SAR
Measurement and Test Report

For

Vonino Electronics LTD.

Miramar Tower 10F- NO.1010, 132 Nathan Road, Tsim Sha Tsui,

Kowloon, Hong Kong

Test Standards:	EN 62479 :2010 EN 62209-1 :2006 EN 62209-2 :2010 EN 50360 :2001+A1 :2012 EN 50566 :2013/AC :2014
Product Description:	Smart Phone
Models:	JAX S
Report No.:	STR16108061H
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Tested By:	Lucy Wei / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

Shenzhen SEM.Test Technology Co., Ltd.
1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C (518101)
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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1. General Information

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Vonino Electronics LTD.
Address of applicant:	Miramar Tower 10F- NO.1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer:	Shenzhen Fortuneship Technology Co., Ltd.
Address of manufacturer:	Room 701-716, 7th Floor, Kanghesheng Building, No.1 ChuangSheng Road, Nanshan District, Shenzhen, Guangdong, P. R. China

General Description of EUT	
Product Name:	Smart Phone
Brand Name:	VONINO
Model No.:	JAX S
Adding Model(s):	/
Software Version:	MEDIACOM_M_PPXG515_V01_20160409_171404_ZH066_CF9_KS671HD_DATAMATIC_W18_B65003_20160409_16G2G_64P8_DDR3_HD_W18_ALS_Hall_171404_OTA
Hardware Version:	ZH066V3.0
Rated Voltage:	DC 3.8V Rechargeable Li-Polymer Battery
Battery Capacity:	2000mAh
Note: Note: The test data is gathered from a production sample provided by the manufacturer.	
The product with two SIM , which the worst case is SIM1	

Technical Characteristics of EUT	
2G	
Support Networks:	GSM, GPRS
Support Bands:	GSM900, DCS1800
Frequency Range:	GSM900: Tx: 880-915MHz, Rx: 925-960MHz
	DCS1800: Tx: 1710-1785MHz, Rx: 1805-1880MHz
RF Output Power:	GSM900: 32.40dBm, GSM1800: 29.78dBm
Modulation Type:	GMSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM900: 0.3dBi, GSM1800: 0.6dBi
GPRS Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Bands:	WCDMA Band I, WCDMA Band 8
Frequency Range:	WCDMA Band I: Tx: 1920-1980MHz, Rx: 2110-2170MHz WCDMA Band 8: Tx: 880-915MHz, Rx: 925-960MHz
RF Output Power:	WCDMA Band I: 22.92dBm, WCDMA Band VIII: 22.52dBm
Modulation Type:	BPSK, QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band I:0.7dBi; WCDMA Band VIII: 0.3dBi
Bluetooth	
Bluetooth Version:	V4.0
Frequency Range:	2402-2480MHz
RF Output Power:	4.07dBm (EIRP)
Type of Modulation:	GFSK, Pi/4 DQPSK, 8DPSK
Data Rate:	1Mbps, 2Mbps, 3Mbps
Quantity of Channels	79/40
Channel Separation:	1MHz/2MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0.7dBi
Wi-Fi	
Support Standards:	802.11b, 802.11g, 802.11n-HT20,802.11n-HT40
Frequency Range:	2412-2472MHz for 802.11b/g/n(HT20) 2422-2462MHz for 802.11b/g/n(HT40)
RF Output Power:	15.21dBm (EIRP)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels	13 for 802.11b/g/n(HT20), 9 for 802.11b/g/n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0.68dBi

1.2 Test Standards

The following report is prepared on behalf of the Vonino Electronics LTD. in accordance with EN 50360 Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetics fields (300MHz – 3GHz), and EN 50566 Assessment of electronic and electrical equipment: related to human exposure restrictions for electromagnetic fields (0Hz – 300GHz), and IEEE 1528-2013. and EN 62479:2010, Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz).

The objective is to determine compliance with EN 50360, EN 50566 and EN 62479

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 standards EN 62209-1 and EN 62209-2 for SAR Measurement Procedure.

EN 62209-1 and EN 62209-2: Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –
Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

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 (5mm Gap)	Hotspot (5mm Gap)	SAR_{10g} Limit (W/kg)
	Maximum SAR_{10g} (W/kg)	Maximum SAR_{10g} (W/kg)	Maximum SAR_{10g} (W/kg)	
GSM900	0.507	0.491	0.646	2.0
GSM1800	0.282	1.025	**1.650**	2.0
WCDMA Band I	0.206	**1.489**	1.489	2.0
WCDMA Band VIII	**0.564**	0.578	0.578	2.0
WLAN 2.4GHz	0.181	0.080	0.080	2.0
Simultaneous Transmission	0.745	1.569	**1.730**	2.0

*The highest reported SAR values for head, body-worn accessory, wireless router(hotspot), and simultaneous transmission conditions are **0.564W/kg, 1.489W/kg, 1.650W/kg, and 1.730W/kg** respectively.*

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (2.0 W/kg) specified in Annex II of Council Recommendation 1999/519/EC, and had been tested in accordance with the measurement methods and procedure specified in IEEE 1528-2013, EN 62209-1 and EN 62209-2.

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.

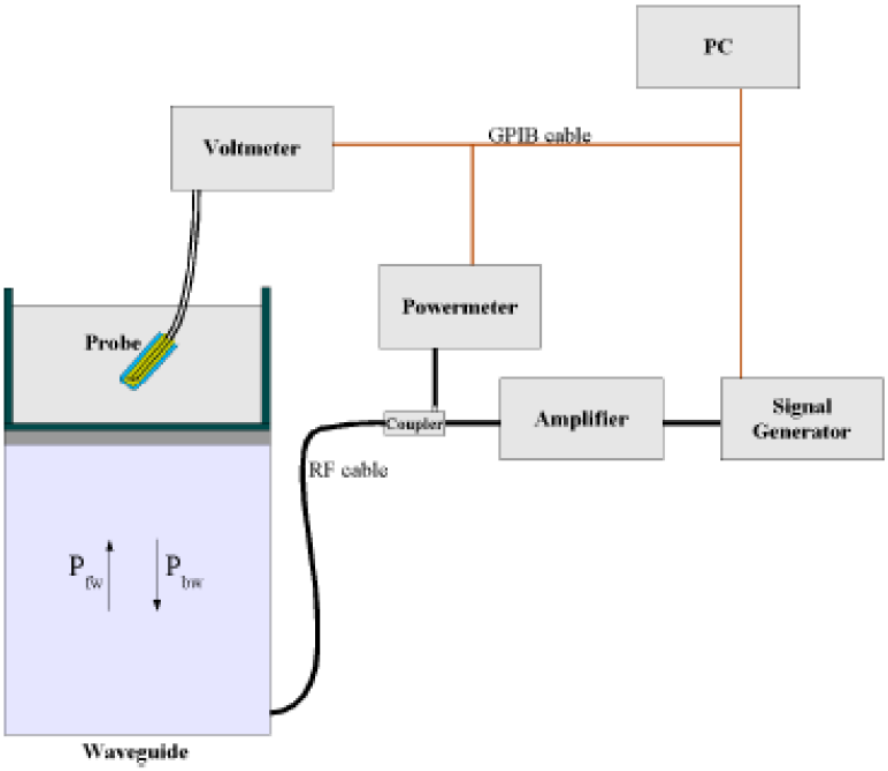
4.2 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 37/08 EP80 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter : 5 mm
- Distance between probe tip and sensor center: 2.10mm
- Distance between sensor center and the inner phantom surface: 4 mm (repeatability better than +/- 1mm)
- Probe linearity: ＜0.25 dB
- Axial Isotropy: ＜0.25 dB

- Spherical Isotropy: ＜0.50 dB
- Calibration range: 835 to 2500MHz 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.



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

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.

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

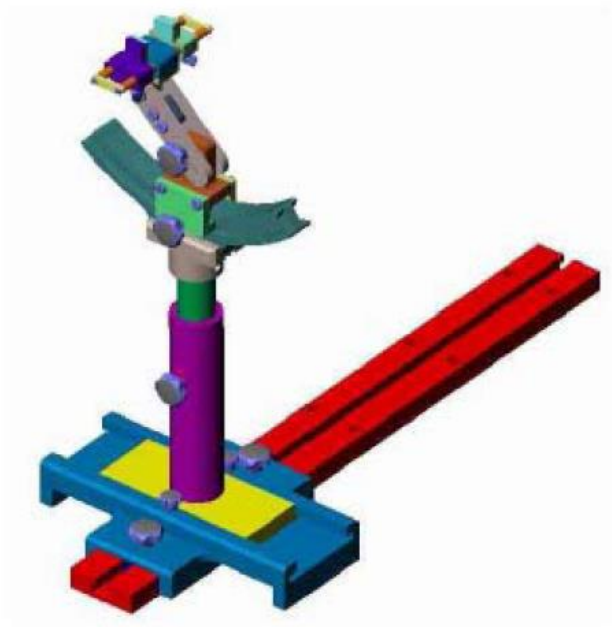
Where:
σ = simulated tissue conductivity,
ρ = Tissue density (1.25 g/cm3 for brain tissue)

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

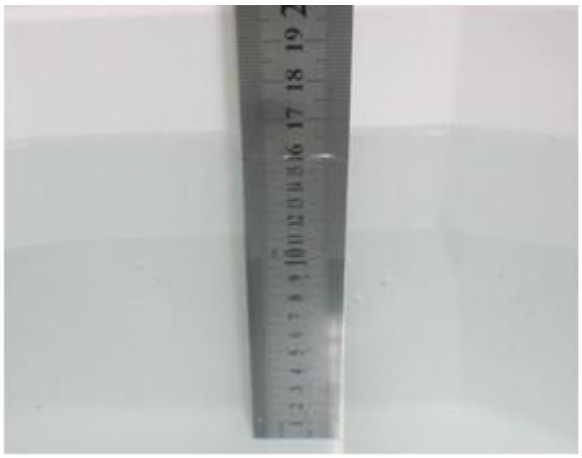
4.6 Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
E-Field Probe	SATIMO	SSE5	SN 09/13 EP168	2016-06-01	2017-05-31
900MHz Dipole	SATIMO	SID900	SN 47/12 DIP 0G900-205	2016-03-20	2017-03-19
1800MHz Dipole	SATIMO	SID1800	SN 47/12 DIP 1G800-206	2016-03-20	2017-03-19
2000MHz Dipole	SATIMO	SID2000	SN 47/12 DIP 2G000-208	2016-03-20	2017-03-19
2450MHz Dipole	SATIMO	SID2450	SN 13/15 DIP 2G450-364	2016-03-20	2017-03-19
Dielectric Probe	SATIMO	SCLMP	SN 47/12 OCPG49	2016-03-20	2017-03-19
SAM Phantom	SATIMO	SAM	SN/ 47/12 SAM95	N/A	N/A
Multi Meter	Keithley	Keithley 2000	4006367	2016-06-04	2017-06-03
Signal Generator	Rohde & Schwarz	SMR20	100047	2016-06-04	2017-06-03
Universal Tester	Rohde & Schwarz	CMU200	112012	2016-06-04	2017-06-03
Network Analyzer	HP	8753C	2901A00831	2016-06-04	2017-06-03
Data Acquisition Electronics	SATIMO	DAE4	915	2016-06-04	2017-06-03
Directional Couplers	Agilent	778D	20160	2016-06-04	2017-06-03

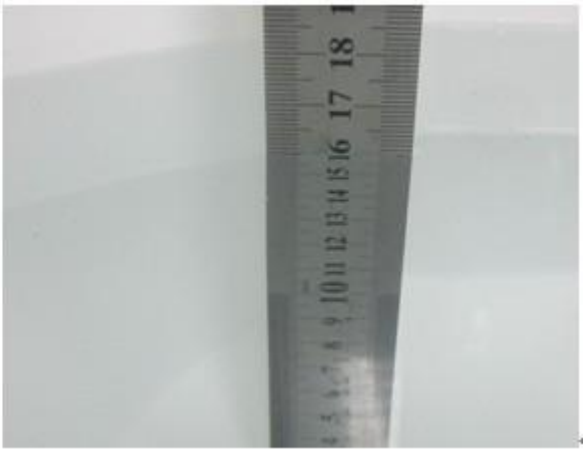
5. Tissue Simulating Liquids

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/ Body						
900	35.34	0.98	0.00	0.00	63.68	0.00
1800	55.19	0.66	30.35	0.00	0.00	13.80
2000	55.36	0.35	30.45	0.00	0.00	13.84
2450	55.44	0.32	30.50	0.00	0.00	13.74

5.2 Tissue Dielectric Parameters for Head and Body Phantoms

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

Target Frequency (MHz)	**Head/Body**	
	Conductivity (σ)	**Permittivity** (ε_r)
150	0.76	52.3
300	0.87	45.3
450	0.87	43.5
835	0.90	41.5
900	**0.97**	**41.5**
915	0.98	41.5
1450	1.20	40.5
1610	1.29	40.3
1800-2000	**1.40**	**40.0**
2450	**1.80**	**39.2**
3000	2.40	38.5
5800	5.27	35.3

5.3 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85033E Dielectric Probe Kit and an Agilent Network Analyzer.

Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Head/Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (℃)	Conductivity			Permittivity			Limit (%)	Date
		Reading (σ)	Target (σ)	Delta (%)	Reading (ε r)	Target (ε r)	Delta (%)		
900	21.2	1.01	0.97	4.12	39.5	41.5	-4.82	±5	2016-09-26
1800	21.3	1.37	1.40	-2.14	39.0	40.0	-2.50	±5	2016-09-26
2000	21.3	1.38	1.40	-1.43	38.9	40.0	-2.75	±5	2016-09-26
2450	21.3	1.76	1.80	-2.22	38.6	39.2	-1.53	±5	2016-09-26

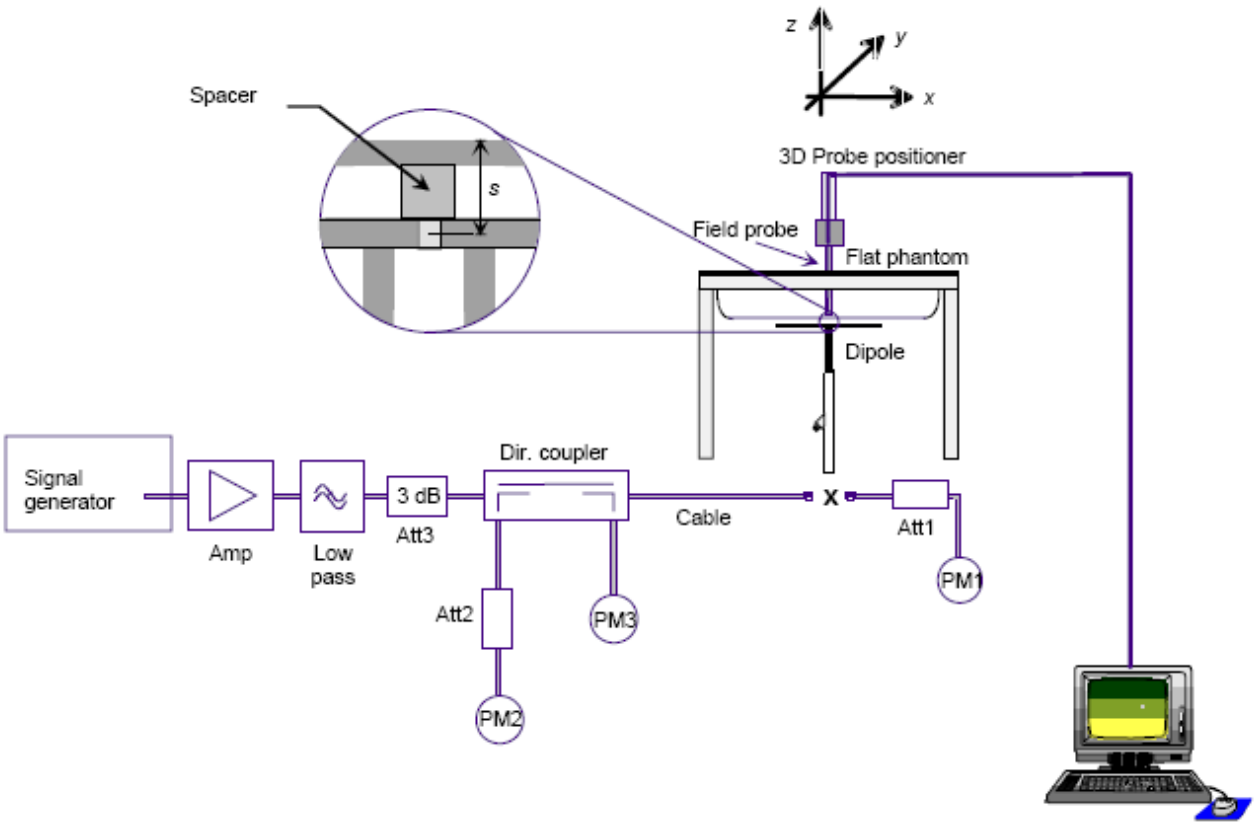
6. SAR Measurement Evaluation

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 900 MHz and 1800 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 %. The following table 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	Liquid	Targeted SAR_{10g}	Measured SAR_{10g}	Normalized SAR_{10g}	Tolerance	Date
MHz	(Head/Body)	(W/kg)	(W/kg)	(W/kg)	(%)	
900	Head/Body	6.83	1.72	6.88	0.73	2016-09-26
1800	Head/Body	20.33	5.15	20.6	1.33	2016-09-26
2000	Head/Body	21.53	5.38	21.52	-0.05	2016-09-26
2450	Head/Body	24.51	6.09	24.36	-0.61	2016-09-26

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.

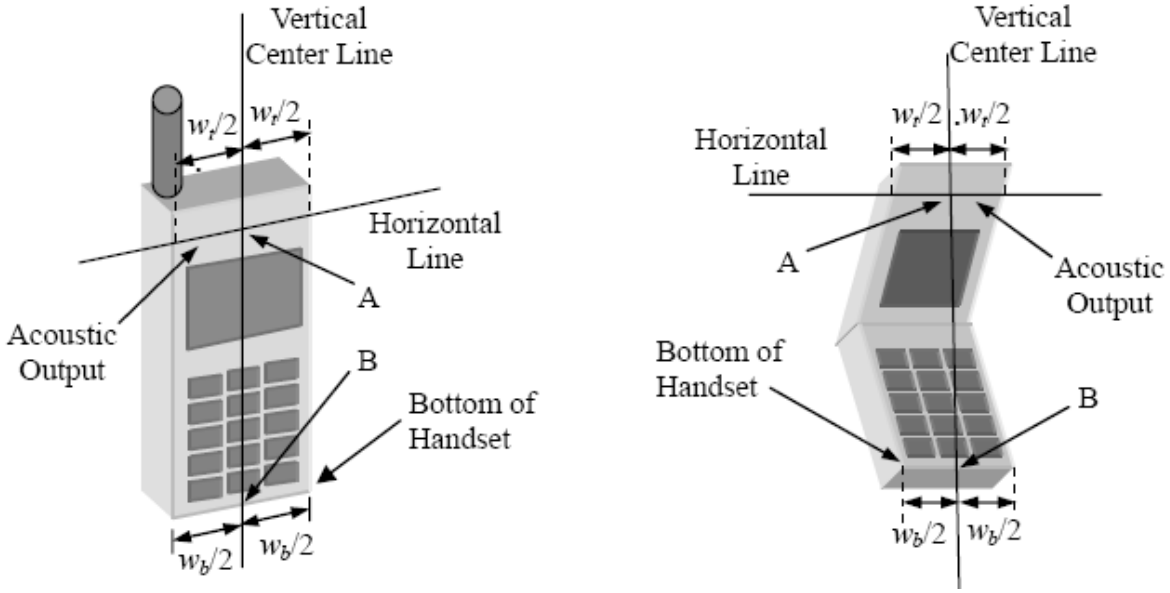


Fig 7.1 Illustration for Handset Vertical and Horizontal Reference Lines

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).

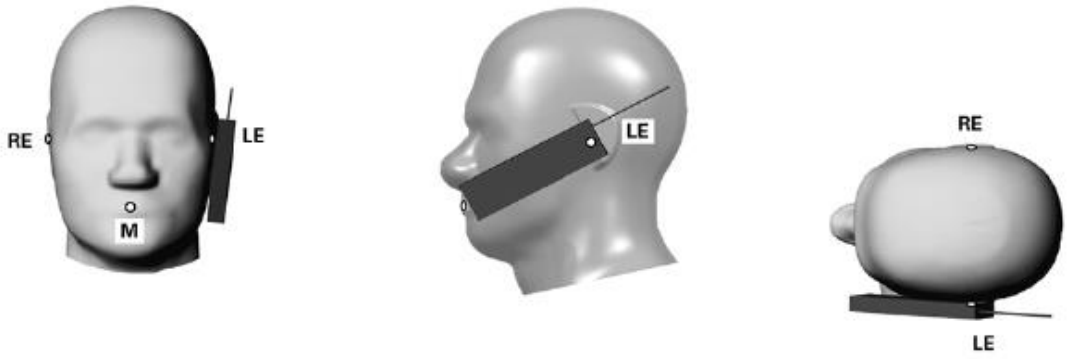


Fig 7.2 Illustration for Cheek Position

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).

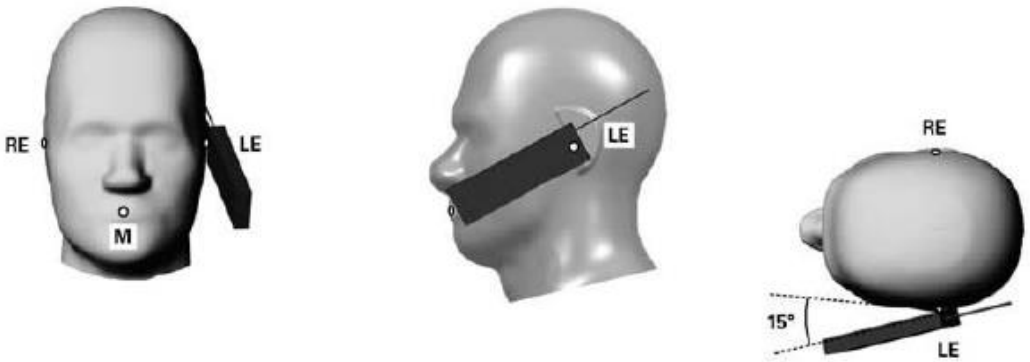


Fig 7.3 Illustration for Tilted Position

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 5mm.

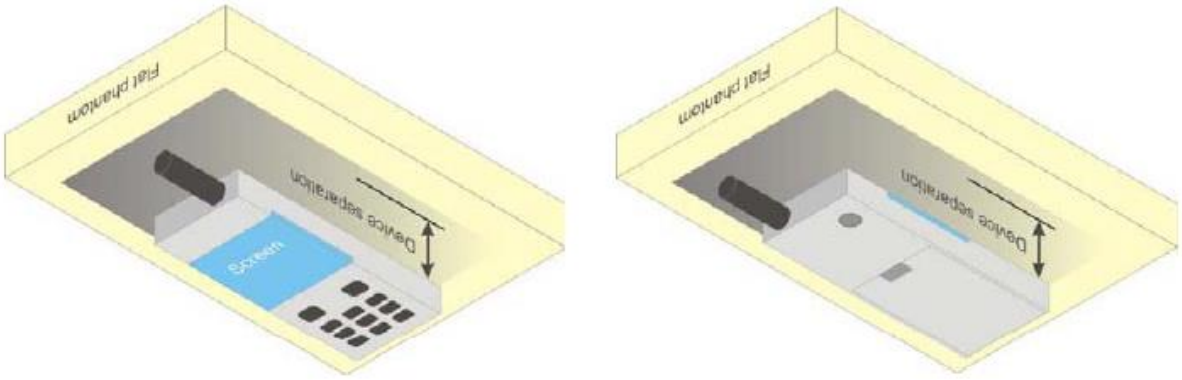


Fig 7.4 Illustration for Body Worn Position

"Note that a separation distance of 5mm between the phone and the body is used in the measurement conducted for body SAR. This distance represents a typical phone-skin distance when the phone is close to the body e.g. located in pants pocket taking into consideration typical average clothing fabric thickness"

7.5 EUT Antenna Position

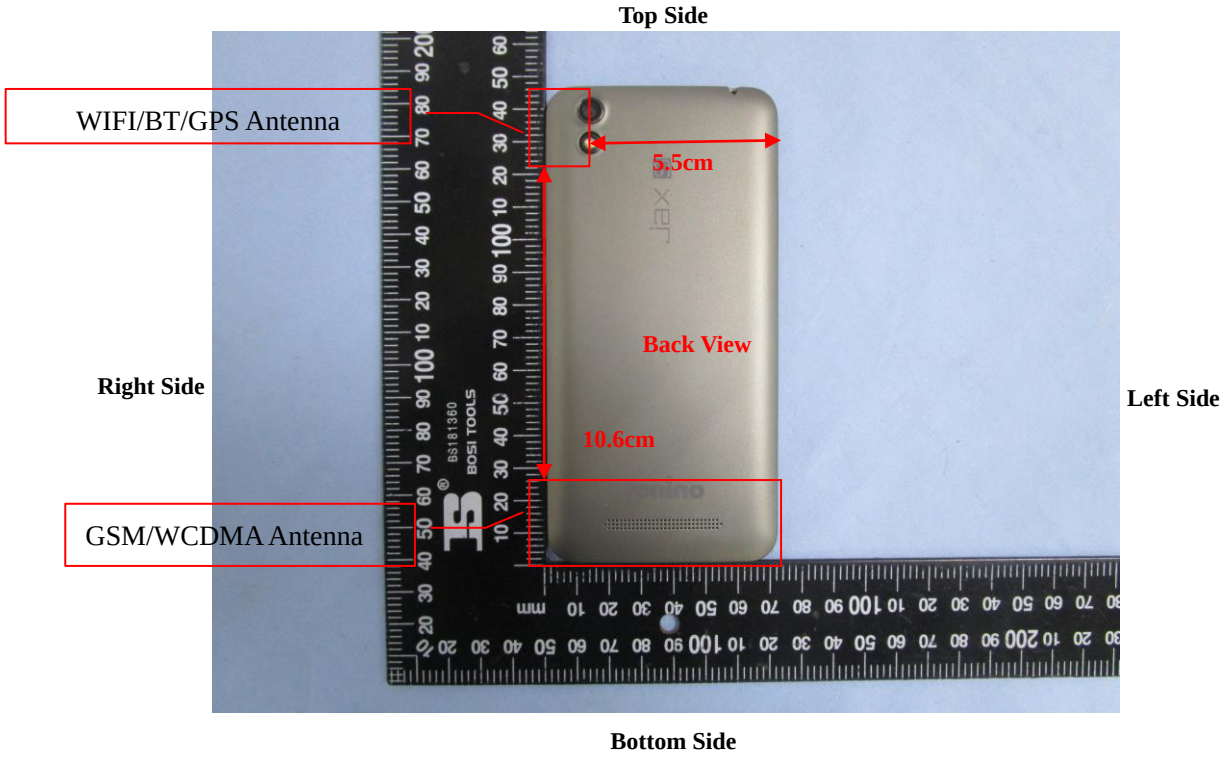


Fig 7.5 Block Diagram for EUT Antenna Position

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: 5mm						
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, Test distance: 5mm		
Antennas	**Front**	**Back**
WWAN	Yes	Yes
WLAN	Yes	Yes

Remark: Body-worn mode SAR is test with the Back side.

