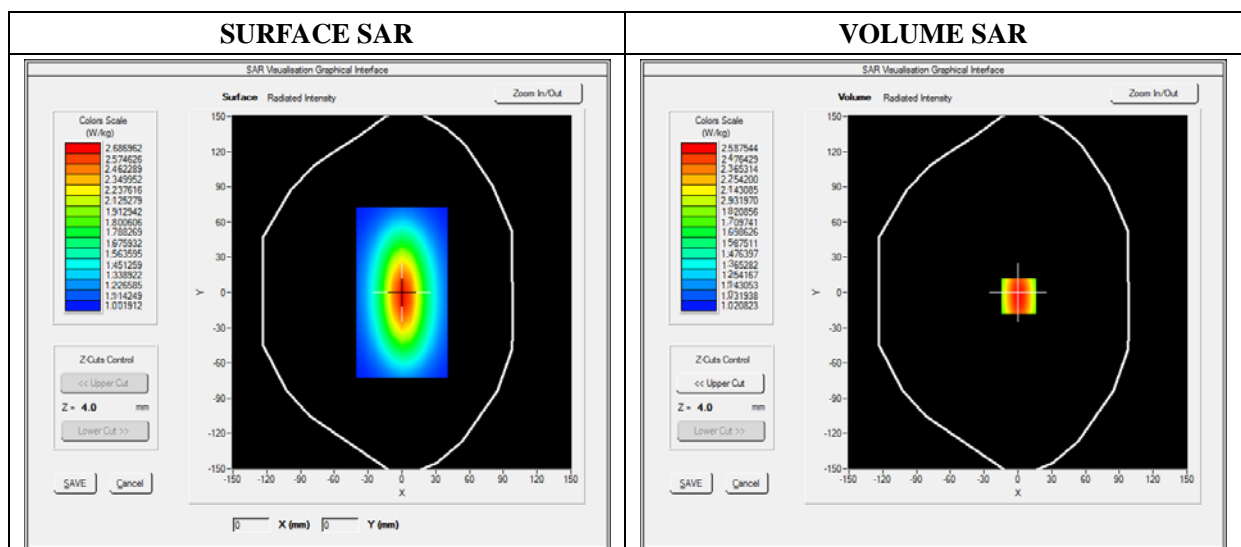
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW750
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative Permittivity (real part)	54.964739
Conductivity (S/m)	0.931048
Power Variation (%)	0.034745
Ambient Temperature	21.1
Liquid Temperature	21.3

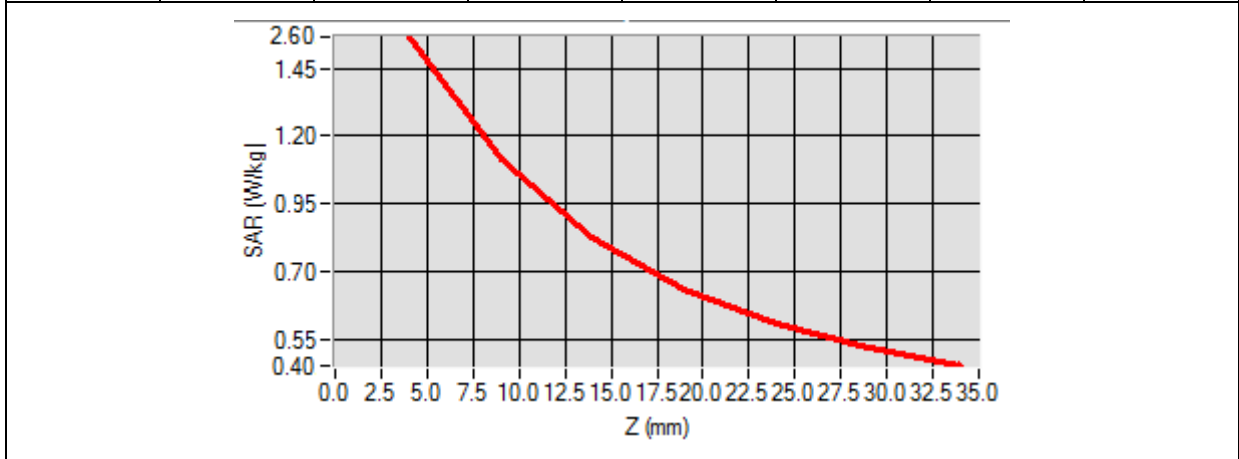


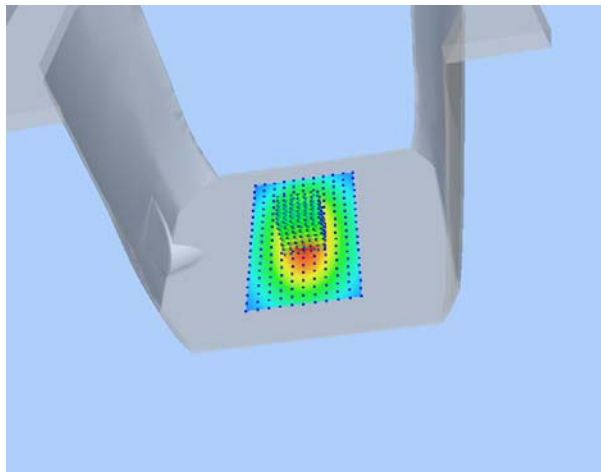
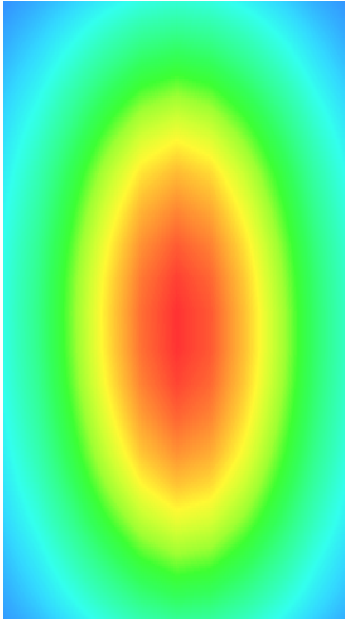
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.000865
SAR 1g (W/Kg)	2.124211

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.5132	1.1087	0.8214	0.5160	0.4875	0.4864



3D screen shot	Hot spot position
	

MEASUREMENT 7

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

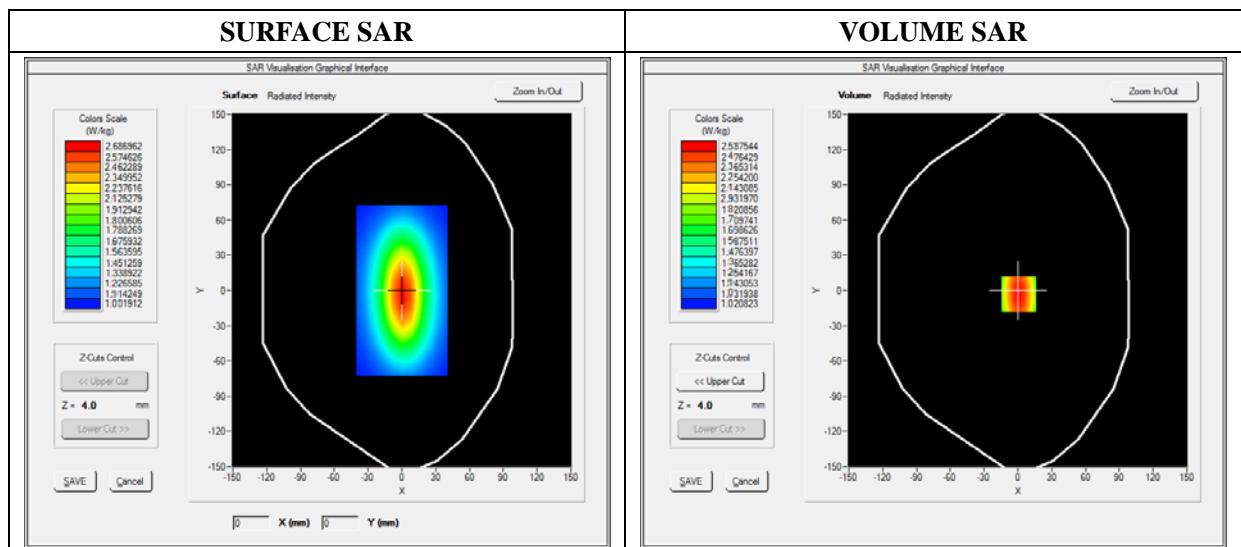
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	0.901472
Ambient Temperature	21.1
Liquid Temperature	21.3

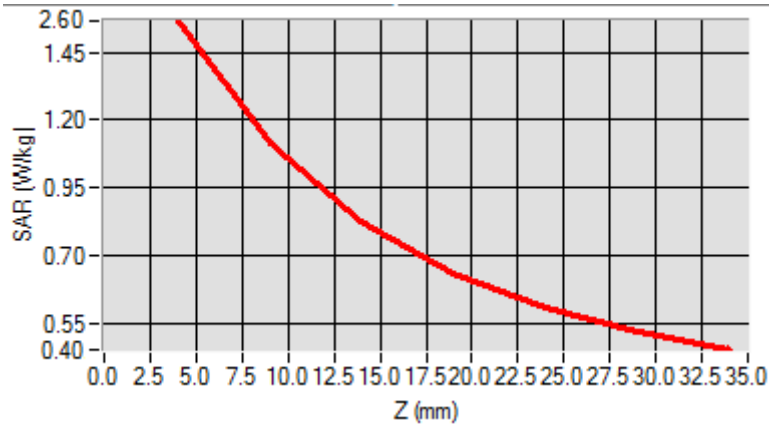


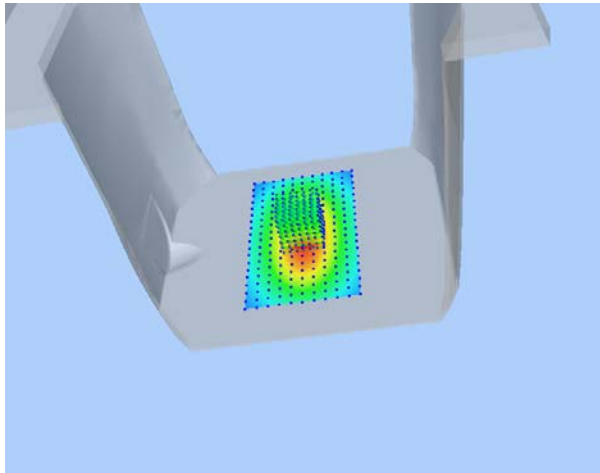
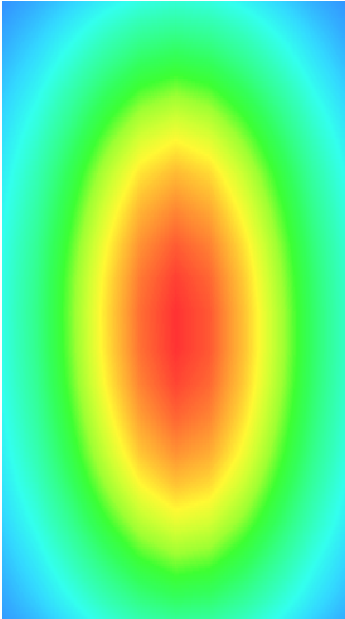
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.028956
SAR 1g (W/Kg)	2.354211

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.5789	1.1300	0.8795	0.5940	0.5011	0.5100



3D screen shot	Hot spot position
	

MEASUREMENT 8

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

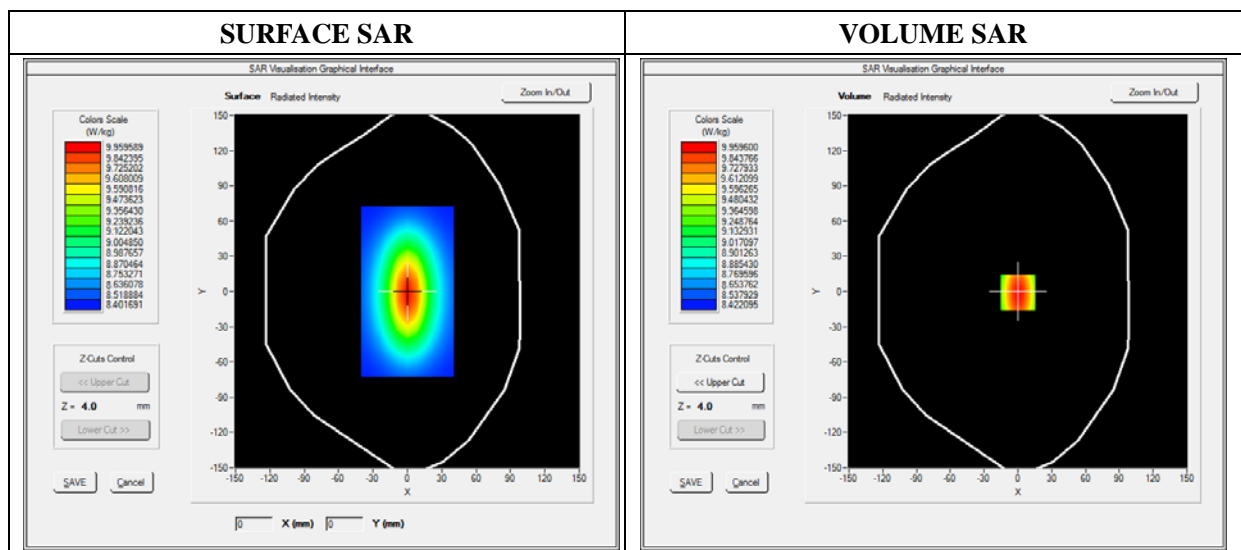
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.06; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative Permittivity (real part)	51.224510
Conductivity (S/m)	1.461261
Power Variation (%)	0.845690
Ambient Temperature	21.1
Liquid Temperature	21.2

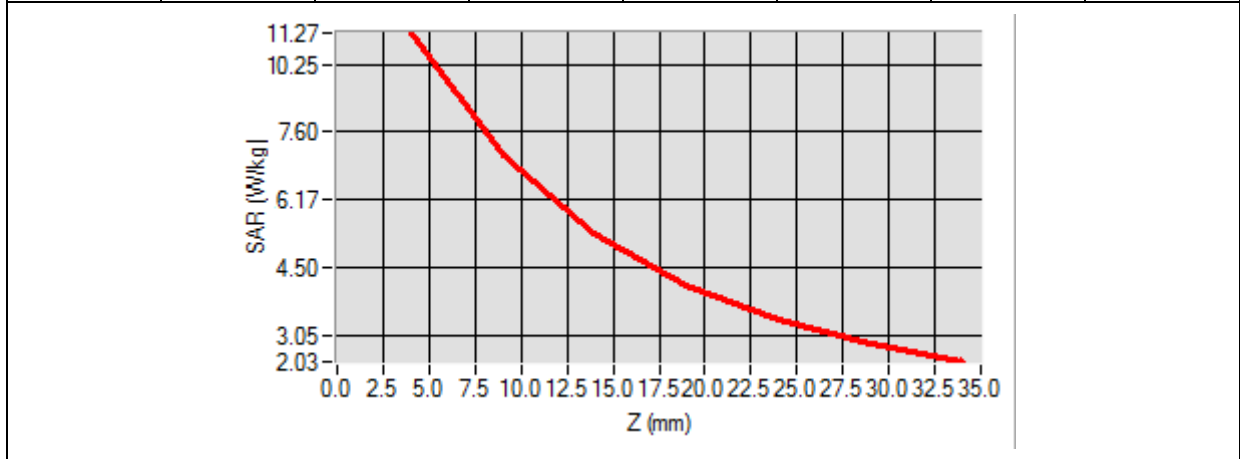


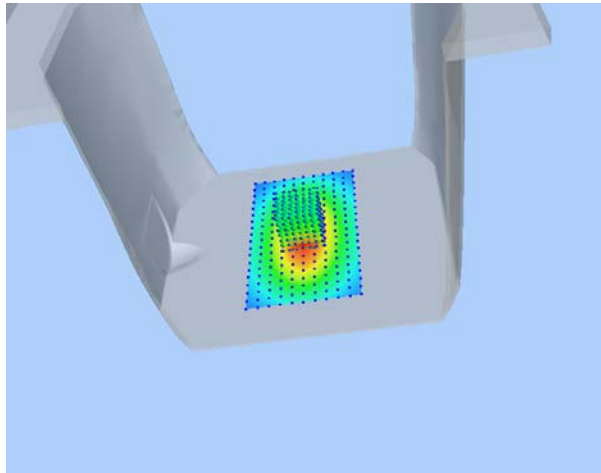
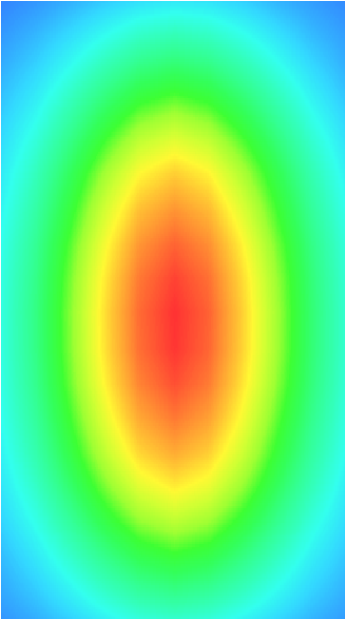
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.221202
SAR 1g (W/Kg)	9.582560

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	11.2425	9.4123	8.0345	6.9125	6.3092	3.9460



3D screen shot	Hot spot position
	

MEASUREMENT 9

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

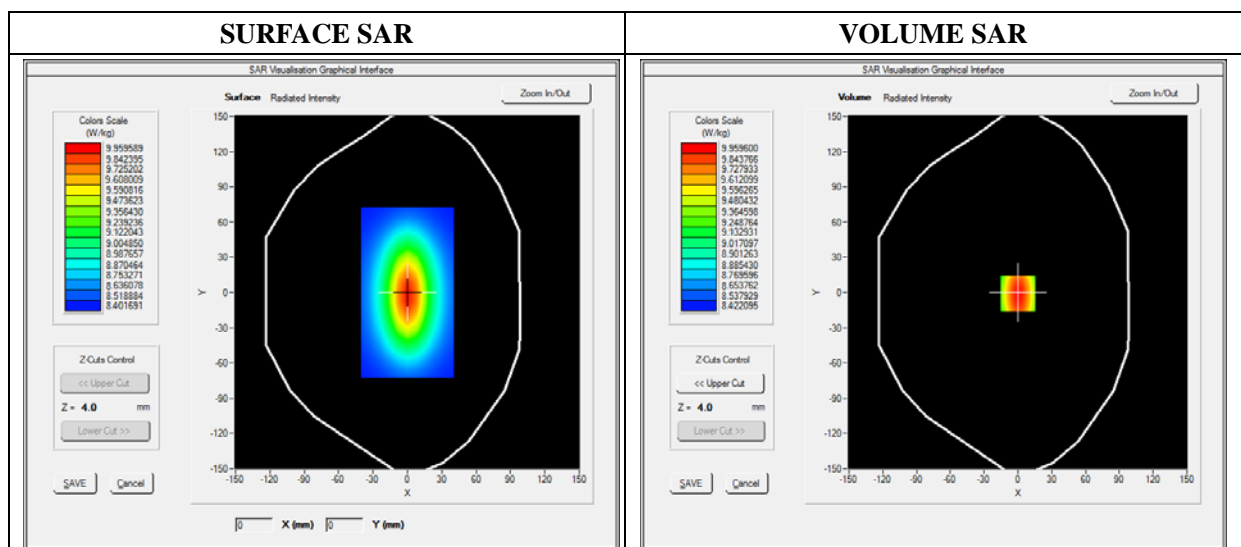
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	0.541872
Ambient Temperature	21.1
Liquid Temperature	21.3

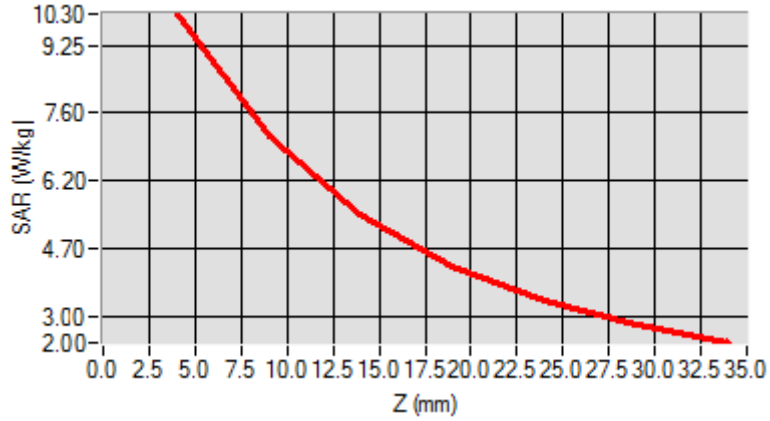


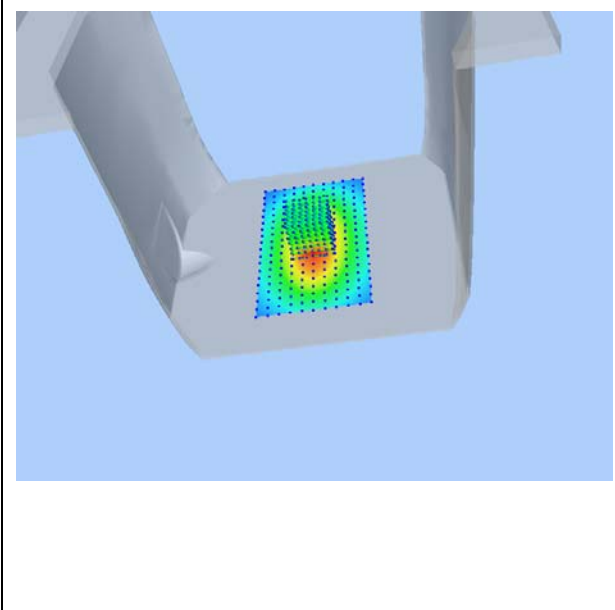
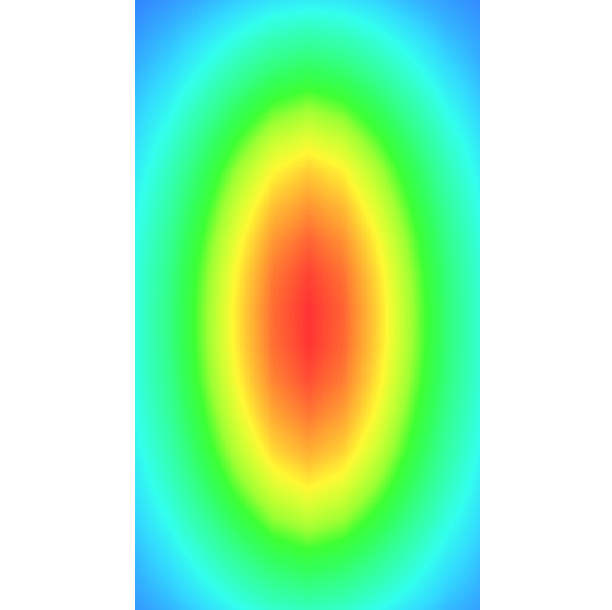
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.134651
SAR 1g (W/Kg)	9.781550

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	10.2031	6.43001	4.9011	4.5325	3.1201	2.5024



