FCC SAR
Measurement and Test Report

For

PCD, LLC.

1500 Tradeport Drive, Suite A. Orlando, FL.

FCC ID: 2ALJJ-PL4002

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:	PL4002
Report No.:	STR17038302H
Tested Date:	2017-04-10 to 2017-04-13
Issued Date:	2017-04-14
Tested By:	Lucy Wei / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager
Prepared By:	

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1. General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	PCD, LLC.
Address of applicant:	1500 Tradeport Drive, Suite A. Orlando, FL.
Manufacturer:	Guizhou Fortuneship Technology Co., Ltd.
Address of manufacturer:	(No. 4 Plant, High-tech Industrial Park, Xinpu Economic Development Zone) Jingkai Road, Xinpu Jingkai District, Xinpu New District, Zunyi City, Guizhou Province, P. R. China

General Description of EUT:	
Product Name:	4G Smart Phone
Brand Name:	PCD
Model No.:	PL4002
Adding Model(s):	/
Hardware version:	FS090-MB-V0.1
Software version:	CLARO_PCD_PL4002_CR_V03
Rated Voltage:	DC 3.8V Battery
Battery Capacity:	1700mAh
Device Category:	Portable Device
Note: The test data is gathered from a production sample provided by the manufacturer.	

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: 32.98dBm, GSM1900: 29.07dBm EDGE850: 26.39dBm, EDGE1900: 24.47dBm
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: 0.2dBi; GSM1900: 1.2dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 5
Uplink Frequency:	WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 5: 869~894MHz
Max RF Output Power:	WCDMA Band 5: 22.64dBm,
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 5: 0.2dBi
4G	
Support Networks:	FDD-LTE
Support Band:	7,17
Uplink Frequency:	FDD-LTE Band 7: Tx: 2500-2570MHz FDD-LTE Band 17: Tx: 704-716MHz
Downlink Frequency:	FDD-LTE Band 7: Rx: 2620-2690MHz, FDD-LTE Band 17: Tx: 734-746MHz
Max RF Output Power:	FDD-LTE Band 7: 23.92dBm, FDD-LTE Band 17: 23.99dBm
Type of Modulation:	QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	FDD-LTE Band 7: 2.3dBi, FDD-LTE Band 17: 0.3dBi,
WIFI	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 11b/g/n(HT20)
RF Output Power:	14.29dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps

Quantity of Channels:	11
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	1.7dBi
Bluetooth	
Bluetooth Version:	V4.0
Frequency Range:	2402-2480MHz
RF Output Power:	4.343dBm (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:	1.7dBi

1.2 Test Standards

The following report is prepared on behalf of the PCD, LLC. 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	**1.008**	**0.891**	**1.178**	1.6
WCDMA	0.698	0.789	0.789	1.6
FDD-LTE	0.232	0.731	0.731	1.6
WLAN 2.4G	0.194	0.094	0.094	1.6
Simultaneous Transmission	1.125	0.985	**1.272**	1.6

Remark:

The highest reported SAR values for head, body-worn accessory, wireless router(hotspot), and simultaneous transmission conditions are ***1.008W/kg, 0.891W/kg , 1.178W/kg, and 1.272W/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 techiques 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:

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

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

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

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

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

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

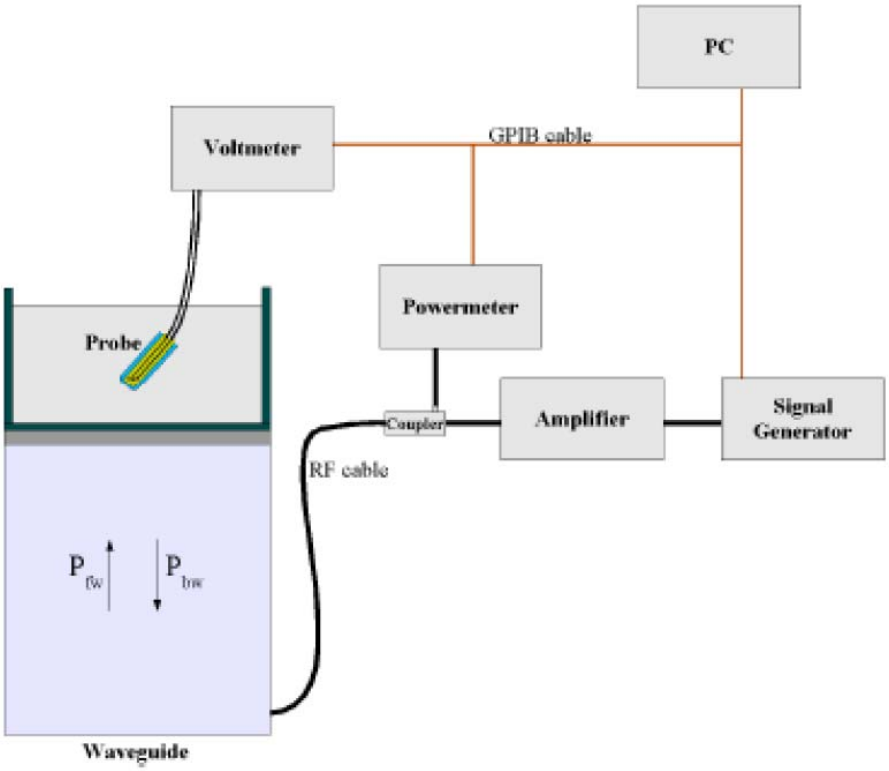
For the measurements the Specific Dosimetric E-Field Probe SSE5 SN 09/13 EP168 with following specifications is used

- 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 suface normal line:1ess than 30°

Probe calibration is realized, in compliance with EN 62209-1 and IEEE 1528 STD, with CALISAR, Antennessa 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 :

Pfw = Forward Power

Pbw = Backward Power

a and b =Waveguide dimensions

I = 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:

$$CF(N)=SAR(N)/Vlin(N) \quad (N=1,2,3)$$

The linearised output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

$$Vlin(N)=V(N)*(1+V(N)/DCP(N)) \quad (N=1,2,3)$$

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.

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

Where:

Δt = exposure time (30 seconds),

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

ΔT = temperature increase due to RF exposure.

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.

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

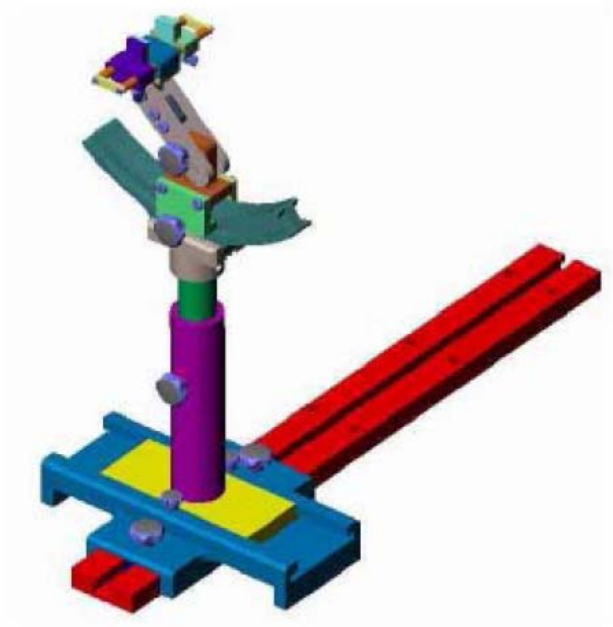
Where:
σ = simulated tissue conductivity,
ρ = Tissue density (1.25 g/cm3 for brain tissue)

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

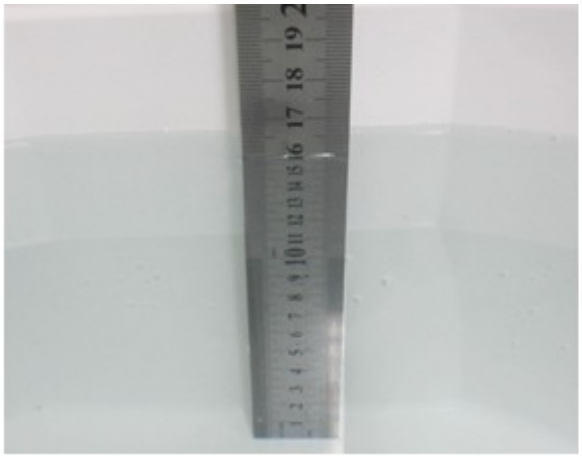
4.6 Test Equipment List

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	2017-03-16	2018-03-15
835MHz Dipole	SATIMO	SID835	SN 47/12 DIP 0G835-204	2017-03-16	2018-03-15
1900MHz Dipole	SATIMO	SID1900	SN 47/12 DIP 1G900-207	2017-03-16	2018-03-15
2450MHz Dipole	SATIMO	SID2450	SN 13/15 DIP 2G450-364	2017-03-16	2018-03-15
Dielectric Probe Kit	SATIMO	SCLMP	SN 47/12 OCPG49	2017-03-16	2018-03-15
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	104036	2016-06-04	2017-06-03
Universal Tester	Rohde & Schwarz	CMU500	148650	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 (%)	Sugar (%)	HEC (%)	Preventol (%)	DGBE (%)
Head						
750	41.1	1.4	57.0	0.2	0.3	0
835	40.3	1.4	57.9	0.2	0.2	0
1900	55.2	0.3	0	0	0	44.5
2450	55.0	0.1	0	0	0	44.9
Body						
750	50.0	0.8	48.8	0.2	0.2	0
835	50.8	0.9	48.1	0.1	0.1	0
1900	70.2	0.4	0	0	0	29.4
2450	68.6	0.1	0	0	0	31.3

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. (℃)	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	2017-04-10
835	21.2	0.87	0.90	-3.33	41.11	41.50	-0.94	±5	2017-04-10
1900	21.3	1.38	1.40	-1.43	38.56	40.00	-3.60	±5	2017-04-10
2450	21.3	1.74	1.80	-3.33	38.15	39.20	-2.68	±5	2017-04-10

Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (℃)	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	2017-04-10
835	21.2	0.95	0.97	-2.06	54.85	55.20	-0.63	±5	2017-04-10
1900	21.3	1.50	1.52	-1.32	52.42	53.30	-1.65	±5	2017-04-10
2450	21.3	1.91	1.95	-2.05	52.01	52.70	-1.31	±5	2017-04-10

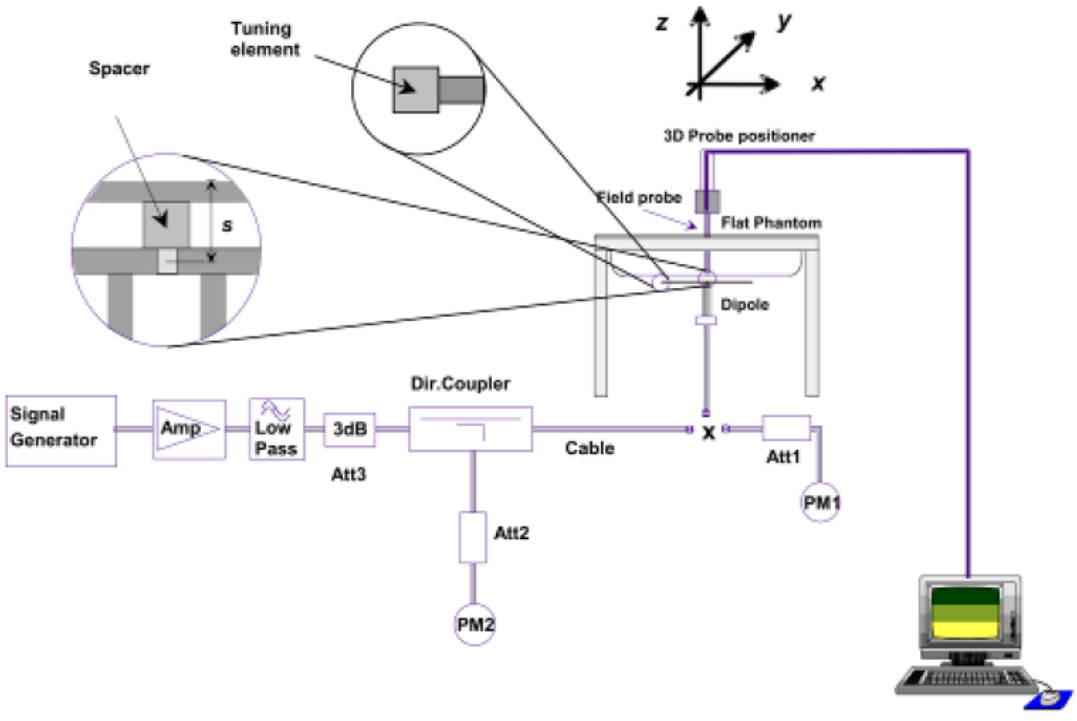
6. SAR Measurement Evaluation

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	9.65	2.41	9.64	-0.10
1900	39.59	9.91	39.64	0.13
2450	53.76	13.45	53.8	0.07
Body				
750	8.40	2.12	8.48	0.95
835	9.36	2.35	9.4	0.43
1900	39.01	9.78	39.12	0.28
2450	50.33	12.59	50.36	0.06

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.

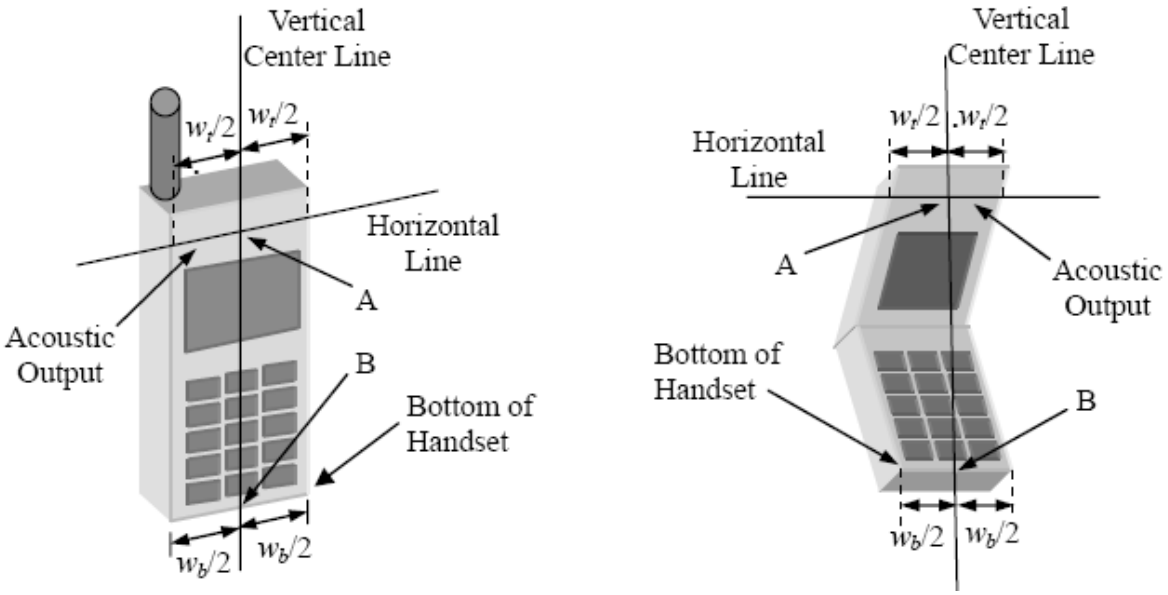


Illustration for Handset Vertical and Horizontal Reference Lines

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).

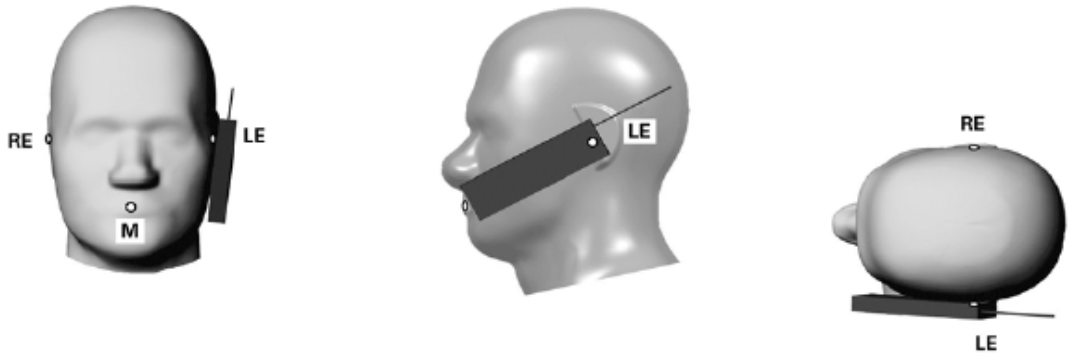


Illustration for Cheek Position

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).

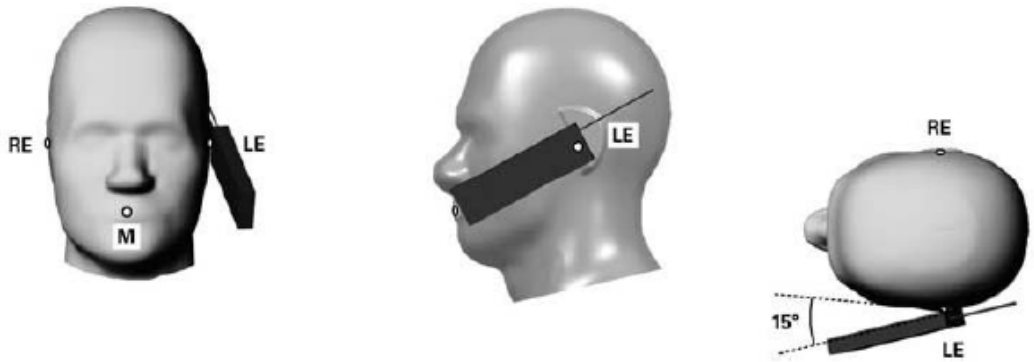


Illustration for Tilted Position

7.4 Body Worn Position

(a) To position the device parallel to the phantom surface with either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 10mm.

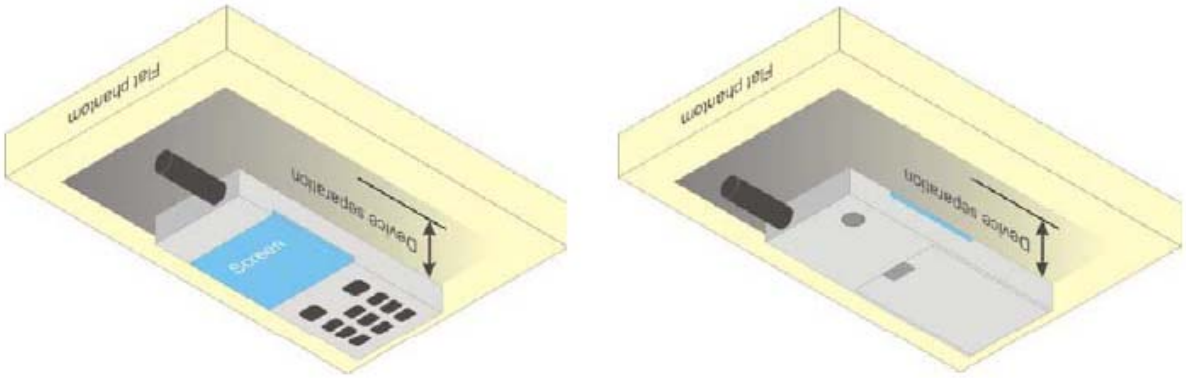
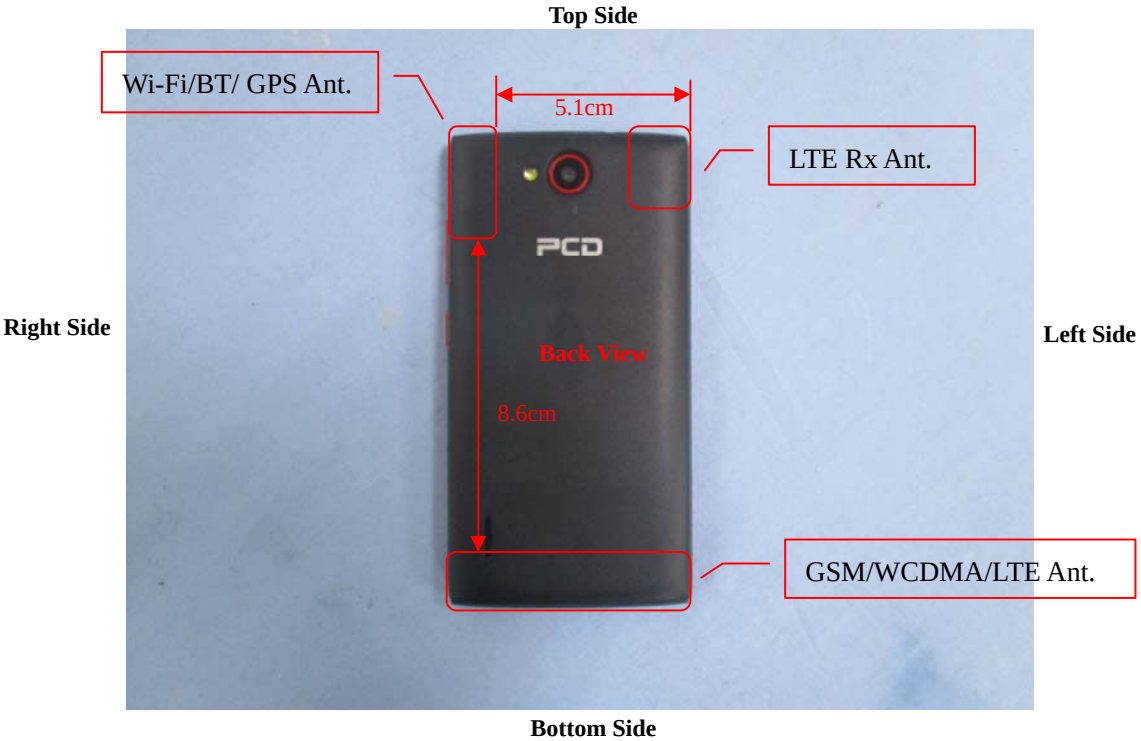


Illustration for Body Worn Position

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	Yes	Yes	No	Yes
WLAN	Yes	Yes	Yes	No	Yes	No

Body-worn SAR tests		
Antennas	**Front**	**Back**
WWAN	Yes	Yes
WLAN	Yes	Yes

Remark:

1. Referring to KDB 941225 D06, when the overall device length and width are >= 9cm*5cm, 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 D 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 form 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**			**Tune-up Power (dBm)**	**PCS1900**			**Tune-up Power (dBm)**
Channel	**128**	**190**	**251**		**512**	**661**	**810**	
Frequency (MHz)	**824.2**	**836.6**	**848.8**		**1850.2**	**1880**	**1909.8**	
GSM	32.98	32.98	32.94	33.0	28.68	28.89	29.07	29.5
GPRS (1 slot)	32.98	32.98	32.94	33.0	28.7	28.9	29.07	29.5
GPRS (2 slots)	31.04	31.07	31	31.5	26.55	26.67	26.79	27.0
GPRS (3 slots)	29.29	29.32	29.2	29.5	25.1	25.22	25.31	25.5
GPRS (4 slots)	27.45	27.4	27.32	27.5	23.12	23.3	23.39	23.5
EDGE (1 slot)	26.31	26.39	26.15	26.5	24.19	24.47	24.44	24.5
EDGE (2 slots)	25.12	25.26	25.94	26.0	24.02	24.16	24.01	24.5
EDGE (3 slots)	24.98	25.01	24.78	25.5	22.82	23.09	23.08	23.5
EDGE (4 slots)	22.49	22.68	22.37	23.0	20.45	20.64	20.46	21.0