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

8. SAR Measurement Procedures

8.1 Measurement Procedures

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

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:
(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

8.2 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The SATIMO software includes all numerical procedures necessary to evaluate the spatial peak SAR value.
The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.
The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:
(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values 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	**GSM900**			**GSM1800**		
Channel	**975**	**37**	**124**	**512**	**698**	**885**
Frequency (MHz)	**880.2**	**897.4**	**914.8**	**1710.2**	**1747.4**	**1784.8**
GSM	32.40	32.32	32.3	28.09	29.25	29.78
GPRS (1 slot)	32.35	32.28	32.24	28.02	29.23	29.75
GPRS (2 slots)	31.42	31.28	31.26	27.27	28.37	28.89
GPRS (3 slots)	29.43	29.2	29.05	25.52	26.43	26.91
GPRS (4 slots)	28.09	27.79	27.59	24.35	25.17	25.65

GSM - Source-Based Time-Average Power (dBm)						
Band	**GSM900**			**GSM1800**		
Channel	**975**	**37**	**124**	**512**	**698**	**885**
Frequency (MHz)	**880.2**	**897.4**	**914.8**	**1710.2**	**1747.4**	**1784.8**
GSM	23.40	23.32	23.30	19.09	20.25	20.78
GPRS (1 slot)	23.35	23.28	23.24	19.02	20.23	20.75
GPRS (2 slots)	25.42	25.28	25.26	21.27	22.37	22.89
GPRS (3 slots)	25.18	24.95	24.80	21.27	22.18	22.66
GPRS (4 slots)	25.09	24.79	24.59	21.35	22.17	22.65
Note: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below: Source based time-average power = Burst averaged power - Duty cycle factor in dB Duty cycle factor = 9 dB for 1 Tx slot, 6 dB for 2 Tx slots, 4.25 dB for 3 Tx slots, 3 dB for 4 Tx slots						

Remark:

1. For Head SAR testing, GSM should be evaluated, therefore the EUT was set in GSM for GSM900 and GSM1800 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 (2Tx slots) for GSM900 and GSM1800 due to its highest source-based time-average power.
3. The DUT do not support DTM function.

WCDMA - Average Power (dBm)						
Band	**WCDMA Band I**			**WCDMA Band VIII**		
Channel	**9612**	**9750**	**9888**	**2712**	**2788**	**2863**
Frequency (MHz)	**1922.4**	**1950.0**	**1977.6**	**882.4**	**897.6**	**912.6**
RMC	22.67	22.92	22.17	22.52	22.26	21.99
HSDPA Subtest-1	21.79	21.97	21.05	21.65	21.54	21.23
HSDPA Subtest-2	21.37	21.89	21.12	21.38	21.56	21.01
HSDPA Subtest-3	21.69	21.72	21.03	21.64	21.21	21.01
HSDPA Subtest-4	21.94	21.87	21.13	21.83	21.16	21.03
HSUPA Subtest-1	21.23	21.98	21.03	21.66	21.51	21.13
HSUPA Subtest-2	21.25	21.92	21.11	21.18	21.86	21.05
HSUPA Subtest-3	21.39	21.63	21.15	21.17	21.98	21.17
HSUPA Subtest-4	21.27	21.94	21.15	21.41	21.12	21.18
HSUPA Subtest-5	21.14	21.81	21.1	21.91	21.7	21.16

Remark:

1. For Head SAR, per EN 62209-1, 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 EN 62209-2, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA subset-1 and HSUPA subset-5 output power is < 1/4 dB higher than RMC, and SAR with RMC 12.2kbps setting is 1.2W/kg, HSDPA and HSUPA SAR evaluation can be excluded.

WLAN - Maximum Average Power				
Test Mode	**Data Rate**	**Channel**	**Frequency (MHz)**	**Average Power (dBm)**
802.11b	1Mbps	CH 01	2412	14.36
		CH 07	2442	14.31
		CH 13	2472	14.53
802.11g	54Mbps	CH 01	2412	10.13
		CH 07	2442	11.8
		CH 13	2472	10.46
802.11n (20MHz)	MCS7	CH 01	2412	10.24
		CH 07	2442	11.77
		CH 13	2472	10.4
802.11n (40MHz)	MCS7	CH 03	2422	11.81
		CH 07	2442	11.93
		CH 11	2462	11.54

Remark:

1. Per EN 62209-1, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per EN 62209-1, if 11g and 11n average output power is higher than 1/4 dB higher than 11b mode, SAR will be verified.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate. For 802.11n mode, SAR test according to the highest power channel with correspondence data rates.

Bluetooth - Maximum Average Power		
Test Mode	**Data Rate**	**Average Power(dBm)**
GFSK	1Mbps	3.27
Pi/4 QDPSK	2Mbps	3.07
8DPSK	3Mbps	3.37

Bluetooth - Maximum Average Power				
Test Mode	**Data Rate**	**Channel**	**Frequency (MHz)**	**Average Power (dBm)**
BLE	1Mbps	CH 00	2402	-5.88
		CH 19	2440	-5.55
		CH 39	2480	-5.65

9.2 Test Results for Standalone SAR Test

Head SAR

GSM900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
1.	GSM	Right Cheek	37	897.4	32.32	32.5	1.0423	0.3466	0.3613
2.	GSM	Right Tilted	37	897.4	32.32	32.5	1.0423	0.1354	0.1411
3.	GSM	Left Cheek	37	897.4	32.32	32.5	1.0423	0.3624	0.3777
4.	GSM	Left Tilted	37	897.4	32.32	32.5	1.0423	0.1673	0.1744
5.	GSM	Left Cheek	975	880.2	32.40	32.5	1.0233	0.4951	0.5066
6.	GSM	Left Cheek	124	914.8	32.3	32.5	1.0471	0.3364	0.3523

GSM1800 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
7.	GSM	Right Cheek	698	1747.4	29.25	30.0	1.1885	0.1781	0.2117
8.	GSM	Right Tilted	698	1747.4	29.25	30.0	1.1885	0.0875	0.1040
9.	GSM	Left Cheek	698	1747.4	29.25	30.0	1.1885	0.1869	0.2221
10.	GSM	Left Tilted	698	1747.4	29.25	30.0	1.1885	0.1076	0.1279
11.	GSM	Left Cheek	512	1710.2	28.09	30.0	1.5524	0.1814	0.2816
12.	GSM	Left Cheek	885	1784.8	29.78	30.0	1.0520	0.1389	0.1461

WCDMA Band I – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
13.	RMC	Right Cheek	9750	1950.0	22.92	23.0	1.0186	0.1558	0.1587
14.	RMC	Right Tilted	9750	1950.0	22.92	23.0	1.0186	0.0755	0.0769
15.	RMC	Left Cheek	9750	1950.0	22.92	23.0	1.0186	0.2026	0.2064
16.	RMC	Left Tilted	9750	1950.0	22.92	23.0	1.0186	0.1028	0.1047
17.	RMC	Left Cheek	9612	1922.4	22.67	23.0	1.0789	0.1648	0.1778
18.	RMC	Left Cheek	9888	1977.6	22.17	23.0	1.2106	0.1301	0.1575

WCDMA Band VIII– Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
19.	RMC	Right Cheek	2788	897.6	22.26	23.0	1.1858	0.4501	0.5337
20.	RMC	Right Tilted	2788	897.6	22.26	23.0	1.1858	0.1948	0.2310
21.	RMC	Left Cheek	2788	897.6	22.26	23.0	1.1858	0.4753	0.5636
22.	RMC	Left Tilted	2788	897.6	22.26	23.0	1.1858	0.2182	0.2587
23.	RMC	Left Cheek	2712	882.4	22.52	23.0	1.1169	0.4725	0.5277
24.	RMC	Left Cheek	2863	912.6	21.99	23.0	1.2618	0.3426	0.4323

WIFI– Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
25.	802.11b	Right Cheek	07	2442	14.31	15.0	1.1722	0.0638	0.0748
26.	802.11b	Right Tilted	07	2442	14.31	15.0	1.1722	0.0356	0.0417
27.	802.11b	Left Cheek	07	2442	14.31	15.0	1.1722	0.1321	0.1548
28.	802.11b	Left Tilted	07	2442	14.31	15.0	1.1722	0.0754	0.0884
29.	802.11b	Left Cheek	01	2412	14.36	15.0	1.1588	0.1164	0.1349
30.	802.11b	Left Cheek	13	2472	14.53	15.0	1.1143	0.1628	0.1814

Body-worn SAR

GSM900 –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
31.	GSM	Body-worn	37	897.4	32.32	32.5	1.0423	0.4290	0.4472
32.	GSM	Body-worn	975	880.2	32.40	32.5	1.0233	0.4794	0.4906
33.	GSM	Body-worn	124	914.8	32.3	32.5	1.0471	0.3917	0.4102

GSM1800 –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
34.	GSM	Body-worn	698	1747.4	29.25	30.0	1.1885	0.8627	1.0253
35.	GSM	Body-worn	512	1710.2	28.09	30.0	1.5524	0.5265	0.8173
36.	GSM	Body-worn	885	1784.8	29.78	30.0	1.0520	0.7821	0.8227

WCDMA Band I– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
55	RMC	Body-worn	9750	1950.0	22.92	23.0	1.0186	1.4617	1.4889
56	RMC	Body-worn	9612	1922.4	22.67	23.0	1.0789	1.3442	1.4503
57	RMC	Body-worn	9888	1977.6	22.17	23.0	1.2106	1.0743	1.3005

WCDMA Band VIII– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
58	RMC	Body-worn	2788	897.6	22.26	23.0	1.1858	0.4873	0.5778
63	RMC	Body-worn	2712	882.4	22.52	23.0	1.1169	0.4863	0.5431
64	RMC	Body-worn	2863	912.4	21.99	23.0	1.2618	0.3637	0.4589

WLAN 2.4GHz– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
65	802.11b	Body-worn	07	2442	14.31	15.0	1.1722	0.0368	0.0431
69	802.11b	Body-worn	01	2412	14.36	15.0	1.1588	0.0189	0.0219
70	802.11b	Body-worn	13	2472	14.53	15.0	1.1143	0.0716	0.0798

Hotspot SAR

GSM900 –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
37.	GPRS_2TX	Back side	37	897.4	31.28	31.5	1.0520	0.5527	0.5814
38.	GPRS_2TX	Front side	37	897.4	31.28	31.5	1.0520	0.4128	0.4342
39.	GPRS_2TX	Right side	37	897.4	31.28	31.5	1.0520	0.2173	0.2286
40.	GPRS_2TX	Left side	37	897.4	31.28	31.5	1.0520	0.1947	0.2048
41.	GPRS_2TX	Bottom side	37	897.4	31.28	31.5	1.0520	0.2507	0.2637
42.	GPRS_2TX	Back side	975	880.2	31.42	31.5	1.0186	0.6337	0.6455
43.	GPRS_2TX	Back side	124	914.8	31.26	31.5	1.0568	0.5439	0.5748

GSM1800 –Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
44.	GPRS_2TX	Back side	698	1747.4	28.37	29.0	1.1561	1.2890	1.4902
45.	GPRS_2TX	Front side	698	1747.4	28.37	29.0	1.1561	0.8398	0.9709
46.	GPRS_2TX	Right side	698	1747.4	28.37	29.0	1.1561	0.3154	0.3646
47.	GPRS_2TX	Left side	698	1747.4	28.37	29.0	1.1561	0.2156	0.2493
48.	GPRS_2TX	Bottom side	698	1747.4	28.37	29.0	1.1561	0.4432	0.5124
49.	GPRS_2TX	Back side	512	1710.2	27.27	29.0	1.4894	1.1079	1.6501
50.	GPRS_2TX	Back side	885	1784.8	28.89	29.0	1.0257	1.0732	1.1007

WCDMA Band I– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
51.	RMC	Back	9750	1950.0	22.92	23.0	1.0186	1.4603	1.4874
52.	RMC	Front	9750	1950.0	22.92	23.0	1.0186	1.0058	1.0245
53.	RMC	Right side	9750	1950.0	22.92	23.0	1.0186	0.3378	0.3441
54.	RMC	Left side	9750	1950.0	22.92	23.0	1.0186	0.2847	0.2900
55.	RMC	Bottom Side	9750	1950.0	22.92	23.0	1.0186	1.4617	1.4889
56.	RMC	Bottom Side	9612	1922.4	22.67	23.0	1.0789	1.3442	1.4503
57.	RMC	Bottom Side	9888	1977.6	22.17	23.0	1.2106	1.0743	1.3005