3D screen shot	Hot spot position
	

MEASUREMENT 10

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 21 seconds

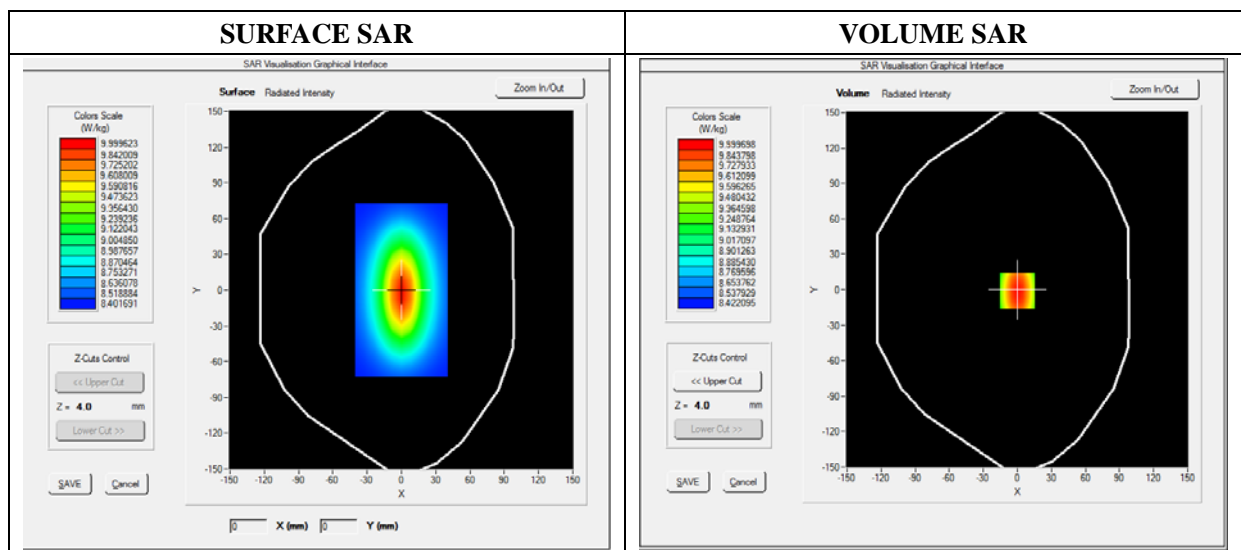
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Signal	Duty Cycle 1:1

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative Permittivity (real part)	52.010212
Conductivity (S/m)	1.910255
Power Variation (%)	1.369745
Ambient Temperature	21.1
Liquid Temperature	21.2

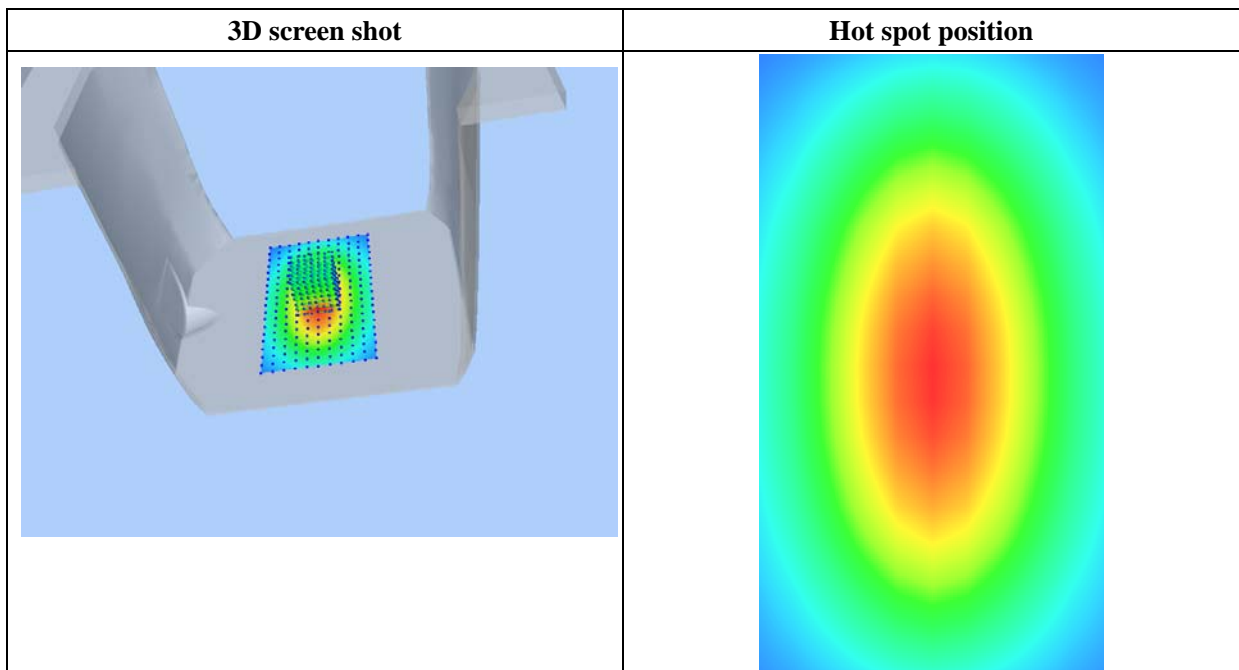
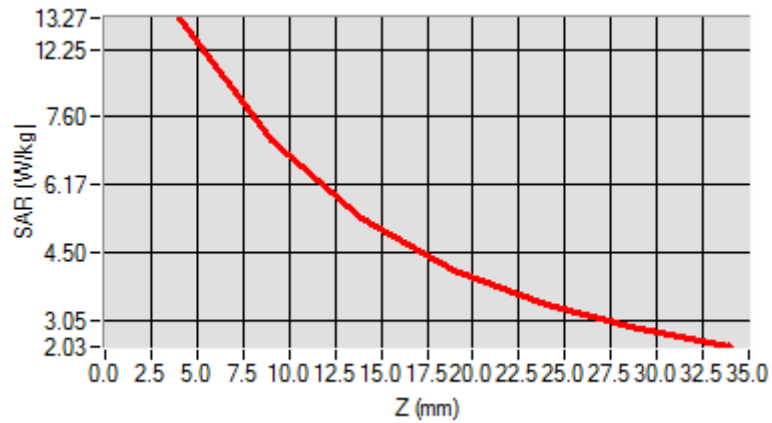


Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	7.119522
SAR 1g (W/Kg)	12.592360

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	13.3911	11.7951	9.2945	8.5400	6.3712	4.6225



Annex B. Plots of SAR Measurement

<u>TYPE</u>	<u>BAND</u>	<u>PARAMETERS</u>
Phone	GSM850	<u>Measurement 1:</u> Right Head with Cheek device position on Low Channel in GSM mode
Phone	GSM1900	<u>Measurement 5:</u> Right Head with Cheek device position on High Channel in GSM mode
Phone	GPRS850_4TX	<u>Measurement 9:</u> Right Head with Cheek device position on Middle Channel in GPRS mode
Phone	GPRS1900_4TX	<u>Measurement 15:</u> Left Head with Cheek device position on High Channel in GPRS mode
Phone	WCDMA1900_RMC	<u>Measurement 17:</u> Right Head with Cheek device position on Low Channel in WCDMA mode
Phone	WCDMA850_RMC	<u>Measurement 21:</u> Right Head with Cheek device position on Middle Channel in WCDMA mode
Phone	WCDMA1700_RMC	<u>Measurement 25:</u> Right Head with Cheek device position on Middle Channel in WCDMA mode
Phone	LTE Band 2_RMC	<u>Measurement 29:</u> Right Head with Cheek device position on Middle Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 4_RMC	<u>Measurement 37:</u> Right Head with Cheek device position on Low Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 7_RMC	<u>Measurement 45:</u> Right Head with Cheek device position on Low Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 17_RMC	<u>Measurement 53:</u> Right Head with Cheek device position on Low Channel in LTE QPSK 10MHz 1RB mode
Phone	WiFi_802.11b	<u>Measurement 61:</u> Right Head with Cheek device position on High Channel in 802.11b mode
Phone	GSM850	<u>Measurement 65:</u> Flat Plane with Back(Body-worn) device position on Low Channel in GSM mode
Phone	GSM1900	<u>Measurement 67:</u> Flat Plane with Back(Body-worn) device position on High Channel in GSM mode
Phone	GPRS850_4TX	<u>Measurement 69:</u> Flat Plane with Back device position on Middle Channel in GPRS mode
Phone	GPRS1900_4TX	<u>Measurement 73:</u> Flat Plane with Back device position on High Channel in GPRS mode
Phone	WCDMA1900_RMC	<u>Measurement 77:</u> Flat Plane with Back side device position on Low Channel in WCDMA mode
Phone	WCDMA850_RMC	<u>Measurement 81:</u> Flat Plane with Back device position on Middle Channel in WCDMA mode
Phone	WCDMA1700_RMC	<u>Measurement 85:</u> Flat Plane with Back device position on Middle Channel in WCDMA mode

Phone	LTE Band 2_RMC	<u>Measurement 91</u> : Flat Plane with Bottom device position on Middle Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 4_RMC	<u>Measurement 99</u> : Flat Plane with Bottom device position on Low Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 7_RMC	<u>Measurement 105</u> : Flat Plane with Back device position on Low Channel in LTE QPSK 20MHz 1RB mode
Phone	LTE Band 17_RMC	<u>Measurement 113</u> : Flat Plane with Back device position on Low Channel in LTE QPSK 10MHz 1RB mode
Phone	WiFi_802.11b	<u>Measurement 121</u> : Flat Plane with Back side device position on High Channel in 802.11b mode

Remark: SAR plot is showed the highest measured SAR in each exposure configuration, wireless mode and frequency band combination.

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 11 minutes 48 seconds

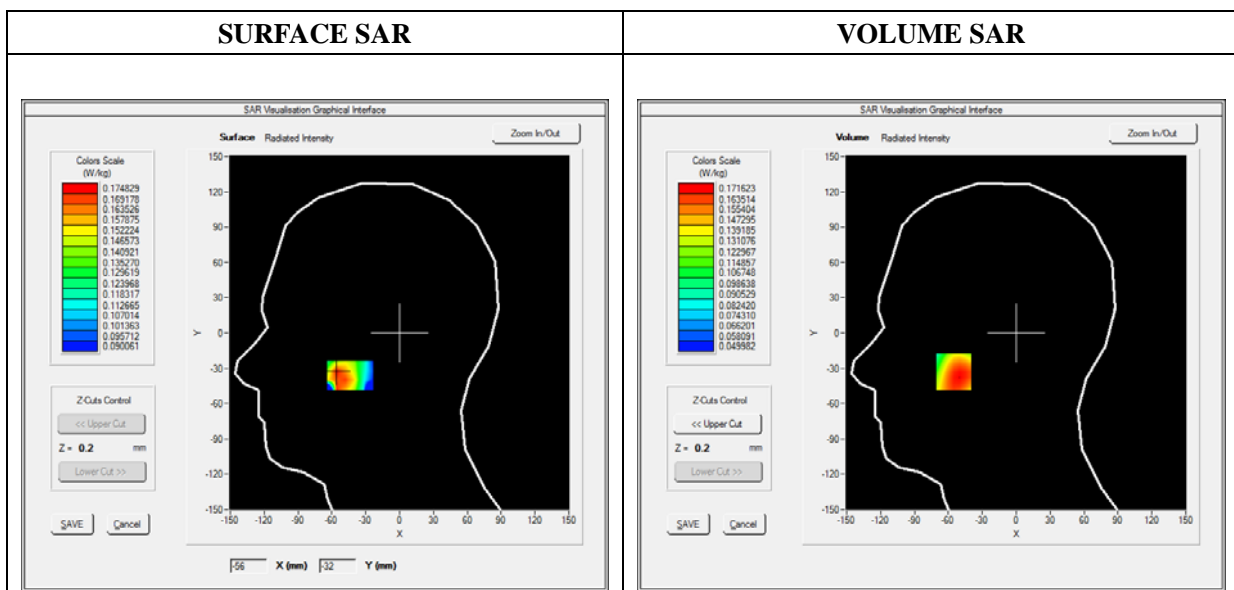
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

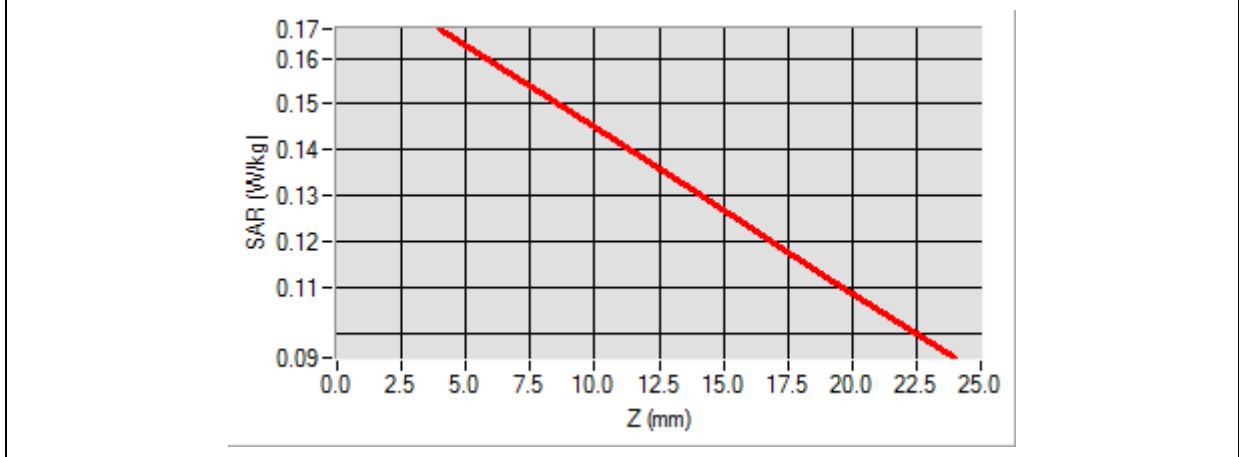
Frequency (MHz)	824.200000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.144536
Ambient Temperature	21.1
Liquid Temperature	21.3

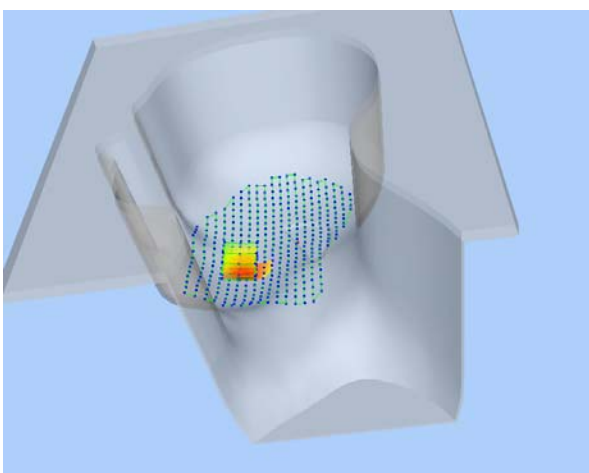
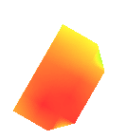


Maximum location: X=-55.00, Y=-33.00

SAR 10g (W/Kg)	0.139259
SAR 1g (W/Kg)	0.167247

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1664	0.1486	0.1303	0.1121



<p align="center">3D screen shot</p>	<p align="center">Hot spot position</p>
	

MEASUREMENT 5

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 11 minutes 48 seconds

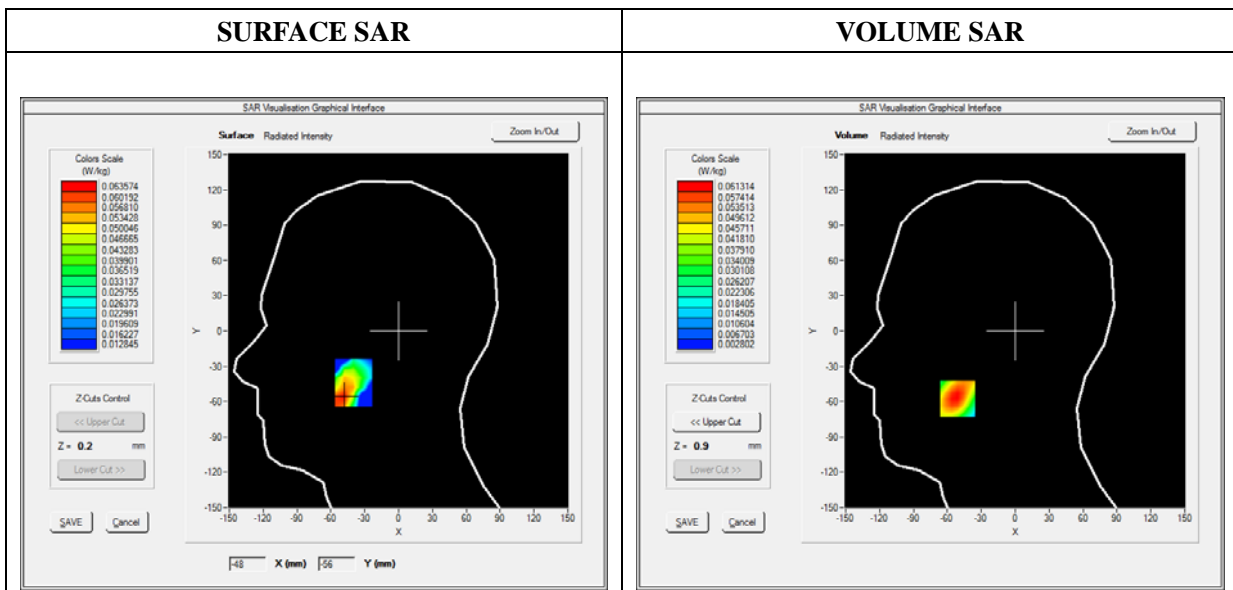
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	High
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

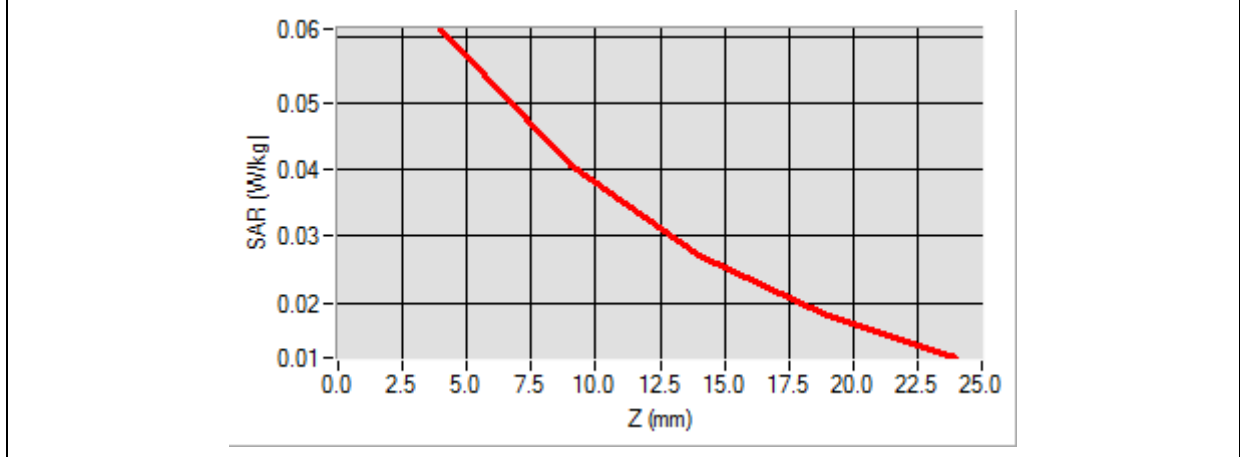
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.442440
Ambient Temperature	21.1
Liquid Temperature	21.3

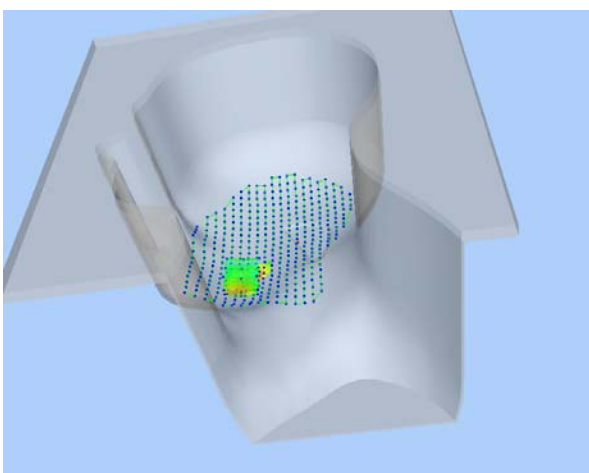
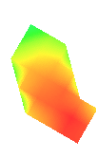


Maximum location: X=-51.00, Y=-58.00

SAR 10g (W/Kg)	0.035917
SAR 1g (W/Kg)	0.057877

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0613	0.0409	0.0272	0.0182



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 9

Type: Phone measurement (Complete)

Date of measurement: 08/18/2016

Measurement duration: 11 minutes 48 seconds

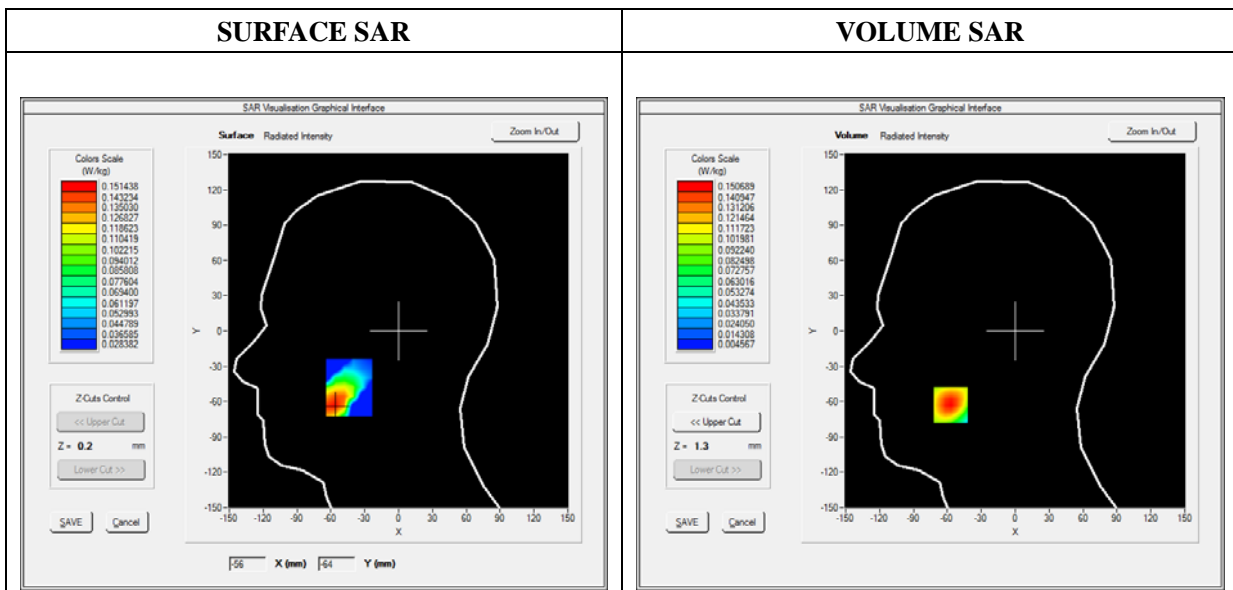
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GPRS850_4TX
Channels	Middle
Signal	Duty Cycle: 1:2