GSM - Source-Based Time-Average Power (dBm)								
Band	**GSM850**			**Tune-up Power (dBm)**	**PCS1900**			**Tune-up Power (dBm)**
Channel	**128**	**190**	**251**		**512**	**661**	**810**	
Frequency (MHz)	**824.2**	**836.6**	**848.8**		**1850.2**	**1880**	**1909.8**	
GSM	23.98	23.98	23.94	24.0	19.68	19.89	20.07	20.5
GPRS (1 slot)	23.98	23.98	23.94	24.0	19.70	19.90	20.07	20.5
GPRS (2 slots)	25.04	25.07	25.00	25.5	20.55	20.67	20.79	21.0
GPRS (3 slots)	25.04	25.07	24.95	25.5	20.85	20.97	21.06	21.5
GPRS (4 slots)	24.45	24.40	24.32	24.5	20.12	20.30	20.39	20.5
EDGE (1 slot)	17.31	17.39	17.15	17.5	15.19	15.47	15.44	15.5
EDGE (2 slots)	19.12	19.26	19.94	20.0	18.02	18.16	18.01	18.5
EDGE (3 slots)	20.73	20.76	20.53	21.0	18.57	18.84	18.83	19.0
EDGE (4 slots)	19.49	19.68	19.37	20.0	17.45	17.64	17.46	18.0
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 and GPRS 3-slots should be evaluated, therefore the EUT was set in GSM and GPRS (3TX slots) 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 (3TX 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 V**							
Channel	**4132**	**4182**	**4233**	**Tune-up Power (dBm)**				
Frequency (MHz)	**826.4**	**836.6**	**846.6**					
RMC 12.2k	22.6	22.61	22.64	23.0				
HSDPA Subtest-1	21.87	21.66	21.38	22.0				
HSDPA Subtest-2	21.71	21.58	21.36	22.0				
HSDPA Subtest-3	21.62	21.41	21.33	22.0				
HSDPA Subtest-4	21.51	21.35	21.25	22.0				
HSUPA Subtest-1	21.94	21.07	21.24	22.0				
HSUPA Subtest-2	21.83	21.05	21.15	22.0				
HSUPA Subtest-3	21.77	21.02	21.02	22.0				
HSUPA Subtest-4	21.68	20.89	20.96	22.0				
HSUPA Subtest-5	21.55	20.78	20.81	22.0				

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 ≦1.2W/kg, HSDPA SAR evaluation can be excluded

FDD-LTE Band 7:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	23.10	24
		1	12	23.53	24
		1	24	23.16	24
		12	0	22.69	24
		12	6	22.43	24
		12	13	22.18	24
		25	0	22.41	24
	MCH	1	0	22.88	24
		1	12	22.87	24
		1	24	22.90	24
		12	0	21.78	24
		12	6	21.85	24
		12	13	21.81	24
		25	0	21.75	24
	HCH	1	0	23.61	24
		1	12	23.71	24
		1	24	23.77	24
		12	0	22.54	24
		12	6	22.51	24
		12	13	22.50	24
		25	0	22.45	24
16QAM	LCH	1	0	23.24	24
		1	12	23.22	24
		1	24	23.06	24
		12	0	21.99	24
		12	6	21.97	24
		12	13	21.93	24
		25	0	21.79	24
	MCH	1	0	22.16	24
		1	12	22.27	24
		1	24	22.16	24
		12	0	21.00	24
		12	6	21.06	24
		12	13	21.10	24
		25	0	20.91	24

	HCH	1	0	22.41	24
		1	12	22.50	24
		1	24	22.40	24
		12	0	21.56	24
		12	6	21.55	24
		12	13	21.51	24
		25	0	21.46	24

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	23.85	24
		1	24	23.71	24
		1	49	23.41	24
		25	0	22.85	24
		25	12	22.71	24
		25	25	22.58	24
		50	0	22.67	24
	MCH	1	0	22.85	24
		1	24	22.87	24
		1	49	22.93	24
		25	0	21.79	24
		25	12	21.80	24
		25	25	21.87	24
		50	0	21.82	24
	HCH	1	0	23.37	24
		1	24	23.55	24
		1	49	23.33	24
		25	0	22.42	24
		25	12	22.47	24
		25	25	22.51	24
		50	0	22.53	24
16QAM	LCH	1	0	23.05	24
		1	24	22.91	24
		1	49	22.62	24
		25	0	21.87	24
		25	12	21.73	24
		25	25	21.60	24
		50	0	21.70	24
	MCH	1	0	22.02	24
		1	24	22.04	24
		1	49	22.08	24

		25	0	20.92	24
		25	12	20.92	24
		25	25	20.90	24
		50	0	20.90	24
	HCH	1	0	22.58	24
		1	24	22.69	24
		1	49	22.70	24
		25	0	21.45	24
		25	12	21.52	24
		25	25	21.51	24
		50	0	21.57	24

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	24	24
		1	37	23.68	24
		1	74	23.20	24
		37	0	22.86	24
		37	18	22.68	24
		37	38	22.48	24
		75	0	22.66	24
	MCH	1	0	22.86	24
		1	37	22.85	24
		1	74	22.95	24
		37	0	21.91	24
		37	18	21.83	24
		37	38	21.86	24
		75	0	21.91	24
	HCH	1	0	23.46	24
		1	37	23.65	24
		1	74	23.49	24
		37	0	22.66	24
		37	18	22.75	24
		37	38	22.77	24
		75	0	22.65	24
16QAM	LCH	1	0	23.11	24
		1	37	22.82	24
		1	74	22.30	24
		37	0	21.81	24
		37	18	21.61	24
		37	38	21.42	24

		75	0	21.63	24
	MCH	1	0	21.95	24
		1	37	22.08	24
		1	74	22.07	24
		37	0	20.86	24
		37	18	20.83	24
		37	38	20.85	24
		75	0	20.94	24
	HCH	1	0	22.46	24
		1	37	22.76	24
		1	74	22.72	24
		37	0	21.47	24
		37	18	21.55	24
		37	38	21.69	24
		75	0	21.58	24

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	23.92	24
		1	49	23.91	24
		1	99	23.82	24
		50	0	22.88	24
		50	25	22.78	24
		50	50	22.71	24
		100	0	22.75	24
	MCH	1	0	23.05	24
		1	49	22.91	24
		1	99	23.19	24
		50	0	21.92	24
		50	25	21.88	24
		50	50	21.95	24
		100	0	21.85	24
	HCH	1	0	23.37	24
		1	49	23.60	24
		1	99	23.58	24
		50	0	22.29	24
		50	25	22.46	24
		50	50	22.55	24
		100	0	22.50	24
16QAM	LCH	1	0	23.26	24
		1	49	22.63	24

		1	99	22.19	24
		50	0	21.70	24
		50	25	21.41	24
		50	50	21.18	24
		100	0	21.44	24
	MCH	1	0	22.14	24
		1	49	22.03	24
		1	99	22.18	24
		50	0	20.90	24
		50	25	20.90	24
		50	50	21.08	24
		100	0	20.92	24
	HCH	1	0	22.44	24
		1	49	22.69	24
		1	99	22.89	24
		50	0	21.36	24
		50	25	21.54	24
		50	50	21.71	24
		100	0	21.53	24

FDD-LTE Band 17:

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	23.62	24
		1	12	23.76	24
		1	24	23.78	24
		12	0	22.84	24
		12	6	22.84	24
		12	13	22.88	24
		25	0	22.84	24
	MCH	1	0	23.80	24
		1	12	23.94	24
		1	24	23.92	24
		12	0	22.91	24
		12	6	22.94	24
		12	13	22.97	24
		25	0	22.90	24
	HCH	1	0	23.91	24
		1	12	23.88	24
		1	24	23.87	24

		12	0	22.97	24
		12	6	22.95	24
		12	13	22.96	24
		25	0	22.91	24
16QAM	LCH	1	0	22.90	24
		1	12	23.11	24
		1	24	23.09	24
		12	0	21.93	24
		12	6	21.96	24
		12	13	22.01	24
		25	0	21.91	24
	MCH	1	0	23.35	24
		1	12	23.43	24
		1	24	23.28	24
		12	0	22.12	24
		12	6	22.10	24
		12	13	22.09	24
		25	0	21.92	24
	HCH	1	0	23.00	24
		1	12	23.07	24
		1	24	22.98	24
		12	0	21.99	24
		12	6	22.00	24
		12	13	22.03	24
		25	0	21.96	24

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	**Tune-up Power (dBm)**
		Size	Offset		
QPSK	LCH	1	0	23.71	24
		1	24	23.82	24
		1	49	23.90	24
		25	0	22.86	24
		25	12	22.95	24
		25	25	22.96	24
		50	0	22.96	24
	MCH	1	0	23.73	24
		1	24	23.85	24
		1	49	23.84	24
		25	0	22.90	24
		25	12	22.94	24
		25	25	22.94	24

		50	0	22.94	24
	HCH	1	0	23.76	24
		1	24	23.99	24
		1	49	23.84	24
		25	0	22.91	24
		25	12	22.97	24
		25	25	22.92	24
		50	0	22.94	24
16QAM	LCH	1	0	23.10	24
		1	24	23.24	24
		1	49	23.22	24
		25	0	21.92	24
		25	12	21.93	24
		25	25	21.94	24
		50	0	21.97	24
	MCH	1	0	23.12	24
		1	24	23.22	24
		1	49	23.19	24
		25	0	21.92	24
		25	12	21.95	24
		25	25	21.95	24
		50	0	21.98	24
	HCH	1	0	23.32	24
		1	24	23.34	24
		1	49	23.36	24
		25	0	21.96	24
		25	12	21.97	24
		25	25	21.95	24
		50	0	21.99	24

Remark:

1. Per KDB941225 D05 v02r05, Start with the largest channel bandwidth then 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. 6 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.
2. Per KDB941225 D05 v02r05, The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
3. 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 5.2.1 and 5.2.2 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.

4. Per KDB941225 D05 v02r05, For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in 5.2.1, 5.2.2, and 5.2.3 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 > ½ 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)**	**Tune-up Power (dBm)**
802.11b	1Mbps	CH 01	2412	11.98	14.5
		CH 06	2437	10.61	14.5
		CH 11	2462	14.29	14.5
802.11g	54Mbps	CH 01	2412	8.94	11.5
		CH 06	2437	8.72	11.5
		CH 11	2462	11.35	11.5
802.11n (20MHz)	MCS7	CH 01	2412	10.04	11.5
		CH 06	2437	8.55	11.5
		CH 11	2462	11.39	11.5

Remark:

1. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

2. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements ,when the reported SAR of the highest measured maximum output power channel (see 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

3 .For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2W/kg.

Bluetooth - Maximum Average Power			
Test Mode	**Data Rate**	**Average Power(dBm)**	**Tune-up Power (dBm)**
GFSK	1Mbps	3.322	4.5
Pi/4 QDPSK	2Mbps	4.191	4.5
8DPSK	3Mbps	4.343	4.5

Bluetooth - Maximum Average Power					
Test Mode	**Data Rate**	**Channel**	**Frequency (MHz)**	**Average Power (dBm)**	**Tune-up Power (dBm)**
BLE	1Mbps	CH 00	2402	-4.789	1.0
		CH 19	2440	-1.298	1.0
		CH 39	2480	-5.777	1.0

Remark:

Bluetooth maximum output power is 4.343dBm, and Maximum Tune-Up output power is 4.5dBm. 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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 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
4.5	2.82	5	2.441	0.88	3

The exclusion thresholds is 0.88< 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	190	836.6	32.98	33.0	1.0046	0.5299	0.5323
2.	GSM	Right Tilted	190	836.6	32.98	33.0	1.0046	0.3221	0.3236
3.	GSM	Left Cheek	190	836.6	32.98	33.0	1.0046	0.4830	0.4852
4.	GSM	Left Tilted	190	836.6	32.98	33.0	1.0046	0.2875	0.2888

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	29.07	29.5	1.1041	0.5414	0.5977
6.	GSM	Right Tilted	810	1909.8	29.07	29.5	1.1041	0.3153	0.3481
7.	GSM	Left Cheek	810	1909.8	29.07	29.5	1.1041	0.3308	0.3652
8.	GSM	Left Tilted	810	1909.8	29.07	29.5	1.1041	0.2108	0.2327

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_3TX	Right Cheek	190	836.6	29.32	29.5	1.0423	0.8423	0.8779
10.	GPRS_3TX	Right Cheek	128	824.2	29.29	29.5	1.0495	0.7697	0.8078
11.	GPRS_3TX	Right Cheek	251	848.8	29.2	29.5	1.0715	0.9406	1.0079
12.	GPRS_3TX	Right Tilted	190	836.6	29.32	29.5	1.0423	0.5378	0.5606
13.	GPRS_3TX	Left Cheek	190	836.6	29.32	29.5	1.0423	0.6758	0.7044
14.	GPRS_3TX	Left Tilted	190	836.6	29.32	29.5	1.0423	0.4624	0.4820

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					
15.	GPRS_3TX	Right Cheek	810	1909.8	25.31	25.5	1.0447	0.2140	0.2236
16.	GPRS_3TX	Right Tilted	810	1909.8	25.31	25.5	1.0447	0.1248	0.1304
17.	GPRS_3TX	Left Cheek	810	1909.8	25.31	25.5	1.0447	0.1535	0.1604
18.	GPRS_3TX	Left Tilted	810	1909.8	25.31	25.5	1.0447	0.1076	0.1124

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					
19.	RMC	Right Cheek	4233	846.6	22.64	23.0	1.0864	0.6424	0.6979
20.	RMC	Right Tilted	4233	846.6	22.64	23.0	1.0864	0.3112	0.3381
21.	RMC	Left Cheek	4233	846.6	22.64	23.0	1.0864	0.5377	0.5842
22.	RMC	Left Tilted	4233	846.6	22.64	23.0	1.0864	0.2433	0.2643

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					
23.	RMC QPSK 20MHz 1RB	Right Cheek	2510.0	23.92	24.0	1.0186	0.1802	0.1836
24.	RMC QPSK 20MHz 1RB	Right Tilted	2510.0	23.92	24.0	1.0186	0.0627	0.0639
25.	RMC QPSK 20MHz 1RB	Left Cheek	2510.0	23.92	24.0	1.0186	0.2281	0.2323
26.	RMC QPSK 20MHz 1RB	Left Tilted	2510.0	23.92	24.0	1.0186	0.1663	0.1694
27.	RMC QPSK 20MHz 50%RB	Right Cheek	2510.0	22.88	23.0	1.0280	0.0827	0.0850
28.	RMC QPSK 20MHz 50%RB	Right Tilted	2510.0	22.88	23.0	1.0280	0.0425	0.0437
29.	RMC QPSK 20MHz 50%RB	Left Cheek	2510.0	22.88	23.0	1.0280	0.1037	0.1066
30.	RMC QPSK 20MHz 50%RB	Left Tilted	2510.0	22.88	23.0	1.0280	0.0622	0.0639

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					
31.	RMC,QPSK 10MHz 1RB	Right Cheek	711.0	23.99	24.0	1.0023	0.2142	0.2147
32.	RMC,QPSK 10MHz 1RB	Right Tilted	711.0	23.99	24.0	1.0023	0.1154	0.1157
33.	RMC,QPSK 10MHz 1RB	Left Cheek	711.0	23.99	24.0	1.0023	0.2317	0.2322
34.	RMC,QPSK 10MHz 1RB	Left Tilted	711.0	23.99	24.0	1.0023	0.1273	0.1276
35.	RMC,QPSK 10MHz 50%RB	Right Cheek	711.0	22.97	23.0	1.0069	0.1536	0.1547
36.	RMC,QPSK 10MHz 50%RB	Right Tilted	711.0	22.97	23.0	1.0069	0.0827	0.0833
37.	RMC,QPSK 10MHz 50%RB	Left Cheek	711.0	22.97	23.0	1.0069	0.1932	0.1945
38.	RMC,QPSK 10MHz 50%RB	Left Tilted	711.0	22.97	23.0	1.0069	0.1083	0.1091

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					
39.	802.11b	Right Cheek	11	2462	14.29	14.5	1.0495	0.0872	0.0915
40.	802.11b	Right Tilted	11	2462	14.29	14.5	1.0495	0.0654	0.0686
41.	802.11b	Left Cheek	11	2462	14.29	14.5	1.0495	0.1845	0.1936
42.	802.11b	Left Tilted	11	2462	14.29	14.5	1.0495	0.1063	0.1116

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					
43.	GSM	Back	190	836.6	32.98	33.0	1.0046	0.8410	0.8449
44.	GSM	Back	128	824.2	32.98	33.0	1.0046	0.8445	0.8484
45.	GSM	Back	251	848.8	32.94	33.0	1.0139	0.8787	0.8909
46.	GSM	Front	190	836.6	32.98	33.0	1.0046	0.6337	0.6366

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					
47.	GSM	Back	810	1909.8	29.07	29.5	1.1041	0.5940	0.6558
48.	GSM	Front	810	1909.8	29.07	29.5	1.1041	0.6175	0.6818

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					
61	RMC 12.2k	Back Side	4233	846.6	22.64	23.0	1.0864	0.7265	0.7893
62	RMC 12.2k	Front Side	4233	846.6	22.64	23.0	1.0864	0.5820	0.6323

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					
66	RMC QPSK 20MHz 1RB	Back Side	2510.0	23.92	24.0	1.0186	0.7177	0.7310
67	RMC QPSK 20MHz 1RB	Front Side	2510.0	23.92	24.0	1.0186	0.4522	0.4606
71	RMC QPSK 20MHz 50%RB	Back Side	2510.0	22.88	23.0	1.0280	0.5627	0.5785
72	RMC QPSK 20MHz 50%RB	Front Side	2510.0	22.88	23.0	1.0280	0.4156	0.4272

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					
76	RMC,QPSK 10MHz 1RB	Back Side	711.0	23.99	24.0	1.0023	0.4386	0.4396
77	RMC,QPSK 10MHz 1RB	Front Side	711.0	23.99	24.0	1.0023	0.2937	0.2944
81	RMC,QPSK 10MHz 50%RB	Back Side	711.0	22.97	23.0	1.0069	0.3022	0.3043
82	RMC,QPSK 10MHz 50%RB	Front Side	711.0	22.97	23.0	1.0069	0.1687	0.1699

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					
86	802.11b	Back Side	11	2462	14.29	14.5	1.0495	0.0899	0.0944
87	802.11b	Front Side	11	2462	14.29	14.5	1.0495	0.0414	0.0435

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					
49.	GPRS_3TX	Back Side	190	836.6	29.32	29.5	1.0423	1.1299	1.1777
50.	GPRS_3TX	Back Side	128	824.2	29.29	29.5	1.0495	1.0506	1.1026
51.	GPRS_3TX	Back Side	251	848.8	29.2	29.5	1.0715	1.0634	1.1395
52.	GPRS_3TX	Front Side	190	836.6	29.32	29.5	1.0423	0.7582	0.7903
53.	GPRS_3TX	Bottom side	190	836.6	29.32	29.5	1.0423	0.2053	0.2140
54.	GPRS_3TX	Right side	190	836.6	29.32	29.5	1.0423	0.5633	0.5871
55.	GPRS_3TX	Left side	190	836.6	29.32	29.5	1.0423	0.4117	0.4291

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					
56.	GPRS_3TX	Back Side	810	1909.8	25.31	25.5	1.0447	0.2007	0.2097
57.	GPRS_3TX	Front Side	810	1909.8	25.31	25.5	1.0447	0.2050	0.2142
58.	GPRS_3TX	Bottom side	810	1909.8	25.31	25.5	1.0447	0.0823	0.0860
59.	GPRS_3TX	Right side	810	1909.8	25.31	25.5	1.0447	0.1726	0.1803
60.	GPRS_3TX	Left side	810	1909.8	25.31	25.5	1.0447	0.1576	0.1646

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					
61.	RMC 12.2k	Back Side	4233	846.6	22.64	23.0	1.0864	0.7265	0.7893
62.	RMC 12.2k	Front Side	4233	846.6	22.64	23.0	1.0864	0.5820	0.6323
63.	RMC 12.2k	Bottom side	4233	846.6	22.64	23.0	1.0864	0.1214	0.1319
64.	RMC 12.2k	Right side	4233	846.6	22.64	23.0	1.0864	0.5533	0.6011
65.	RMC 12.2k	Left side	4233	846.6	22.64	23.0	1.0864	0.4199	0.4562

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					
66.	RMC QPSK 20MHz 1RB	Back Side	2510.0	23.92	24.0	1.0186	0.7177	0.7310

67.	RMC QPSK 20MHz 1RB	Front Side	2510.0	23.92	24.0	1.0186	0.4522	0.4606
68.	RMC QPSK 20MHz 1RB	Bottom side	2510.0	23.92	24.0	1.0186	0.1978	0.2015
69.	RMC QPSK 20MHz 1RB	Right side	2510.0	23.92	24.0	1.0186	0.3288	0.3349
70.	RMC QPSK 20MHz 1RB	Left side	2510.0	23.92	24.0	1.0186	0.3622	0.3689
71.	RMC QPSK 20MHz 50%RB	Back Side	2510.0	22.88	23.0	1.0280	0.5627	0.5785
72.	RMC QPSK 20MHz 50%RB	Front Side	2510.0	22.88	23.0	1.0280	0.4156	0.4272
73.	RMC QPSK 20MHz 50%RB	Bottom side	2510.0	22.88	23.0	1.0280	0.1738	0.1787
74.	RMC QPSK 20MHz 50%RB	Right side	2510.0	22.88	23.0	1.0280	0.1526	0.1569
75.	RMC QPSK 20MHz 50%RB	Left side	2510.0	22.88	23.0	1.0280	0.2181	0.2242

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**					
76.	RMC,QPSK 10MHz 1RB	Back Side	711.0	23.99	24.0	1.0023	0.4386	0.4396
77.	RMC,QPSK 10MHz 1RB	Front Side	711.0	23.99	24.0	1.0023	0.2937	0.2944
78.	RMC,QPSK 10MHz 1RB	Bottom side	711.0	23.99	24.0	1.0023	0.0715	0.0717
79.	RMC,QPSK 10MHz 1RB	Right side	711.0	23.99	24.0	1.0023	0.1823	0.1827
80.	RMC,QPSK 10MHz 1RB	Left side	711.0	23.99	24.0	1.0023	0.1638	0.1642
81.	RMC,QPSK 10MHz 50%RB	Back Side	711.0	22.97	23.0	1.0069	0.3022	0.3043
82.	RMC,QPSK 10MHz 50%RB	Front Side	711.0	22.97	23.0	1.0069	0.1687	0.1699
83.	RMC,QPSK 10MHz 50%RB	Bottom side	711.0	22.97	23.0	1.0069	0.0937	0.0943
84.	RMC,QPSK 10MHz 1RB	Right side	711.0	22.97	23.0	1.0069	0.1272	0.1281
85.	RMC,QPSK 10MHz 50%RB	Left side	711.0	22.97	23.0	1.0069	0.1234	0.1243

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**					
86.	802.11b	Back Side	11	2462	14.29	14.5	1.0495	0.0899	0.0944
87.	802.11b	Front Side	11	2462	14.29	14.5	1.0495	0.0414	0.0435
88.	802.11b	Right side	11	2462	14.29	14.5	1.0495	0.0575	0.0603
89.	802.11b	Top Side	11	2462	14.29	14.5	1.0495	0.0413	0.0433

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:

1. GSM and WCDMA share the same antenna, and cannot transmit simultaneously.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. 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:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

For simultaneous transmission analysis, Bluetooth 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
4.5	2.82	5/10	2.441	7.5	0.1175	0.0587