WCDMA Band VIII– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
58.	RMC	Back	2788	897.6	22.26	23.0	1.1858	0.4873	0.5778
59.	RMC	Front	2788	897.6	22.26	23.0	1.1858	0.4015	0.4761
60.	RMC	Right Side	2788	897.6	22.26	23.0	1.1858	0.2108	0.2500
61.	RMC	Left Side	2788	897.6	22.26	23.0	1.1858	0.1754	0.2080
62.	RMC	Bottom Side	2788	897.6	22.26	23.0	1.1858	0.2355	0.2792
63.	RMC	Back	2712	882.4	22.52	23.0	1.1169	0.4863	0.5431
64.	RMC	Back	2863	912.4	21.99	23.0	1.2618	0.3637	0.4589

WLAN 2.4GHz– Body SAR Test									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR10g (W/kg)	Scaled SAR10g (W/kg)
			CH.	MHz					
65.	802.11b	Back side	07	2442	14.31	15.0	1.1722	0.0368	0.0431
66.	802.11b	Front side	07	2442	14.31	15.0	1.1722	0.0250	0.0293
67.	802.11b	Top side	07	2442	14.31	15.0	1.1722	0.0079	0.0093
68.	802.11b	Right side	07	2442	14.31	15.0	1.1722	0.0107	0.0125
69.	802.11b	Back side	01	2412	14.36	15.0	1.1588	0.0189	0.0219
70.	802.11b	Back side	13	2472	14.53	15.0	1.1143	0.0716	0.0798

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 (Data) + WLAN(Data)	-	-	Yes
3	WCDMA(Voice) + WLAN(Data)	Yes	Yes	-
4	HSDPA(Data) + WLAN(Data)	-	-	Yes
5	HSUPA(Data) + WLAN(Data)	-	-	Yes
6	GSM(Voice) + Bluetooth(Data)	Yes	Yes	-
7	GPRS (Data) + Bluetooth(Data)	-	-	Yes
8	WCDMA(Voice) + Bluetooth(Data)	Yes	Yes	-
9	HSDPA(Data) + Bluetooth(Data)	-	-	Yes
10	HSUPA(Data) + Bluetooth(Data)	-	-	Yes

Remark:

One way of determining the threshold power level available to the secondary transmitter ($P_{available}$) is to calculate it from the measured peak spatial-average SAR of the primary transmitter (SAR_1) according to the equation:

$$P_{available} = P_{th,m} \times (SAR_{lim} - SAR_1) / SAR_{lim}$$

where $P_{th,m}$ is the threshold exclusion power level taken from Annex B of IEC 62479[7] for the frequency of the secondary transmitter at the separation distance used in the testing.

For simultaneous transmission analysis, Bluetooth SAR is below:

Bluetooth:

Average Power (dBm)	Output Power (mW)	$P_{th,m}$ (mw)	SAR_{lim} (W/kg)	SAR_1 (W/kg)	$P_{available}$ (mw)
3.37	2.17	20	2.0	1.6501	3.499

The Bluetooth output power of the secondary transmitter is less than $P_{available}$, So SAR measurement for the secondary transmitter is not necessary.

Maximum SAR value and the sum of the 10-g SAR for WWAN & RLAN

WWAN			WLAN		Max. SAR Sum (W/kg)	Scaled SAR Sum (W/kg)
WWAN Band	Max. SAR (W/kg)	Scaled SAR (W/kg)	Max. SAR (W/kg)	Scaled SAR (W/kg)		
Head						
GSM900	0.4951	0.5066	0.1628	0.1814	0.6579	0.688
GSM1800	0.1814	0.2816	0.1628	0.1814	0.3442	0.463
WCDMA Band I	0.2026	0.2064	0.1628	0.1814	0.3654	0.3878
WCDMA Band VIII	0.4753	0.5636	0.1628	0.1814	0.6381	0.745
Body-worn SAR						
GSM900	0.4794	0.4906	0.0716	0.0798	0.551	0.5704
GSM1800	0.8627	1.0253	0.0716	0.0798	0.9343	1.1051
WCDMA Band I	1.4617	1.4889	0.0716	0.0798	1.5333	1.5687
WCDMA Band VIII	0.4873	0.5778	0.0716	0.0798	0.5589	0.6576
Hotspot SAR						
GSM900	0.6337	0.6455	0.0716	0.0798	0.7053	0.7253
GSM1800	1.1079	1.6501	0.0716	0.0798	1.1795	1.7299
WCDMA Band I	1.4617	1.4889	0.0716	0.0798	1.5333	1.5687
WCDMA Band VIII	0.4873	0.5778	0.0716	0.0798	0.5589	0.6576

Remark:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. GSM and WCDMA share the same antenna, and cannot transmit simultaneously.
3. The maximum SAR summation is calculated based on the same configuration and test position.
4. If 10g-SAR scalar summation < 2.0W/kg, simultaneous SAR measurement is not necessary.

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

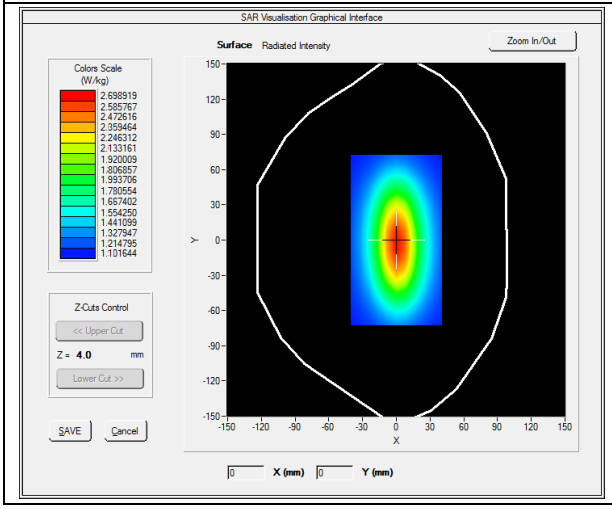
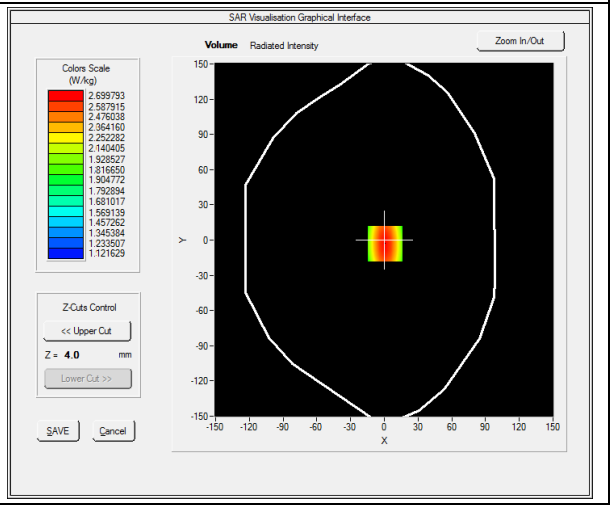
Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 21 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW900
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	900.000000
Relative Permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Power Variation (%)	1.856850
Ambient Temperature	21.1
Liquid Temperature	21.2

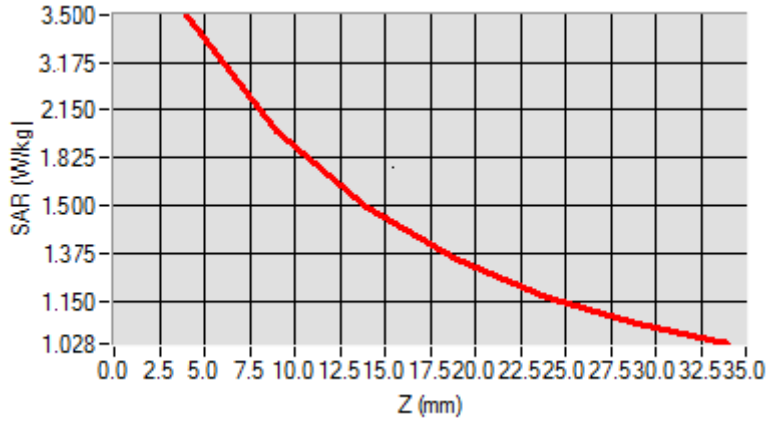
SURFACE SAR	VOLUME SAR
	

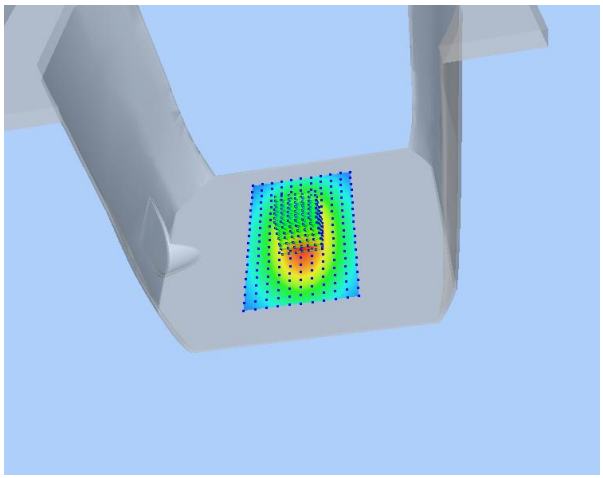
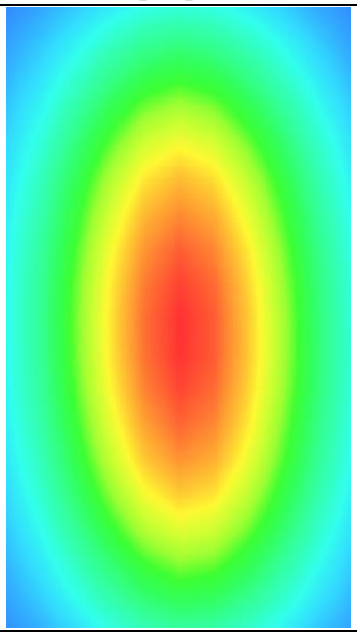
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	**1.722021**
SAR 1g (W/Kg)	**2.742150**

Z Axis Scan

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**	**24.00**	**29.00**
SAR (W/Kg)	**0.0000**	**3.2725**	**2.6125**	**2.01258**	**1.6112**	**1.1210**	**1.0492s**



3D screen shot	**Hot spot position**
	

MEASUREMENT 2

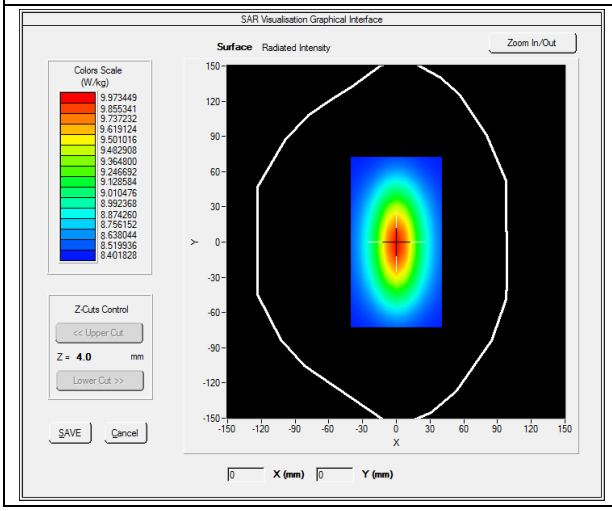
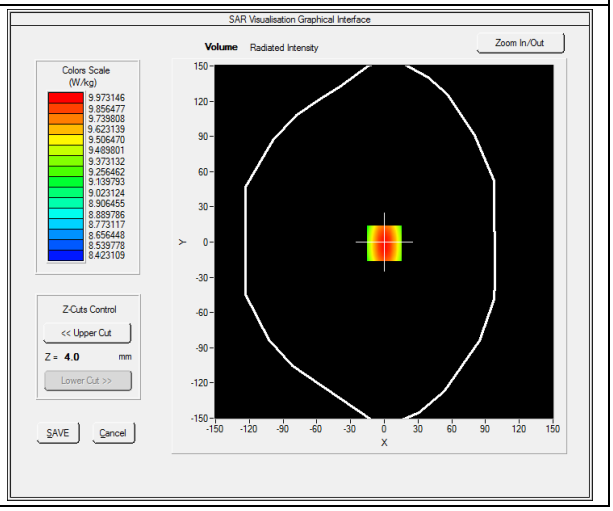
Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 21 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 2016/06/01