B. SAR Measurement Results

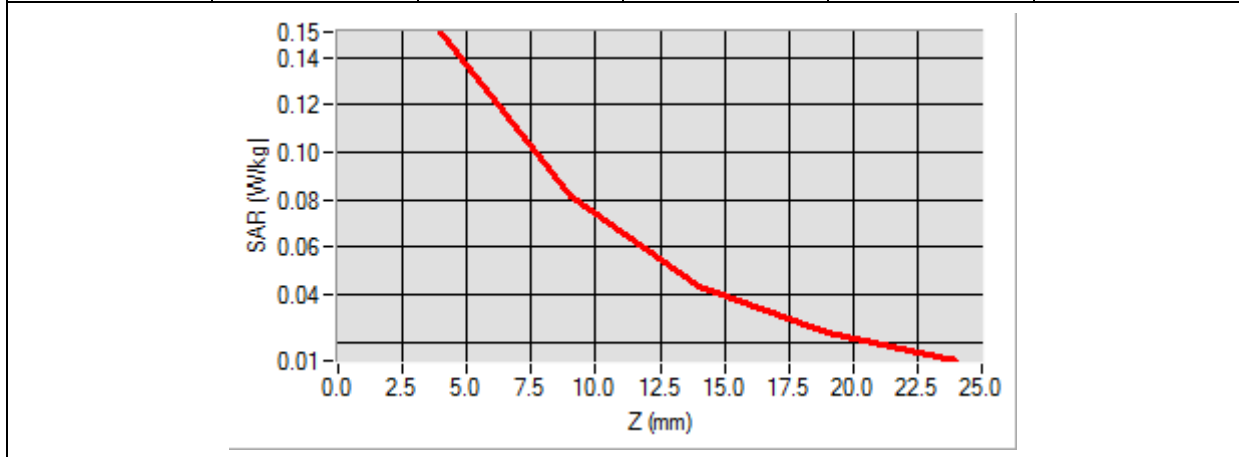
Frequency (MHz)	836.600000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.903833
Ambient Temperature	21.1
Liquid Temperature	21.3

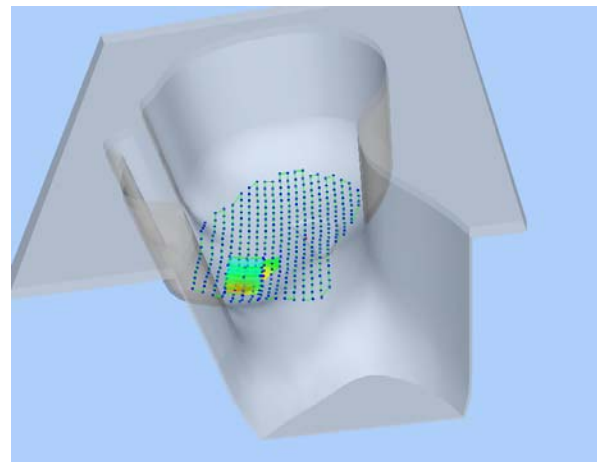
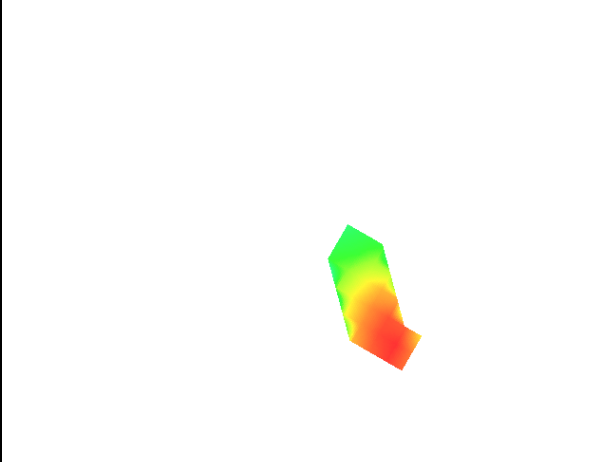


Maximum location: X=-57.00, Y=-63.00

SAR 10g (W/Kg)	0.076616
SAR 1g (W/Kg)	0.140918

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1507	0.0817	0.0436	0.0237



3D screen shot	Hot spot position
	

MEASUREMENT 15

Type: Phone measurement (Complete)

Date of measurement: 08/18/2016

Measurement duration: 12 minutes 3 seconds

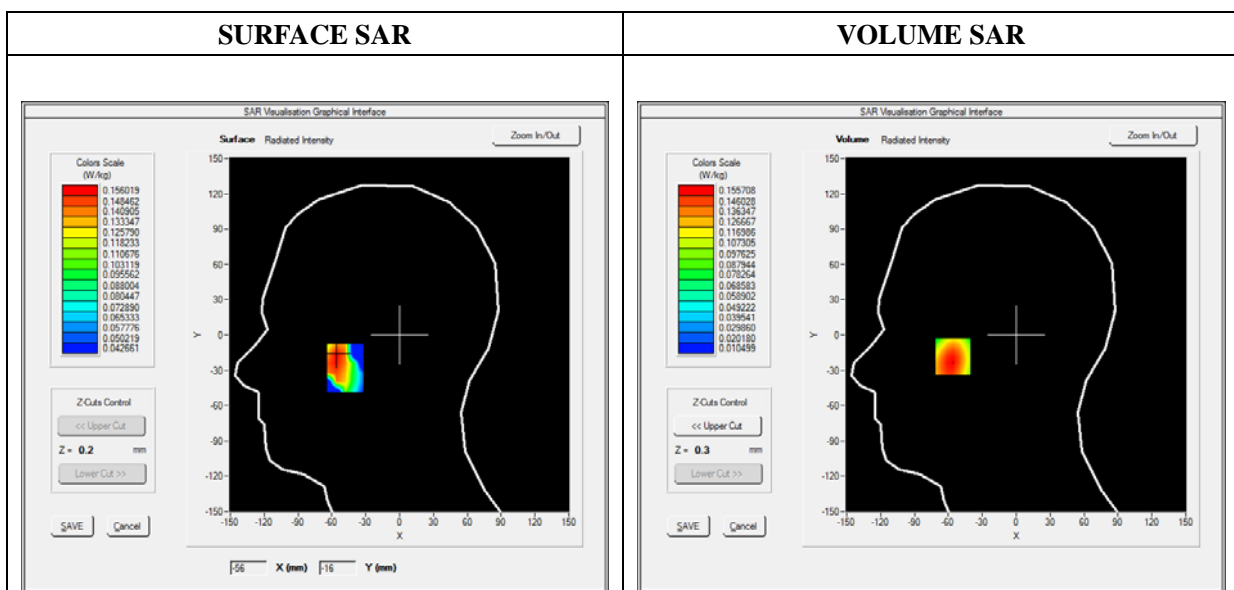
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GPRS1900_4TX
Channels	High
Signal	Duty Cycle: 1:2

B. SAR Measurement Results

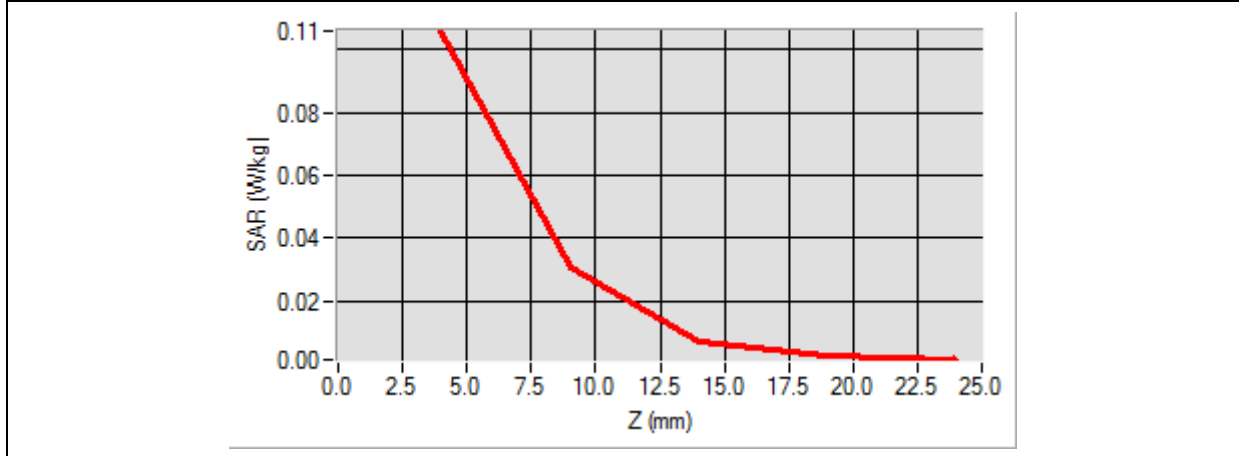
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.536272
Ambient Temperature	21.1
Liquid Temperature	21.3

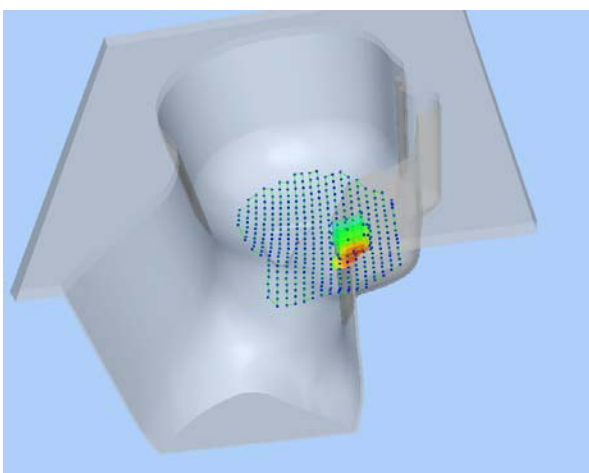
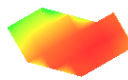


Maximum location: X=-18.00, Y=25.00

SAR 10g (W/Kg)	0.038686
SAR 1g (W/Kg)	0.097940

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1061	0.0307	0.0073	0.0023



3D screen shot	Hot spot position
	

MEASUREMENT 17

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

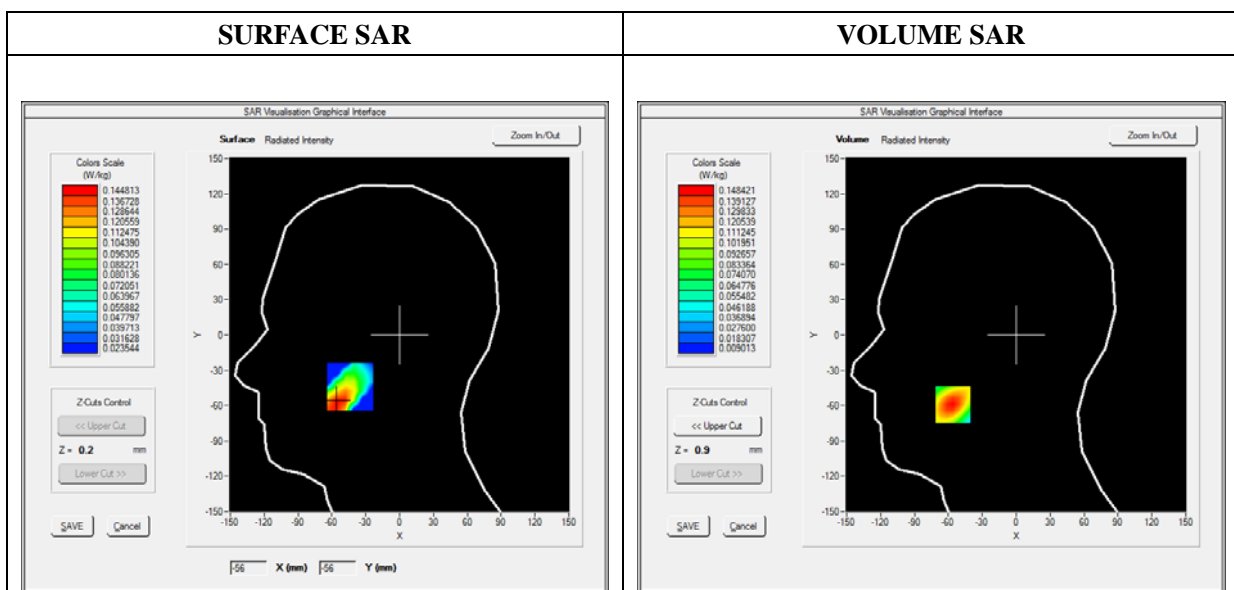
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WCDMA1900_RMC
Channels	Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

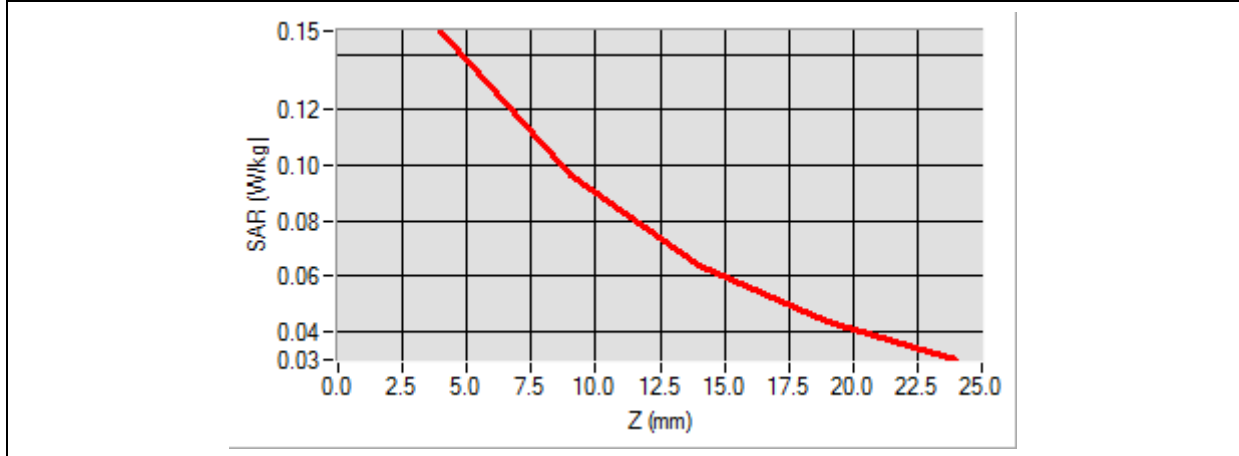
Frequency (MHz)	1852.400000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.524540
Ambient Temperature	21.1
Liquid Temperature	21.3

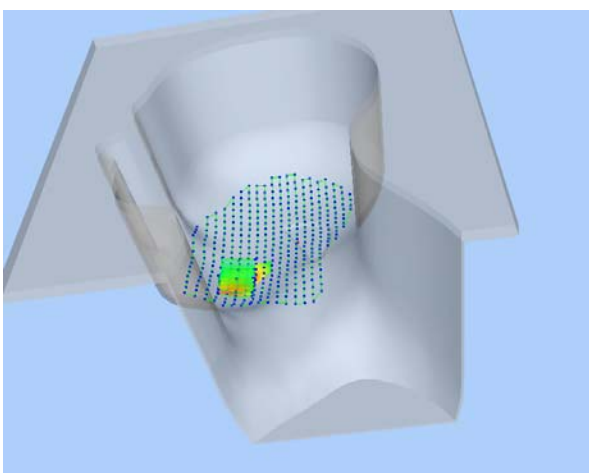
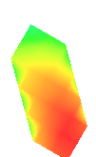


Maximum location: X=-56.00, Y=-59.00

SAR 10g (W/Kg)	0.085218
SAR 1g (W/Kg)	0.138344

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1484	0.0966	0.0640	0.0438



3D screen shot	Hot spot position
	

MEASUREMENT 21

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

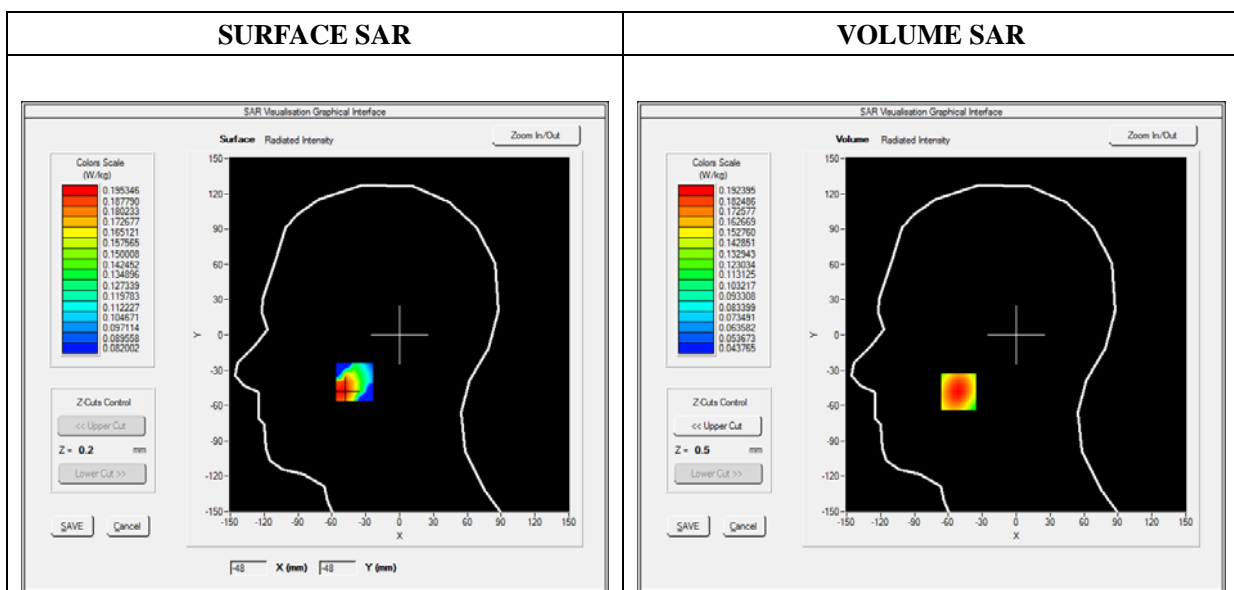
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WCDMA850_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

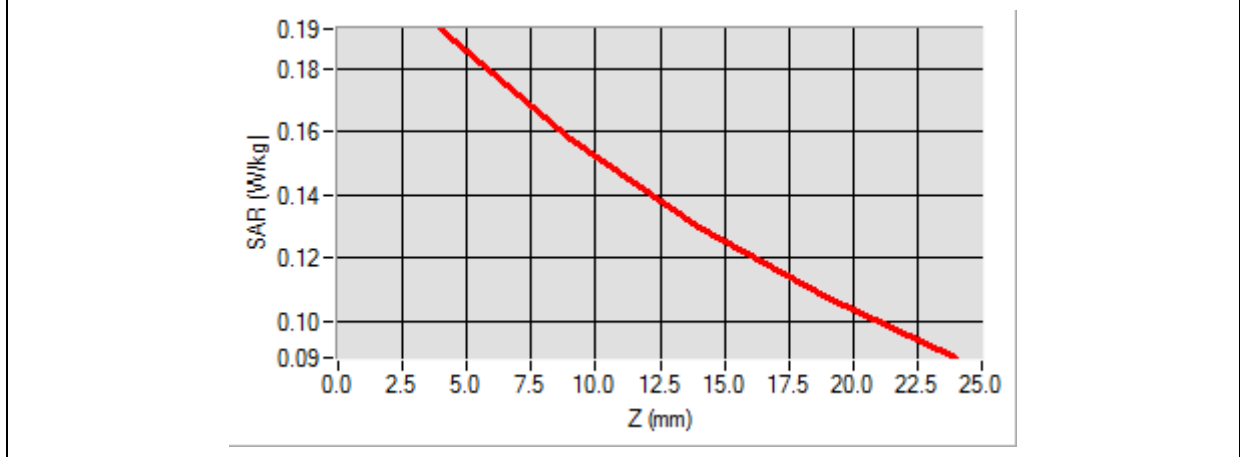
Frequency (MHz)	836.600000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.342427
Ambient Temperature	21.1
Liquid Temperature	21.3

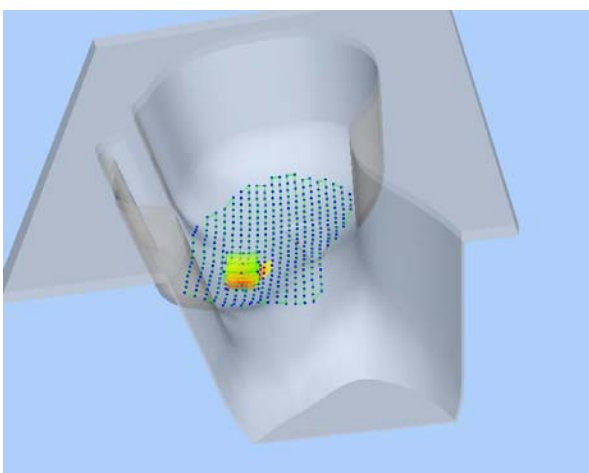
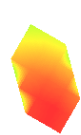


Maximum location: X=-51.00, Y=-48.00

SAR 10g (W/Kg)	0.141857
SAR 1g (W/Kg)	0.184376

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1924	0.1578	0.1300	0.1076



<p align="center">3D screen shot</p>	<p align="center">Hot spot position</p>
	

MEASUREMENT 25

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

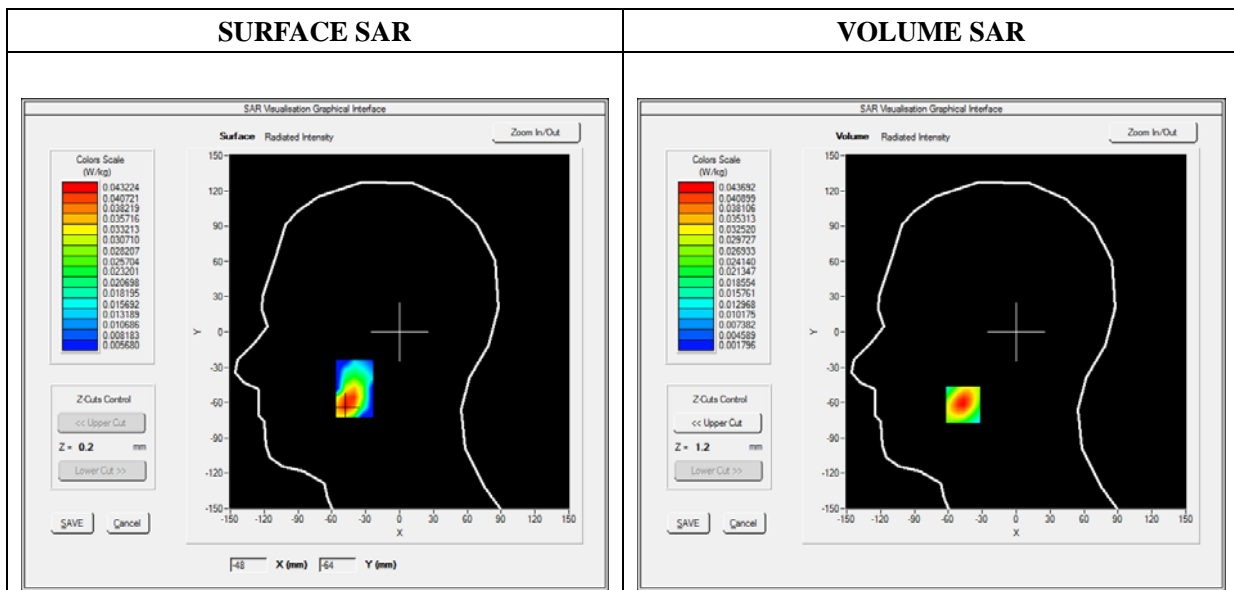
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WCDMA1700_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