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

Head SAR

WWAN and WLAN

	WWAN		WLAN	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Right Cheek	GSM850	0.5323	0.0915	0.6238
Right Tilted	GSM850	0.3236	0.0686	0.3922
Left Cheek	GSM850	0.4852	0.1936	0.6788
Left Tilted	GSM850	0.2888	0.1116	0.4004
Right Cheek	GSM1900	0.5977	0.0915	0.6892
Right Tilted	GSM1900	0.3481	0.0686	0.4167
Left Cheek	GSM1900	0.3652	0.1936	0.5588
Left Tilted	GSM1900	0.2327	0.1116	0.3443
Right Cheek	GPRS850	1.0079	0.0915	**1.0994**
Right Tilted	GPRS850	0.5606	0.0686	0.6292
Left Cheek	GPRS850	0.7044	0.1936	0.898
Left Tilted	GPRS850	0.4820	0.1116	0.5936
Right Cheek	GPRS1900	0.2236	0.0915	0.3151
Right Tilted	GPRS1900	0.1304	0.0686	0.199
Left Cheek	GPRS1900	0.1604	0.1936	0.354
Left Tilted	GPRS1900	0.1124	0.1116	0.224
Right Cheek	WCDMA Band 5	0.6979	0.0915	0.7894
Right Tilted	WCDMA Band 5	0.3381	0.0686	0.4067
Left Cheek	WCDMA Band 5	0.5842	0.1936	0.7778
Left Tilted	WCDMA Band 5	0.2643	0.1116	0.3759
Right Cheek	LTE Band 7	0.1836	0.0915	0.2751
Right Tilted	LTE Band 7	0.0639	0.0686	0.1325
Left Cheek	LTE Band 7	0.2323	0.1936	0.4259
Left Tilted	LTE Band 7	0.1694	0.1116	0.281
Right Cheek	LTE Band 17	0.2147	0.0915	0.3062
Right Tilted	LTE Band 17	0.1157	0.0686	0.1843
Left Cheek	LTE Band 17	0.2322	0.1936	0.4258
Left Tilted	LTE Band 17	0.1276	0.1116	0.2392

WWAN and Bluetooth

	WWAN		Bluetooth	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Right Cheek	GSM850	0.5323	0.1175	0.6498
Right Tilted	GSM850	0.3236	0.1175	0.4411
Left Cheek	GSM850	0.4852	0.1175	0.6027
Left Tilted	GSM850	0.2888	0.1175	0.4063
Right Cheek	GSM1900	0.5977	0.1175	0.7152
Right Tilted	GSM1900	0.3481	0.1175	0.4656
Left Cheek	GSM1900	0.3652	0.1175	0.4827
Left Tilted	GSM1900	0.2327	0.1175	0.3502
Right Cheek	GPRS850	1.0079	0.1175	**1.1254**
Right Tilted	GPRS850	0.5606	0.1175	0.6781
Left Cheek	GPRS850	0.7044	0.1175	0.8219
Left Tilted	GPRS850	0.4820	0.1175	0.5995
Right Cheek	GPRS1900	0.2236	0.1175	0.3411
Right Tilted	GPRS1900	0.1304	0.1175	0.2479
Left Cheek	GPRS1900	0.1604	0.1175	0.2779
Left Tilted	GPRS1900	0.1124	0.1175	0.2299
Right Cheek	WCDMA Band 5	0.6979	0.1175	0.8154
Right Tilted	WCDMA Band 5	0.3381	0.1175	0.4556
Left Cheek	WCDMA Band 5	0.5842	0.1175	0.7017
Left Tilted	WCDMA Band 5	0.2643	0.1175	0.3818
Left Tilted	LTE Band 4	0.1836	0.1175	0.3011
Right Cheek	LTE Band 7	0.0639	0.1175	0.1814
Right Tilted	LTE Band 7	0.2323	0.1175	0.3498
Left Cheek	LTE Band 7	0.1694	0.1175	0.2869
Left Tilted	LTE Band 7	0.2147	0.1175	0.3322
Right Cheek	LTE Band 17	0.1157	0.1175	0.2332
Right Tilted	LTE Band 17	0.2322	0.1175	0.3497
Left Cheek	LTE Band 17	0.1276	0.1175	0.2451
Left Tilted	LTE Band 17	0.5323	0.1175	0.6498

Body-worn SAR

WWAN and WLAN

	WWAN		WLAN	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Back	GSM850	0.8909	0.0944	**0.9853**
Front	GSM850	0.6366	0.0435	0.6801
Back	GSM1900	0.6558	0.0944	0.7502
Front	GSM1900	0.6818	0.0435	0.7253
Back	WCDMA Band 5	0.7893	0.0944	0.8837
Front	WCDMA Band 5	0.6323	0.0435	0.6758
Back	LTE Band 7	0.7310	0.0944	0.8254
Front	LTE Band 7	0.4606	0.0435	0.5041
Back	LTE Band 17	0.4396	0.0944	0.534
Front	LTE Band 17	0.2944	0.0435	0.3379

WWAN and Bluetooth

	WWAN		Bluetooth	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Back	GSM850	0.8909	0.0587	**0.9496**
Front	GSM850	0.6366	0.0587	0.6953
Back	GSM1900	0.6558	0.0587	0.7145
Front	GSM1900	0.6818	0.0587	0.7405
Back	WCDMA Band 5	0.7893	0.0587	0.848
Front	WCDMA Band 5	0.6323	0.0587	0.691
Back	LTE Band 7	0.7310	0.0587	0.7897
Front	LTE Band 7	0.4606	0.0587	0.5193
Back	LTE Band 17	0.4396	0.0587	0.4983
Front	LTE Band 17	0.2944	0.0587	0.3531

Hotspot SAR

WWAN and WLAN

	WWAN		WLAN	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Back	GSM850	1.1777	0.0944	**1.2721**
Front	GSM850	0.7903	0.0435	0.8338
Top side	GSM850	--	0.0433	0.0433
Bottom side	GSM850	0.2140	--	0.2140
Right side	GSM850	0.5871	0.0603	0.6474
Left side	GSM850	0.4291	--	0.4291
Back	GSM1900	0.2097	0.0944	0.3041
Front	GSM1900	0.2142	0.0435	0.2577
Top side	GSM1900	--	0.0433	0.0433
Bottom side	GSM1900	0.0860	--	0.0860
Right side	GSM1900	0.1803	0.0603	0.2406
Left side	GSM1900	0.1646	--	0.1646
Back	WCDMA Band 5	0.7893	0.0944	0.8837
Front	WCDMA Band 5	0.6323	0.0435	0.6758
Top side	WCDMA Band 5	--	0.0433	0.0433
Bottom side	WCDMA Band 5	0.1319	--	0.1319
Right side	WCDMA Band 5	0.6011	0.0603	0.6614
Left side	WCDMA Band 5	0.4562	--	0.4562
Back	LTE Band 7	0.7310	0.0944	0.8254
Front	LTE Band 7	0.4606	0.0435	0.5041
Top side	LTE Band 7	--	0.0433	0.0433
Bottom side	LTE Band 7	0.2015	--	0.2015
Right side	LTE Band 7	0.3349	0.0603	0.3952
Left side	LTE Band 7	0.3689	--	0.3689
Back	LTE Band 17	0.4396	0.0944	0.534
Front	LTE Band 17	0.2944	0.0435	0.3379
Top side	LTE Band 17	--	0.0433	0.0433
Bottom side	LTE Band 17	0.0717	--	0.0717
Right side	LTE Band 17	0.1827	0.0603	0.243
Left side	LTE Band 17	0.1642	--	0.1642

WWAN and Bluetooth

	WWAN		Bluetooth	Summed SAR (W/kg)
Position	**Band**	**Scaled SAR (W/kg)**	**Scaled SAR (W/kg)**	
Back	GSM850	1.1777	0.0587	**1.2364**

Front	GSM850	0.7903	0.0587	0.849
Top side	GSM850	--	0.0587	0.0587
Bottom side	GSM850	0.2140	--	0.2140
Right side	GSM850	0.5871	0.0587	0.6458
Left side	GSM850	0.4291	--	0.4291
Back	GSM1900	0.2097	0.0587	0.2684
Front	GSM1900	0.2142	0.0587	0.2729
Top side	GSM1900	--	0.0587	0.0587
Bottom side	GSM1900	0.0860	--	0.0860
Right side	GSM1900	0.1803	0.0587	0.239
Left side	GSM1900	0.1646	--	0.1646
Back	WCDMA Band 5	0.7893	0.0587	0.848
Front	WCDMA Band 5	0.6323	0.0587	0.691
Top side	WCDMA Band 5	--	0.0587	0.0587
Bottom side	WCDMA Band 5	0.1319	--	0.1319
Right side	WCDMA Band 5	0.6011	0.0587	0.6598
Left side	WCDMA Band 5	0.4562	--	0.4562
Back	LTE Band 7	0.7310	0.0587	0.7897
Front	LTE Band 7	0.4606	0.0587	0.5193
Top side	LTE Band 7	--	0.0587	0.0587
Bottom side	LTE Band 7	0.2015	--	0.2015
Right side	LTE Band 7	0.3349	0.0587	0.3936
Left side	LTE Band 7	0.3689	--	0.3689
Back	LTE Band 17	0.4396	0.0587	0.4983
Front	LTE Band 17	0.2944	0.0587	0.3531
Top side	LTE Band 17	--	0.0587	0.0587
Bottom side	LTE Band 17	0.0717	--	0.0717
Right side	LTE Band 17	0.1827	0.0587	0.2414
Left side	LTE Band 17	0.1642	--	0.1642

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	√3	(1_Cp)^1/2	(1_Cp)^1/2	1.02	1.02	∝
Hemispherical Isotropy	E.2.2	4.0	R	√3	(Cp)^1/2	(Cp)^1/2	1.63	1.63	∝
Boundary effect	E.2.3	1.0	R	√3	1	1	0.58	0.58	∝
Linearity	E.2.4	5.0	R	√3	1	1	2.89	2.89	∝
System detection limits	E.2.5	1.0	R	√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	√3	1	1	1.73	1.73	∝
Integration Time	E.2.8	2.0	R	√3	1	1	1.15	1.15	∝
RF ambient Conditions – Noise	E.6.1	3.0	R	√3	1	1	1.73	1.73	∝
RF ambient Conditions - Reflections	E.6.1	3.0	R	√3	1	1	1.73	1.73	∝
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	√3	1	1	1.15	1.15	∝
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	√3	1	1	0.03	0.03	∝
Extrapolation, interpolation and integration Algoritms for Max. SAR Evaluation	E.5	5.0	R	√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	√3	1	1	6.94	6.94	∝
SAR scaling	E6.5	0.0	R	√3	1	1	0.0	0.0	∝
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	√3	1	1	0.03	0.03	∝
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	1.9	R	√3	1	0.84	1.10	0.90	∝
Liquid conductivity - deviation	E.3.2	5.00	R	√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	√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	√3	(1_Cp)^1/2	(1_Cp)^1/2	1.02	1.02	∝
Hemispherical Isotropy	E.2.2	4.0	R	√3	(Cp)^1/2	(Cp)^1/2	1.63	1.63	∝
Boundary effect	E.2.3	1.0	R	√3	1	1	0.58	0.58	∝
Linearity	E.2.4	5.0	R	√3	1	1	2.89	2.89	∝
System detection limits	E.2.5	1.0	R	√3	1	1	0.58	0.58	∝
Modulation response	E.2.5	0	R	√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	√3	1	1	1.73	1.73	∝
Integration Time	E.2.8	2.0	R	√3	1	1	1.15	1.15	∝
RF ambient Conditions – Noise	E.6.1	3.0	R	√3	1	1	1.73	1.73	∝
RF ambient Conditions - Reflections	E.6.1	3.0	R	√3	1	1	1.73	1.73	∝
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	√3	1	1	1.15	1.15	∝
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	√3	1	1	0.03	0.03	∝
Extrapolation, interpolation and integration Algoritms for Max.	E.5.2	5.0	R	√3	1	1	2.89	2.89	∝

SAR Evaluation									
Dipole									
Dipole axis to liquid Distance	8,E.4.2	1.00	N	√3	1	1	0.58	0.58	N–1
Input power and SAR drift measurement	8,6.6.2	12.02	R	√3	1	1	6.94	6.94	∝
Deviation of experimental dipole from numerical dipole	E.6.4	5.5	R	√3	1	1	3.20	3.20	∝
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	0.05	R	√3	1	1	0.03	0.03	∝
Uncertainty in SAR correction for deviations in permittivity and conductivity	E3.2	2.0	R	√3	1	0.84	1.10	1.10	∝
Liquid conductivity - deviation from target value	E.3.2	5.00	R	√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	√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: 04/10/2017

Measurement duration: 7 minutes 21 seconds

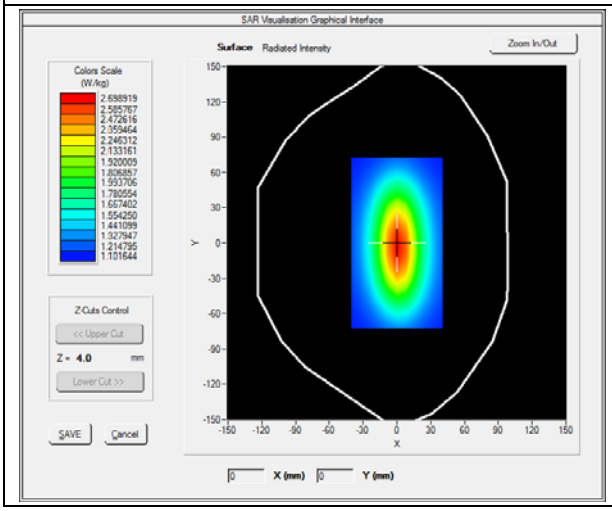
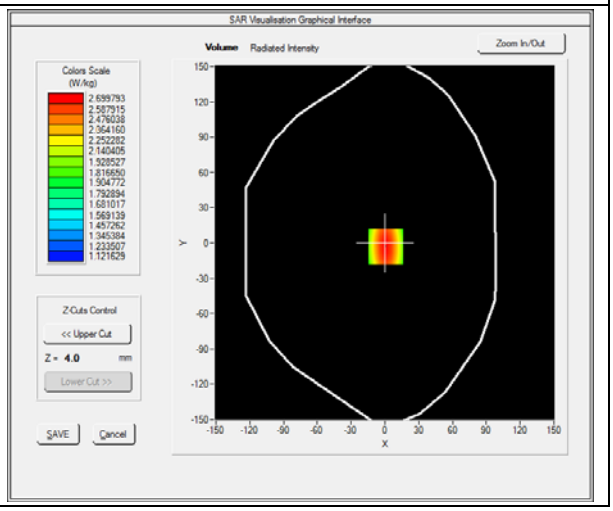
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2016

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

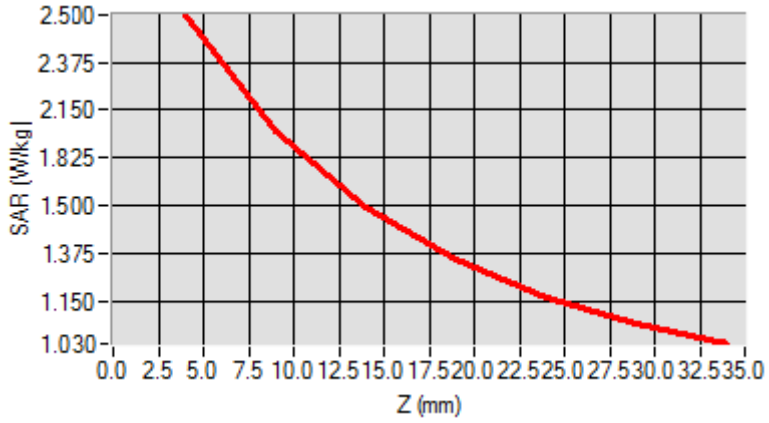
SURFACE SAR	VOLUME SAR
	

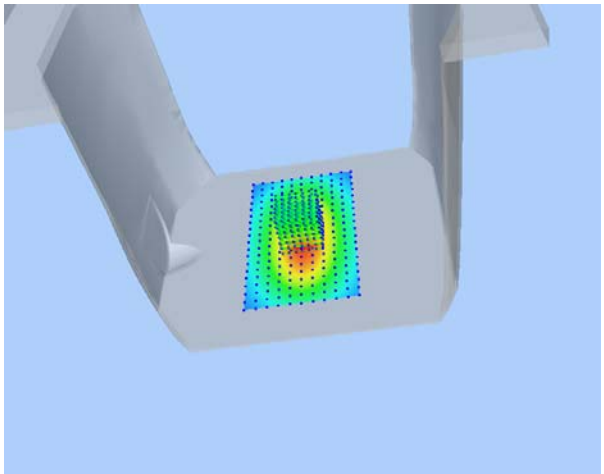
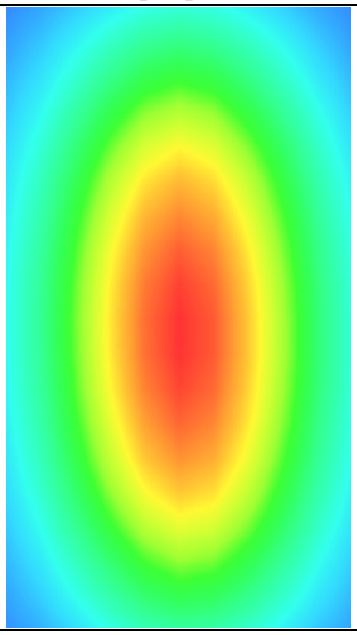
Maximum location: X=0.00, Y=0.00

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: 04/10/2017

Measurement duration: 7 minutes 21 seconds

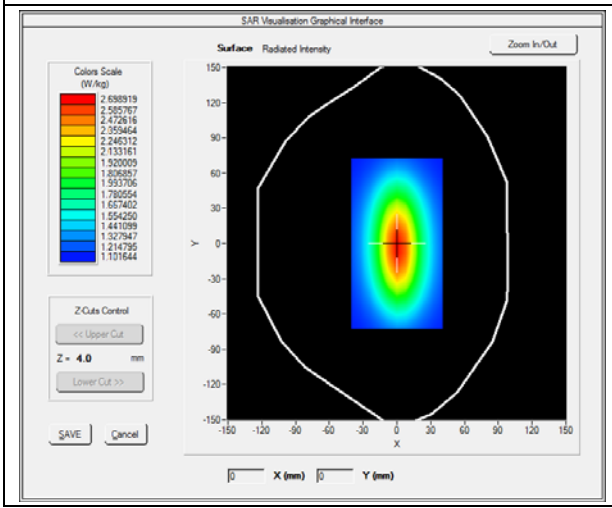
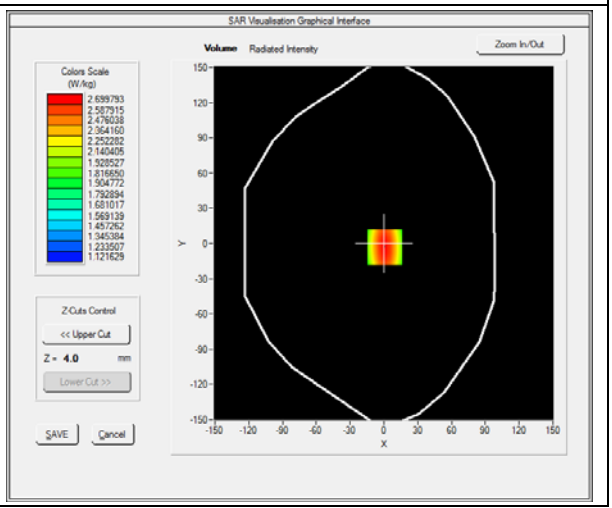
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

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

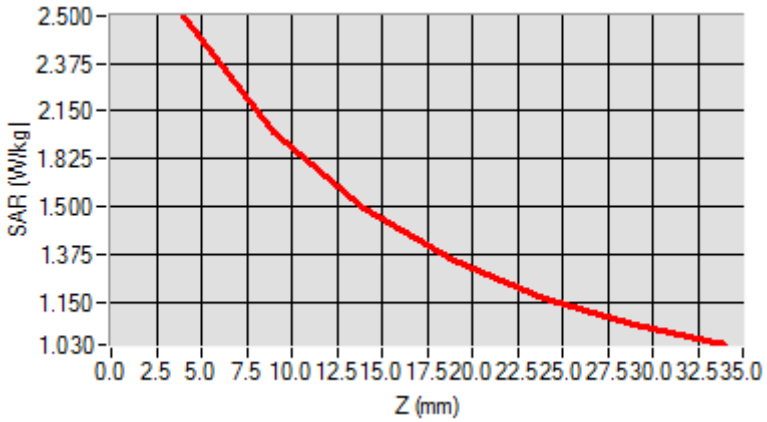
SURFACE SAR	VOLUME SAR
	

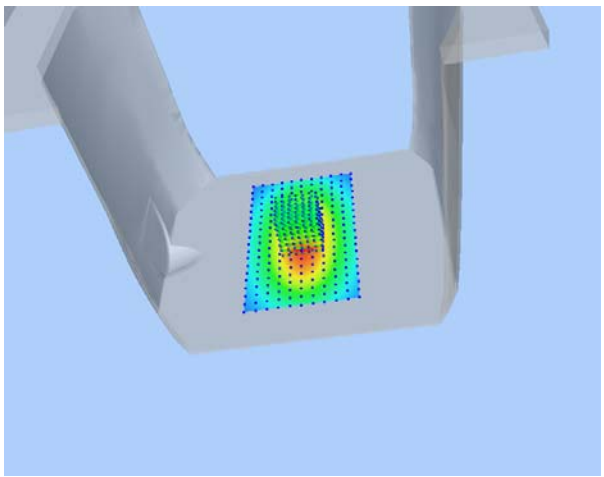
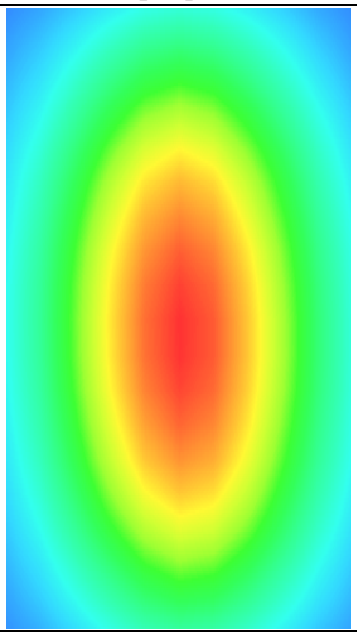
Maximum location: X=0.00, Y=0.00

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: 04/10/2017

Measurement duration: 12 minutes 21 seconds

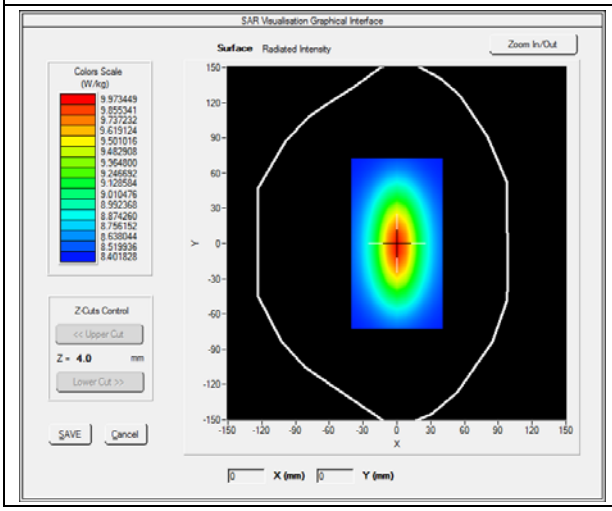
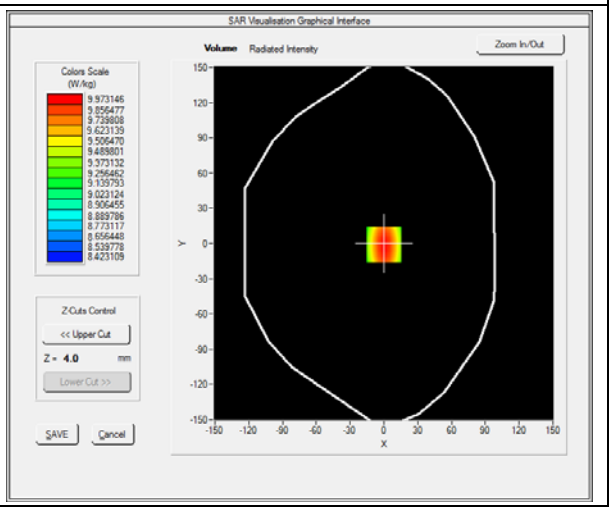
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