A. Experimental conditions

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

B. SAR Measurement Results

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

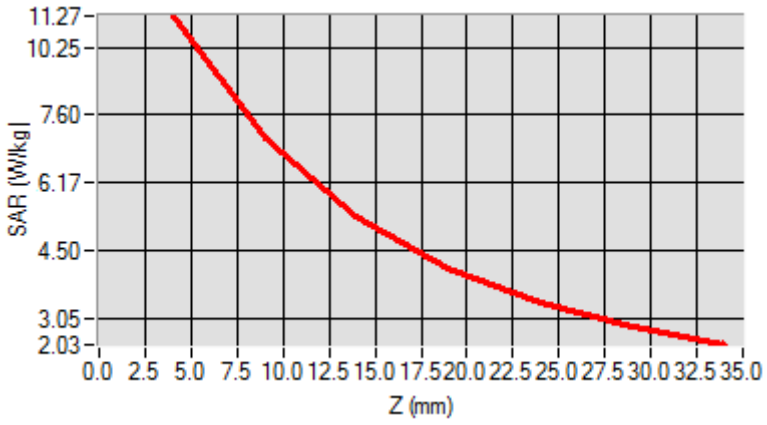
SURFACE SAR	VOLUME SAR
	

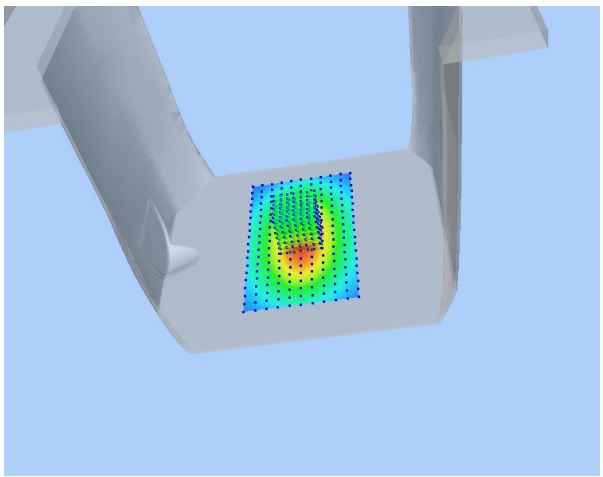
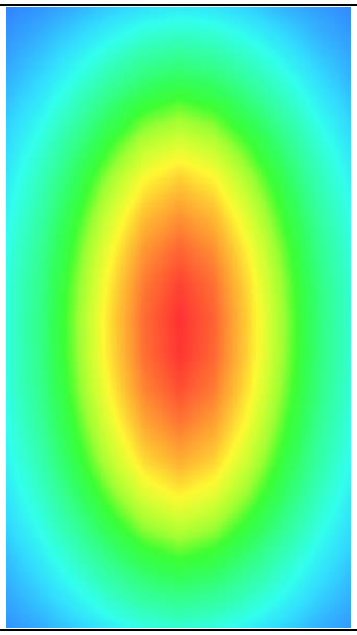
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.151252
SAR 1g (W/Kg)	8.701250

Z Axis Scan

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



3D screen shot	Hot spot position
	

MEASUREMENT 3

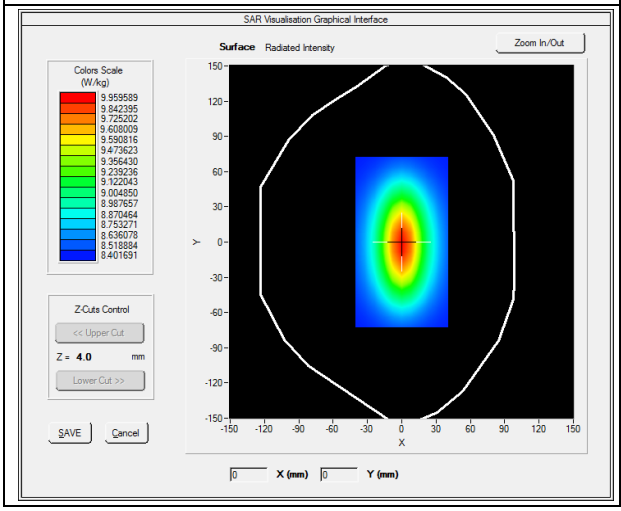
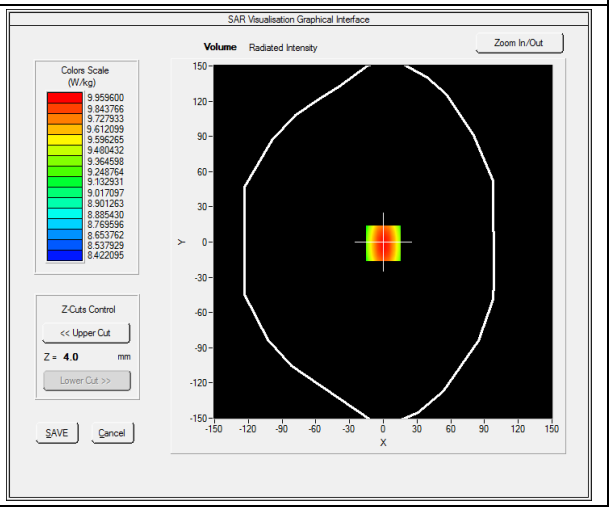
Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 21 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.76; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2000
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	2000.00000
Relative Permittivity (real part)	38.912500
Conductivity (S/m)	1.381250
Power Variation (%)	1.457347
Ambient Temperature	21.1
Liquid Temperature	21.2

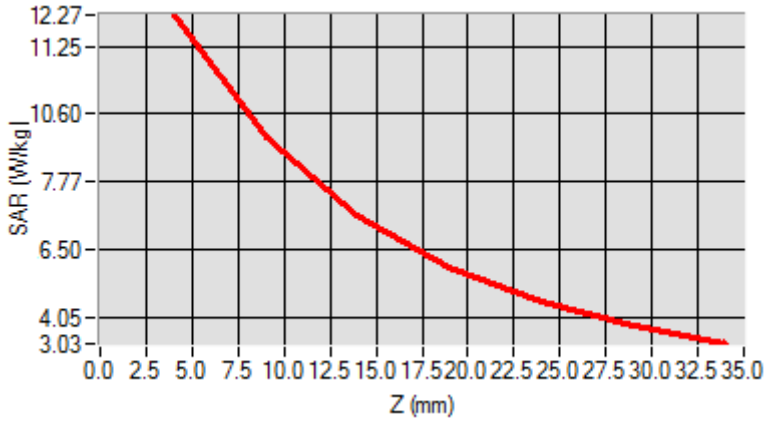
SURFACE SAR	VOLUME SAR
	

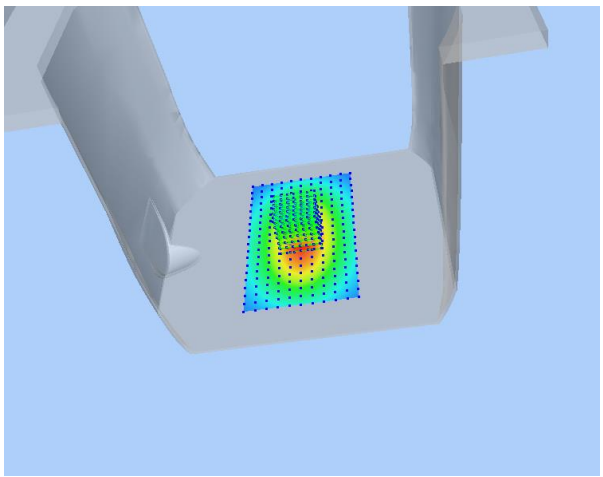
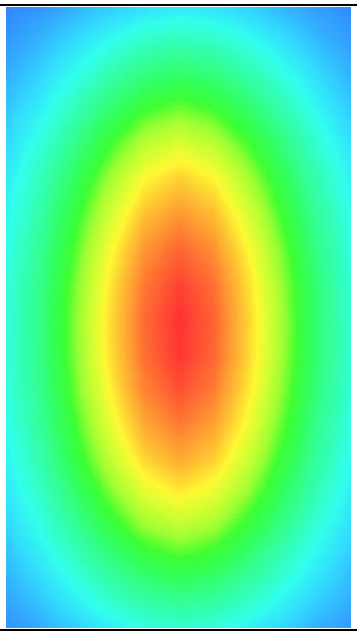
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	5.381250
SAR 1g (W/Kg)	8.901250

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	12.1250	10.3114	8.4212	6.4041	5.3425	3.3642



3D screen shot	Hot spot position
	

MEASUREMENT 4

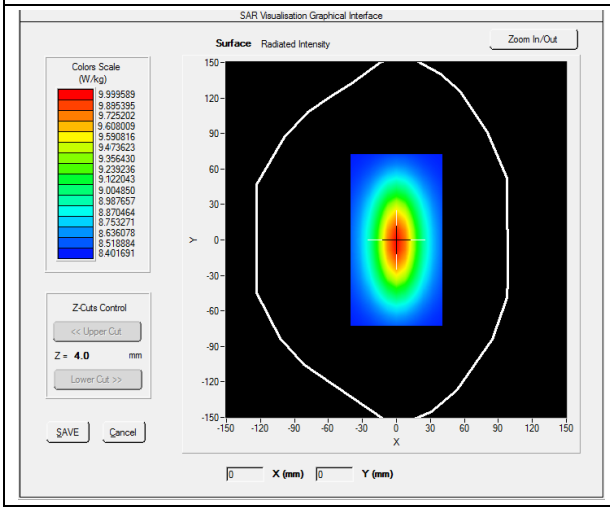
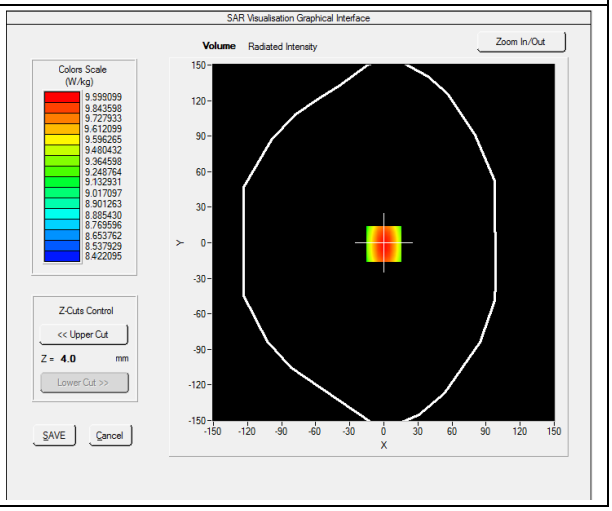
Type: Validation measurement (Fast, 75.00 %)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 21 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	dx=8mm dy=8mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Signal	CW (Crest factor: 1.0)

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative Permittivity (real part)	38.611212
Conductivity (S/m)	1.761202
Power Variation (%)	1.187593
Ambient Temperature	21.1
Liquid Temperature	21.2

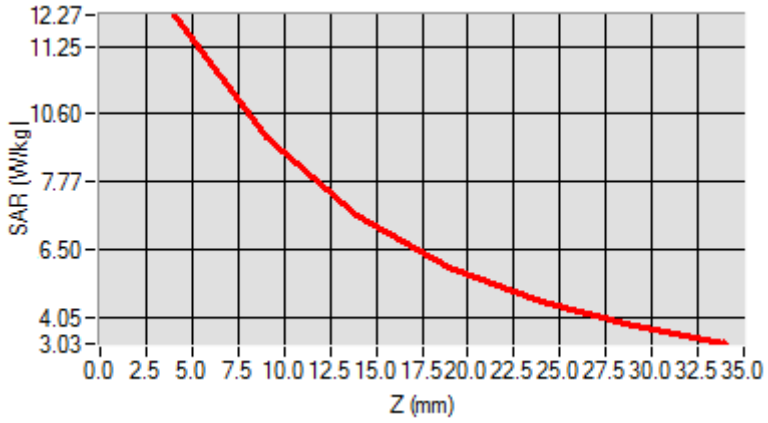
SURFACE SAR	VOLUME SAR
	

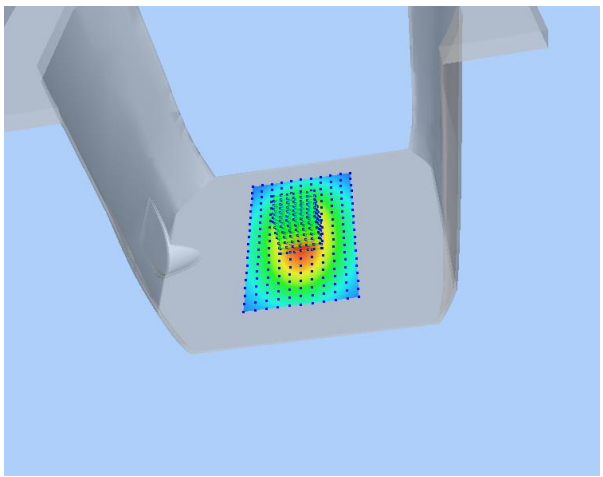
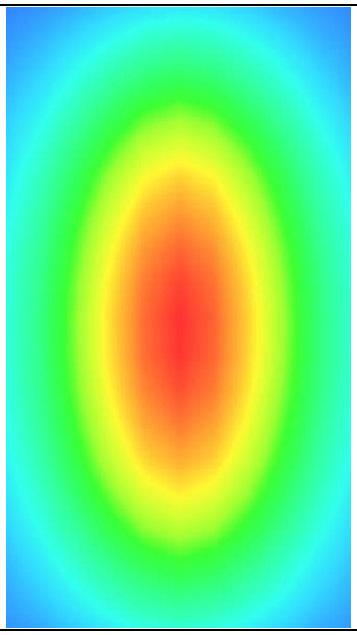
Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	6.092122
SAR 1g (W/Kg)	9.641201

Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	12.1365	10.3321	8.4512	6.4365	5.6123	3.5621