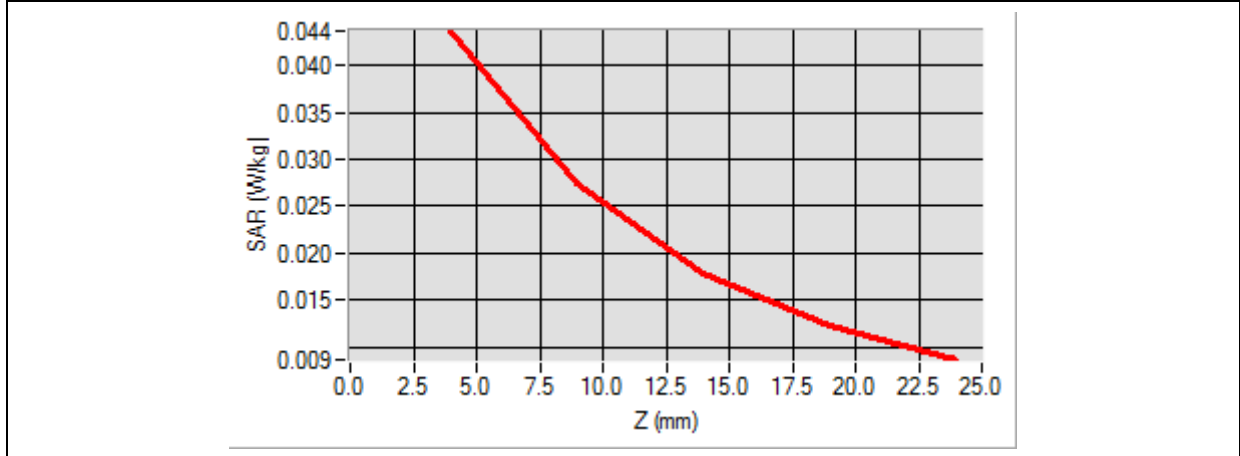
Frequency (MHz)	1732.400000
Relative Permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	1.022540
Ambient Temperature	21.1
Liquid Temperature	21.3

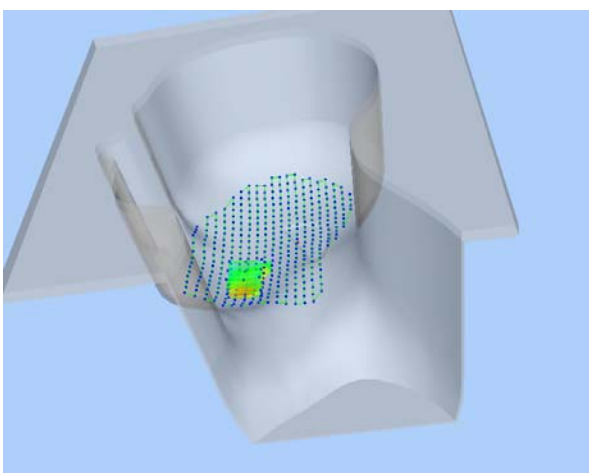
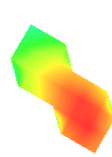


Maximum location: X=-47.00, Y=-62.00

SAR 10g (W/Kg)	0.024128
SAR 1g (W/Kg)	0.040705

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0437	0.0275	0.0178	0.0123



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 29

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

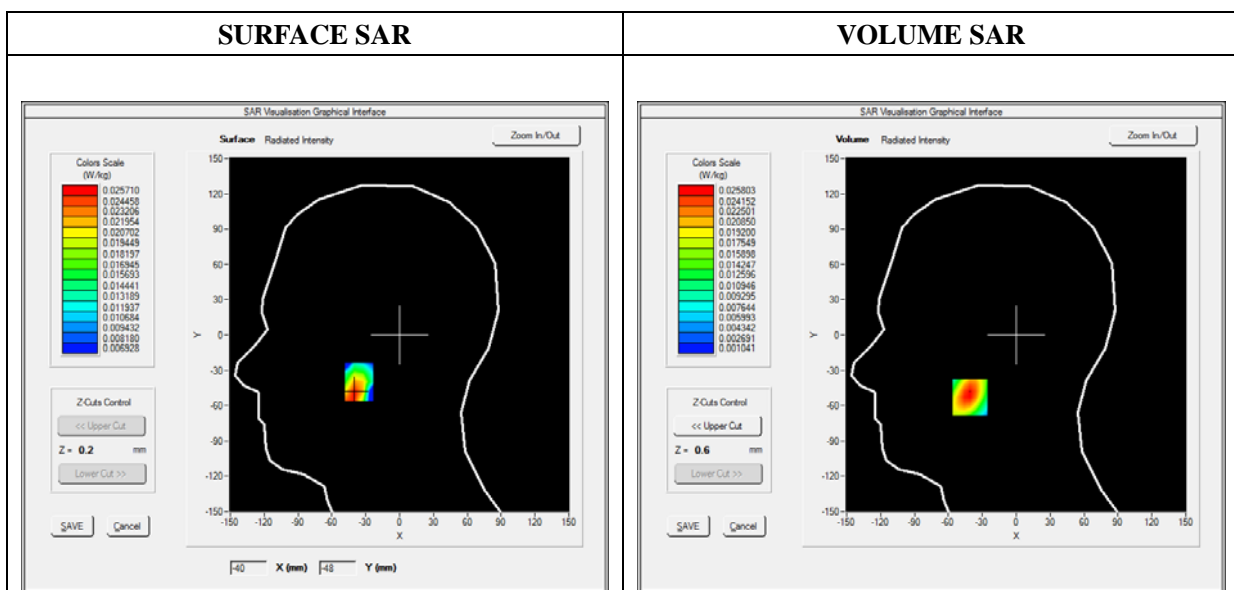
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	LTE Band 2_RMC
Channels	QPSK, 20MHz, 1RB, Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

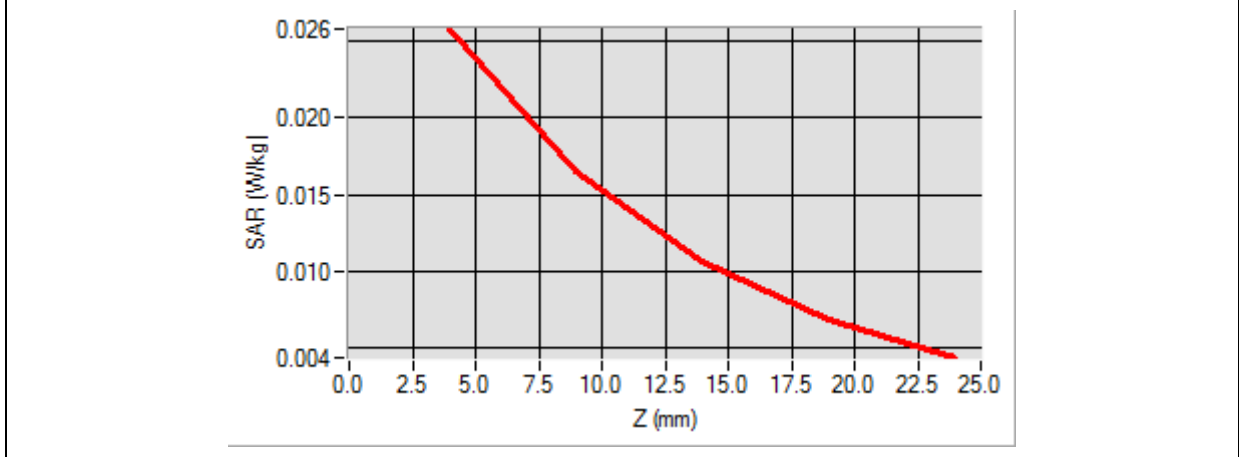
Frequency (MHz)	1880.000000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.743564
Ambient Temperature	21.1
Liquid Temperature	21.3

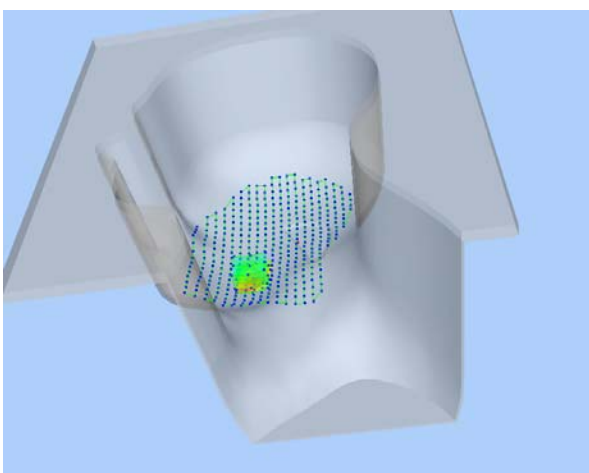
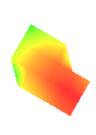


Maximum location: X=-41.00, Y=-53.00

SAR 10g (W/Kg)	0.014326
SAR 1g (W/Kg)	0.024215

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0258	0.0165	0.0106	0.0069



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 37

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

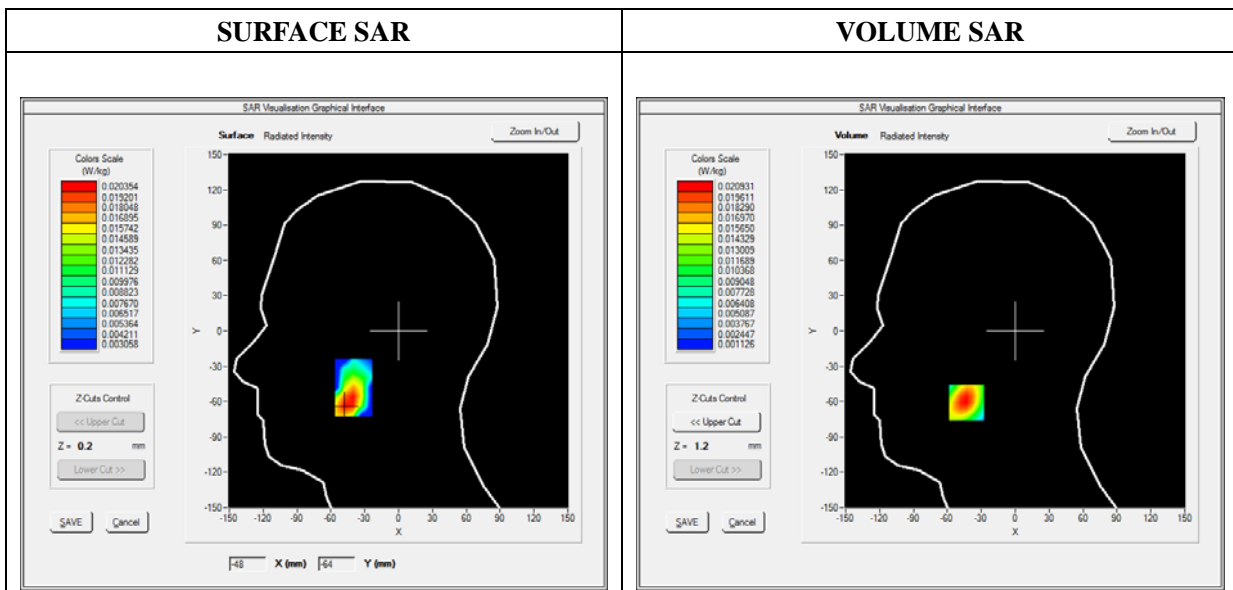
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	LTE Band 4_RMC
Channels	QPSK, 20MHz, 1RB, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

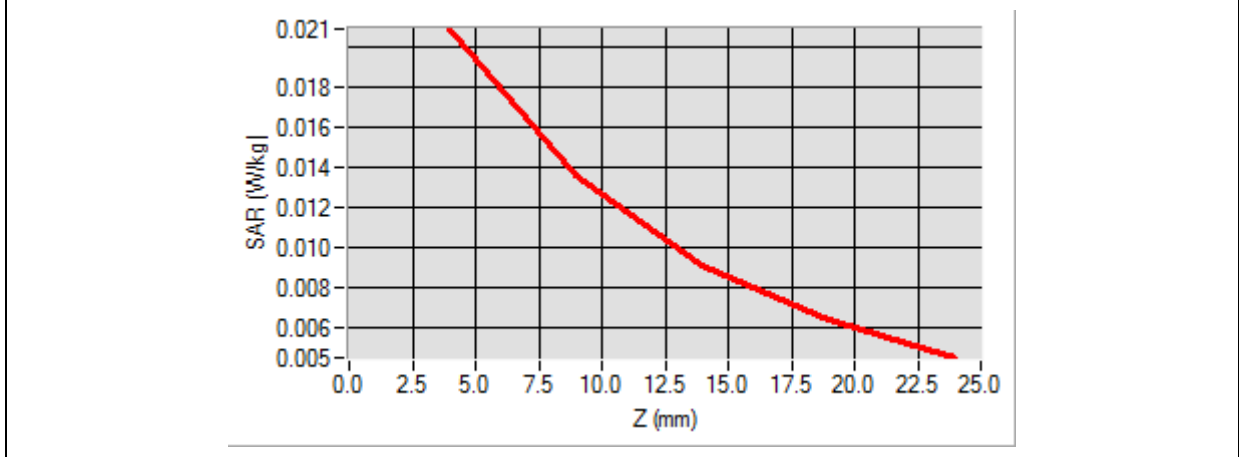
Frequency (MHz)	1720.000000
Relative Permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	1.374628
Ambient Temperature	21.1
Liquid Temperature	21.2

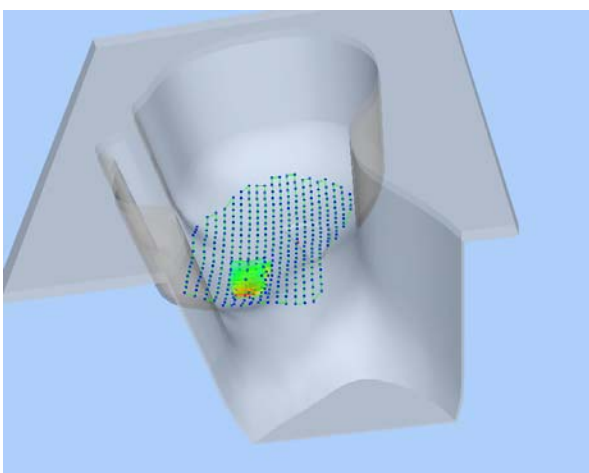
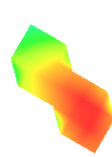


Maximum location: X=-43.00, Y=-61.00

SAR 10g (W/Kg)	0.011830
SAR 1g (W/Kg)	0.019601

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0209	0.0136	0.0091	0.0064



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 45

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

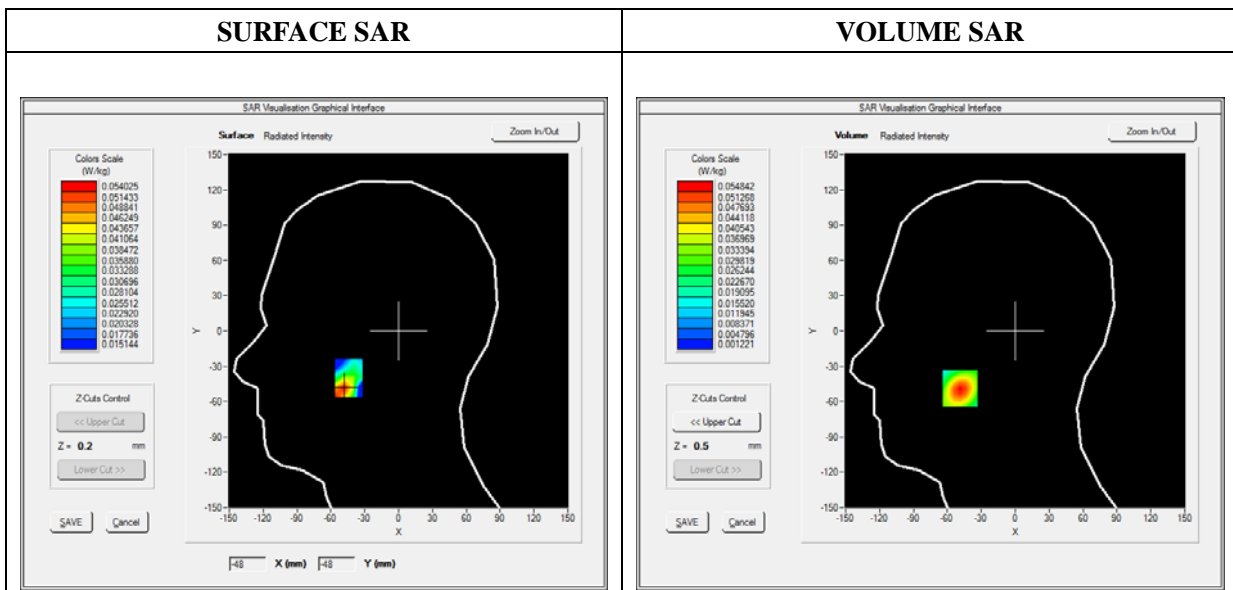
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	LTE Band 7_RMC
Channels	QPSK, 20MHz, 1RB, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

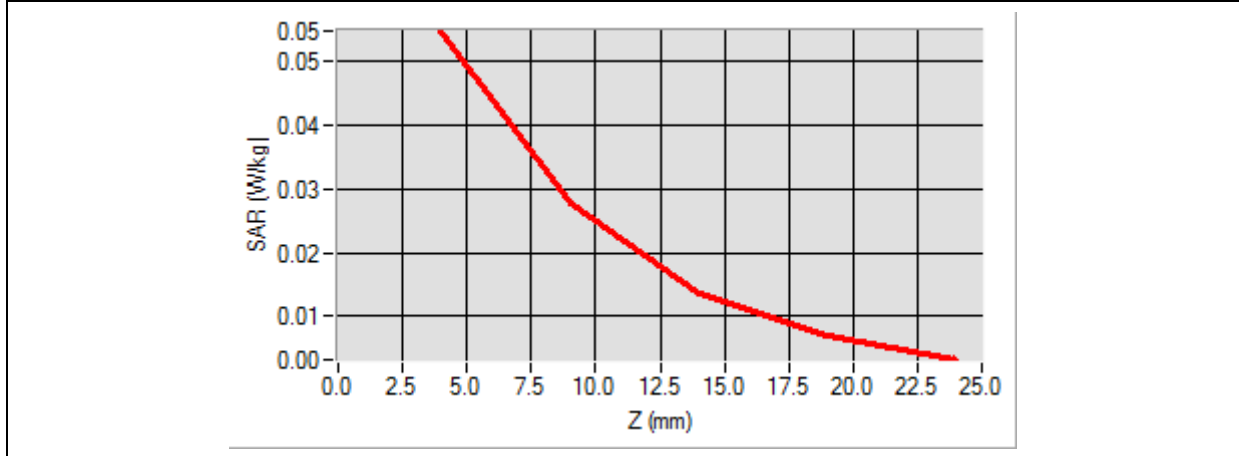
Frequency (MHz)	2510.000000
Relative Permittivity (real part)	38.153660
Conductivity (S/m)	1.740236
Power Variation (%)	0.924535
Ambient Temperature	21.1
Liquid Temperature	21.2

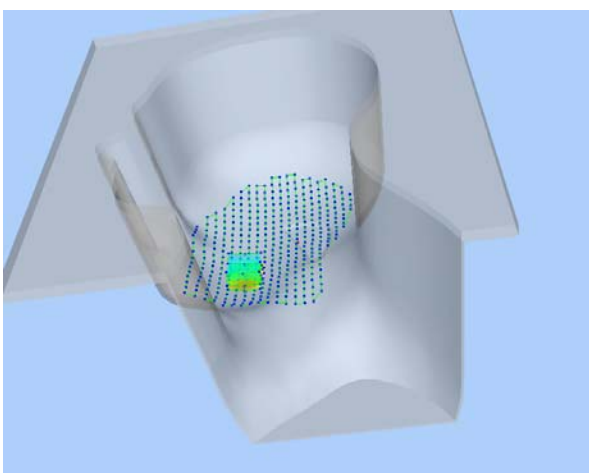
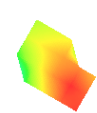


Maximum location: X=-49.00, Y=-49.00

SAR 10g (W/Kg)	0.025725
SAR 1g (W/Kg)	0.053579

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0548	0.0277	0.0136	0.0068



3D screen shot	Hot spot position
	

MEASUREMENT 53

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

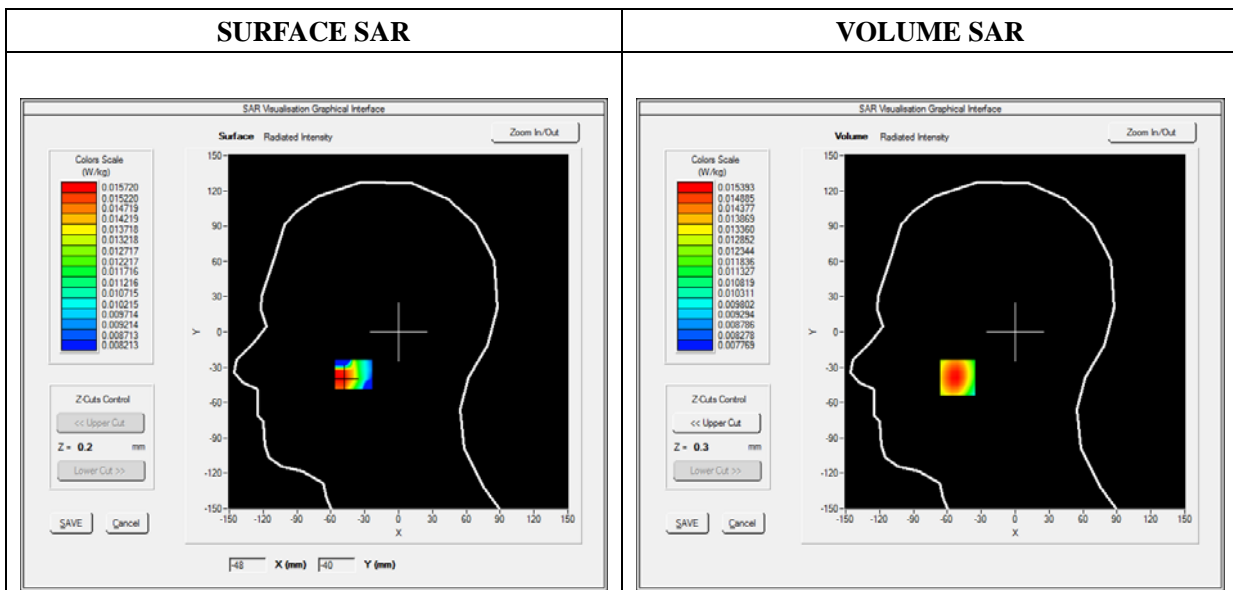
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	LTE Band 17_RMC
Channels	QPSK, 10MHz, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