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

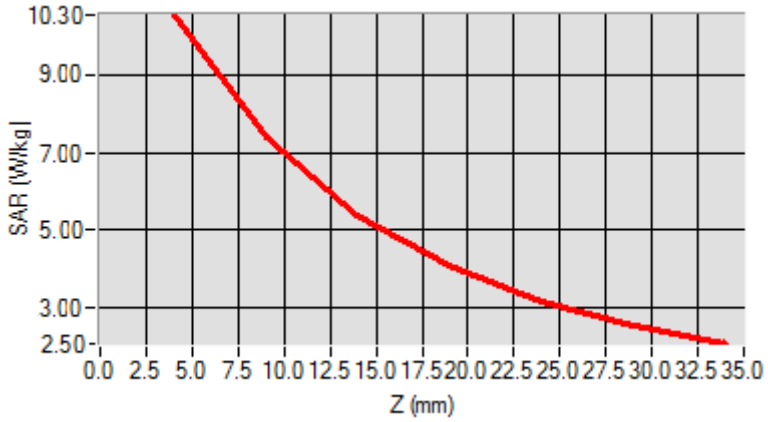
SURFACE SAR	VOLUME SAR
	

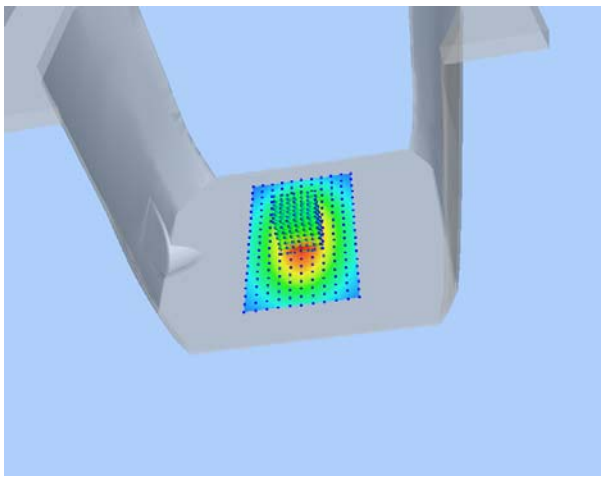
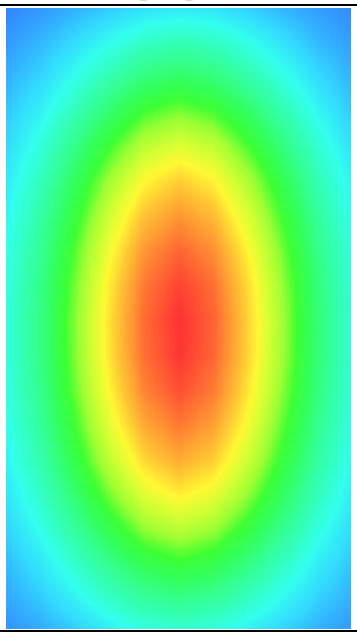
Maximum location: X=0.00, Y=0.00

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 4

For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 04/10/2017

Measurement duration: 12 minutes 21 seconds

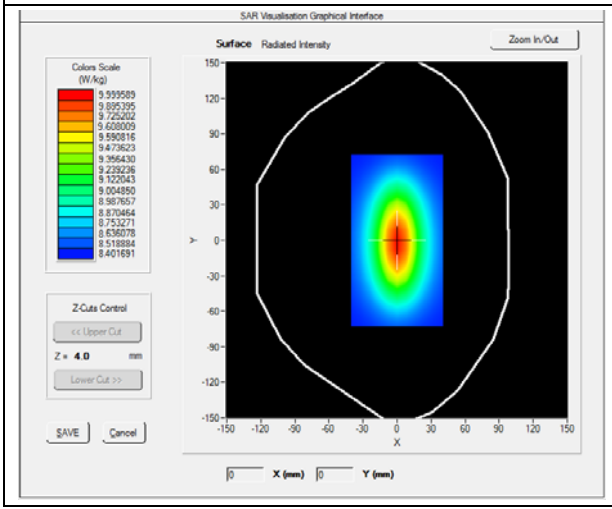
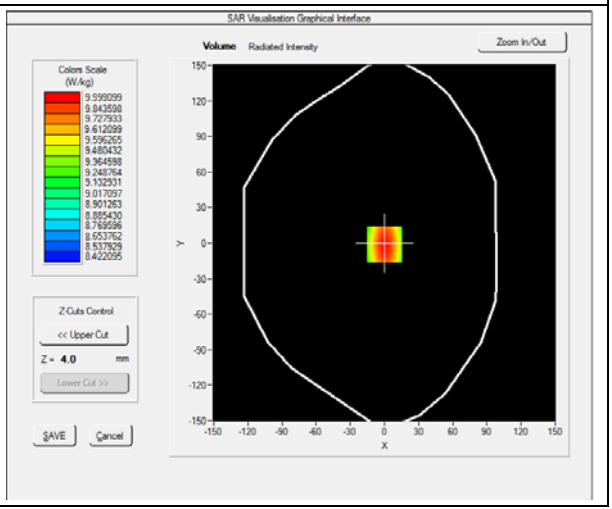
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

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

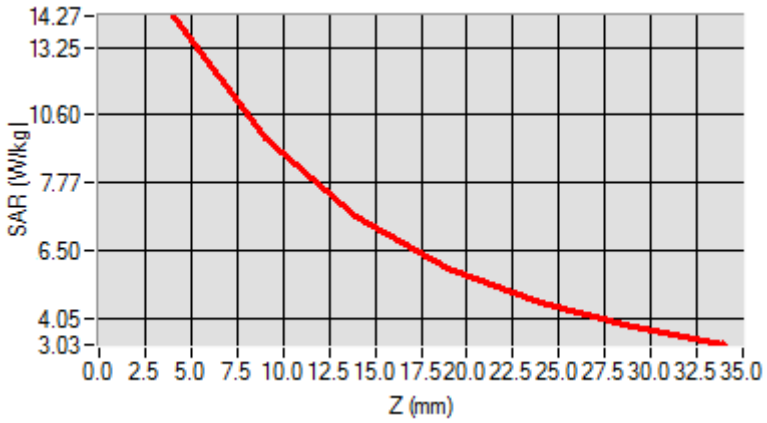
SURFACE SAR	VOLUME SAR
	

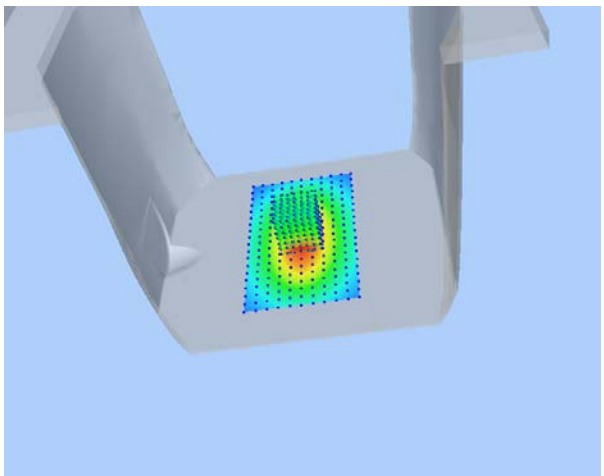
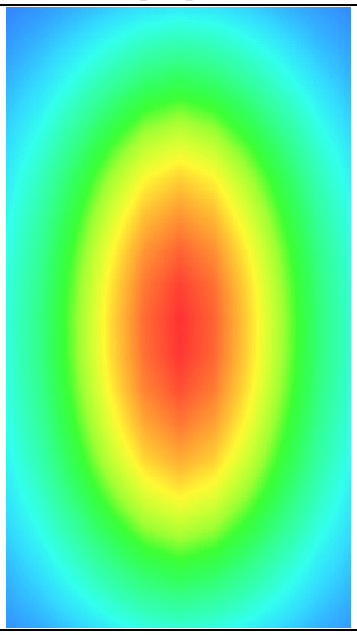
Maximum location: X=0.00, Y=0.00

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 5

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 04/10/2017

Measurement duration: 12 minutes 21 seconds

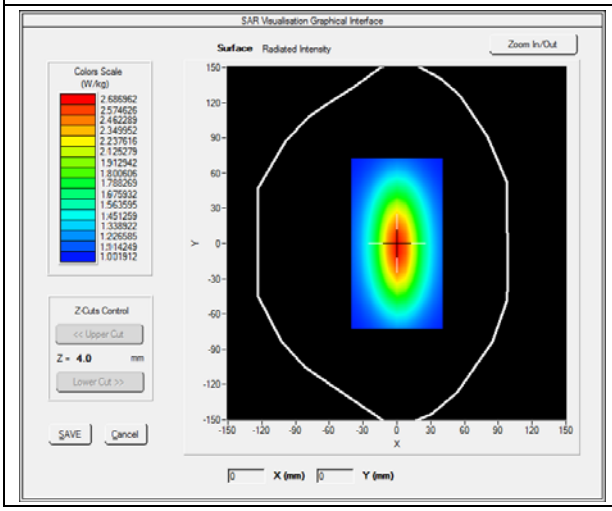
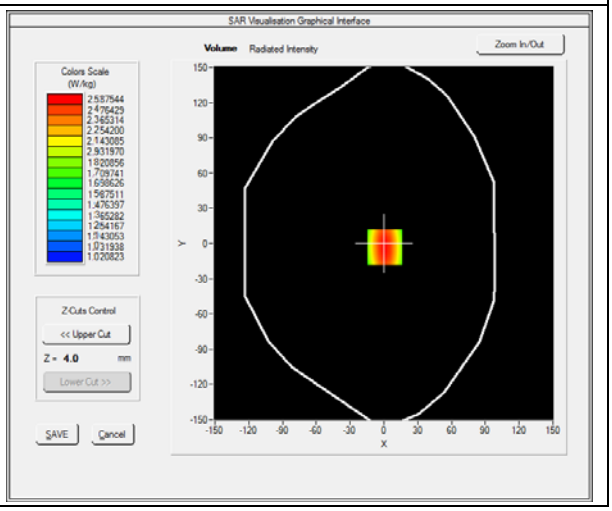
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2016

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

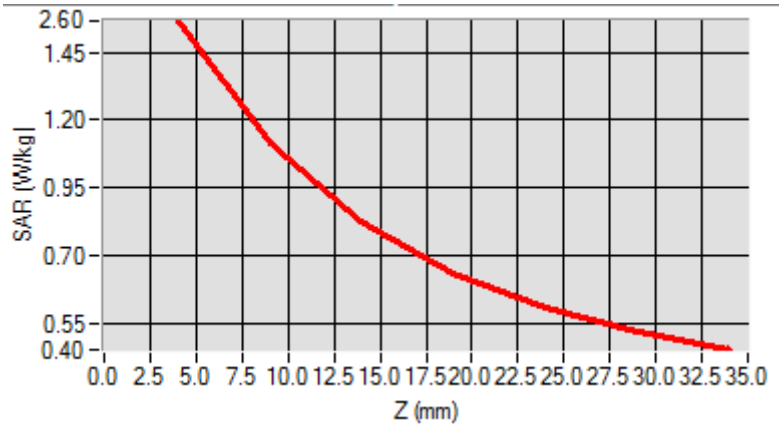
SURFACE SAR	VOLUME SAR
	

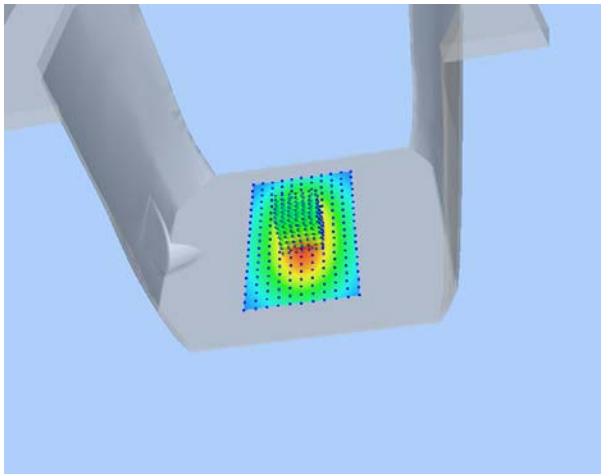
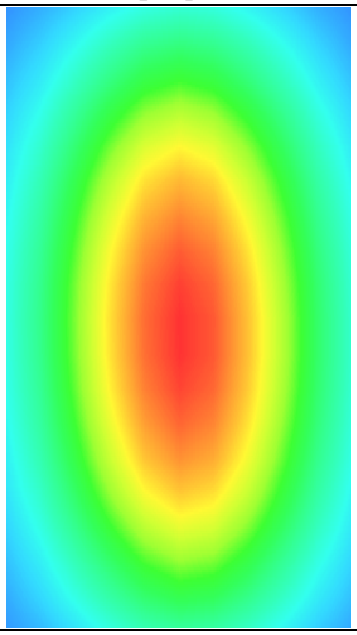
Maximum location: X=0.00, Y=0.00

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 6

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 04/10/2017

Measurement duration: 12 minutes 21 seconds

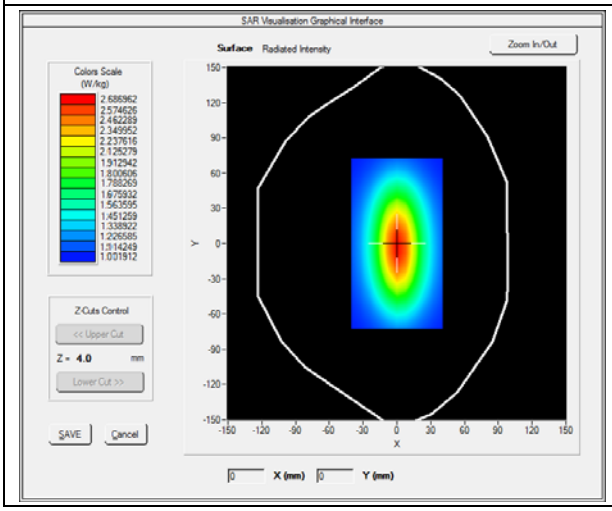
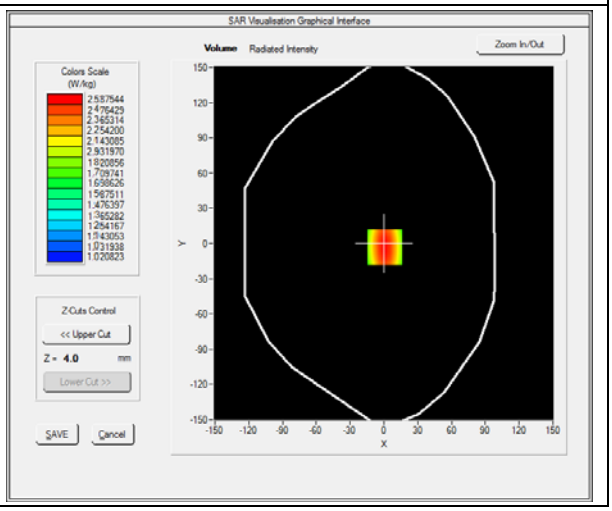
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

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

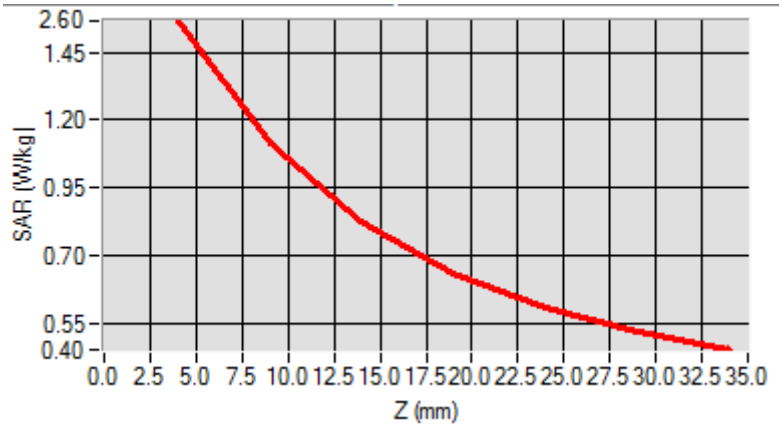
SURFACE SAR	VOLUME SAR
	

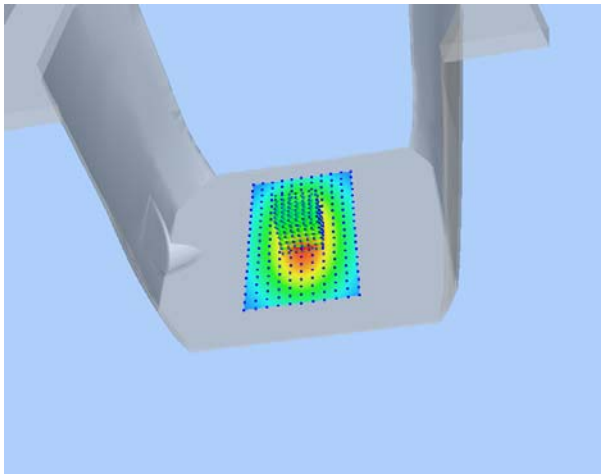
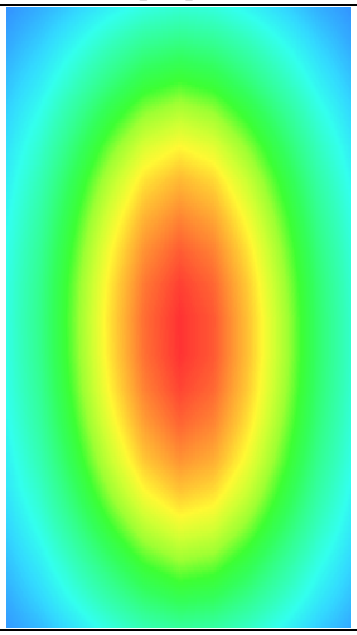
Maximum location: X=0.00, Y=0.00

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 7

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 04/10/2017

Measurement duration: 12 minutes 21 seconds

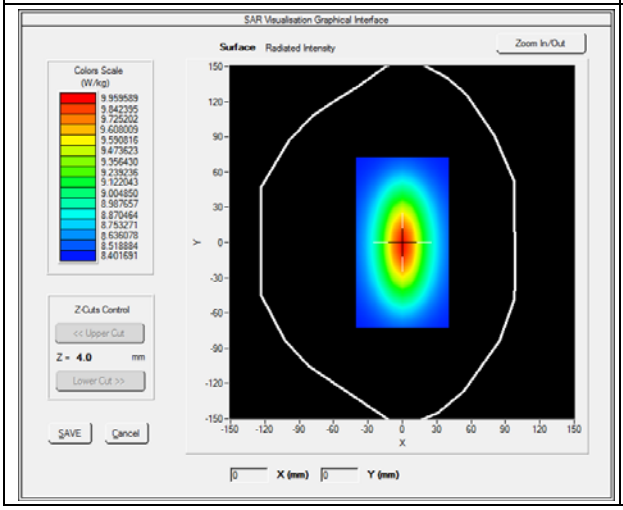
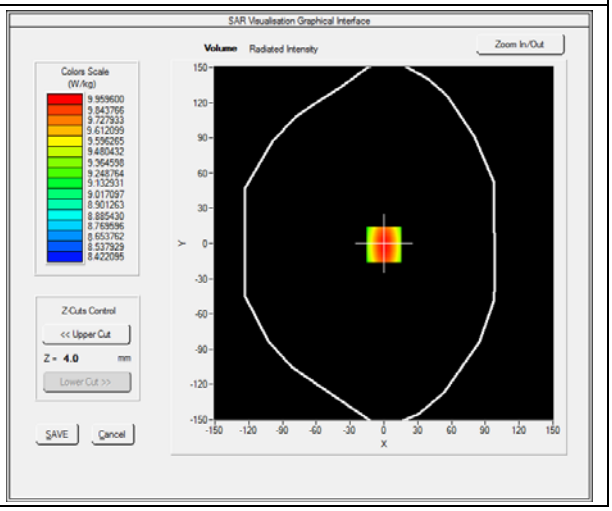
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

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

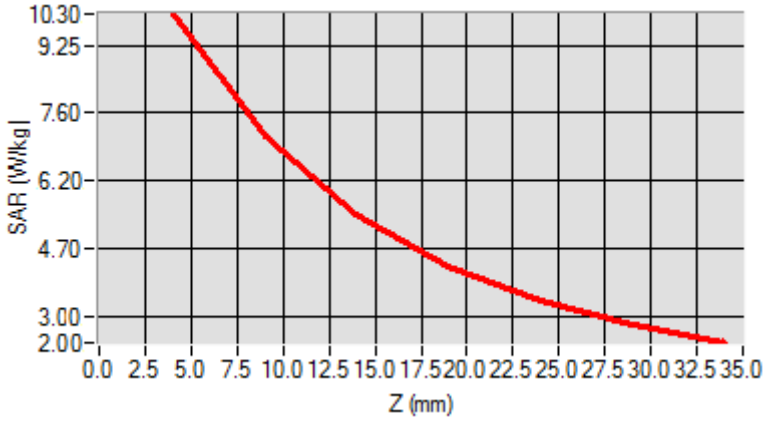
SURFACE SAR	VOLUME SAR
	

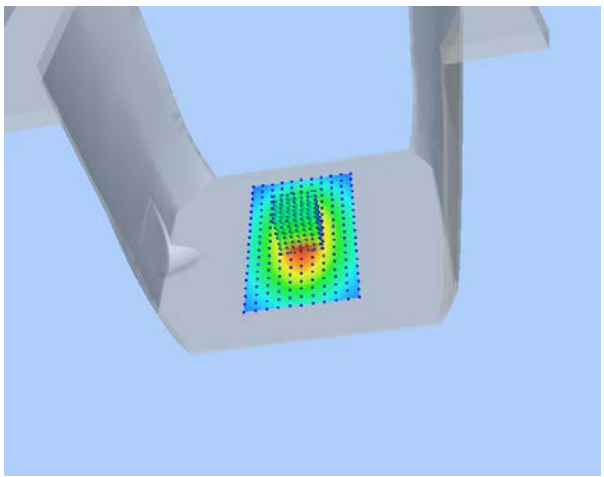
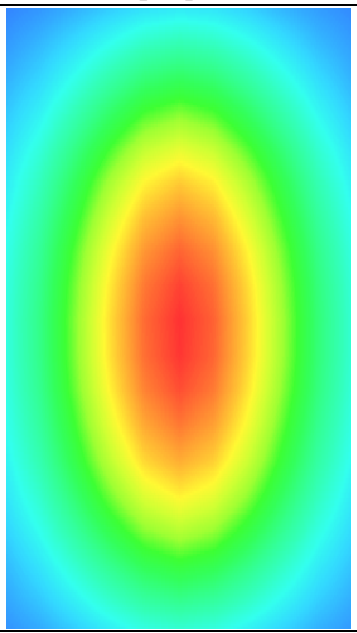
Maximum location: X=0.00, Y=0.00