3D screen shot	Hot spot position
	

Annex B. Plots of SAR Measurement

TYPE	BAND	PARAMETERS
Phone	**GSM900**	Measurement 5: Left Head with Cheek device position on Low Channel in GSM mode
Phone	**GSM1800**	Measurement 9: Left Head with Cheek device position on Middle Channel in GSM mode
Phone	**WCDMA2100**	Measurement 15: Left Head with Cheek device position on Middle Channel in WCDMA mode
Phone	**WCDMA900**	Measurement 21: Left Head with Cheek device position on Middle Channel in WCDMA mode
Phone	**WIFI_802.11b**	Measurement 30: Left Head with Cheek device position on High Channel in 802.11b mode
Phone	**GSM900**	Measurement 32: Flat Plane with Body-worn device position on Low Channel in GSM mode
Phone	**GSM1800**	Measurement 34: Flat Plane with Body-worn device position on Middle Channel in GSM mode
Phone	**GPRS900_2TX**	Measurement 42: Flat Plane with Back side device position on Low Channel in GPRS mode
Phone	**GPRS1800_2TX**	Measurement 44: Flat Plane with Back side device position on Middle Channel in GPRS mode
Phone	**WCDMA2100**	Measurement 55 Flat Plane with Bottom side device position on Middle Channel in WCDMA mode
Phone	**WCDMA900**	Measurement 58: Flat Plane with Back side device position on Middle Channel in WCDMA mode
Phone	**WIFI_802.11b**	Measurement 70: 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 5

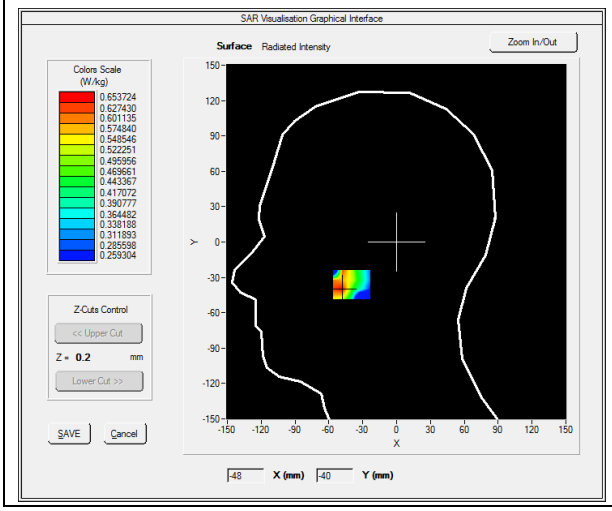
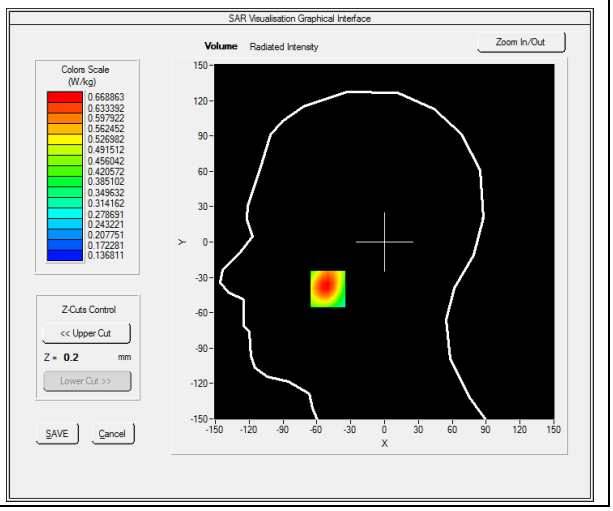
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GSM900
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

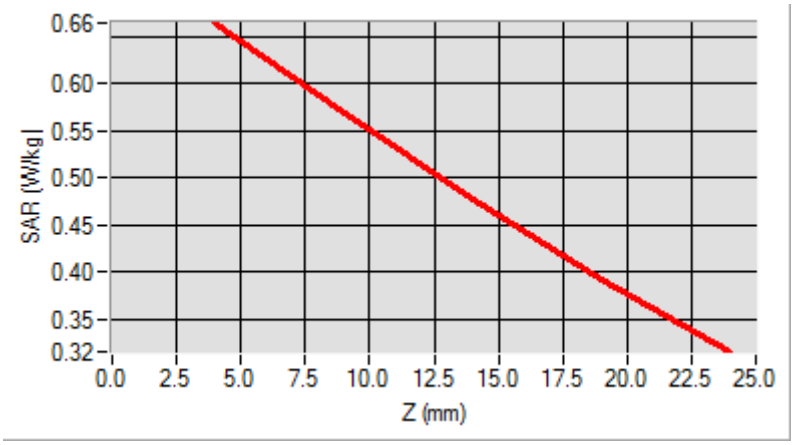
Frequency (MHz)	880.200000
Relative Permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Power Variation (%)	1.843748
Ambient Temperature	21.1
Liquid Temperature	21.2

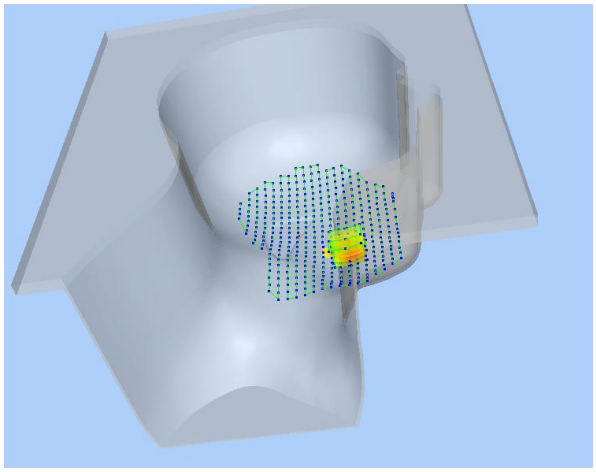
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-50.00, Y=-40.00

SAR 10g (W/Kg)	0.495120
SAR 1g (W/Kg)	0.643429

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6644	0.5679	0.4769	0.3924



3D screen shot	Hot spot position
	

MEASUREMENT 9

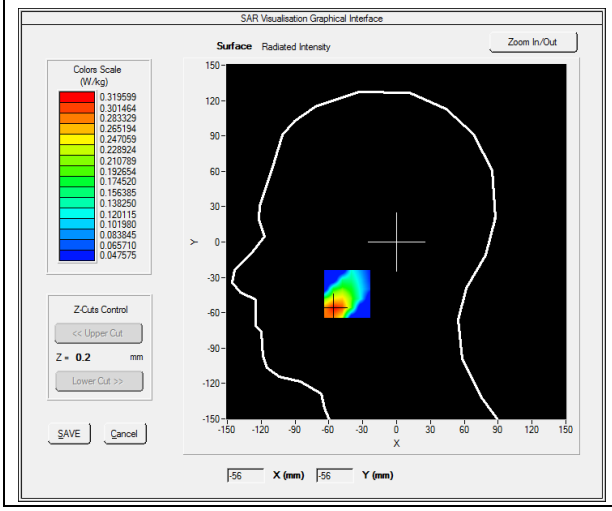
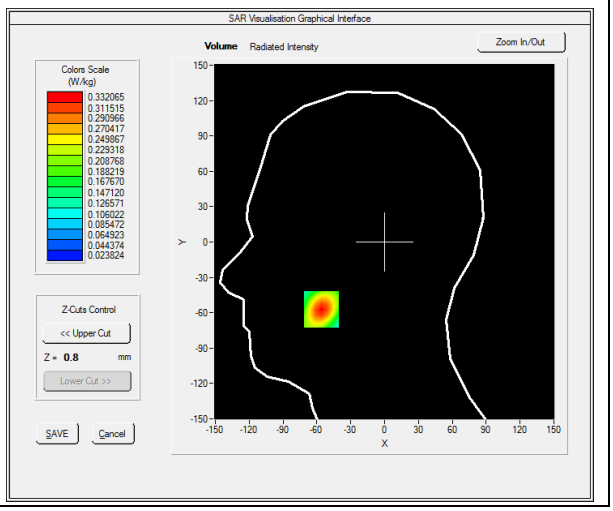
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	GSM1800
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

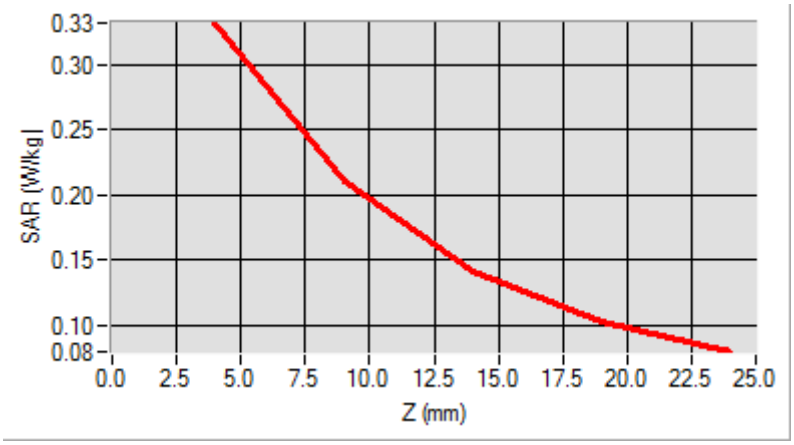
Frequency (MHz)	1747.400000
Relative permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	1.758498
Ambient Temperature	21.1
Liquid Temperature	21.2

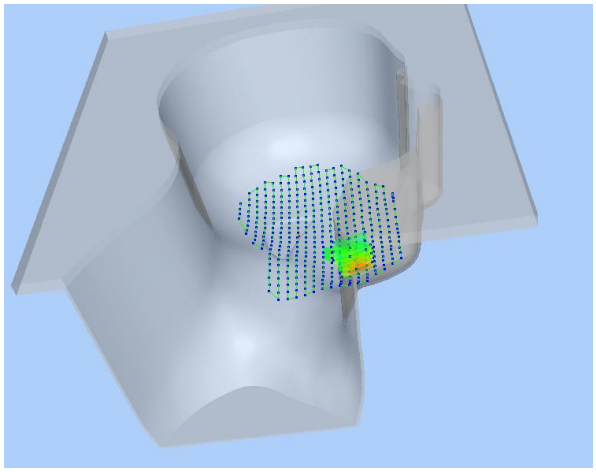
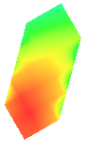
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-56.00, Y=-57.00

SAR 10g (W/Kg)	0.186945
SAR 1g (W/Kg)	0.307180

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3321	0.2108	0.1414	0.1037



3D screen shot	Hot spot position
	

MEASUREMENT 15

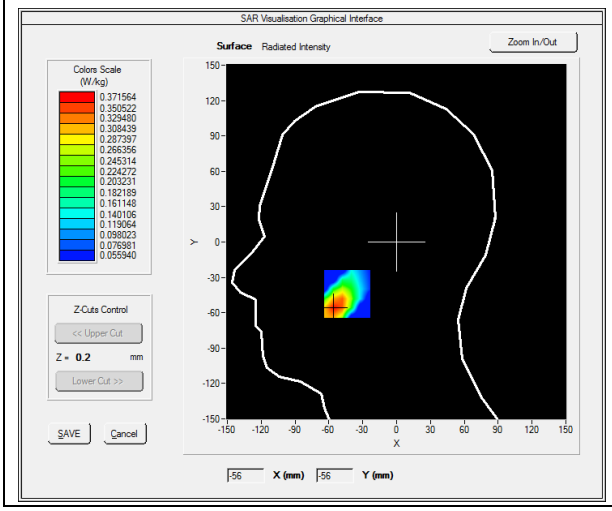
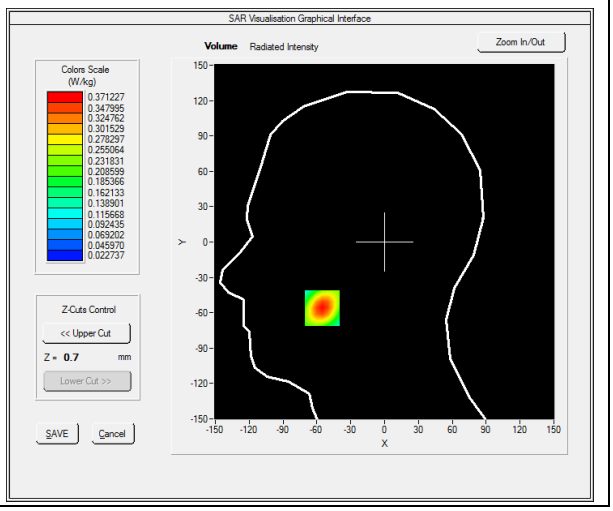
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.76; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	WCDMA2100_RMC
Channels	Middle
Signal	Duty Cycle: 1:1

B. SAR Measurement Results

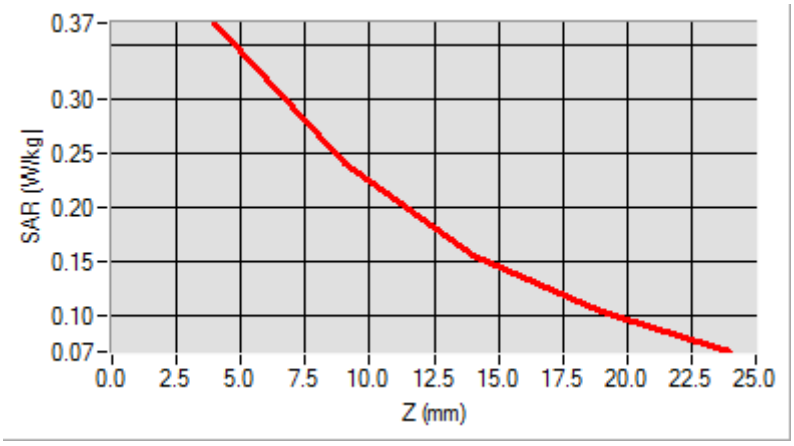
Frequency (MHz)	1950.000000
Relative Permittivity (real part)	38.912500
Conductivity (S/m)	1.381250
Power Variation (%)	1.462356
Ambient Temperature	21.1
Liquid Temperature	21.2