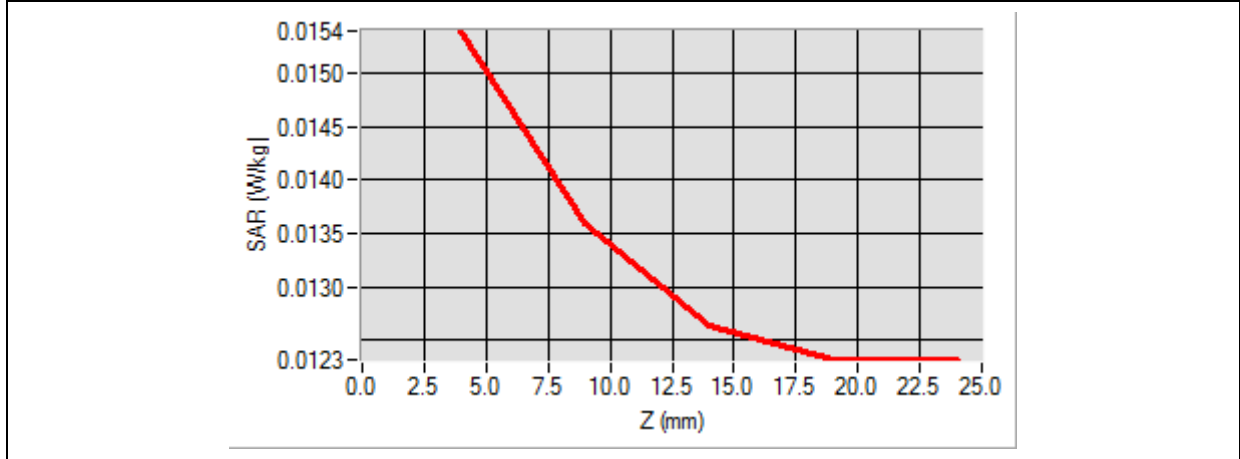
Frequency (MHz)	709.000000
Relative Permittivity (real part)	41.320574
Conductivity (S/m)	0.862373
Power Variation (%)	1.422112
Ambient Temperature	21.1
Liquid Temperature	21.3

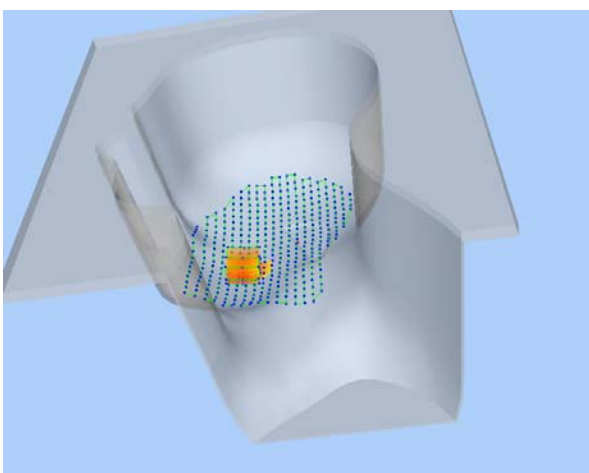



Maximum location: X=-51.00, Y=-39.00

SAR 10g (W/Kg)	0.013189
SAR 1g (W/Kg)	0.015042

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0154	0.0136	0.0126	0.0123



3D screen shot	Hot spot position
	

MEASUREMENT 61

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

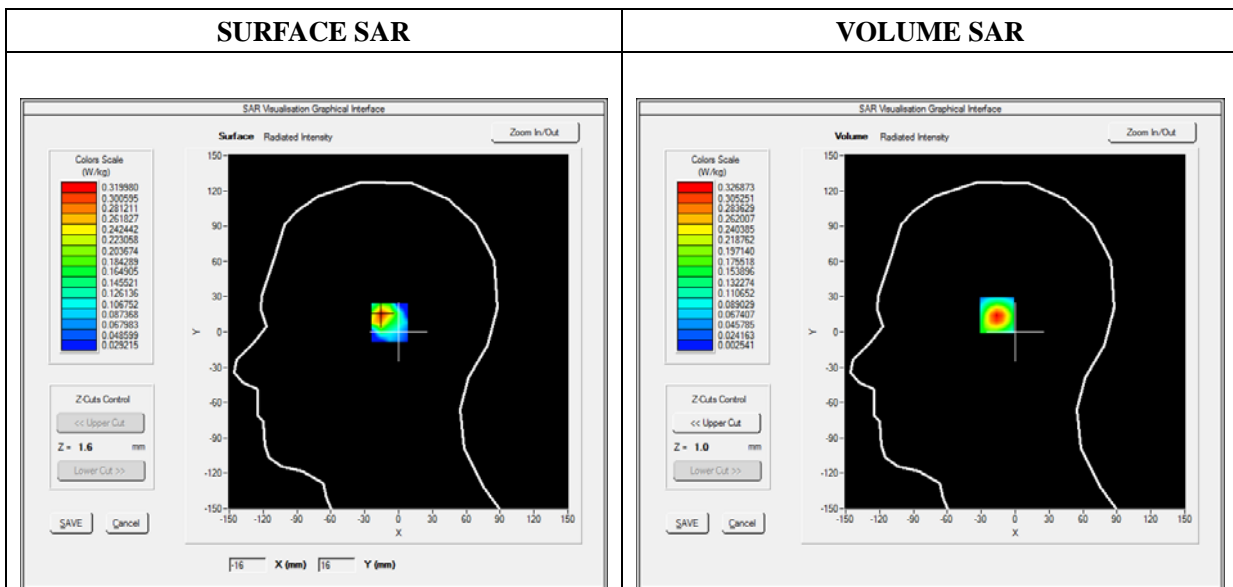
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	WiFi_802.11b
Channels	High
Signal	Duty Cycle 1:1

B. SAR Measurement Results

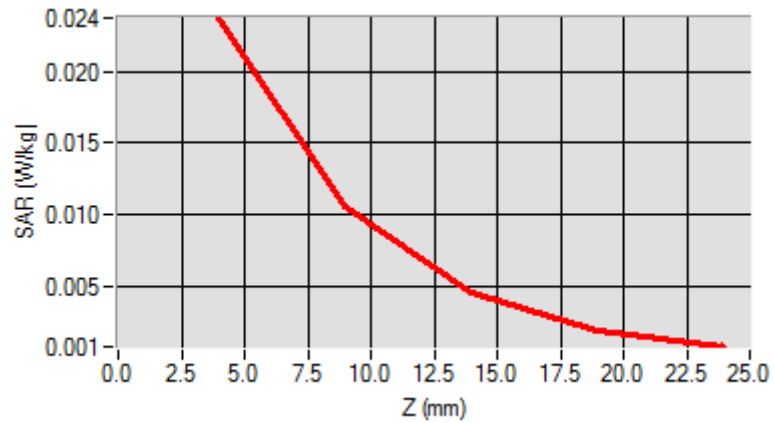
Frequency (MHz)	2462.000000
Relative Permittivity (real part)	38.153660
Conductivity (S/m)	1.740236
Power Variation (%)	3.234772
Ambient Temperature	21.1
Liquid Temperature	21.2

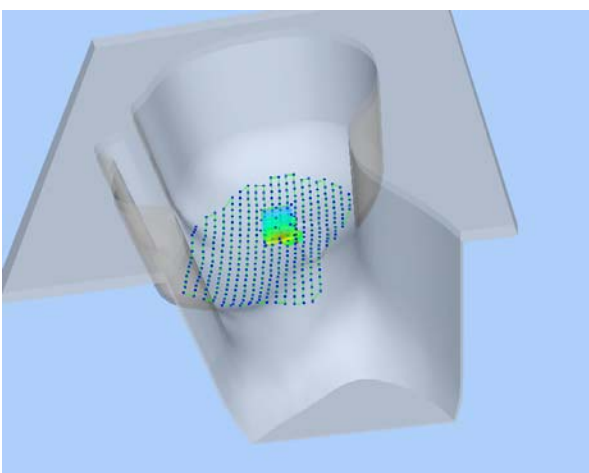
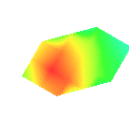


Maximum location: X=-8.00, Y=0.00

SAR 10g (W/Kg)	0.010875
SAR 1g (W/Kg)	0.022160

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.0237	0.0106	0.0045	0.0020



3D screen shot	Hot spot position
	

MEASUREMENT 65

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

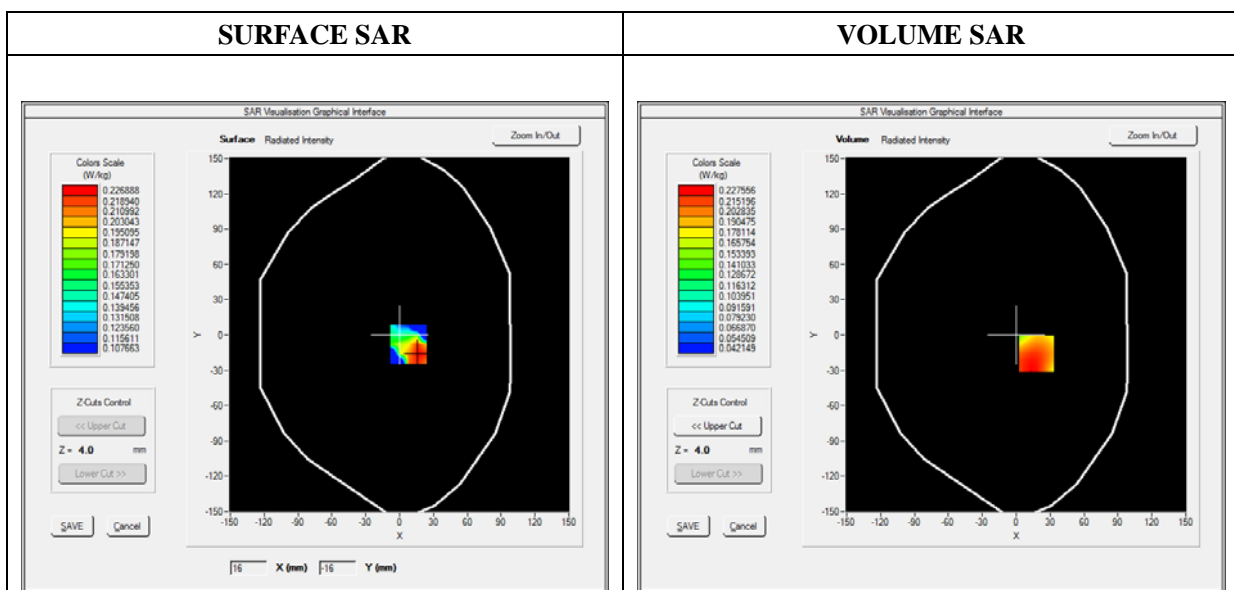
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back(Body-worn)
Band	GSM850
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

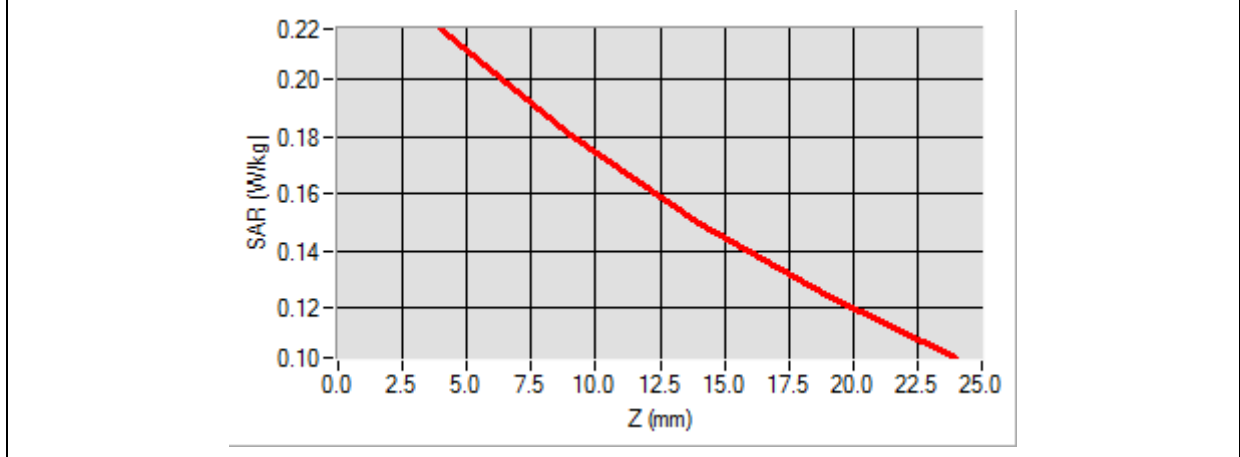
Frequency (MHz)	824.200000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	0.901472
Ambient Temperature	21.1
Liquid Temperature	21.3

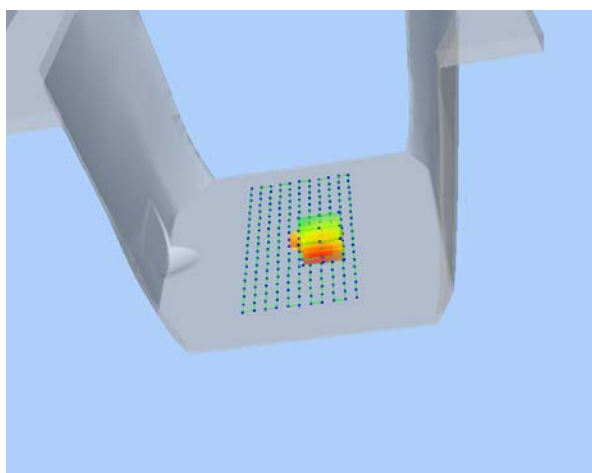
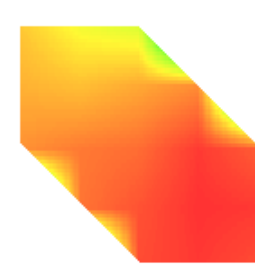


Maximum location: X=18.00, Y=-16.00

SAR 10g (W/Kg)	0.187829
SAR 1g (W/Kg)	0.240189

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.2177	0.1804	0.1498	0.1244



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 67

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

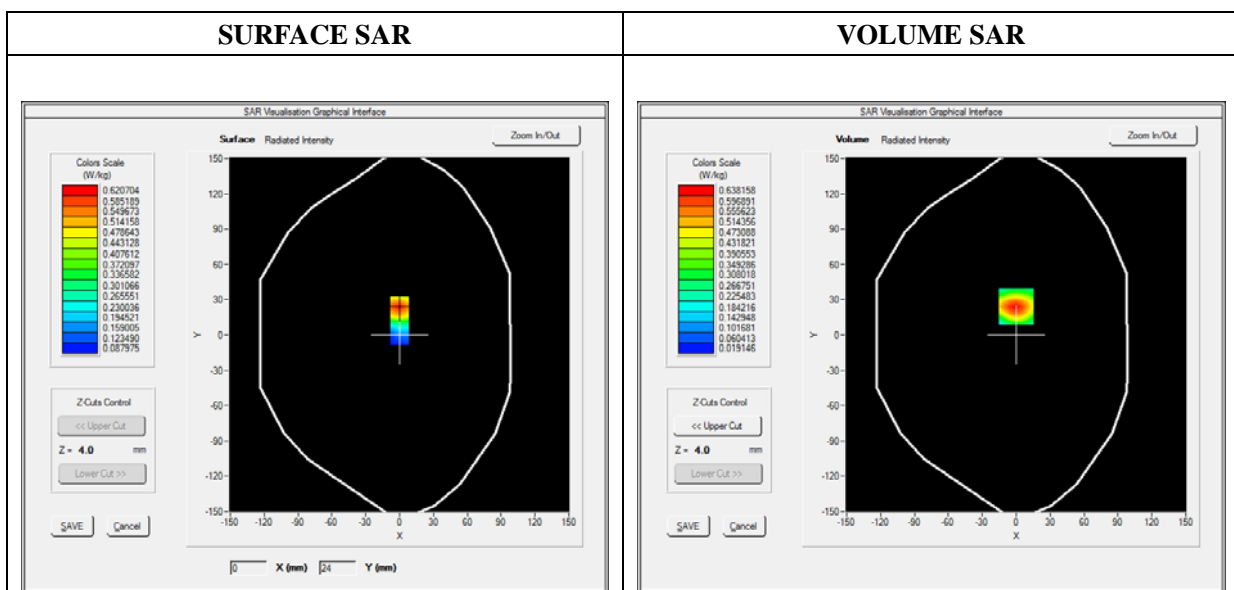
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back(Body-worn)
Band	GSM1900
Channels	High
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

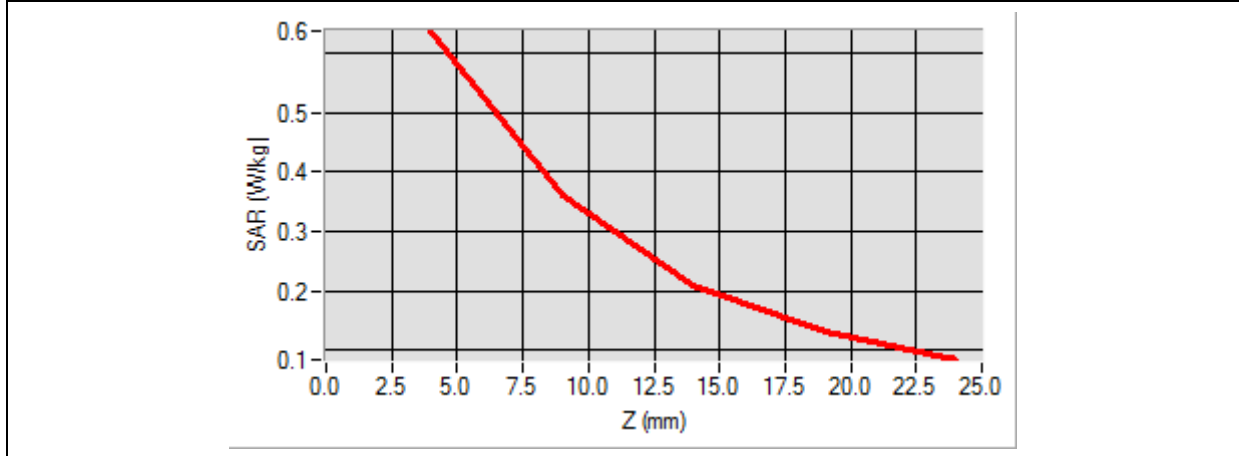
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	1.474622
Ambient Temperature	21.1
Liquid Temperature	21.3

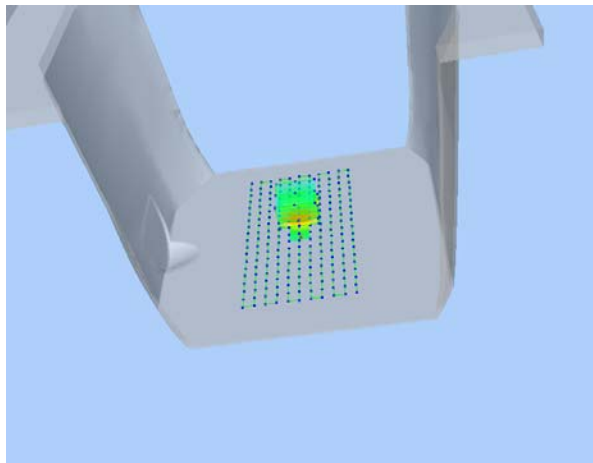



Maximum location: X=0.00, Y=24.00

SAR 10g (W/Kg)	0.388794
SAR 1g (W/Kg)	0.705511

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6382	0.3606	0.2091	0.1305



3D screen shot	Hot spot position
	

MEASUREMENT 69

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

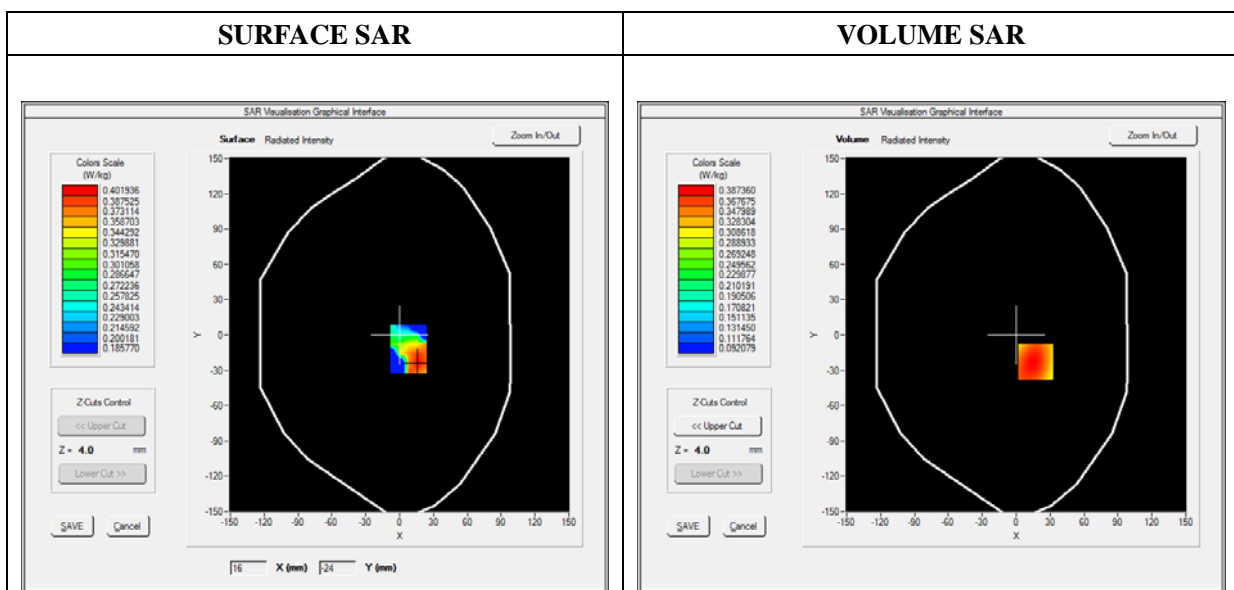
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat plane
Device Position	Back
Band	GPRS850_4TX
Channels	Middle
Signal	Duty Cycle: 1:2

B. SAR Measurement Results

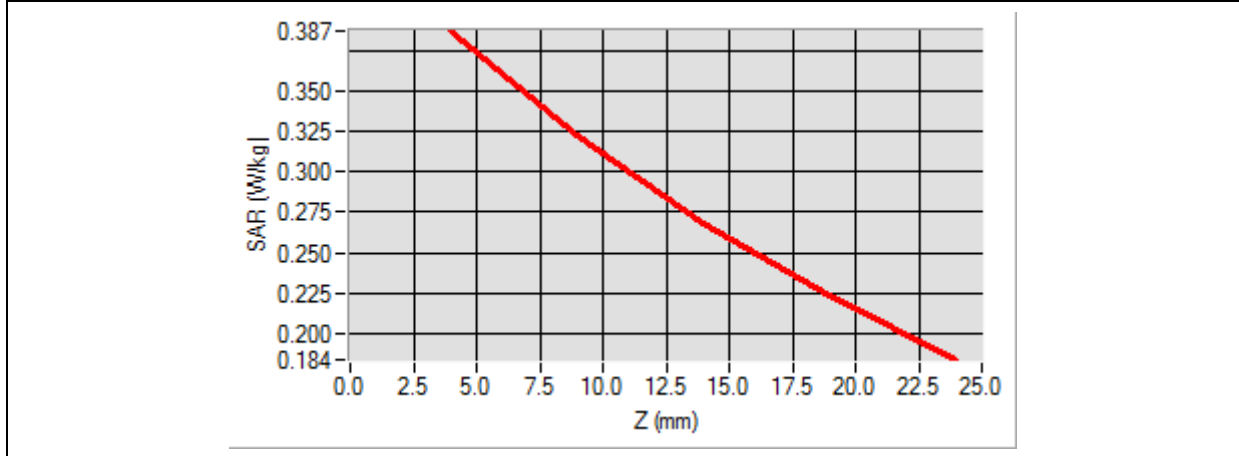
Frequency (MHz)	836.600000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	0.901472
Ambient Temperature	21.1
Liquid Temperature	21.3