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 8

For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 04/10/2017

Measurement duration: 12 minutes 21 seconds

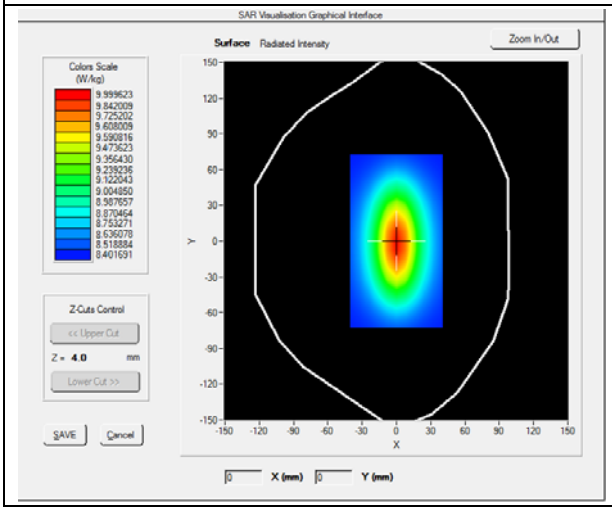
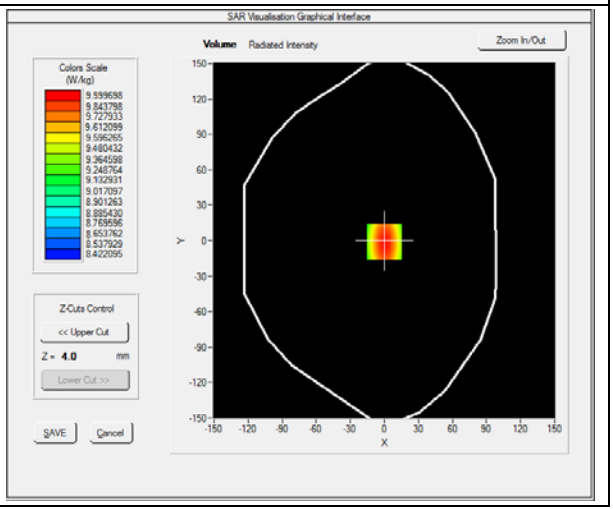
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

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

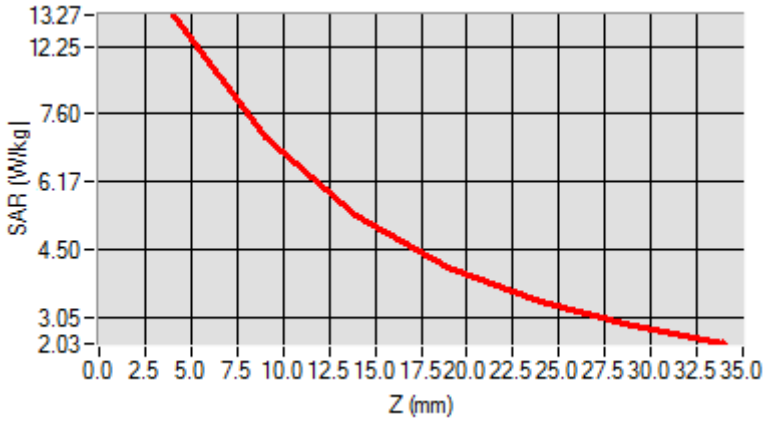
SURFACE SAR	VOLUME SAR
	

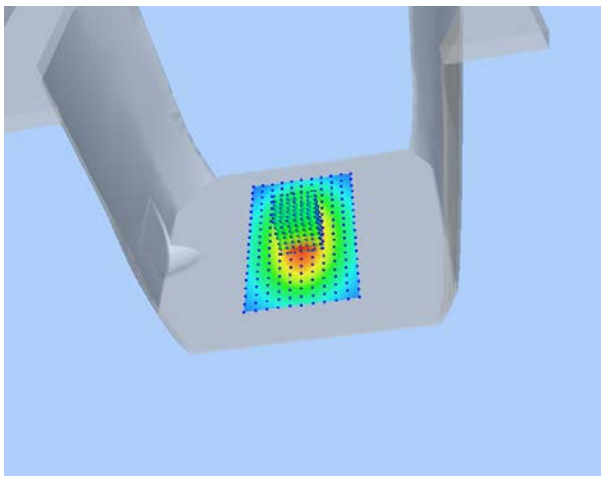
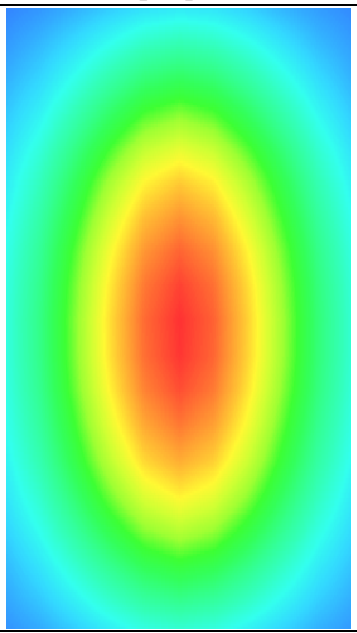
Maximum location: X=0.00, Y=0.00

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



3D screen shot	Hot spot position
	

Annex B. Plots of SAR Measurement

TYPE	BAND	PARAMETERS
Phone	**GSM850**	Measurement 1: Right Head with Cheek device position on Middle Channel in GSM mode
Phone	**GSM1900**	Measurement 5: Right Head with Cheek device position on High Channel in GSM mode
Phone	**GPRS850_3TX**	Measurement 11:Right Head with Cheek device position on High Channel in GPRS mode
Phone	**GPRS1900_3TX**	Measurement 15: Right Head with Cheek device position on High Channel in GPRS mode
Phone	**WCDMA850_RMC**	Measurement 19: Right Head with Cheek device position on High Channel in WCDMA mode
Phone	**LTE Band 7_RMC**	Measurement 25: Left Head with Cheek device position on Low Channel in LTE mode
Phone	**LTE Band 17_RMC**	Measurement 33: Left Head with Cheek device position on High Channel in mode
Phone	**WiFi_802.11b**	Measurement 41: Left Head with Cheek device position on High Channel in 802.11b mode
Phone	**GSM850**	Measurement 45: Flat Plane with Back(Body-worn) device position on High Channel in GSM mode
Phone	**GSM1900**	Measurement 48: Flat Plane with Front(Body-worn) device position on High Channel in GSM mode
Phone	**GPRS850_3TX**	Measurement 49: Flat Plane with Back device position on Middle Channel in GPRS mode
Phone	**GPRS1900_3TX**	Measurement 57: Flat Plane with Front device position on High Channel in GPRS mode
Phone	**WCDMA850_RMC**	Measurement 61: Flat Plane with Back device position on High Channel in WCDMA mode
Phone	**LTE Band 7_RMC**	Measurement 66: Flat Plane with Back device position on Low Channel in LTE mode
Phone	**LTE Band 17_RMC**	Measurement 76: Flat Plane with Back device position on High Channel in LTE mode
Phone	**WiFi_802.11b**	Measurement 86: 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

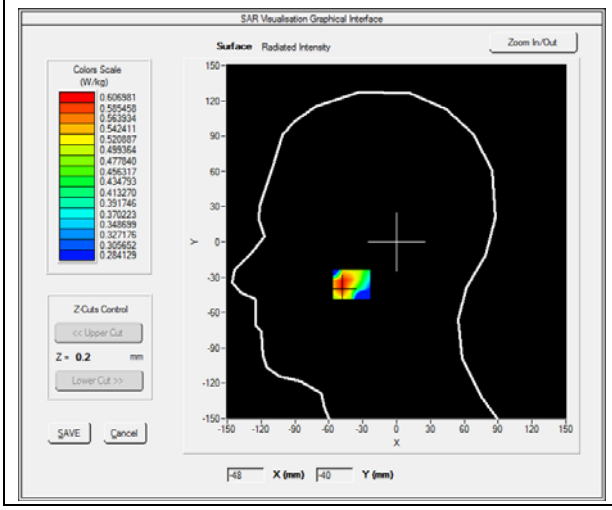
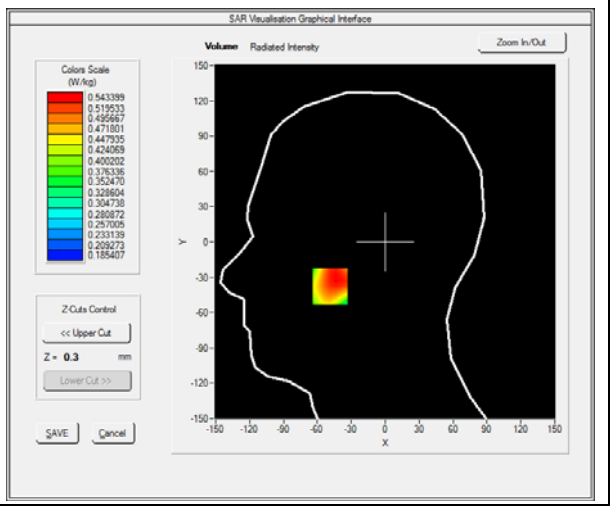
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 11 minutes 48 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

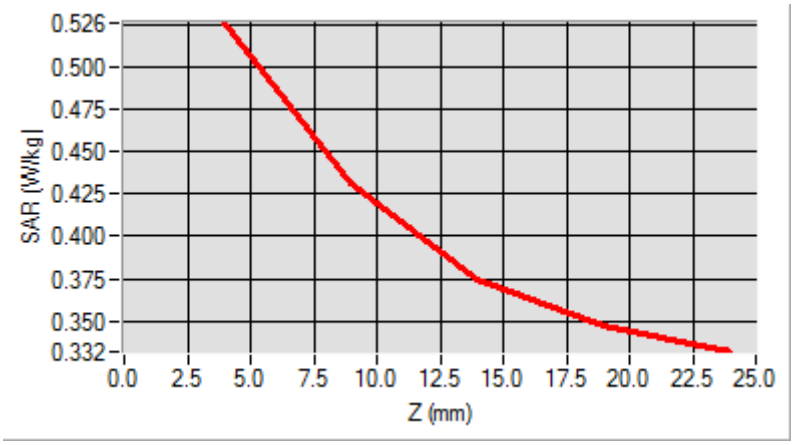
Frequency (MHz)	836.600000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.144536
Ambient Temperature	21.1
Liquid Temperature	21.3

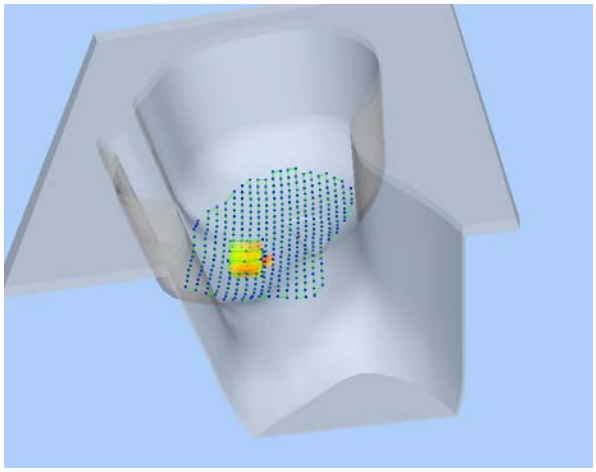
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-38.00

SAR 10g (W/Kg)	0.440036
SAR 1g (W/Kg)	0.529942

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.5258	0.4307	0.3745	0.3467



3D screen shot	Hot spot position
	

MEASUREMENT 5

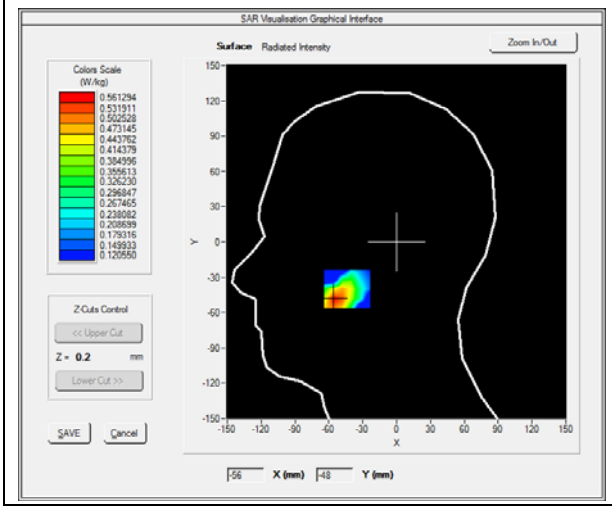
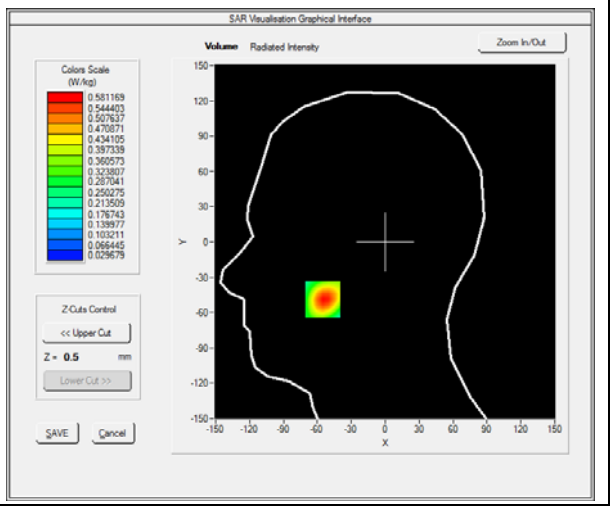
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 11 minutes 48 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

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

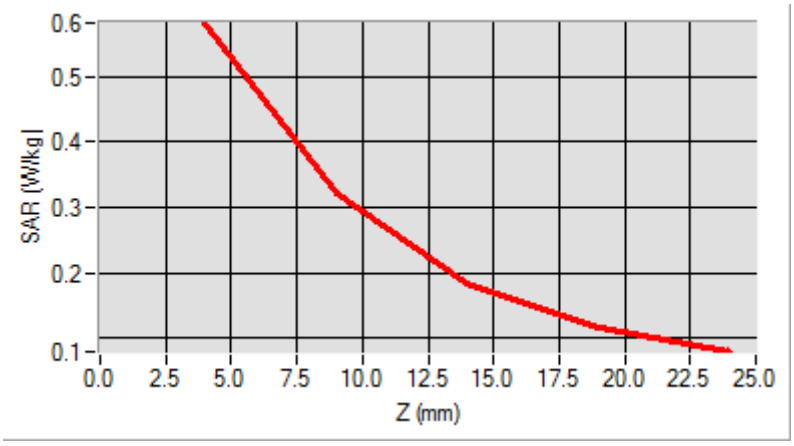
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.442440
Ambient Temperature	21.1
Liquid Temperature	21.3

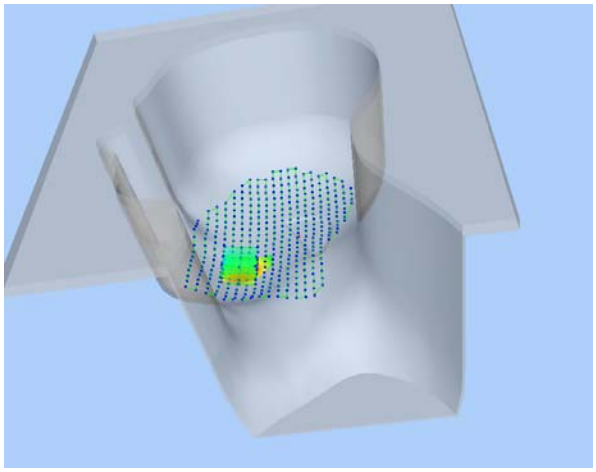
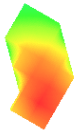
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-55.00, Y=-49.00

SAR 10g (W/Kg)	**0.300483**
SAR 1g (W/Kg)	**0.541383**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.5812**	**0.3204**	**0.1841**	**0.1176**



3D screen shot	**Hot spot position**
	

MEASUREMENT 11

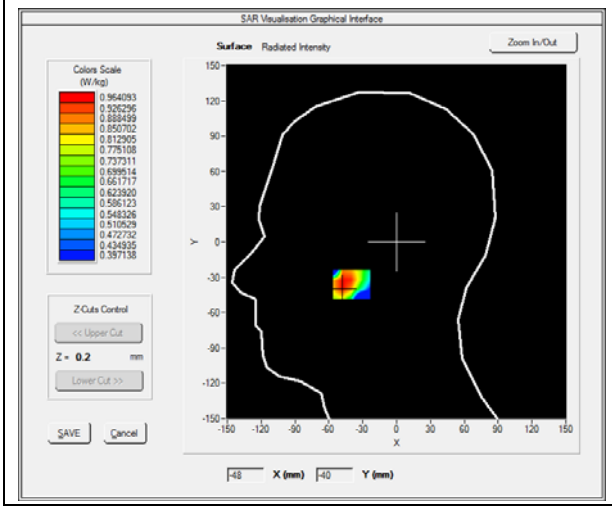
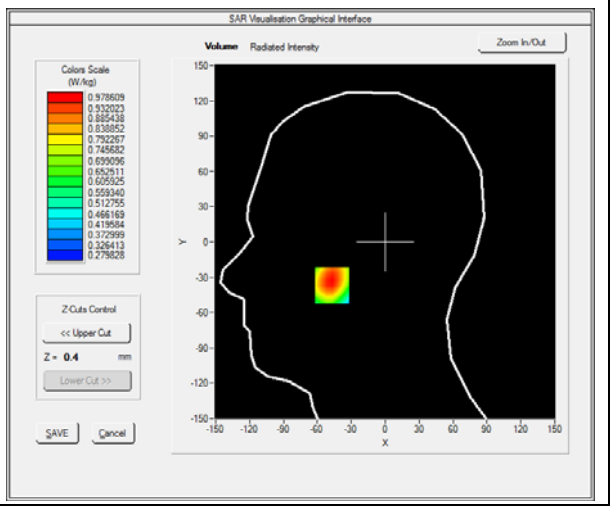
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 11 minutes 48 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GPRS850_3TX
Channels	High
Signal	Duty Cycle: 1:2.66

B. SAR Measurement Results

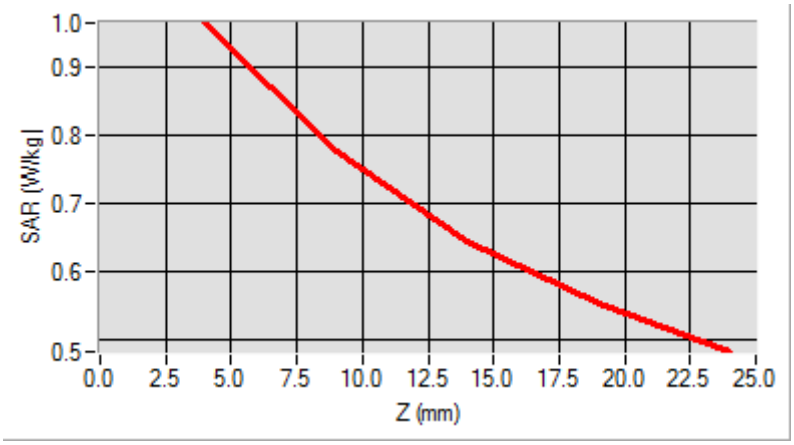
Frequency (MHz)	848.800000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.903833
Ambient Temperature	21.1
Liquid Temperature	21.3

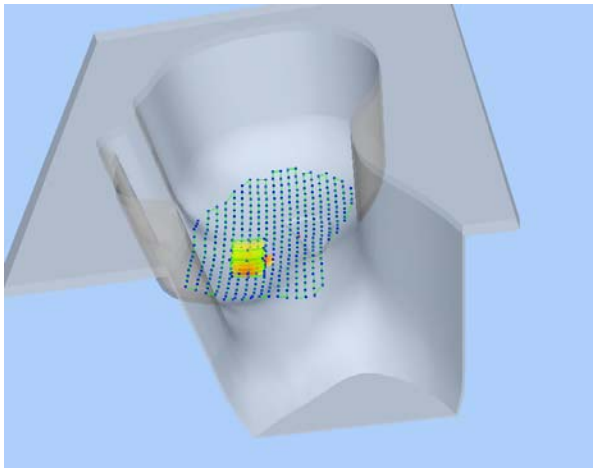
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-47.00, Y=-37.00

SAR 10g (W/Kg)	0.717739
SAR 1g (W/Kg)	0.940629

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.9641	0.7762	0.6446	0.5538



3D screen shot	Hot spot position
	

MEASUREMENT 15

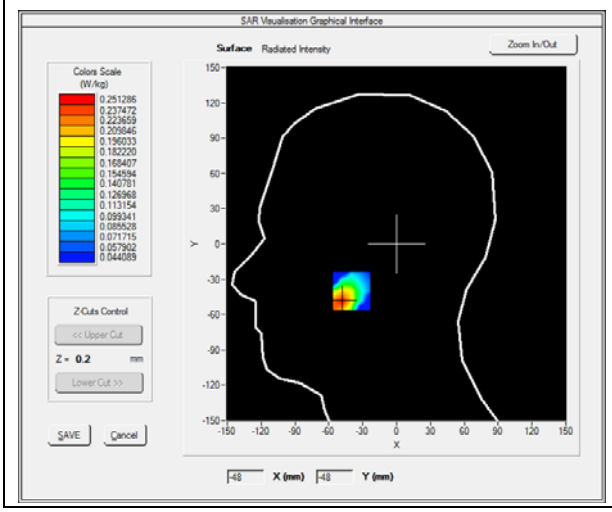
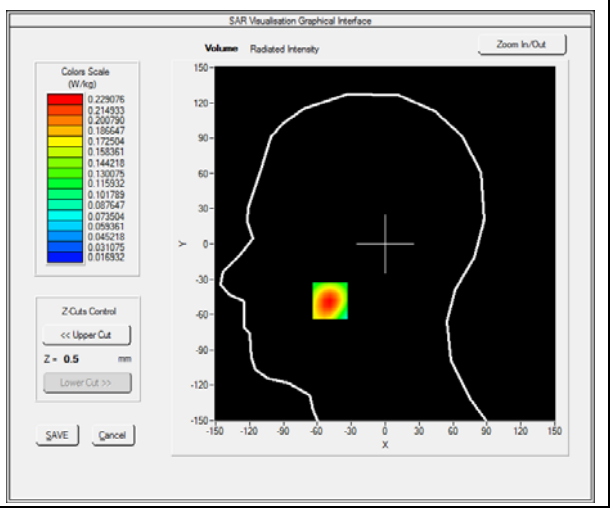
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Right head
Device Position	Cheek
Band	GPRS1900_3TX
Channels	High
Signal	Duty Cycle: 1:2.66

B. SAR Measurement Results

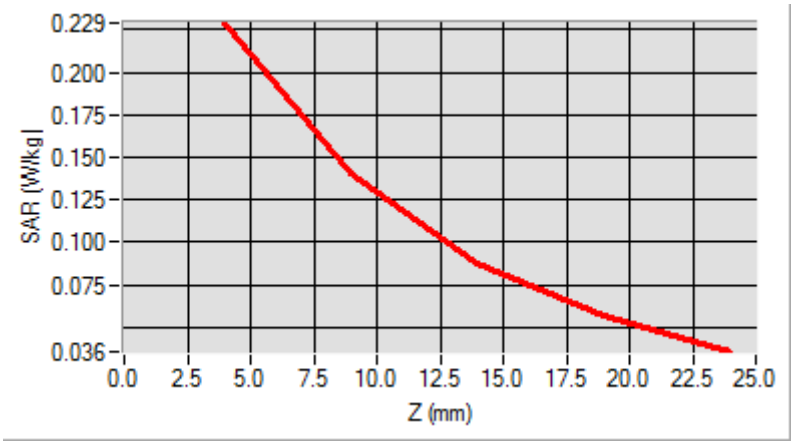
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	38.560124
Conductivity (S/m)	1.380369
Power Variation (%)	1.536272
Ambient Temperature	21.1
Liquid Temperature	21.3