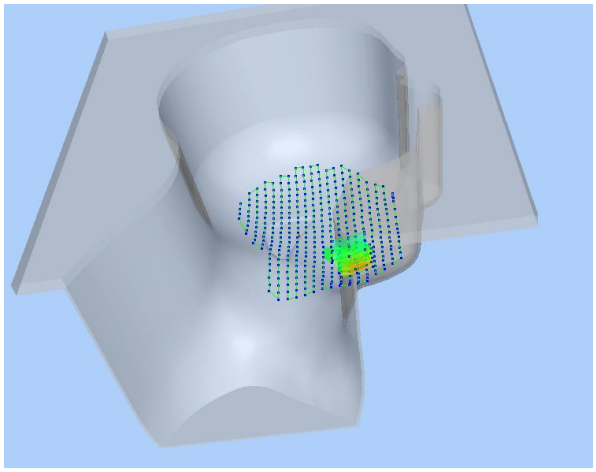
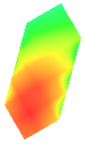
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-55.00, Y=-56.00

SAR 10g (W/Kg)	**0.202565**
SAR 1g (W/Kg)	**0.342294**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.3712**	**0.2402**	**0.1561**	**0.1028**



3D screen shot	**Hot spot position**
	

MEASUREMENT 21

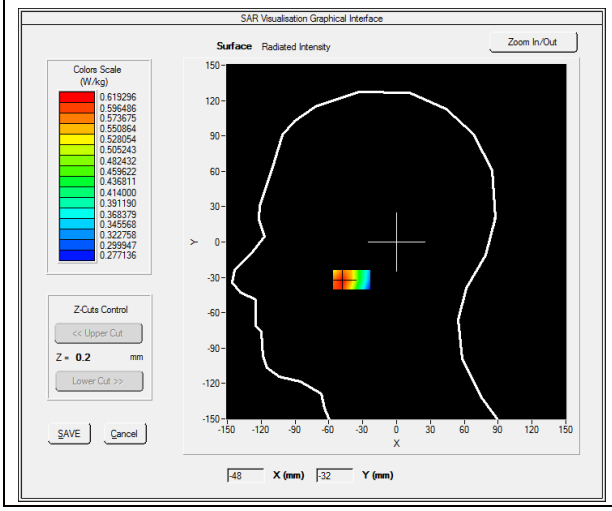
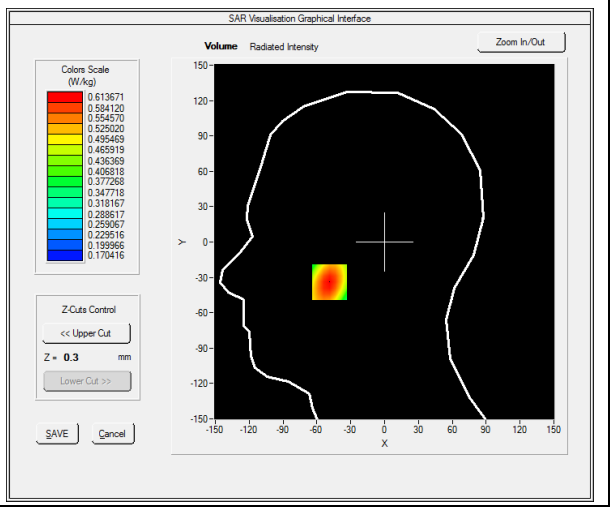
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Left head
Device Position	Cheek
Band	WCDMA900_RMC
Channels	Middle
Signal	Duty Cycle: 1:1

B. SAR Measurement Results

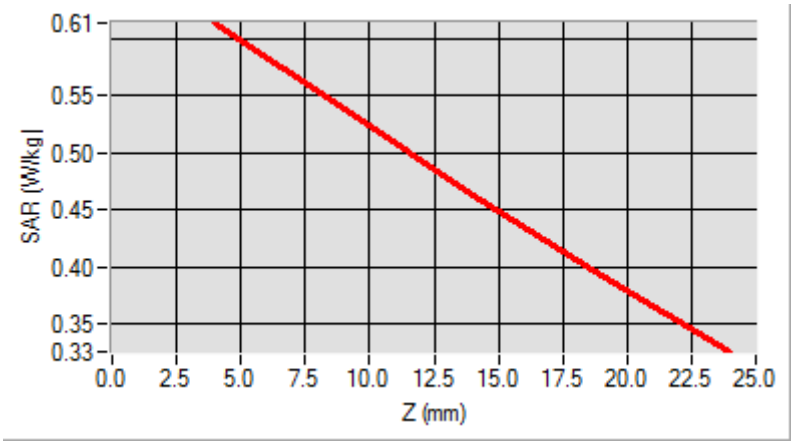
Frequency (MHz)	897.600000
Relative permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Variation (%)	-0.759384
Ambient Temperature	21.1
Liquid Temperature	21.2

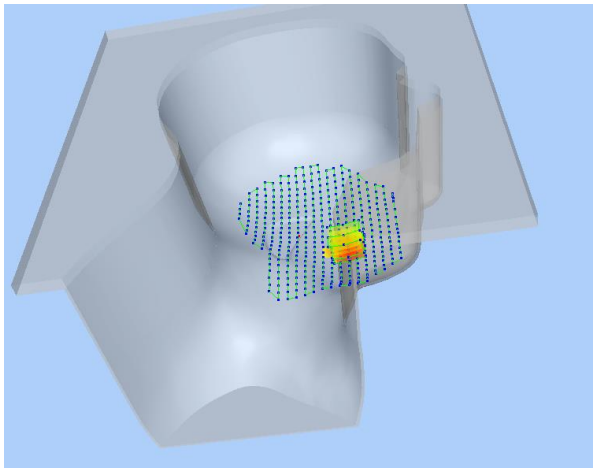
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-49.00, Y=-34.00

SAR 10g (W/Kg)	0.475349
SAR 1g (W/Kg)	0.590869

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.6137	0.5376	0.4634	0.3923



3D screen shot	Hot spot position
	

MEASUREMENT 30

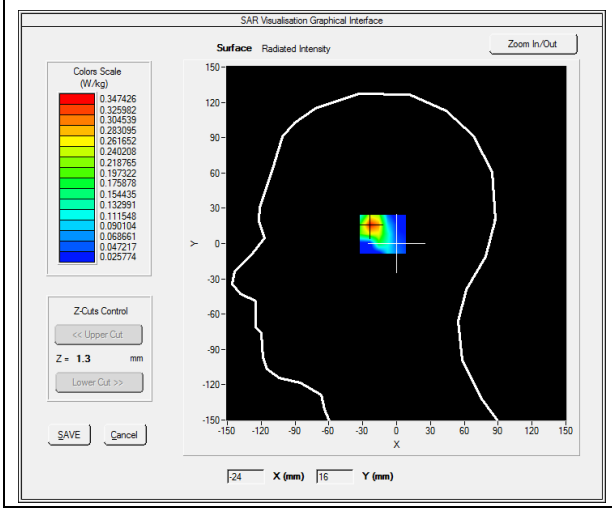
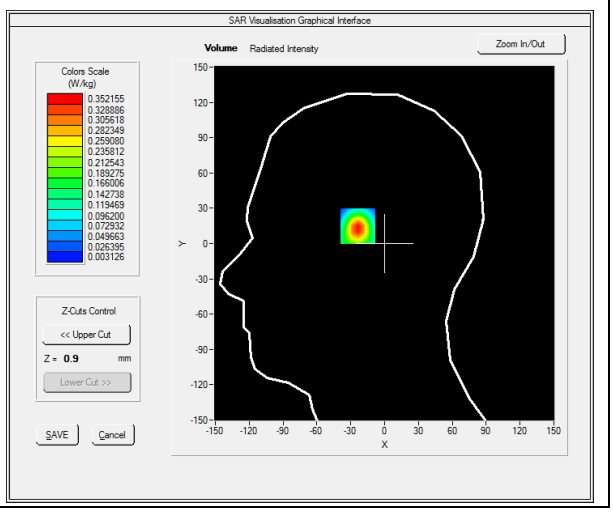
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 2016/06/01

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

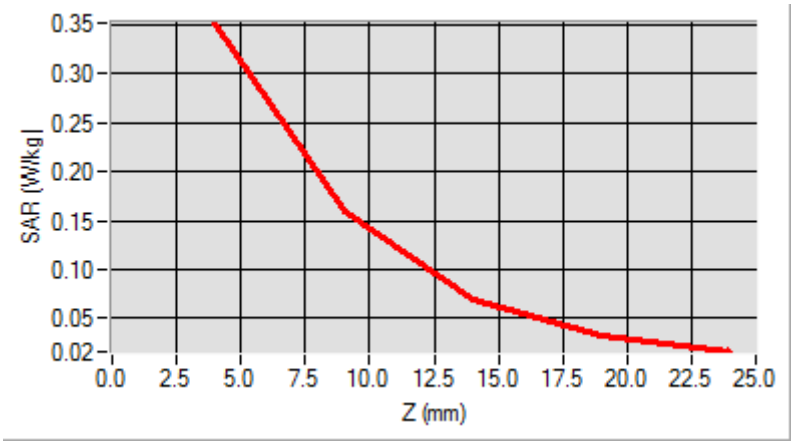
Frequency (MHz)	2472.000000
Relative Permittivity (real part)	38.611212
Conductivity (S/m)	1.761202
Power Variation (%)	1.885843
Ambient Temperature	21.1
Liquid Temperature	21.2

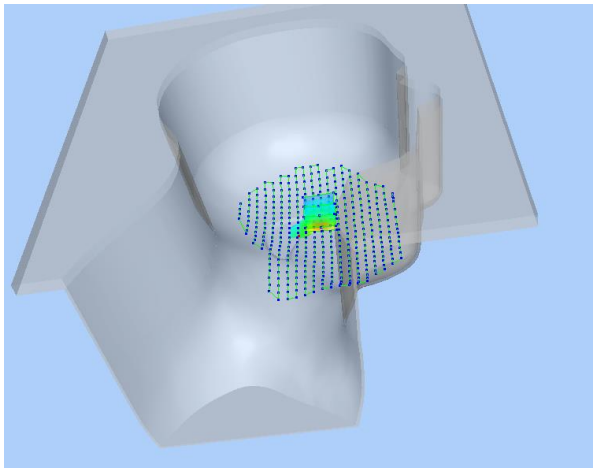
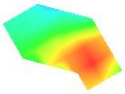
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-21.00, Y=18.00

SAR 10g (W/Kg)	**0.162811**
SAR 1g (W/Kg)	**0.338294**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.3645**	**0.1599**	**0.0776**	**0.0354**



3D screen shot	**Hot spot position**
	

MEASUREMENT 32

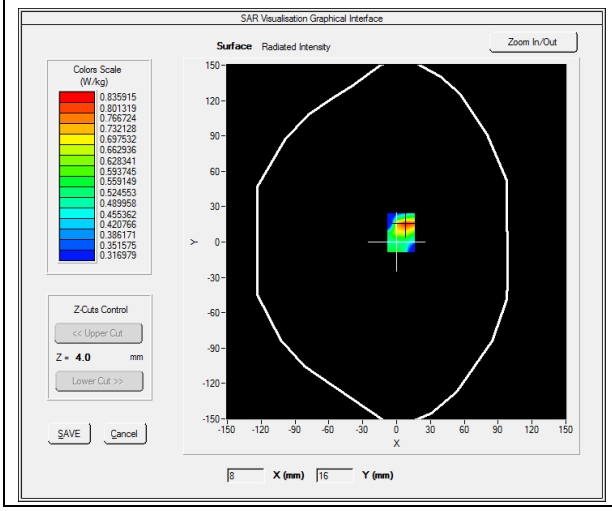
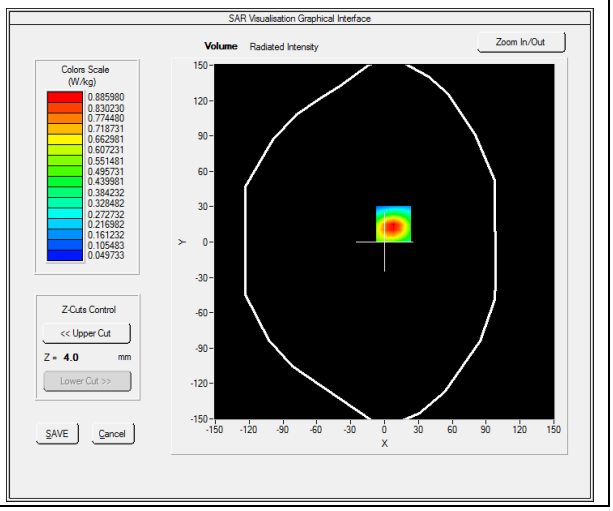
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Body-worn
Band	GSM900
Channels	Low
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