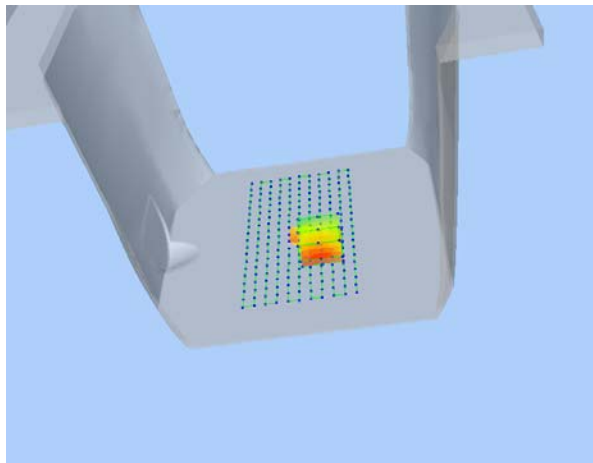



Maximum location: X=17.00, Y=-23.00

SAR 10g (W/Kg)	0.304816
SAR 1g (W/Kg)	0.379147

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3874	0.3222	0.2681	0.2228



3D screen shot	Hot spot position
	

MEASUREMENT 73

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

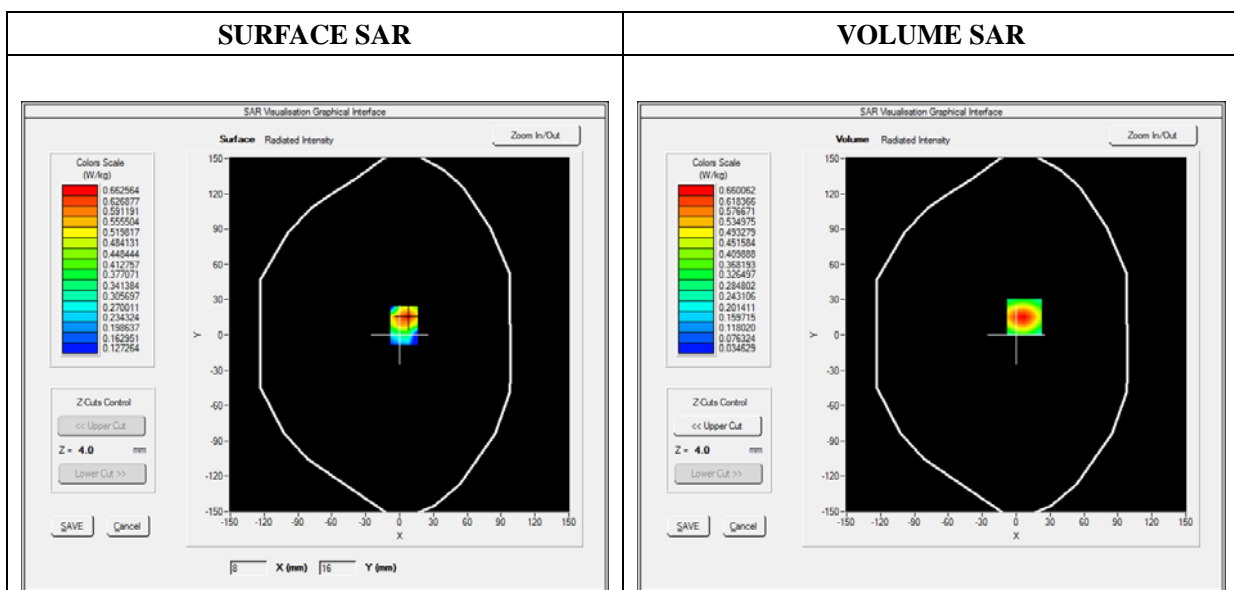
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat plane
Device Position	Back
Band	GPRS1900_4TX
Channels	High
Signal	Duty Cycle: 1:2

B. SAR Measurement Results

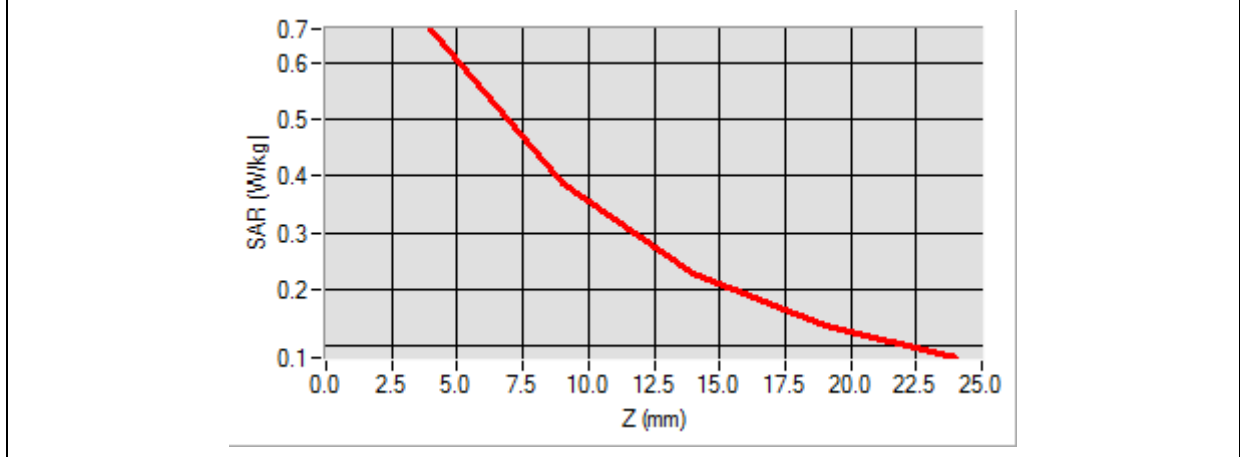
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	2.483762
Ambient Temperature	21.1
Liquid Temperature	21.3

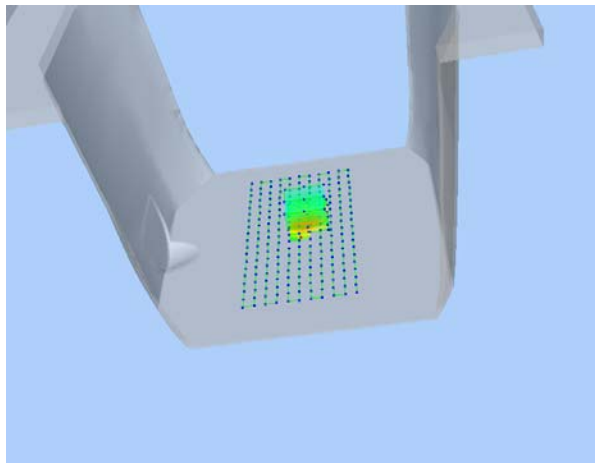
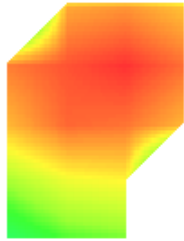


Maximum location: X=7.00, Y=15.00

SAR 10g (W/Kg)	0.340183
SAR 1g (W/Kg)	0.608835

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6601	0.3872	0.2272	0.1365



3D screen shot	Hot spot position
	

MEASUREMENT 77

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

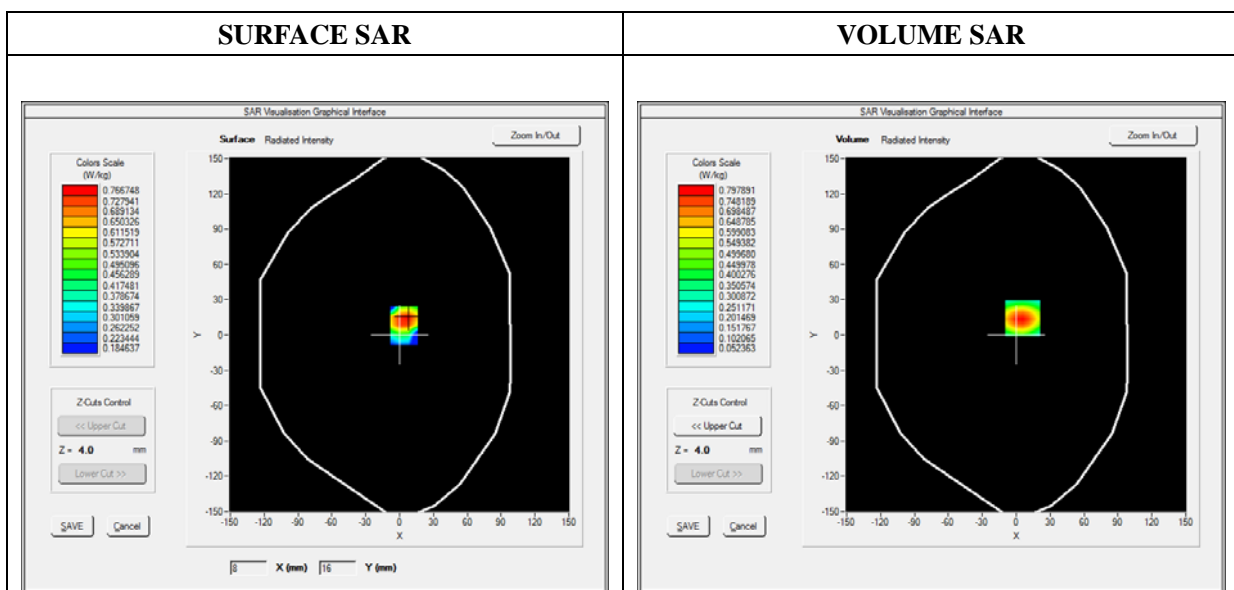
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	WCDMA1900_RMC
Channels	Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

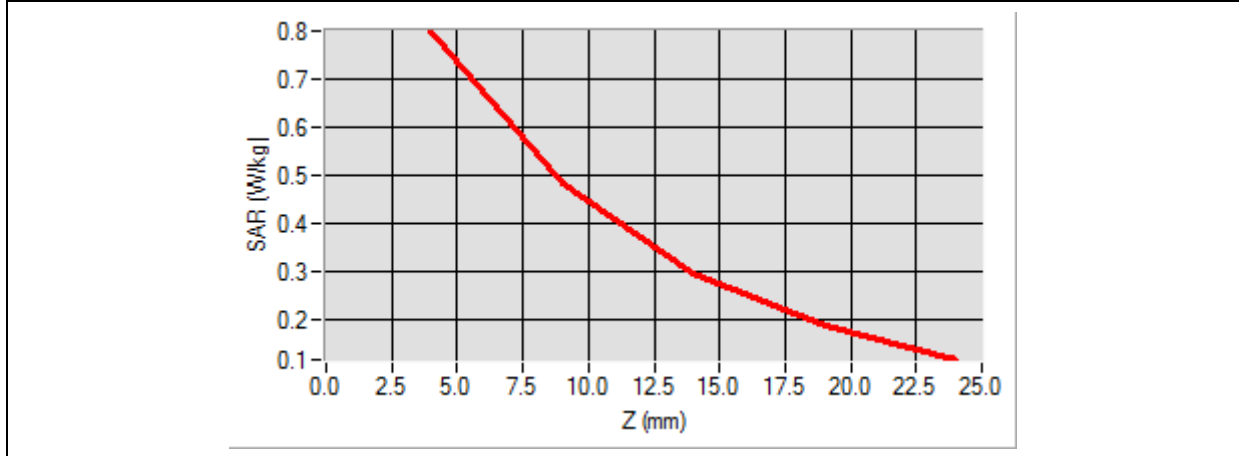
Frequency (MHz)	1852.400000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	1.847552
Ambient Temperature	21.1
Liquid Temperature	21.3

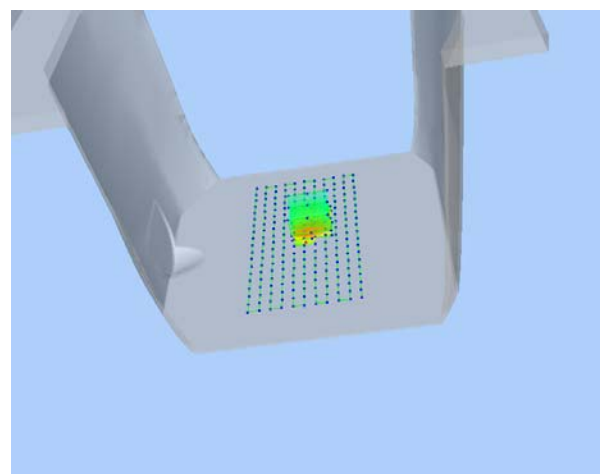
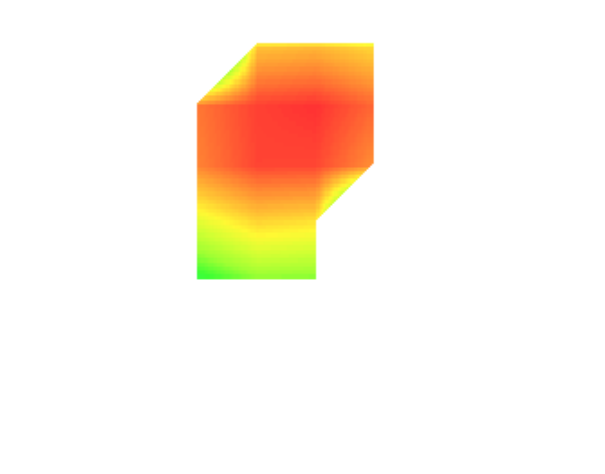


Maximum location: X=6.00, Y=14.00

SAR 10g (W/Kg)	0.419902
SAR 1g (W/Kg)	0.736259

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.7979	0.4834	0.2963	0.1881



3D screen shot	Hot spot position
	

MEASUREMENT 81

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

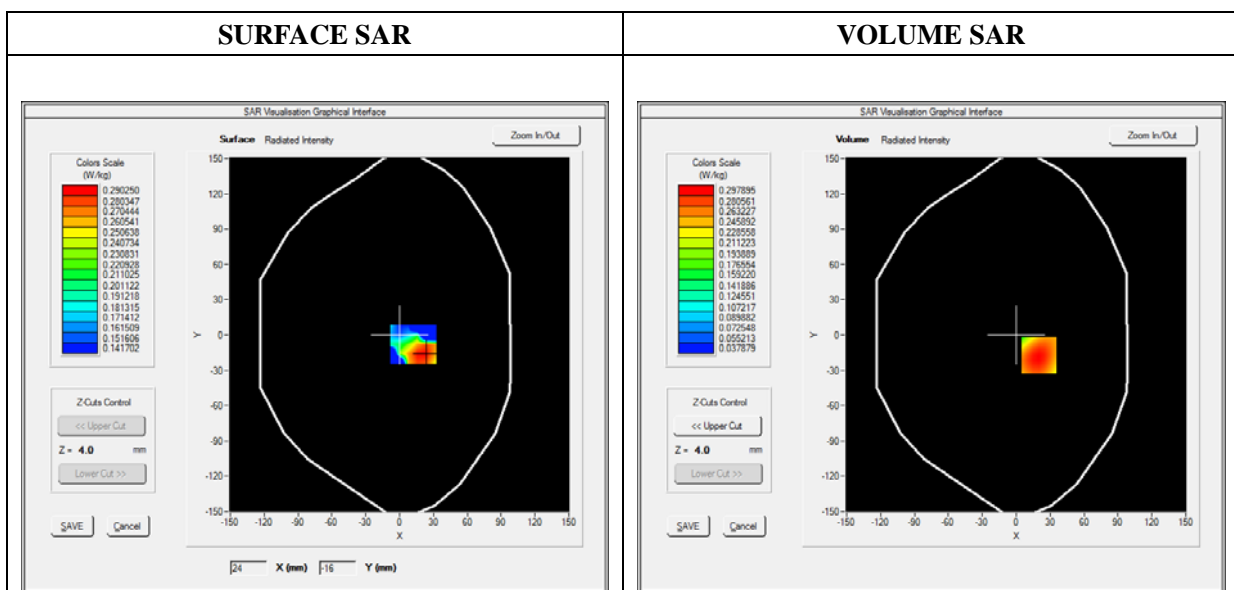
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	WCDMA850_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

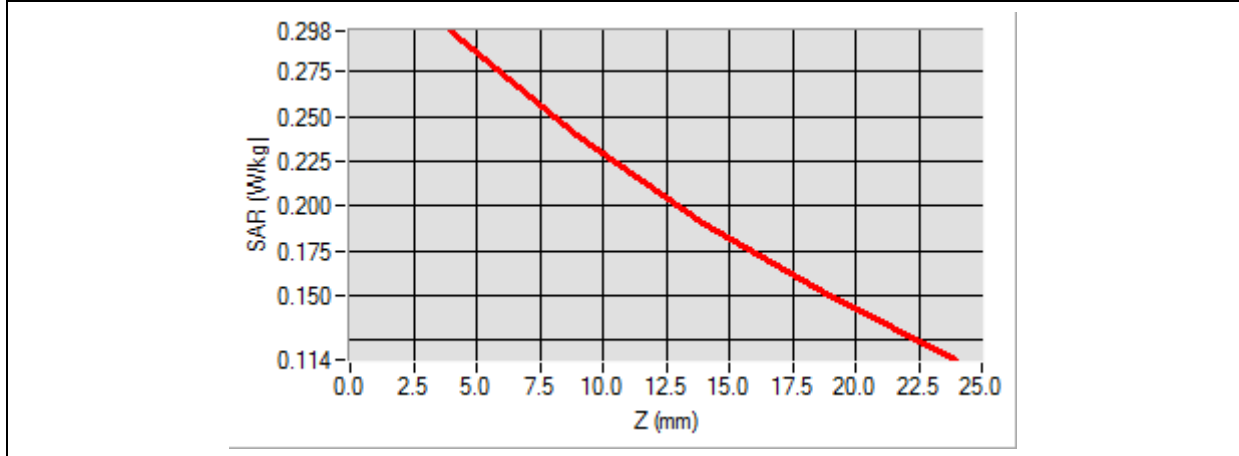
Frequency (MHz)	836.600000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	2.341234
Ambient Temperature	21.1
Liquid Temperature	21.3

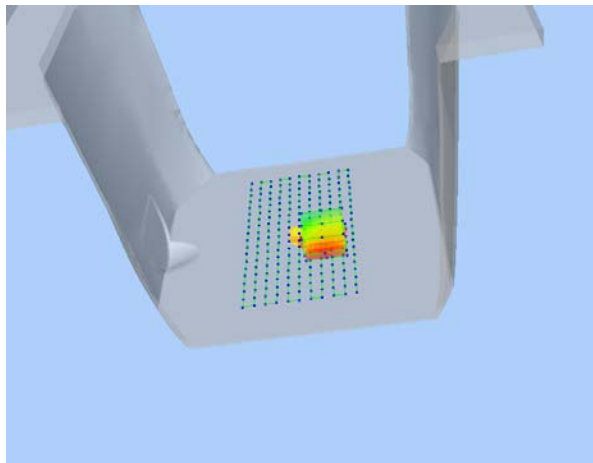
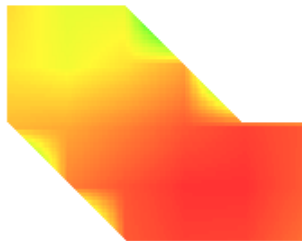


Maximum location: X=20.00, Y=-17.00

SAR 10g (W/Kg)	0.219813
SAR 1g (W/Kg)	0.287409

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.2979	0.2399	0.1909	0.1496



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 85

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

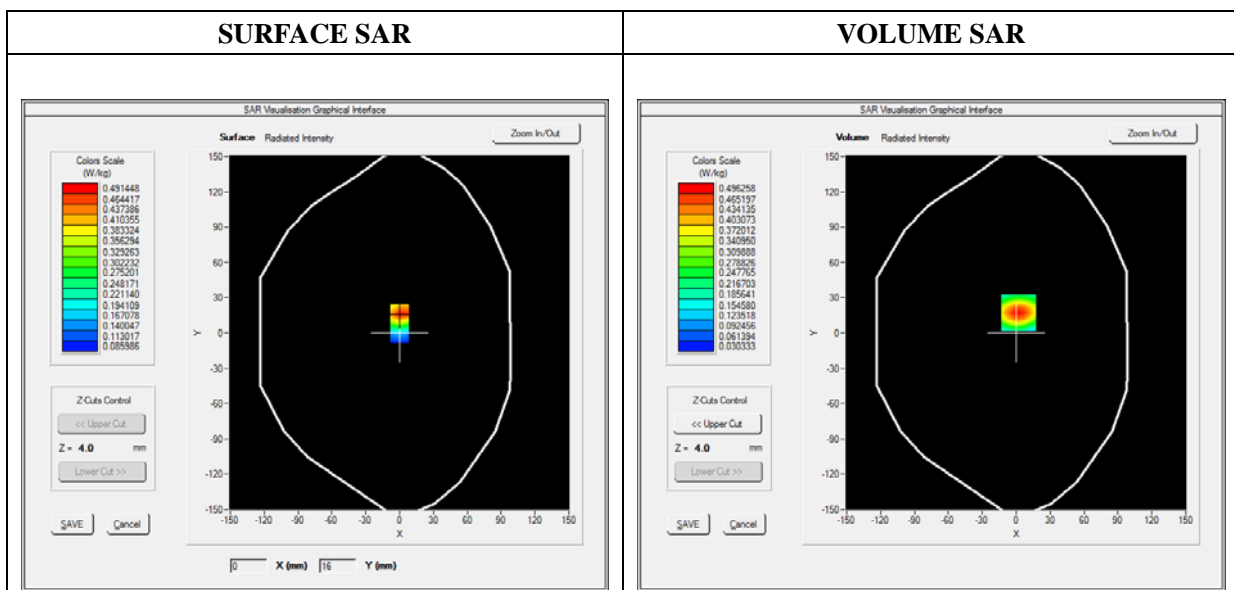
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.06; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	WCDMA1700_RMC
Channels	Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