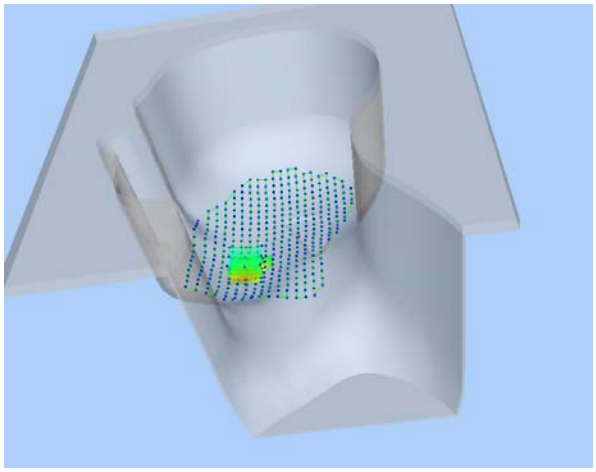
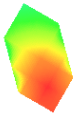
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-48.00

SAR 10g (W/Kg)	**0.125424**
SAR 1g (W/Kg)	**0.213961**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.2291**	**0.1410**	**0.0877**	**0.0564**



3D screen shot	**Hot spot position**
	

MEASUREMENT 19

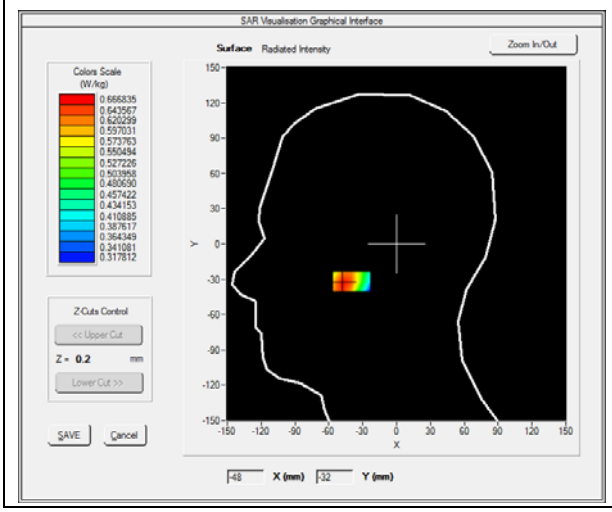
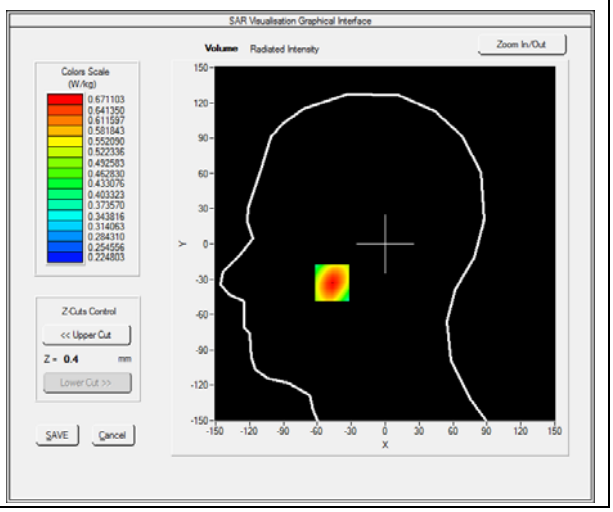
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

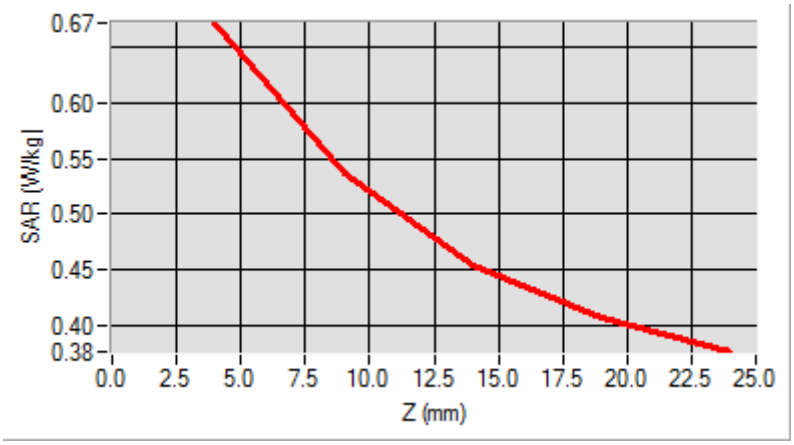
Frequency (MHz)	846.600000
Relative Permittivity (real part)	41.110245
Conductivity (S/m)	0.871245
Power Variation (%)	1.342427
Ambient Temperature	21.1
Liquid Temperature	21.3

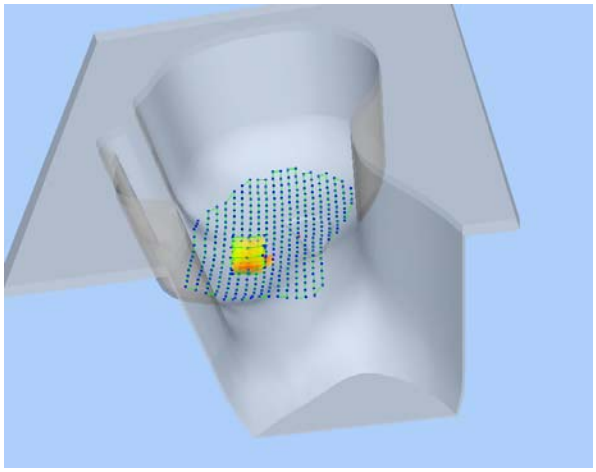
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-47.00, Y=-33.00

SAR 10g (W/Kg)	0.498886
SAR 1g (W/Kg)	0.642446

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6711	0.5374	0.4543	0.4073



3D screen shot	Hot spot position
	

MEASUREMENT 25

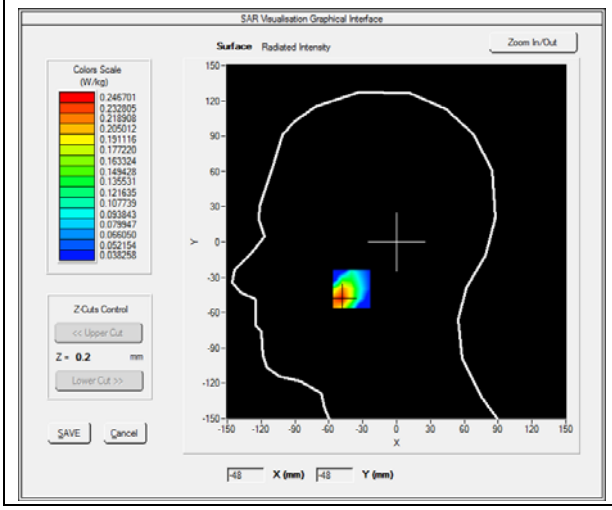
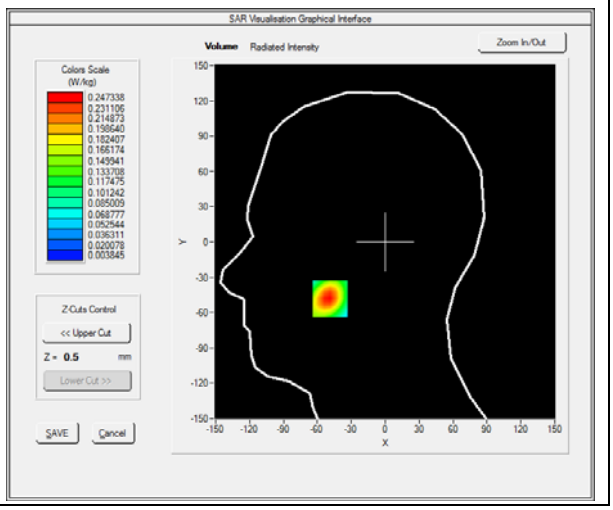
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

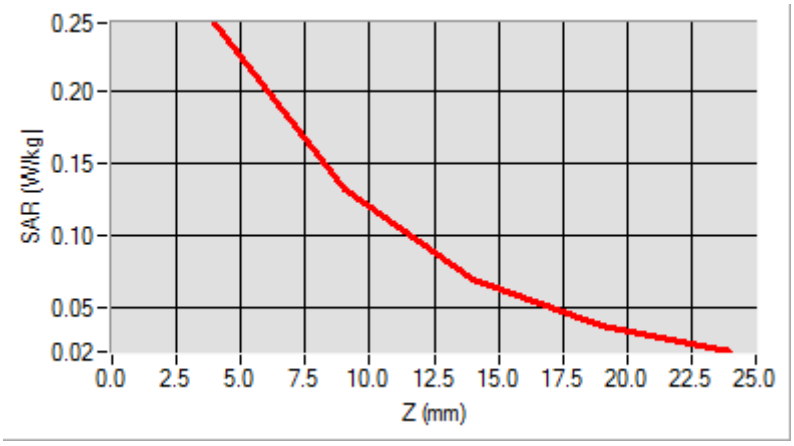
Frequency (MHz)	2510.000000
Relative Permittivity (real part)	38.153660
Conductivity (S/m)	1.740236
Power Variation (%)	0.924535
Ambient Temperature	21.1
Liquid Temperature	21.2

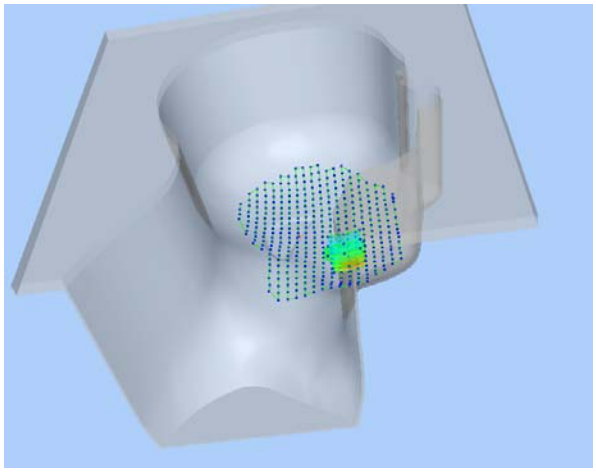
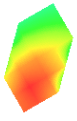
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-48.00

SAR 10g (W/Kg)	**0.117837**
SAR 1g (W/Kg)	**0.228083**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.2473**	**0.1312**	**0.0687**	**0.0369**



3D screen shot	**Hot spot position**
	

MEASUREMENT 33

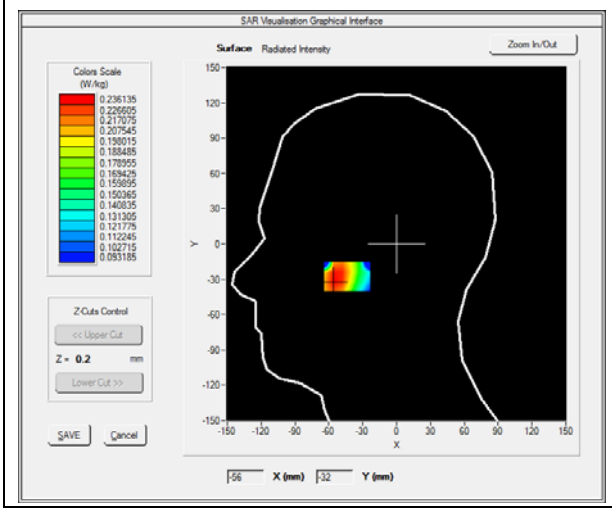
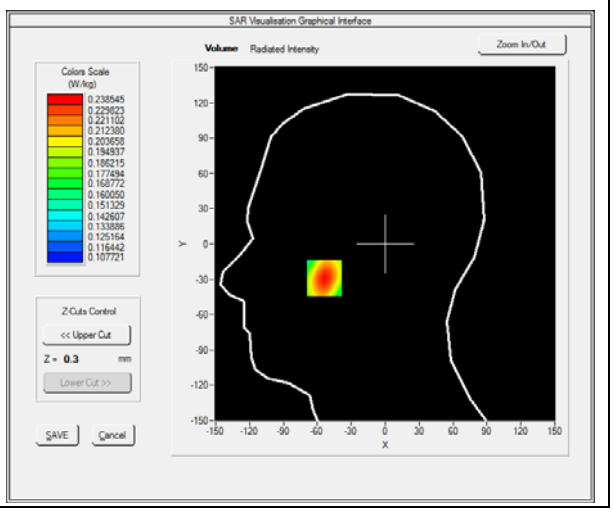
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

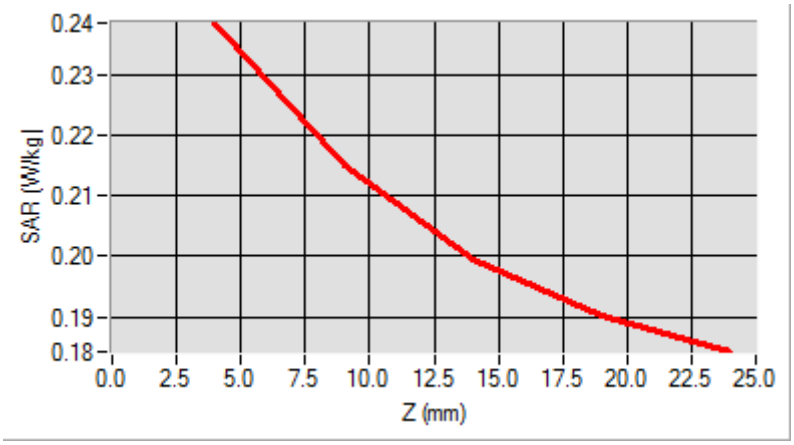
Frequency (MHz)	711.000000
Relative Permittivity (real part)	41.320574
Conductivity (S/m)	0.862373
Power Variation (%)	1.422112
Ambient Temperature	21.1
Liquid Temperature	21.3

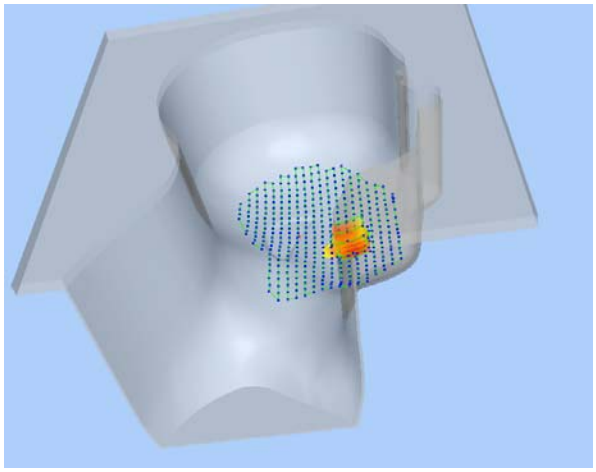
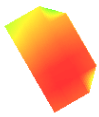
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-54.00, Y=-29.00

SAR 10g (W/Kg)	**0.203421**
SAR 1g (W/Kg)	**0.231724**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.2385**	**0.2149**	**0.1994**	**0.1903**



3D screen shot	**Hot spot position**
	

MEASUREMENT 41

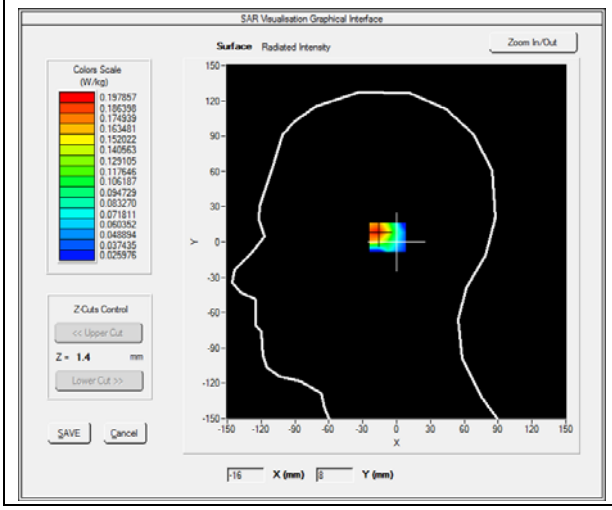
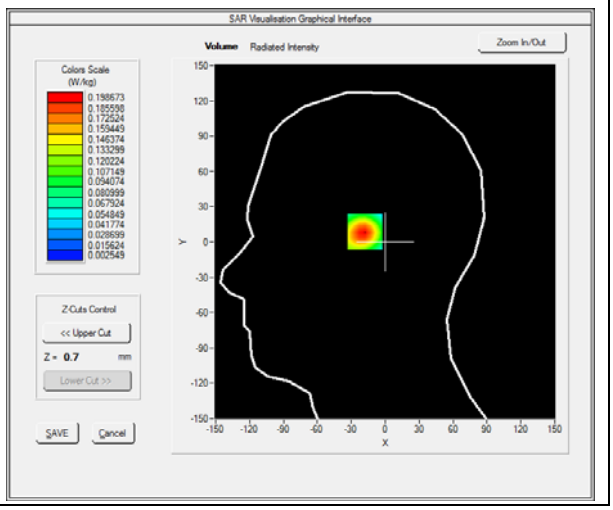
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

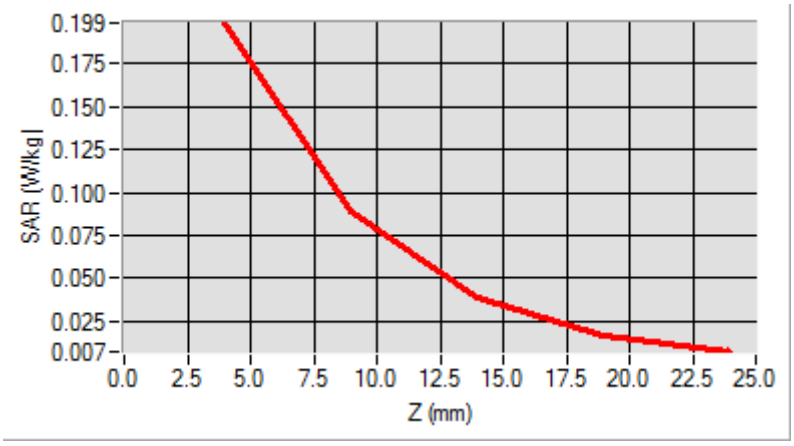
Frequency (MHz)	2462.000000
Relative Permittivity (real part)	38.153660
Conductivity (S/m)	1.740236
Power Variation (%)	3.234772
Ambient Temperature	21.1
Liquid Temperature	21.2

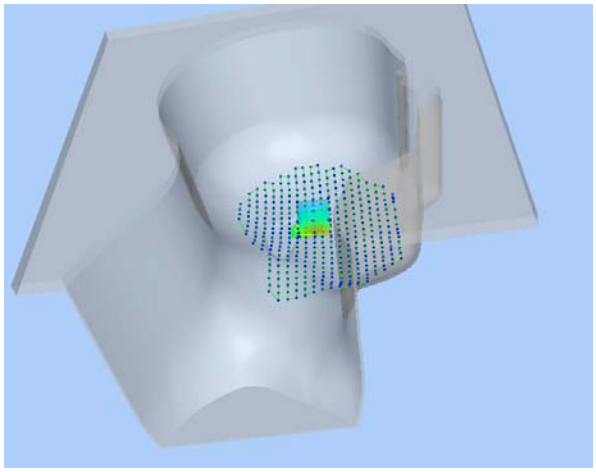
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-17.00, Y=9.00

SAR 10g (W/Kg)	**0.089866**
SAR 1g (W/Kg)	**0.184454**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.1987**	**0.0891**	**0.0383**	**0.0173**



3D screen shot	**Hot spot position**
	

MEASUREMENT 45

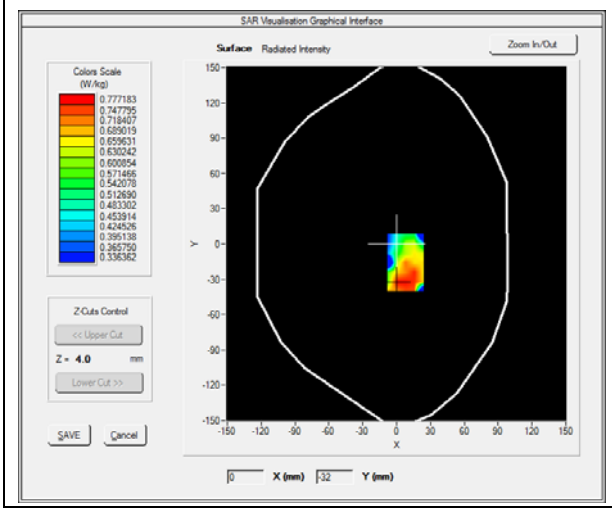
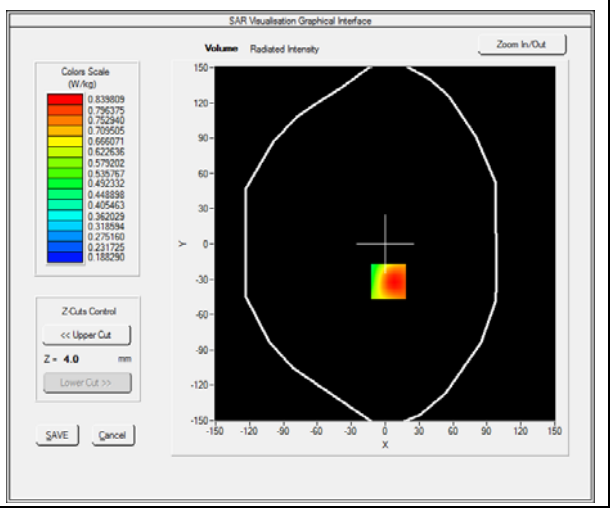
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

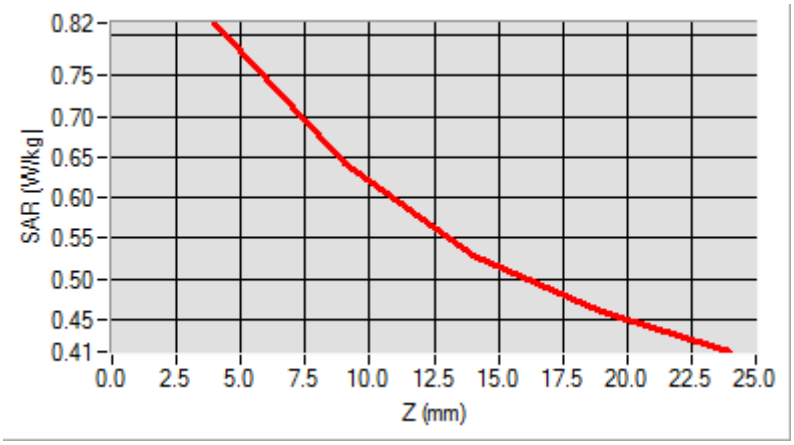
Frequency (MHz)	848.800000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	0.901472
Ambient Temperature	21.1
Liquid Temperature	21.3

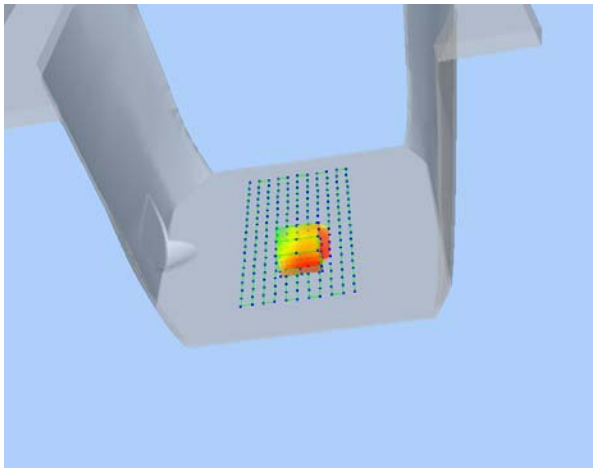
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=-32.00