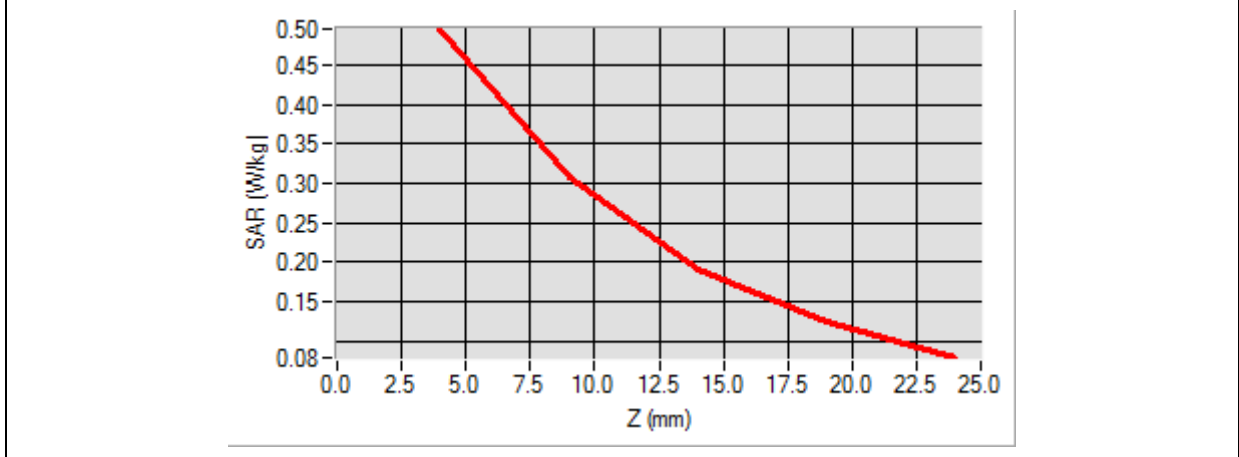
Frequency (MHz)	1732.400000
Relative Permittivity (real part)	51.224510
Conductivity (S/m)	1.461261
Power Variation (%)	0.541872
Ambient Temperature	21.1
Liquid Temperature	21.3

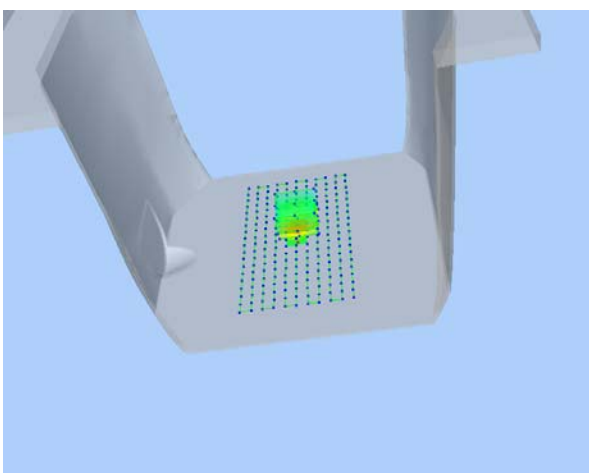



Maximum location: X=2.00, Y=17.00

SAR 10g (W/Kg)	0.359505
SAR 1g (W/Kg)	0.627280

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.4963	0.3070	0.1921	0.1240



3D screen shot	Hot spot position
	

MEASUREMENT 91

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

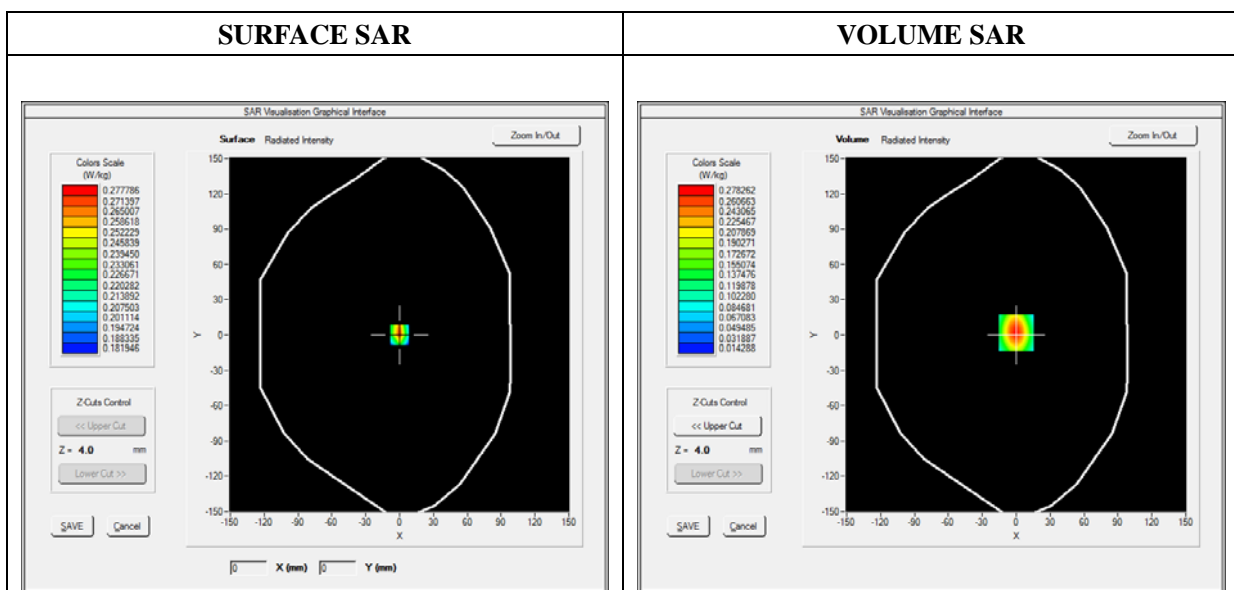
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Bottom
Band	LTE Band 2_RMC
Channels	QPSK, 20MHz, 1RB, Middle
Signal	Duty Cycle 1:1

B. SAR Measurement Results

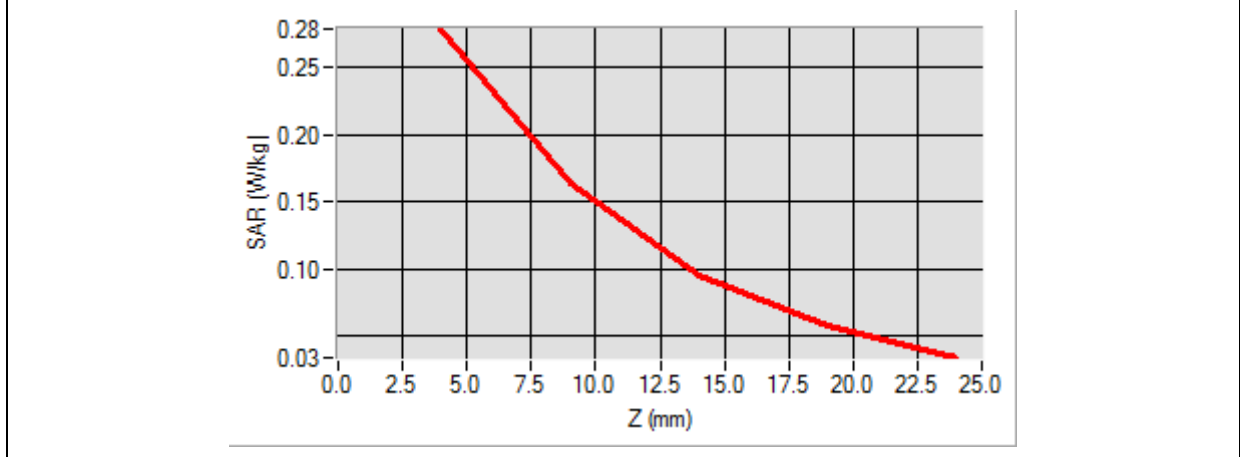
Frequency (MHz)	1880.000000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	1.523573
Ambient Temperature	21.1
Liquid Temperature	21.3

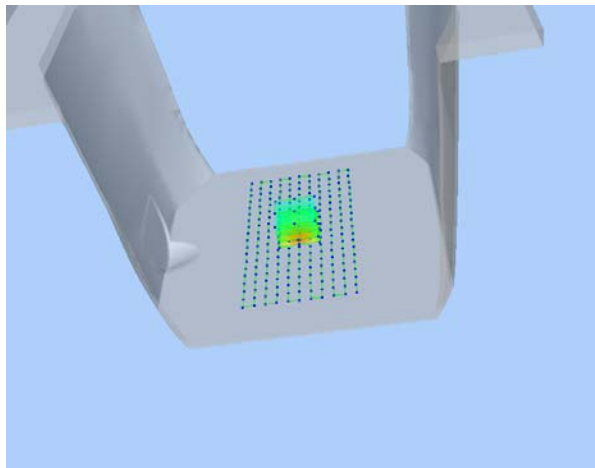



Maximum location: X=0.00, Y=2.00

SAR 10g (W/Kg)	0.152102
SAR 1g (W/Kg)	0.276098

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.2783	0.1632	0.0961	0.0582



<p>3D screen shot</p>	<p>Hot spot position</p>
	

MEASUREMENT 99

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

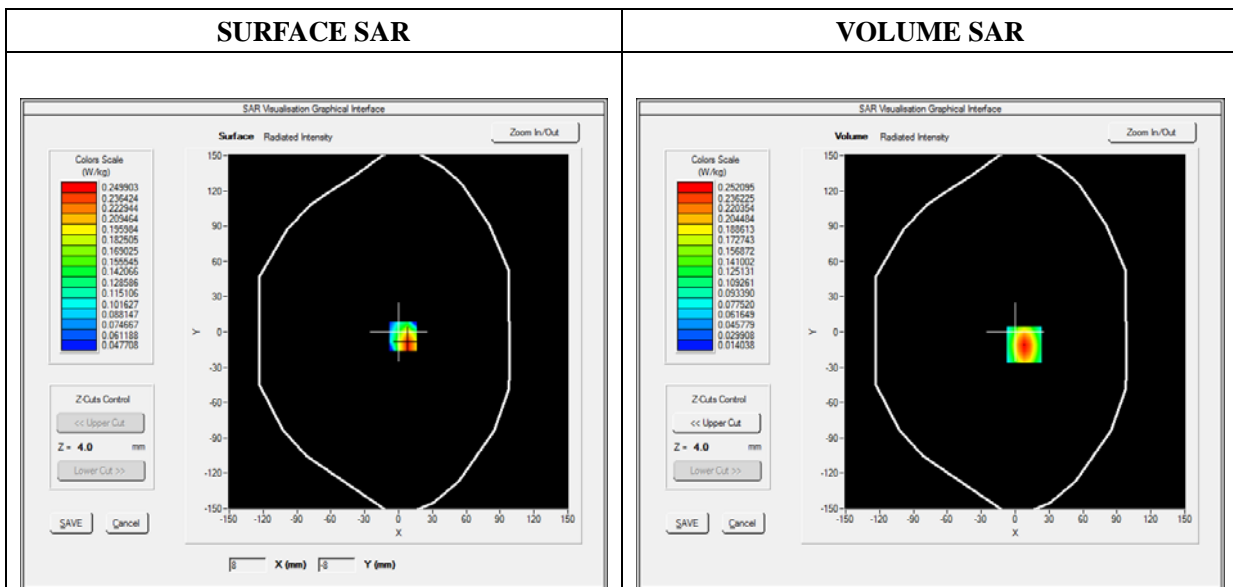
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.06; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Bottom
Band	LTE Band 4_RMC
Channels	QPSK, 20MHz, 1RB, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

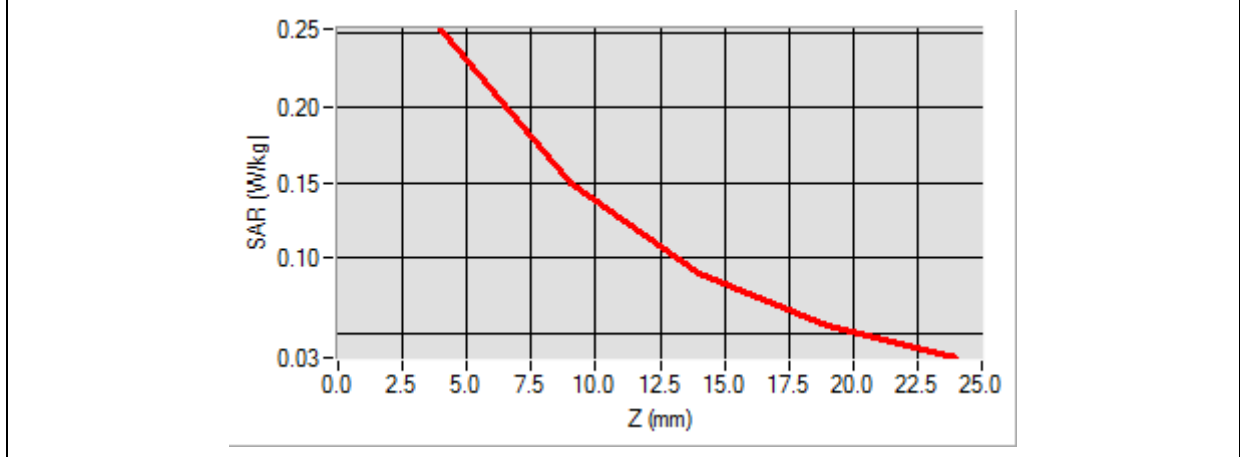
Frequency (MHz)	1720.000000
Relative Permittivity (real part)	51.224510
Conductivity (S/m)	1.461261
Power Variation (%)	0.858383
Ambient Temperature	21.1
Liquid Temperature	21.2

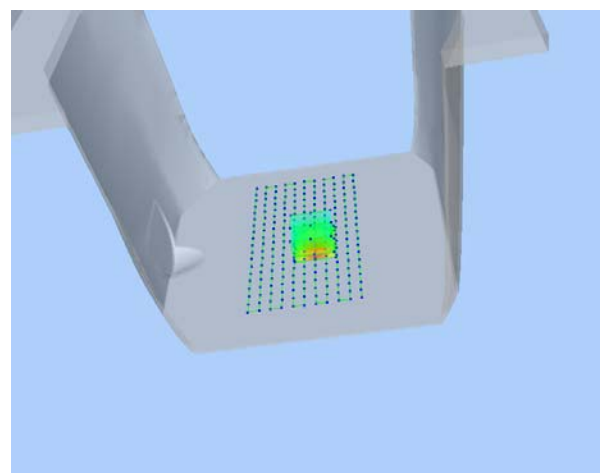
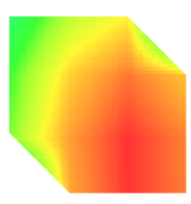


Maximum location: X=8.00, Y=-11.00

SAR 10g (W/Kg)	0.138514
SAR 1g (W/Kg)	0.250779

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.2521	0.1499	0.0900	0.0560



3D screen shot	Hot spot position
	

MEASUREMENT 105

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

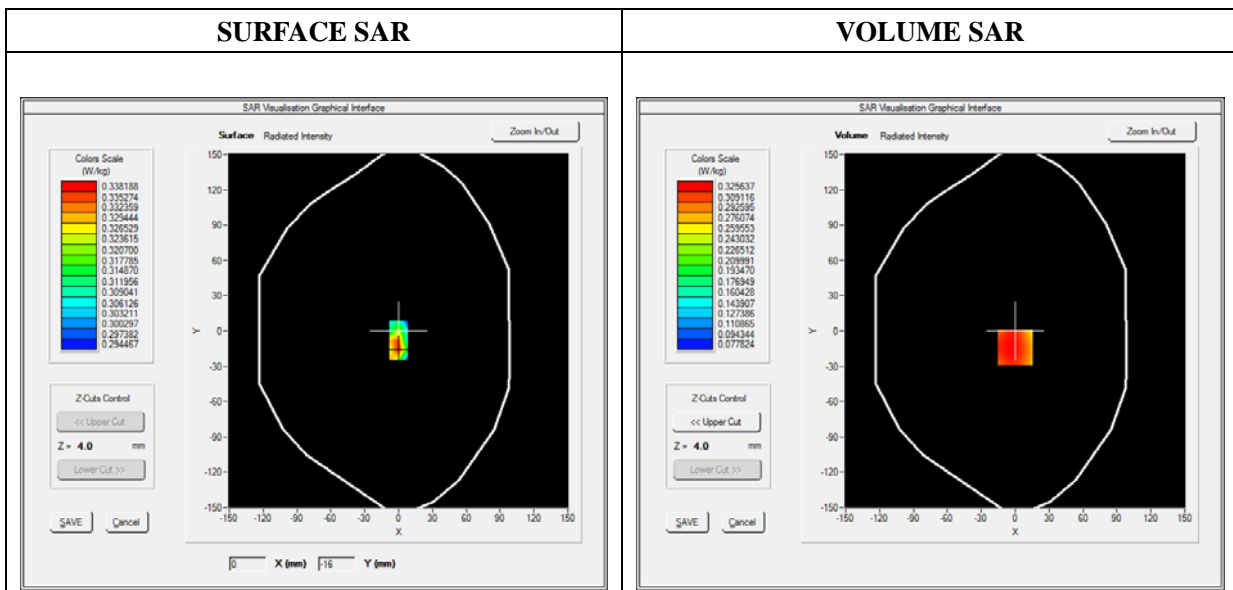
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	LTE Band 7_RMC
Channels	QPSK, 20MHz, 1RB, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

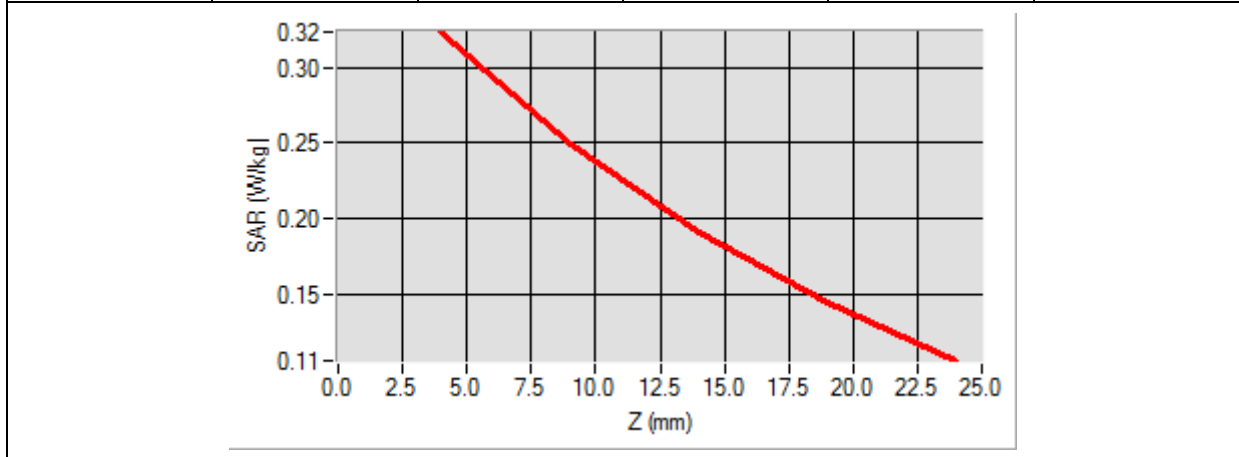
Frequency (MHz)	2510.000000
Relative Permittivity (real part)	52.010212
Conductivity (S/m)	1.910255
Power Variation (%)	3.672346
Ambient Temperature	21.1
Liquid Temperature	21.2

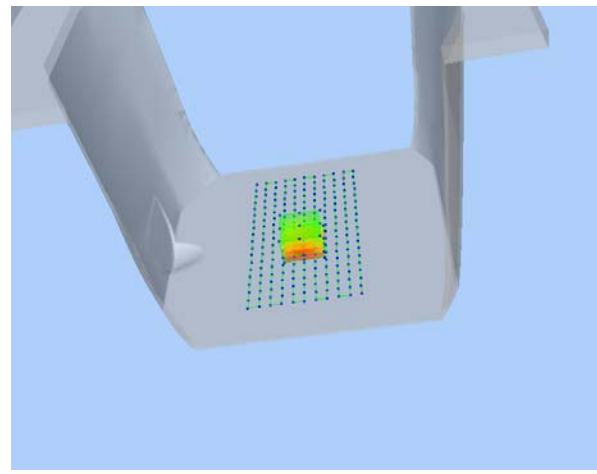



Maximum location: X=0.00, Y=-14.00

SAR 10g (W/Kg)	0.233306
SAR 1g (W/Kg)	0.314899

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3235	0.2493	0.1907	0.1443



3D screen shot	Hot spot position
	

MEASUREMENT 113

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

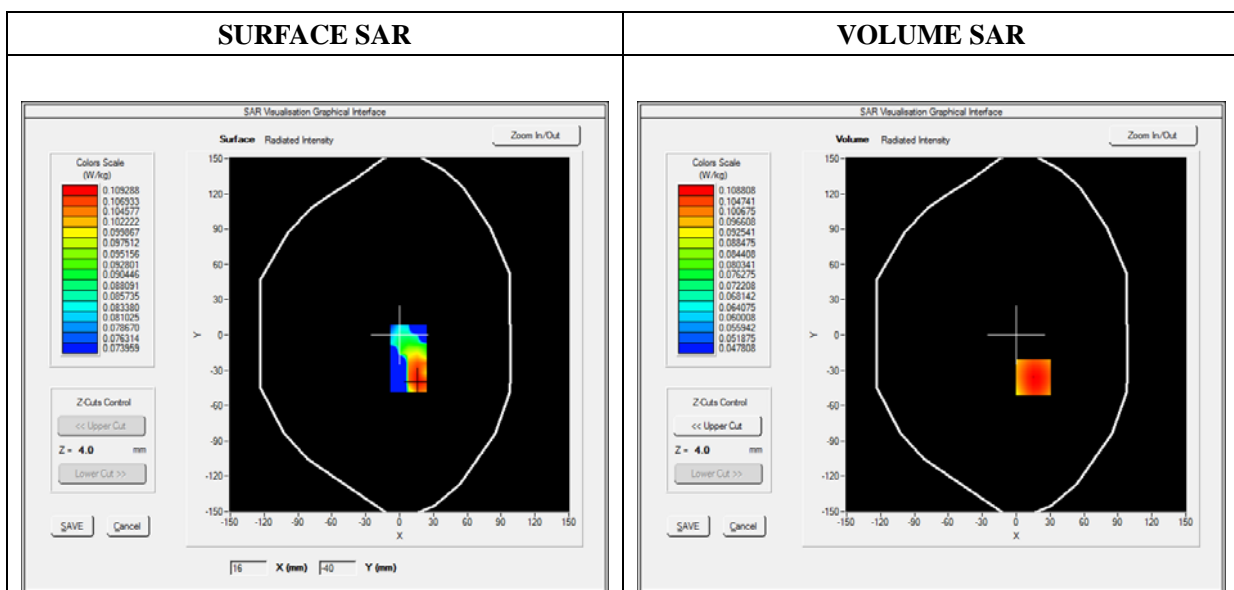
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	LTE Band 17_RMC
Channels	QPSK, 10MHz, Low
Signal	Duty Cycle 1:1

B. SAR Measurement Results

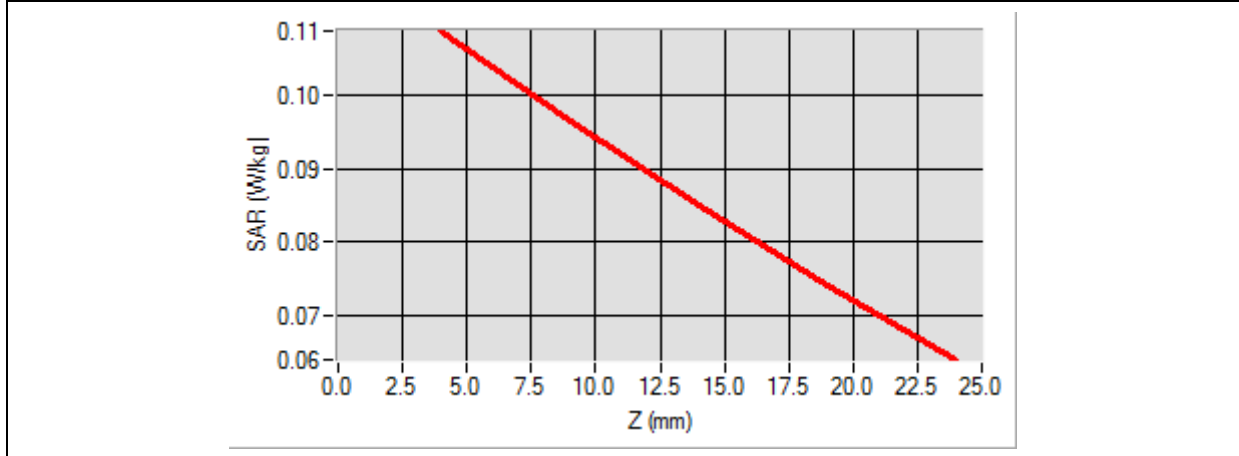
Frequency (MHz)	709.000000
Relative Permittivity (real part)	54.964739
Conductivity (S/m)	0.931048
Power Variation (%)	0.954431
Ambient Temperature	21.1
Liquid Temperature	21.3

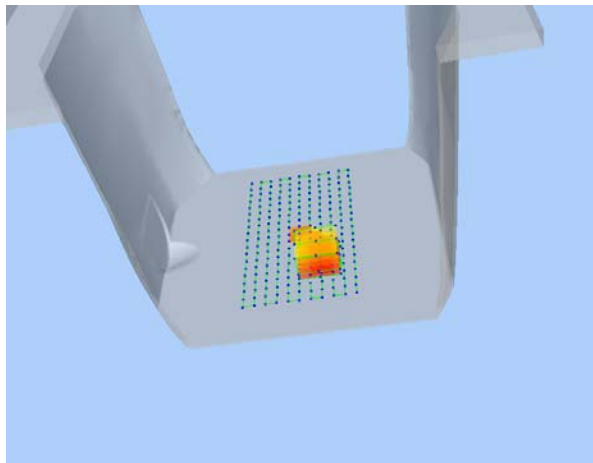



Maximum location: X=15.00, Y=-36.00

SAR 10g (W/Kg)	0.091012
SAR 1g (W/Kg)	0.106627

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1088	0.0966	0.0851	0.0742



3D screen shot	Hot spot position
	

MEASUREMENT 121

Type: Phone measurement (Complete)

Date of measurement: 08/15/2016

Measurement duration: 12 minutes 3 seconds

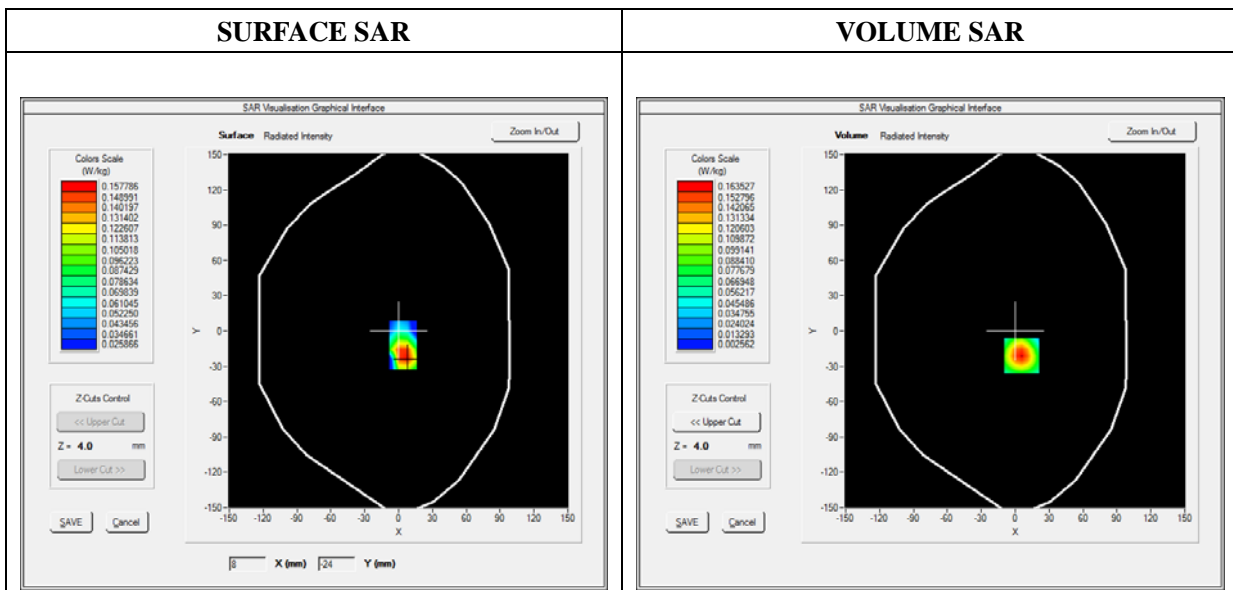
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	WiFi_802.11b
Channels	High
Signal	Duty Cycle 1:1

B. SAR Measurement Results

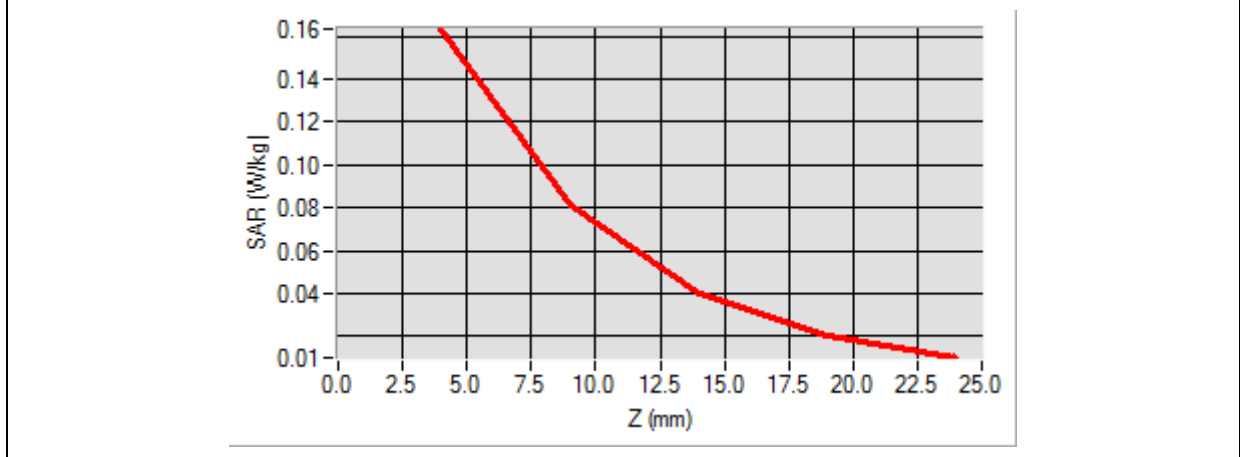
Frequency (MHz)	2462.000000
Relative Permittivity (real part)	52.010212
Conductivity (S/m)	1.910255
Power Variation (%)	2.492743
Ambient Temperature	21.1
Liquid Temperature	21.2

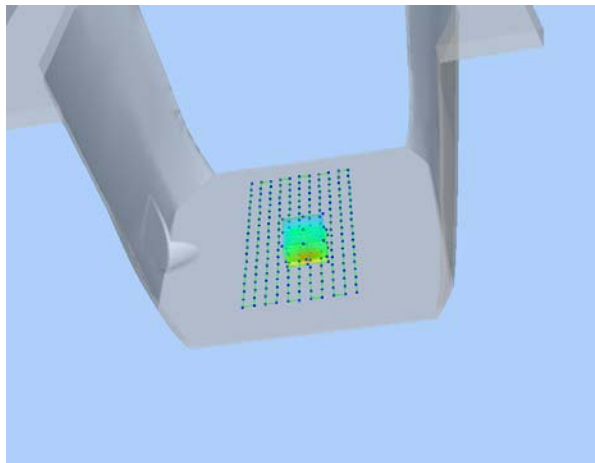
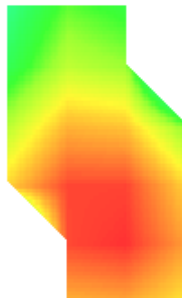


Maximum location: X=6.00, Y=-21.00

SAR 10g (W/Kg)	0.074031
SAR 1g (W/Kg)	0.149653

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.1635	0.0812	0.0396	0.0202



3D screen shot	Hot spot position
	

Annex C. EUT Photos

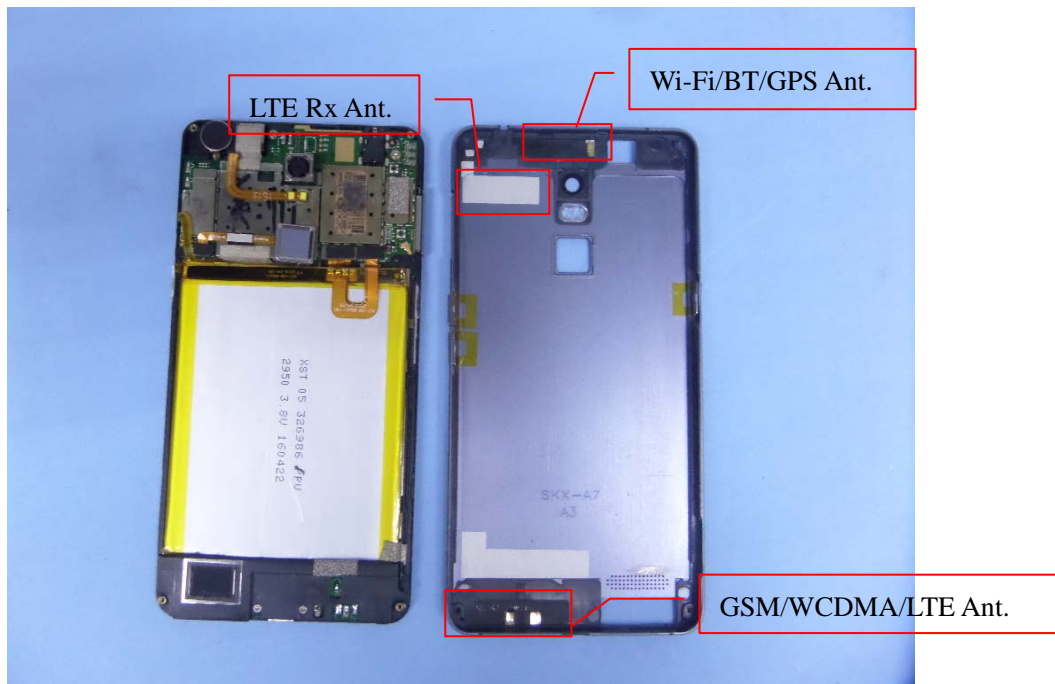
EUT View Front



EUT View Back



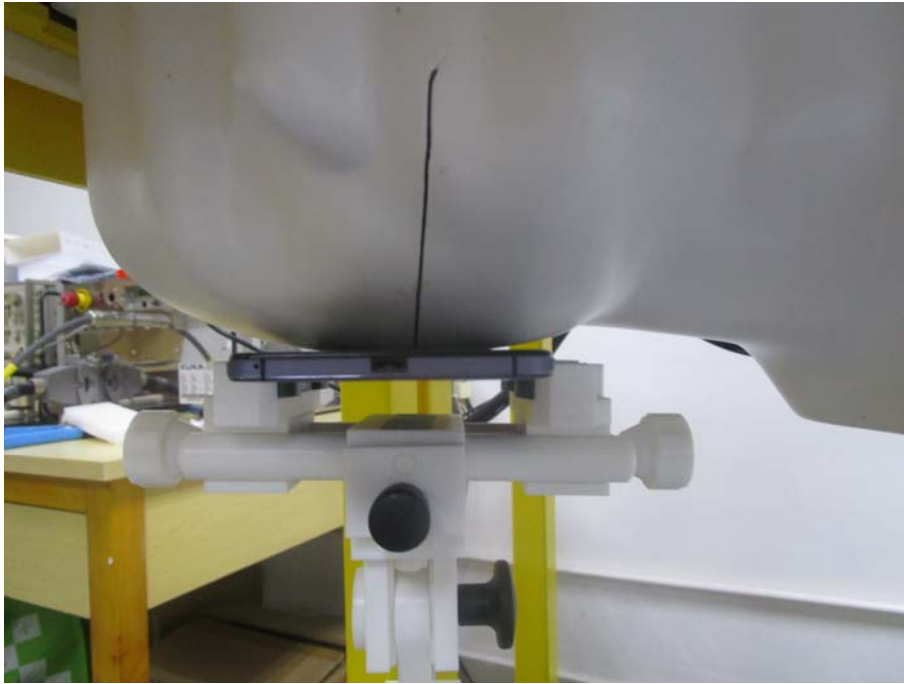
Antenna View



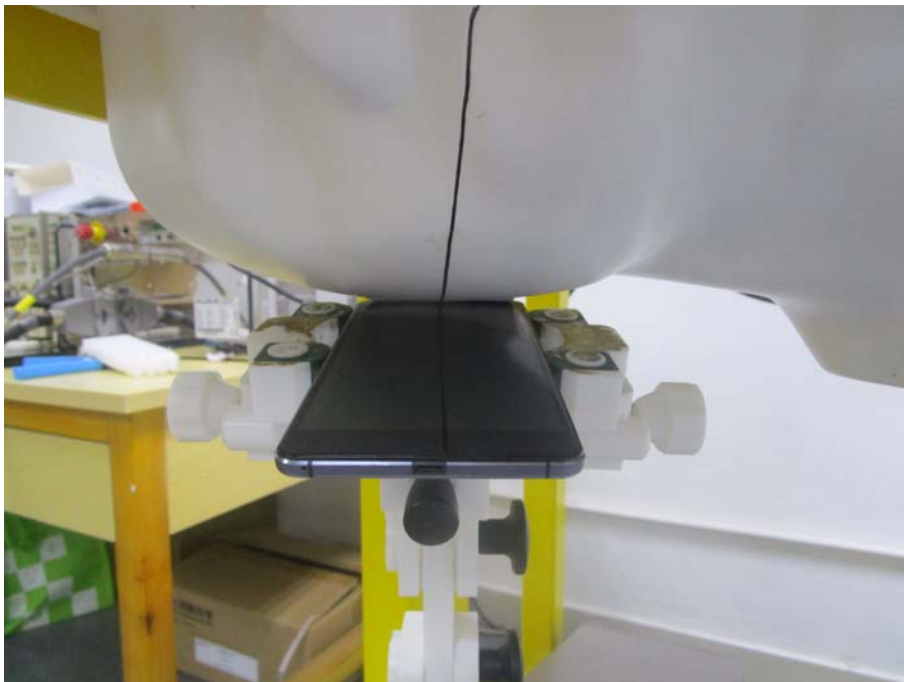
Annex D. Test Setup Photos

Head Exposure Conditions

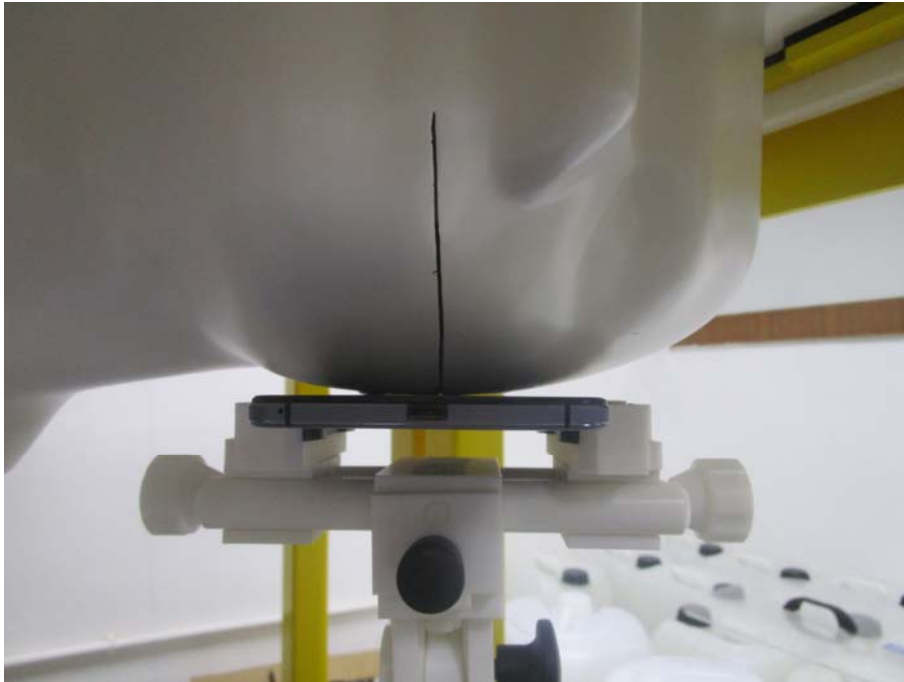
Cheek



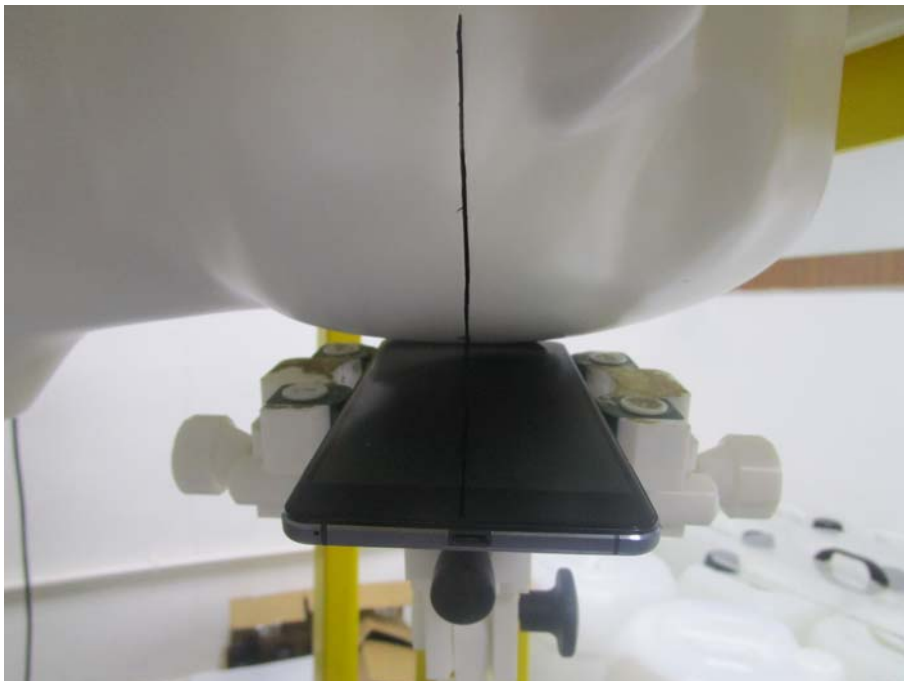
Tilt



Cheek

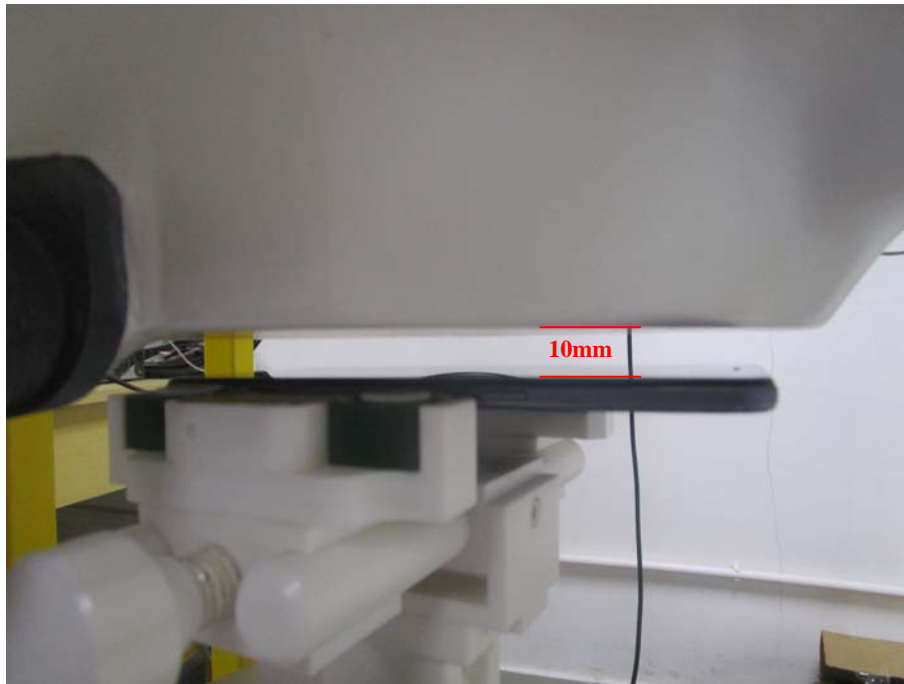


Tilt



Body-worn & Hotspot mode Exposure Conditions

Body Front

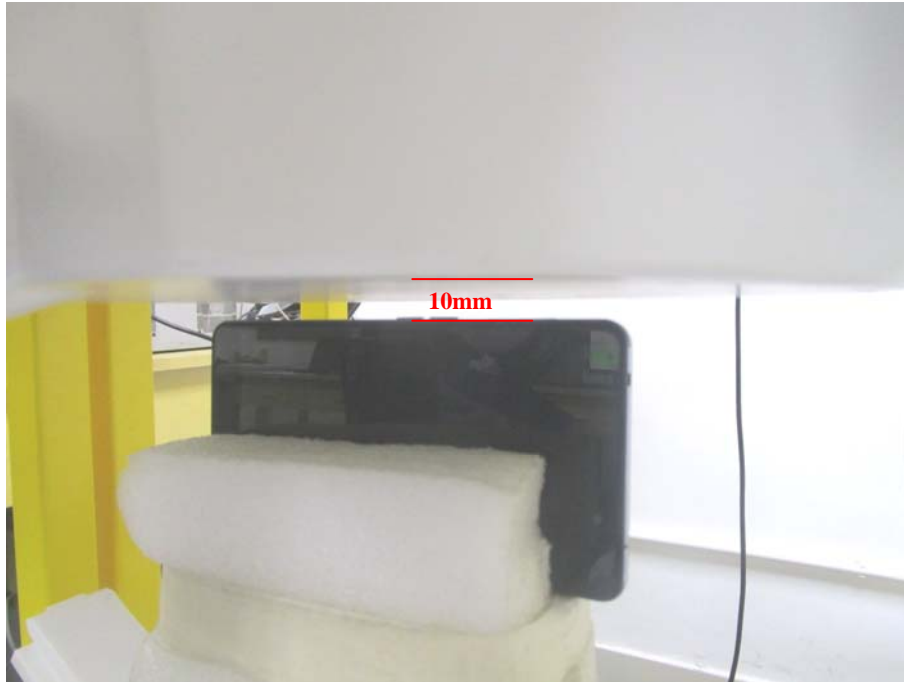


Body Back



Hotspot Exposure Conditions

Body Left



Body Top



Body Bottom



Annex E. Calibration Certificate

Please refer to the exhibit for the calibration certificate

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