SAR 10g (W/Kg)	0.687413
SAR 1g (W/Kg)	0.878708

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.8151	0.6424	0.5299	0.4601



3D screen shot	Hot spot position
	

MEASUREMENT 48

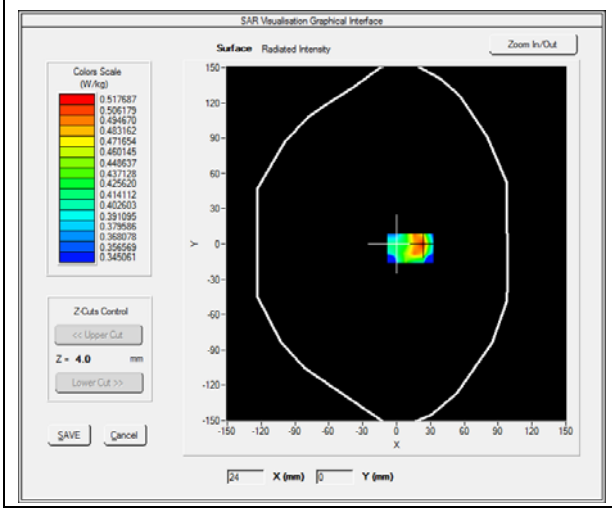
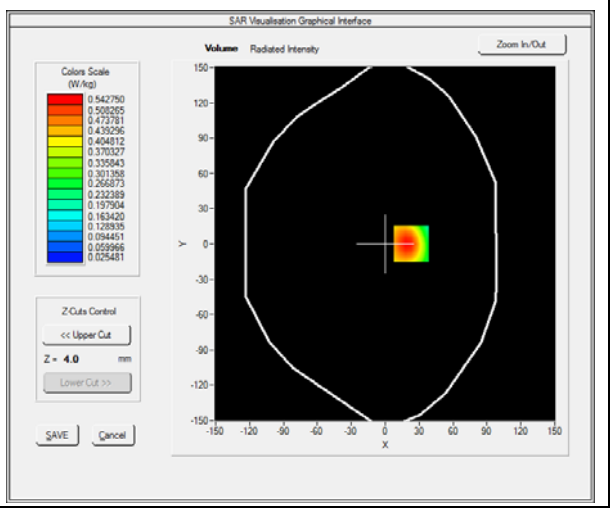
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

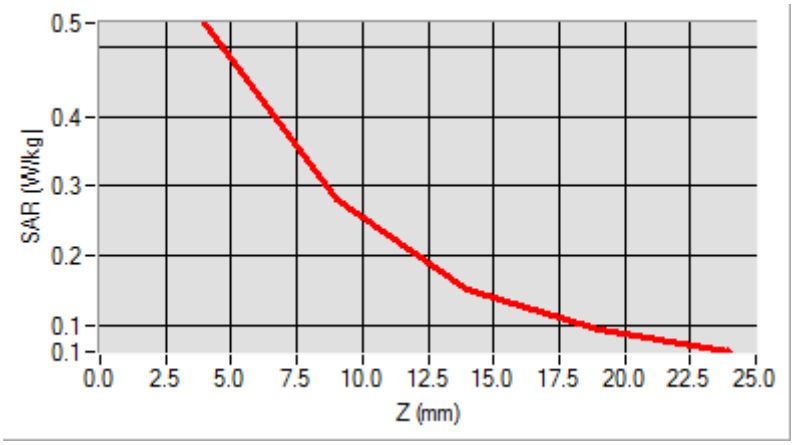
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	1.474622
Ambient Temperature	21.1
Liquid Temperature	21.3

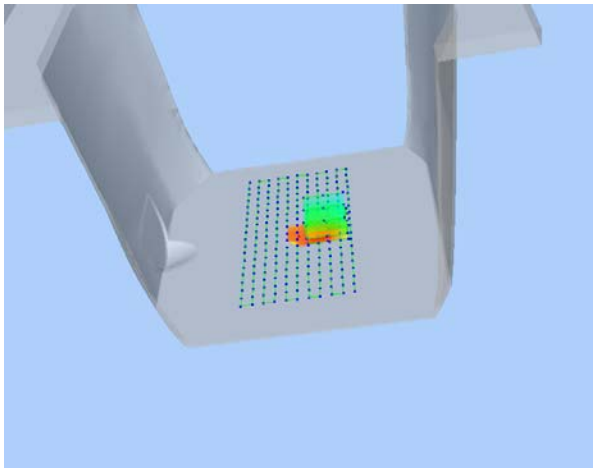
SURFACE SAR	VOLUME SAR
	

Maximum location: X=23.00, Y=0.00

SAR 10g (W/Kg)	**0.351307**
SAR 1g (W/Kg)	**0.617464**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.5343**	**0.2791**	**0.1515**	**0.0928**



3D screen shot	**Hot spot position**
	

MEASUREMENT 49

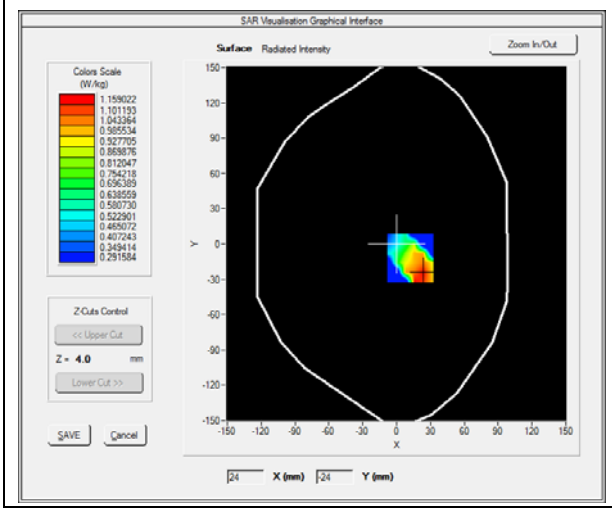
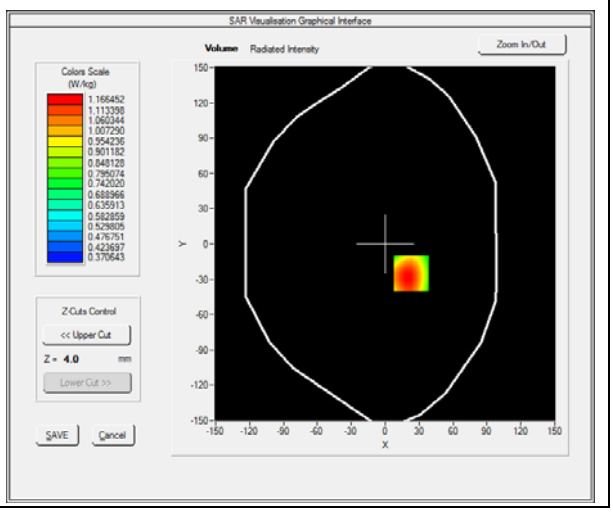
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat plane
Device Position	Back
Band	GPRS850_3TX
Channels	Middle
Signal	Duty Cycle: 1:2.66

B. SAR Measurement Results

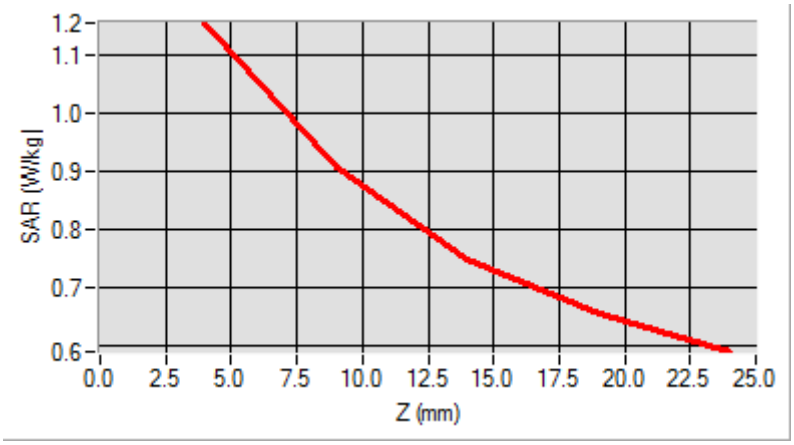
Frequency (MHz)	836.600000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	0.901472
Ambient Temperature	21.1
Liquid Temperature	21.3

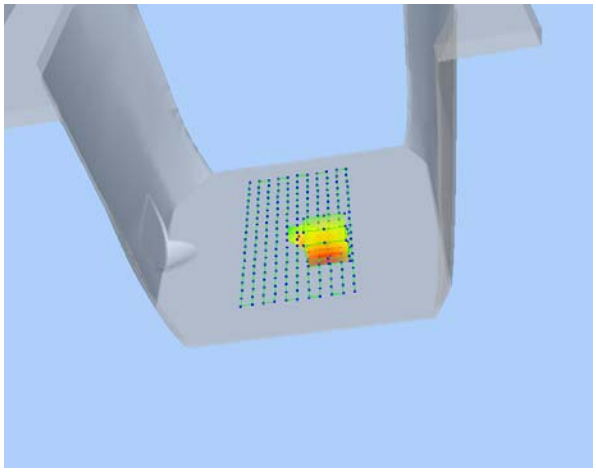
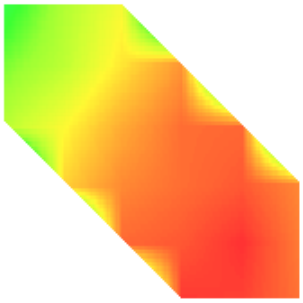
SURFACE SAR	VOLUME SAR
	

Maximum location: X=23.00, Y=-25.00

SAR 10g (W/Kg)	**0.867002**
SAR 1g (W/Kg)	**1.129924**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**1.1572**	**0.9060**	**0.7470**	**0.6526**



3D screen shot	**Hot spot position**
	

MEASUREMENT 57

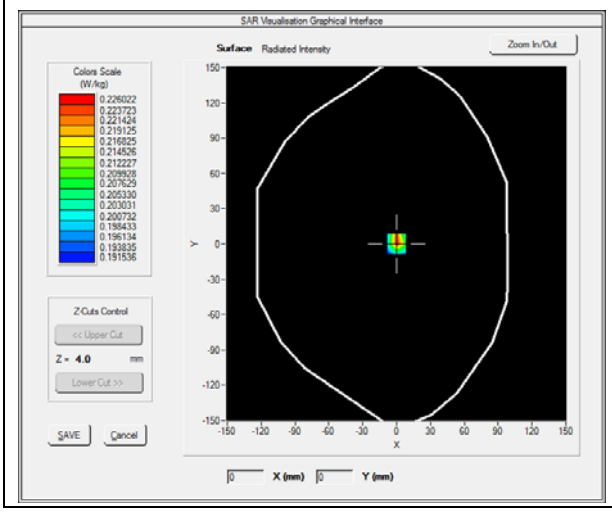
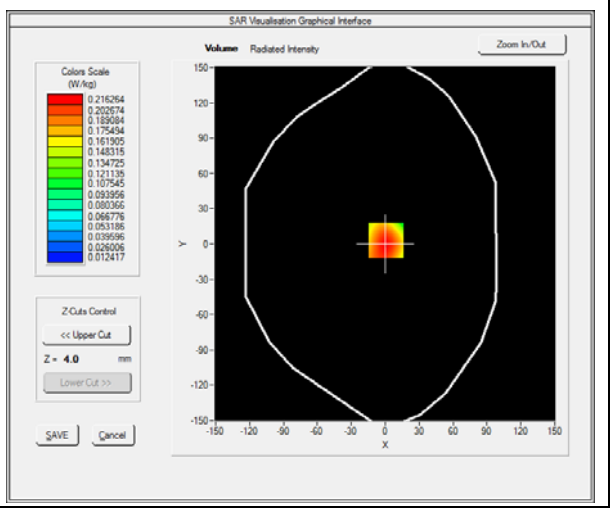
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2016

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat plane
Device Position	Front
Band	GPRS1900_3TX
Channels	High
Signal	Duty Cycle: 1:2.66

B. SAR Measurement Results

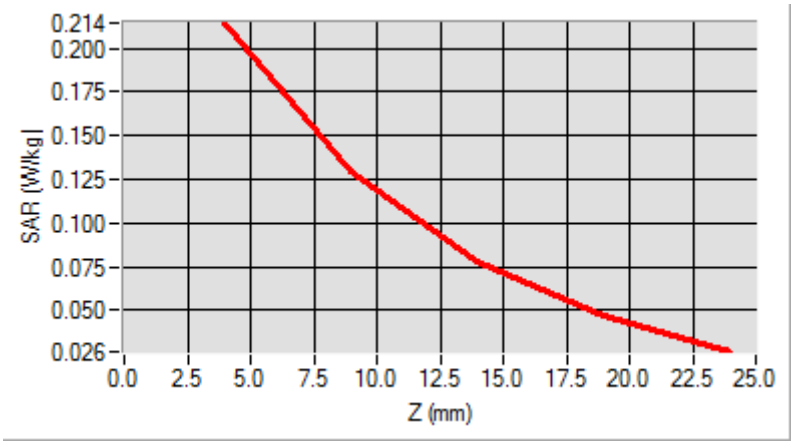
Frequency (MHz)	1909.800000
Relative Permittivity (real part)	52.420415
Conductivity (S/m)	1.501966
Power Variation (%)	2.483762
Ambient Temperature	21.1
Liquid Temperature	21.3

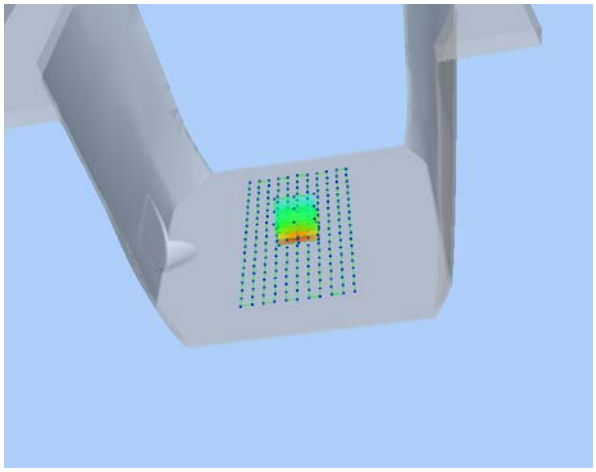
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=3.00

SAR 10g (W/Kg)	0.123632
SAR 1g (W/Kg)	0.205034

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.2144	0.1298	0.0778	0.0467



3D screen shot	Hot spot position
	

MEASUREMENT 61

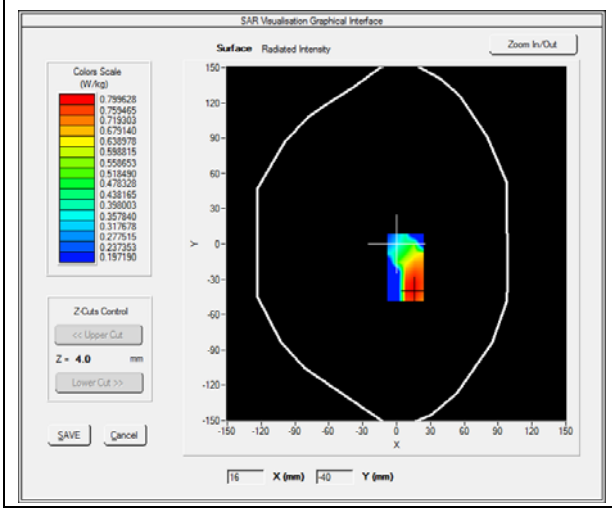
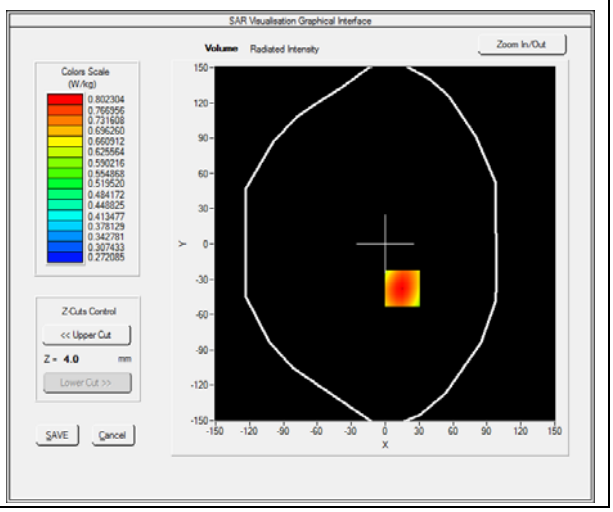
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

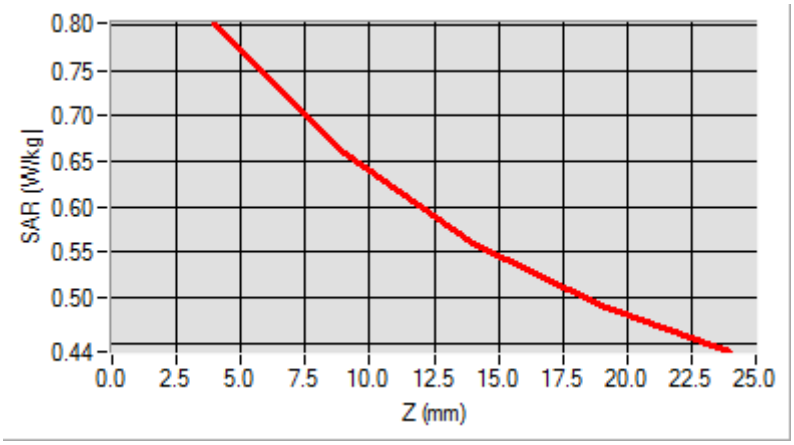
Frequency (MHz)	846.600000
Relative Permittivity (real part)	54.851214
Conductivity (S/m)	0.951454
Power Variation (%)	2.341234
Ambient Temperature	21.1
Liquid Temperature	21.3

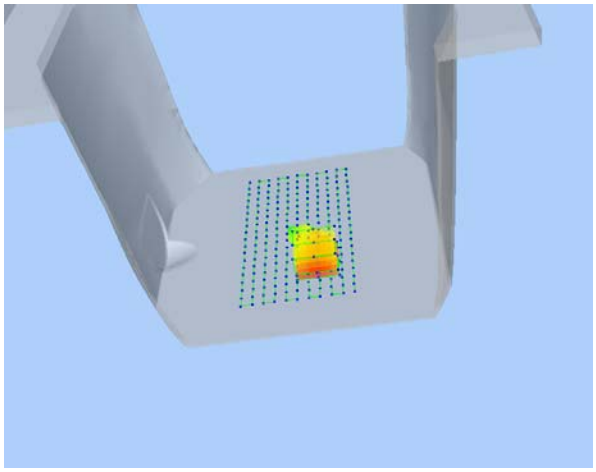
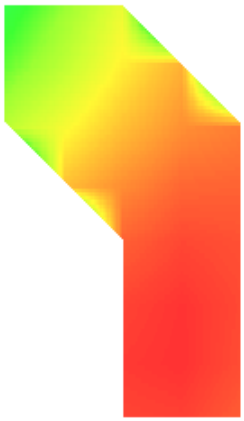
SURFACE SAR	VOLUME SAR
	

Maximum location: X=15.00, Y=-38.00

SAR 10g (W/Kg)	0.623370
SAR 1g (W/Kg)	0.726511

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.8023	0.6590	0.5594	0.4920



3D screen shot	Hot spot position
	

MEASUREMENT 66

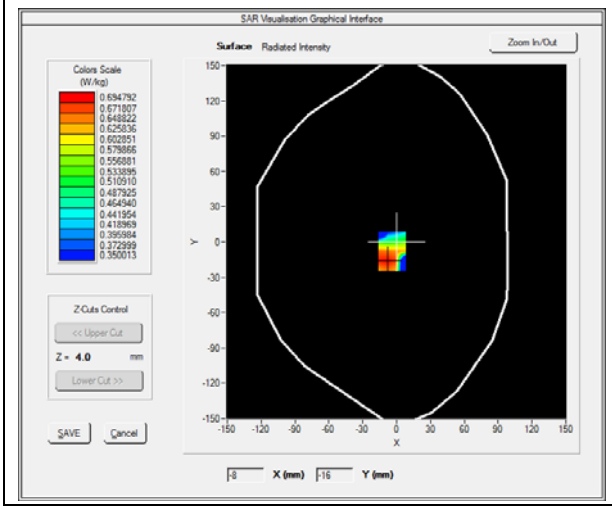
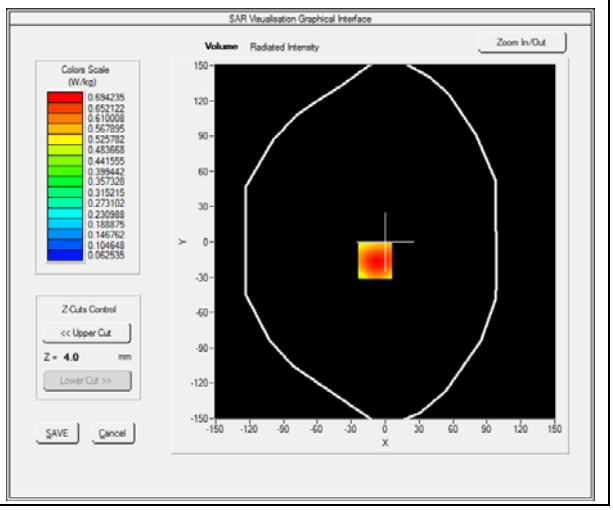
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

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

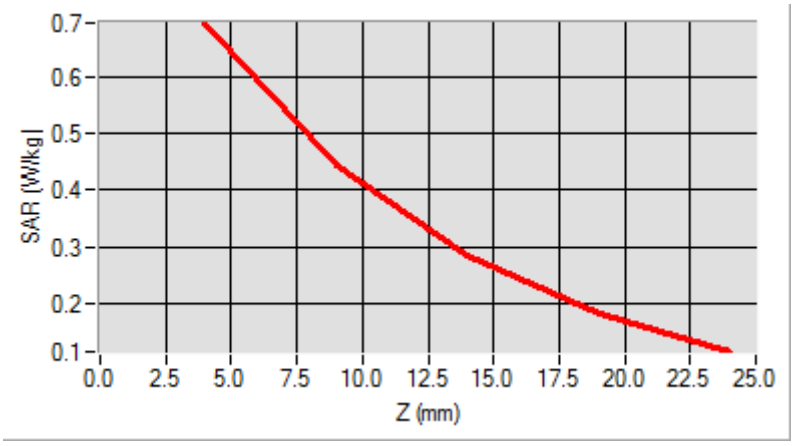
Frequency (MHz)	2510.000000
Relative Permittivity (real part)	52.010212
Conductivity (S/m)	1.910255
Power Variation (%)	3.672346
Ambient Temperature	21.1
Liquid Temperature	21.2

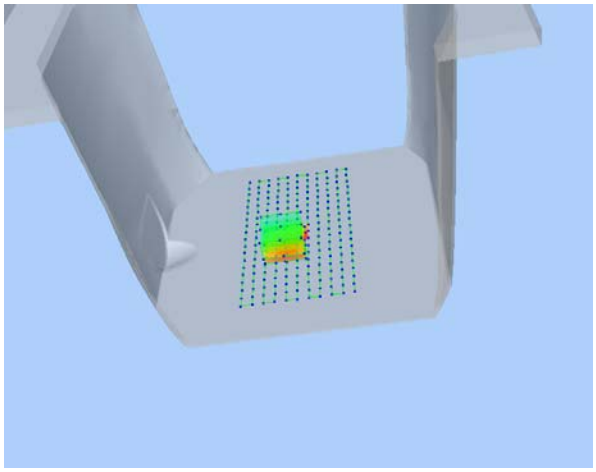
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-9.00, Y=-16.00

SAR 10g (W/Kg)	0.457581
SAR 1g (W/Kg)	0.717673

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6942	0.4430	0.2833	0.1835



3D screen shot	Hot spot position
	

MEASUREMENT 76

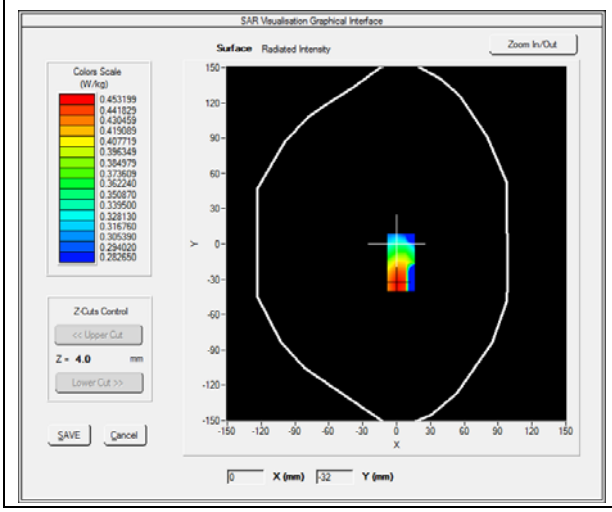
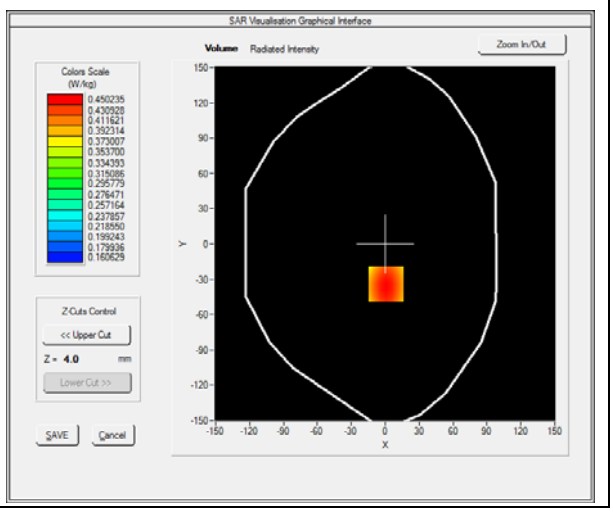
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2016

A. Experimental conditions

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

B. SAR Measurement Results

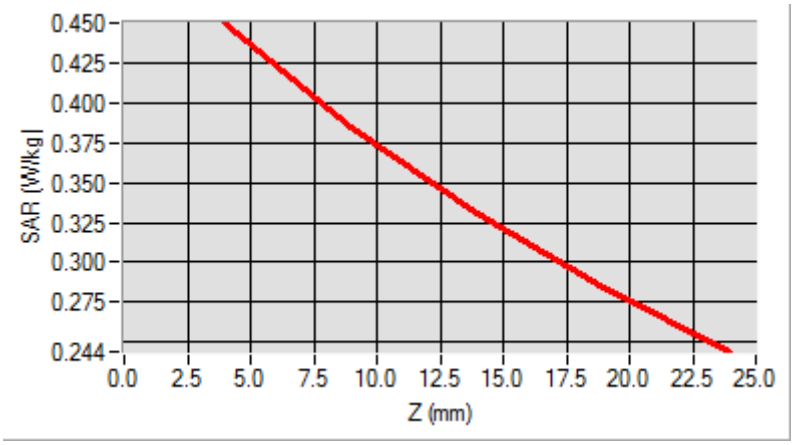
Frequency (MHz)	711.000000
Relative Permittivity (real part)	54.964739
Conductivity (S/m)	0.931048
Power Variation (%)	0.954431
Ambient Temperature	21.1
Liquid Temperature	21.3

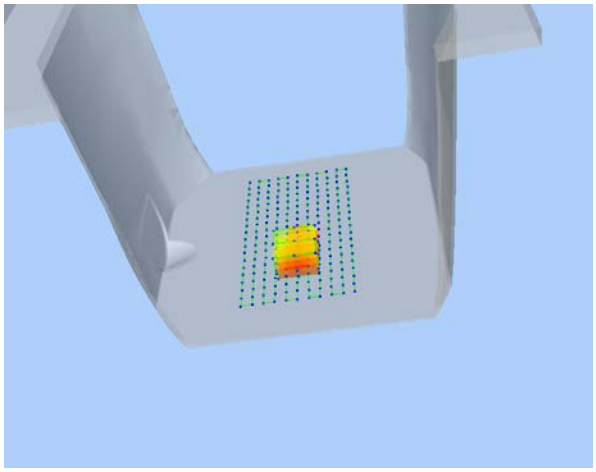
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=-34.00

SAR 10g (W/Kg)	0.362477
SAR 1g (W/Kg)	0.438553

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.4502	0.3853	0.3308	0.2847



3D screen shot	Hot spot position
	

MEASUREMENT 86

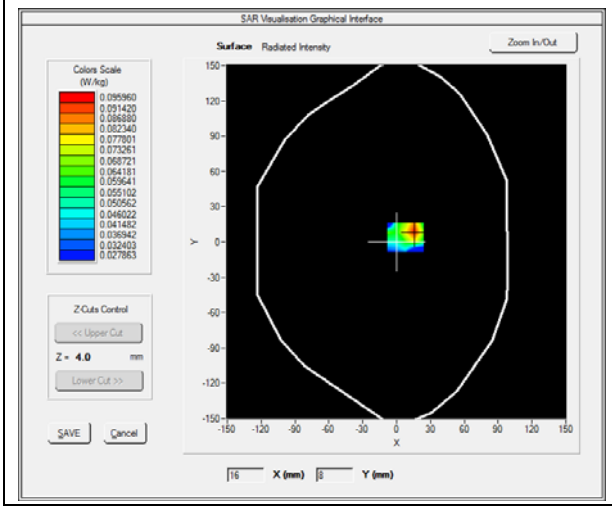
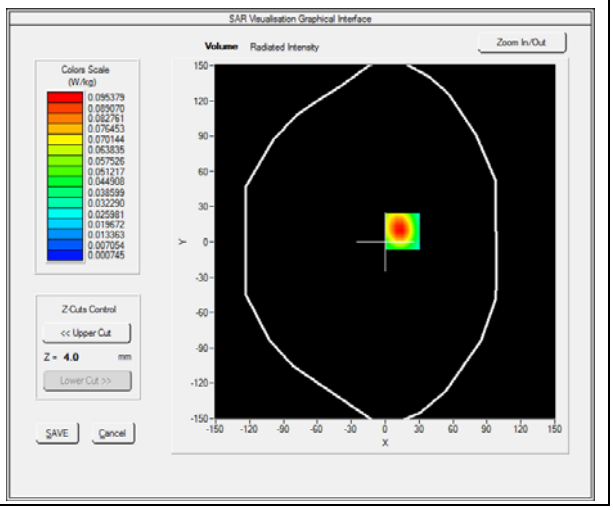
Type: Phone measurement (Complete)
Date of measurement: 04/10/2017
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2016

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

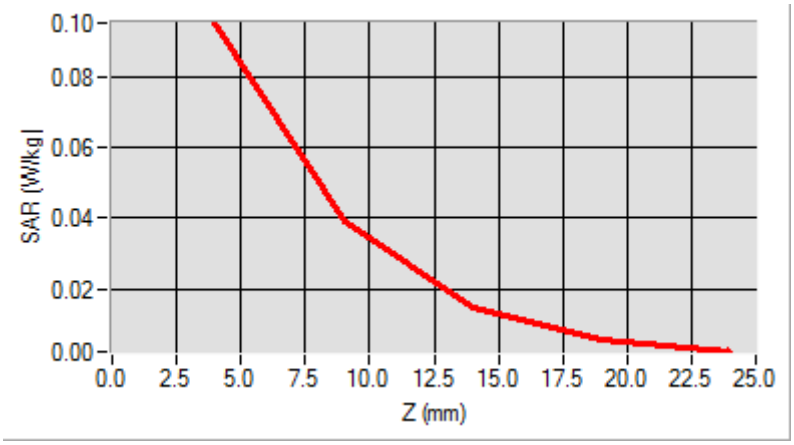
Frequency (MHz)	2462.000000
Relative Permittivity (real part)	52.010212
Conductivity (S/m)	1.910255
Power Variation (%)	2.492743
Ambient Temperature	21.1
Liquid Temperature	21.2

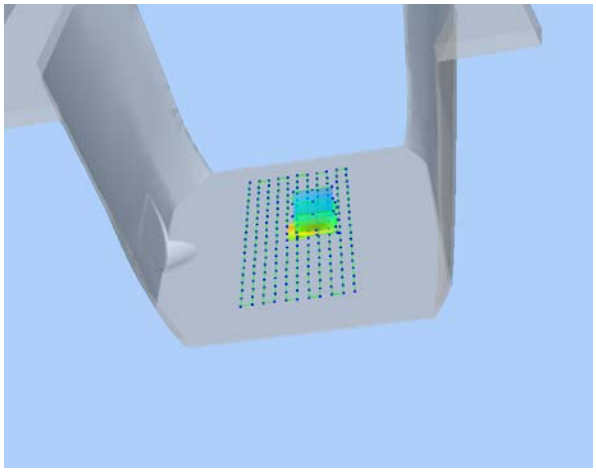
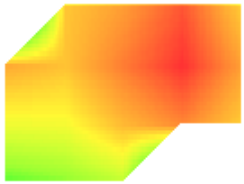
SURFACE SAR	VOLUME SAR
	

Maximum location: X=15.00, Y=9.00

SAR 10g (W/Kg)	**0.042193**
SAR 1g (W/Kg)	**0.089876**

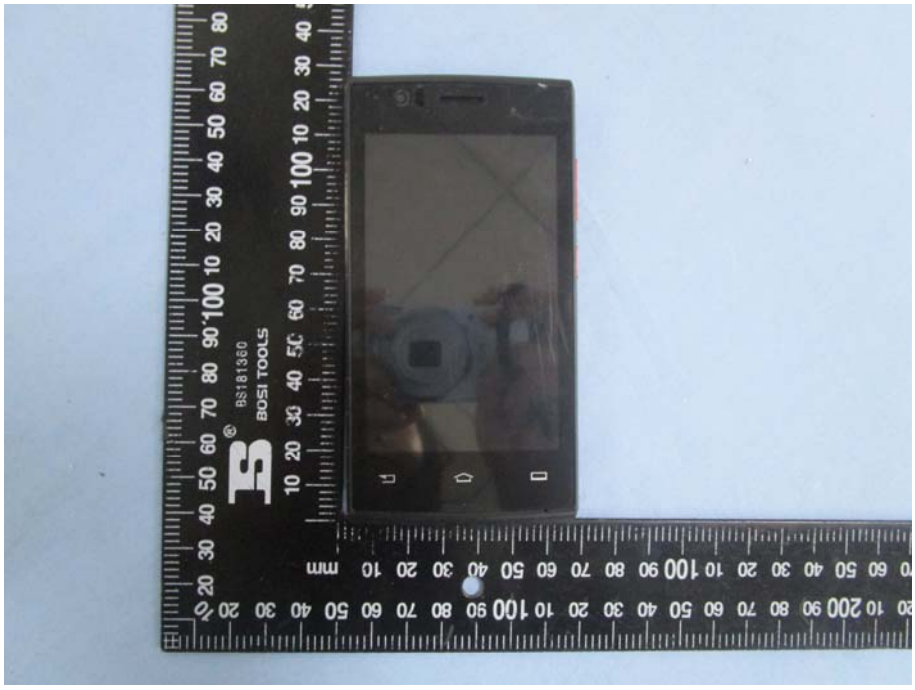
Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.0954**	**0.0390**	**0.0148**	**0.0059**



3D screen shot	**Hot spot position**
	

Annex C. EUT Photos

EUT View Front



EUT View Back

Antenna View

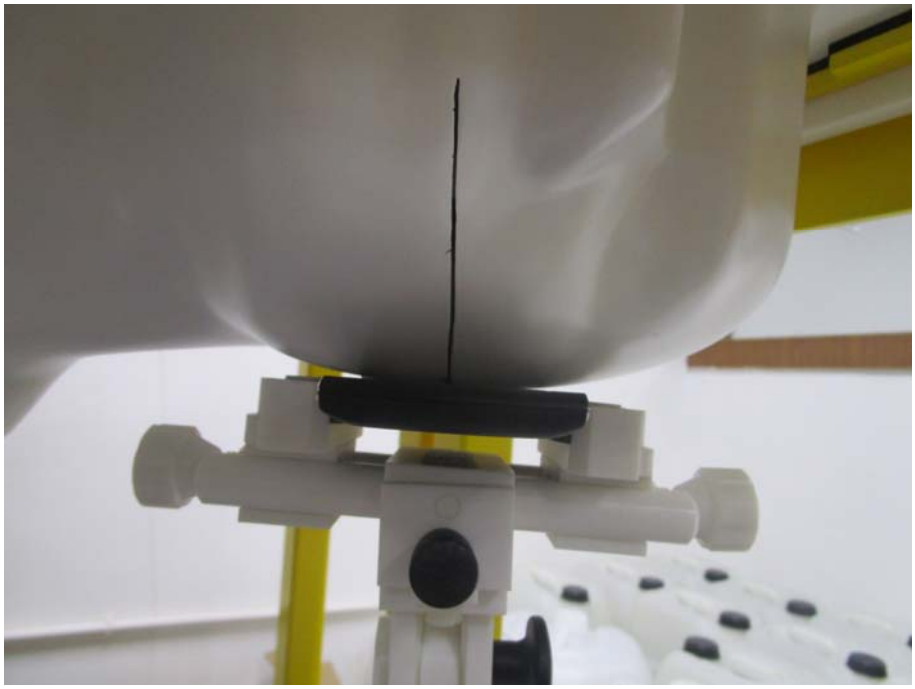
Annex D. Test Setup Photos

Head Exposure Conditions

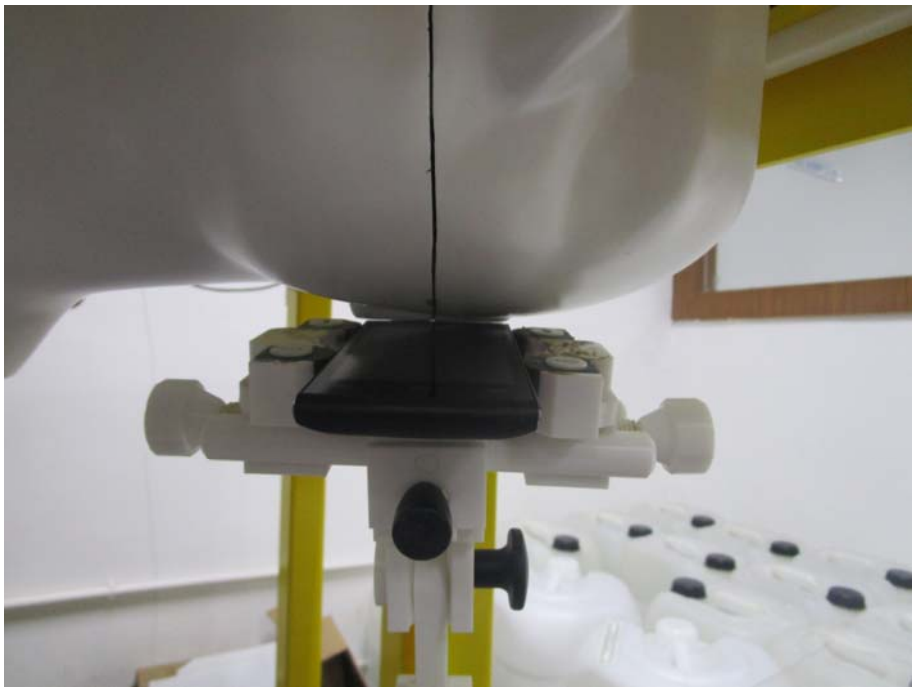
Cheek

Tilt

Cheek

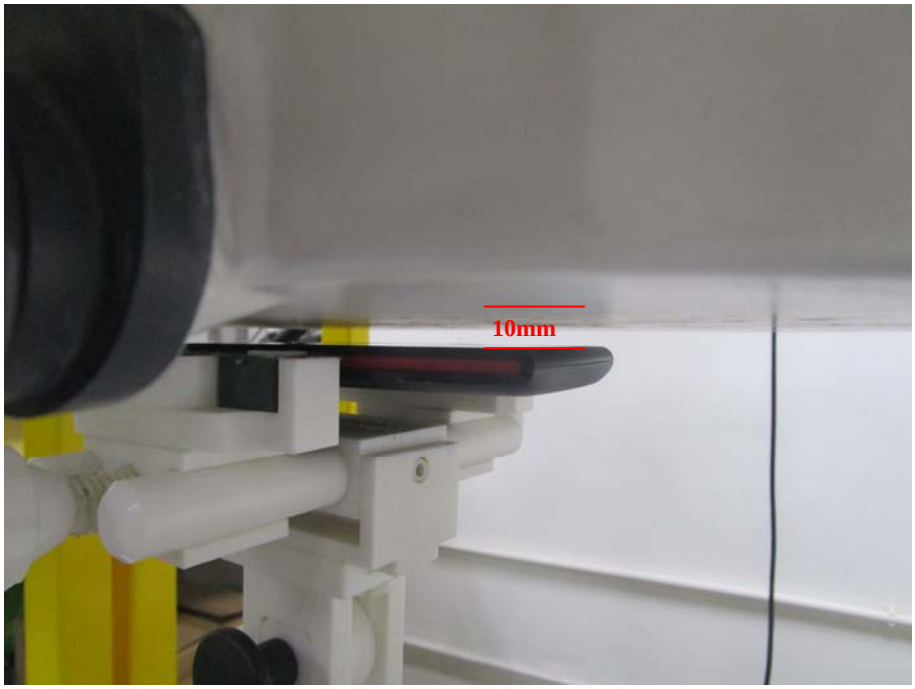


Tilt

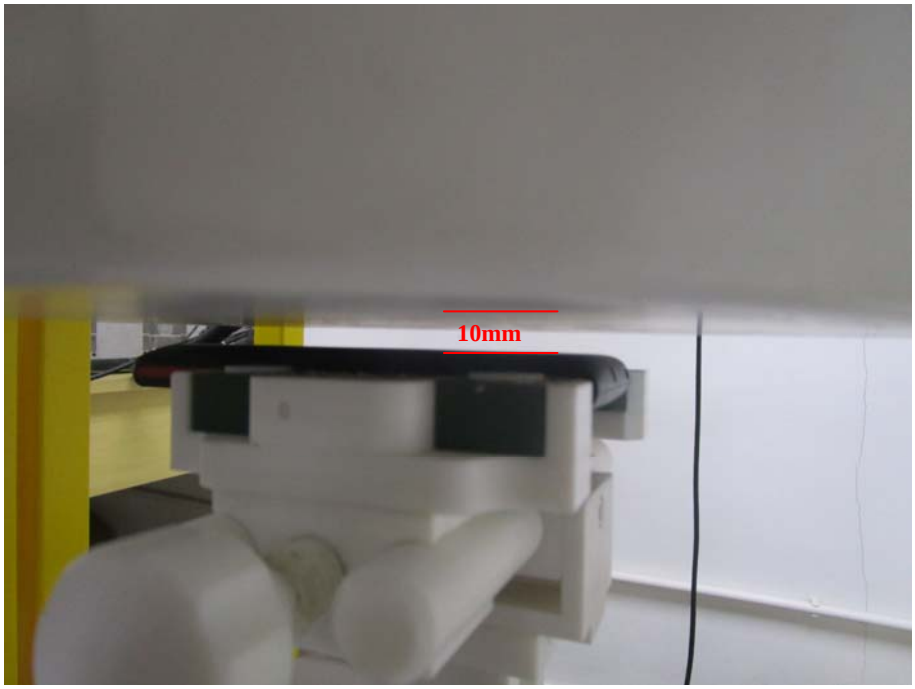


Body-worn & Hotspot mode Exposure Conditions

Body Front

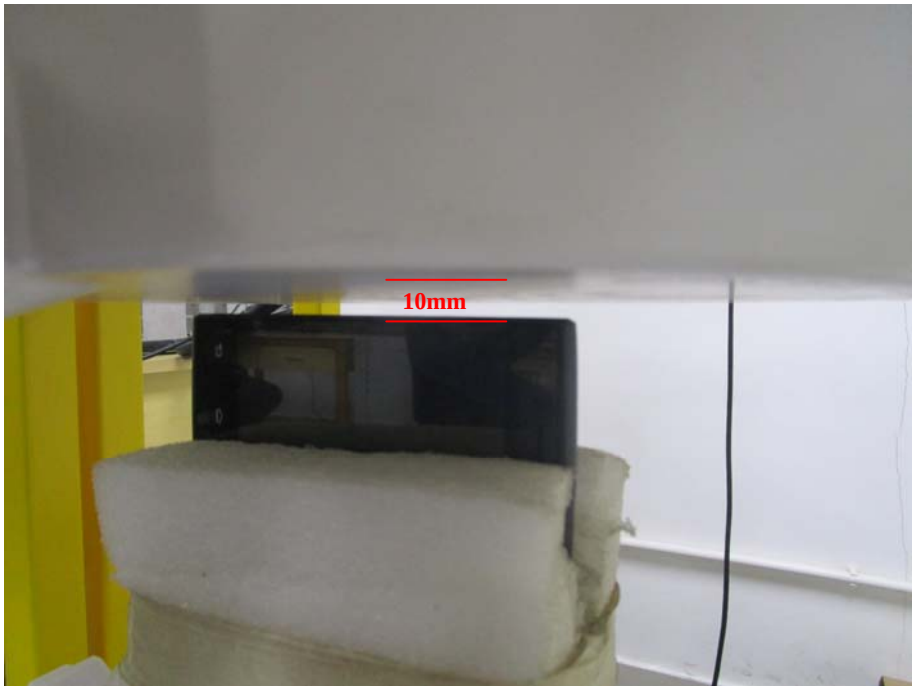


Body Back

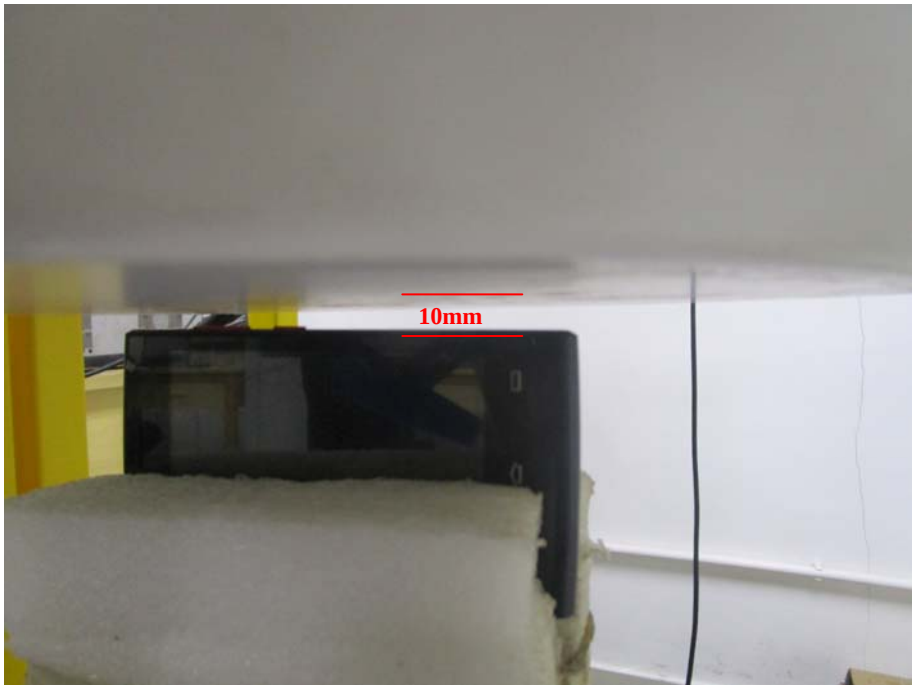


Hotspot Exposure Conditions

Body Left



Body Right



Body Top

Body Bottom

Annex E. Calibration Certificate

Please refer to the exhibit for the calibration certificate

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