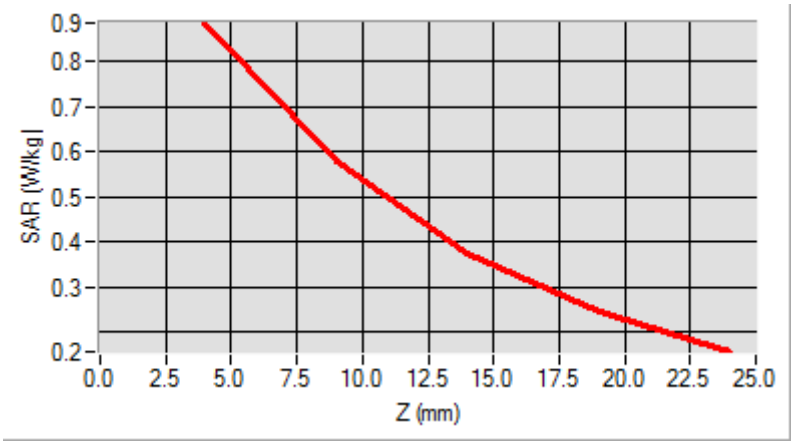
Frequency (MHz)	880.200000
Relative Permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Power Variation (%)	0.798439
Ambient Temperature	21.1
Liquid Temperature	21.2

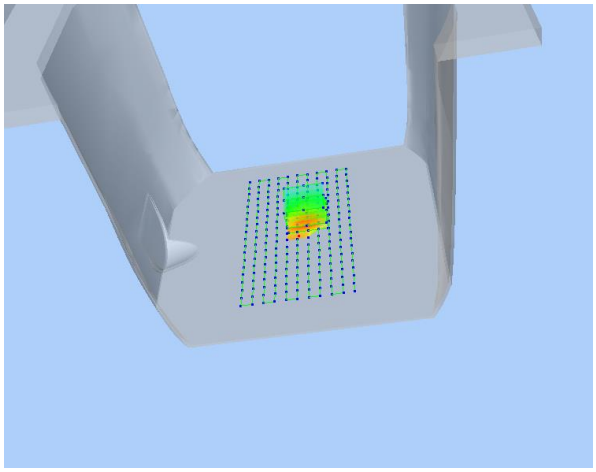
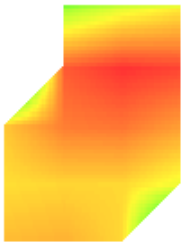
SURFACE SAR	VOLUME SAR
	

Maximum location: X=8.00, Y=15.00

SAR 10g (W/Kg)	0.479354
SAR 1g (W/Kg)	0.821173

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.8860	0.5775	0.3766	0.2474



3D screen shot	Hot spot position
	

MEASUREMENT 34

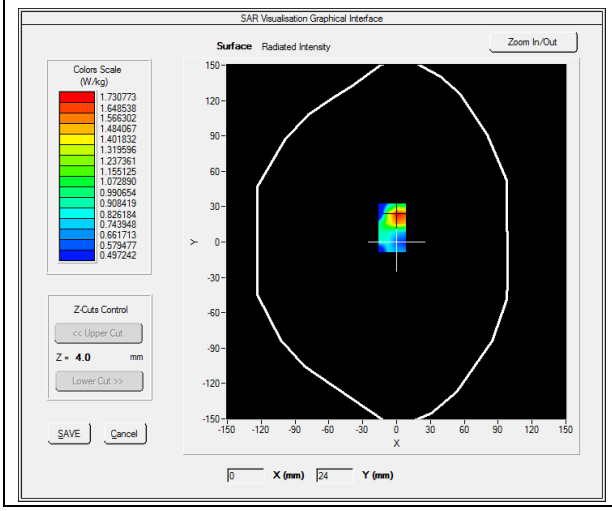
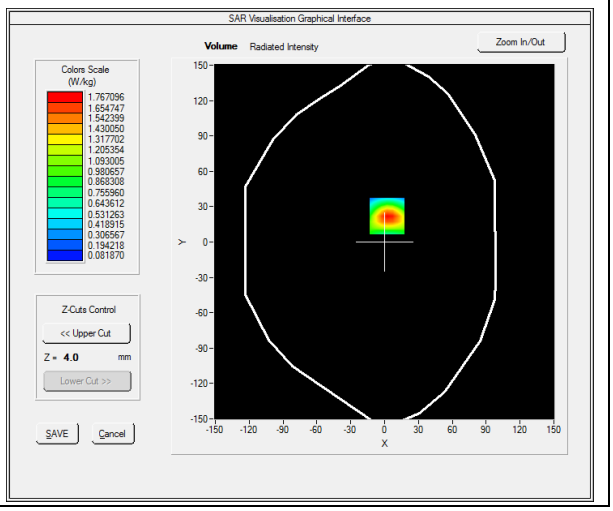
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Body-Worn
Band	GSM1800
Channels	Middle
Signal	TDMA (Crest factor: 8.0)

B. SAR Measurement Results

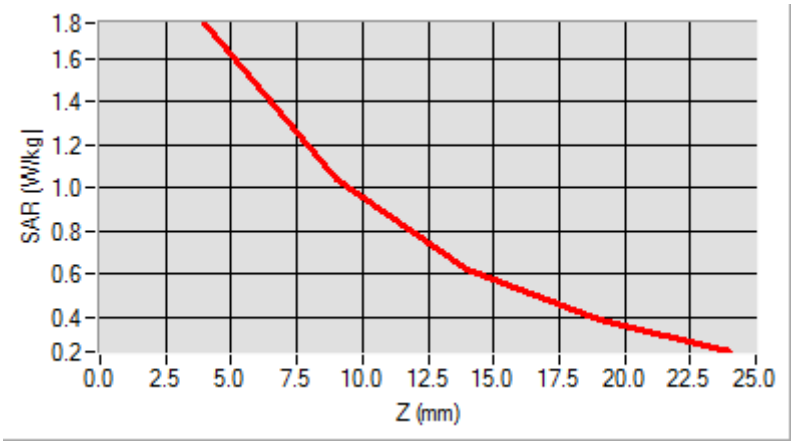
Frequency (MHz)	1747.400000
Relative permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	0.998023
Ambient Temperature	21.1
Liquid Temperature	21.2

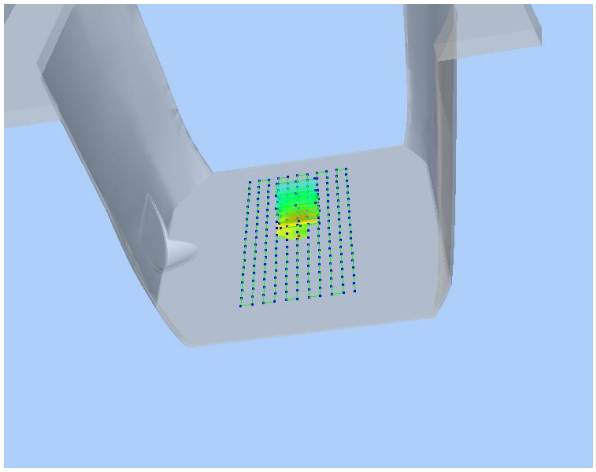
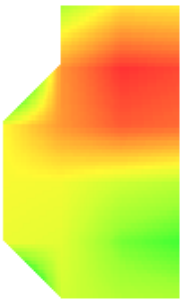
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=22.00

SAR 10g (W/Kg)	**0.862740**
SAR 1g (W/Kg)	**1.607210**

Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**1.7671**	**1.0371**	**0.6169**	**0.3836**



3D screen shot	**Hot spot position**
	

MEASUREMENT 42

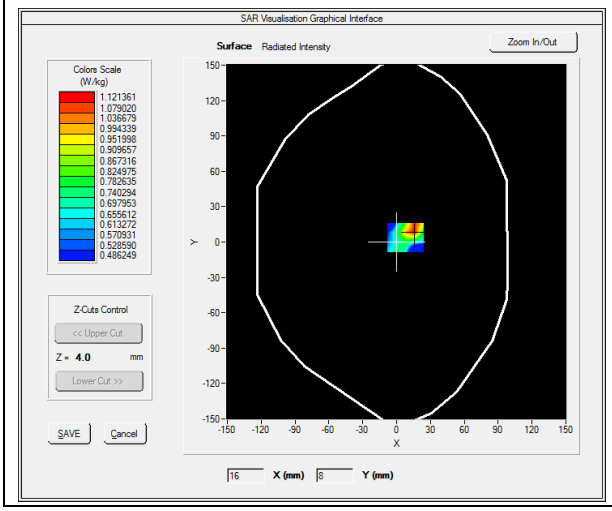
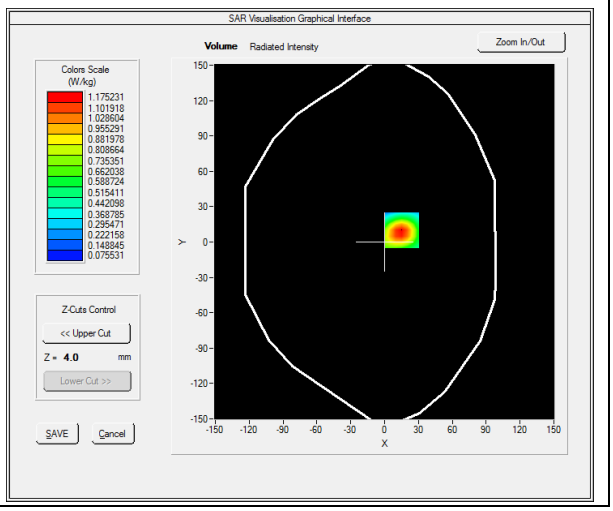
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	GPRS900_2TX
Channels	Low
Signal	Duty Cycle: 1:4

B. SAR Measurement Results

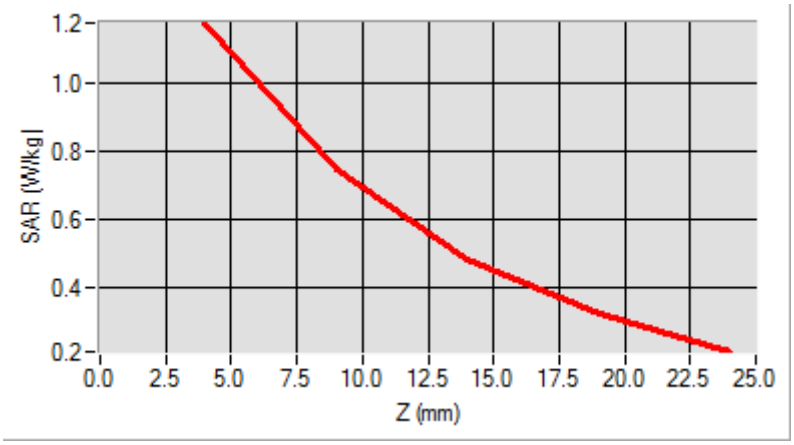
Frequency (MHz)	880.200000
Relative Permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Power Variation (%)	0.543523
Ambient Temperature	21.1
Liquid Temperature	21.2

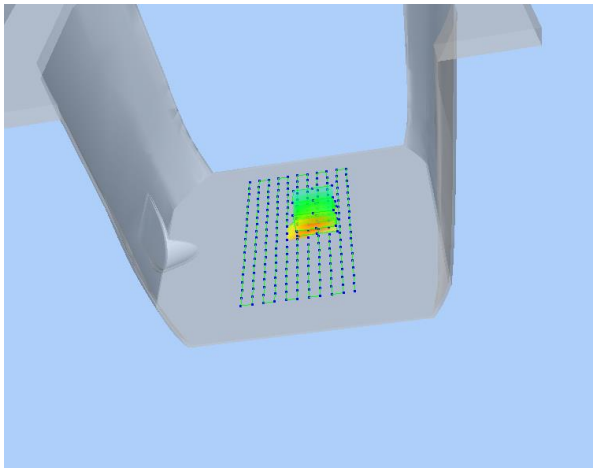
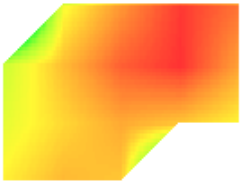
SURFACE SAR	VOLUME SAR
	

Maximum location: X=15.00, Y=10.00

SAR 10g (W/Kg)	0.633724
SAR 1g (W/Kg)	1.081253

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	1.1752	0.7484	0.4837	0.3228



3D screen shot	Hot spot position
	

MEASUREMENT 44

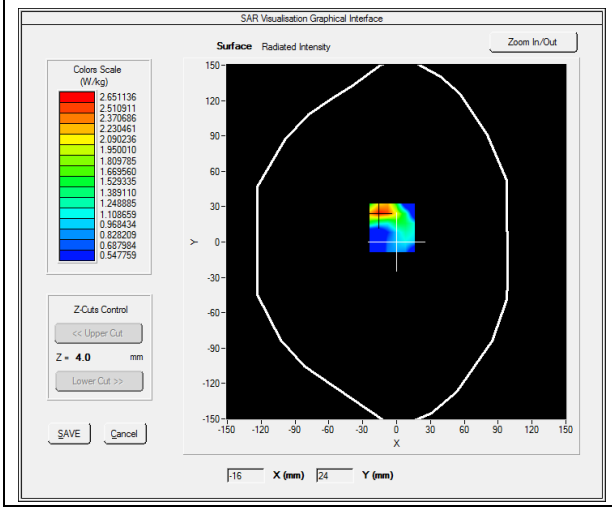
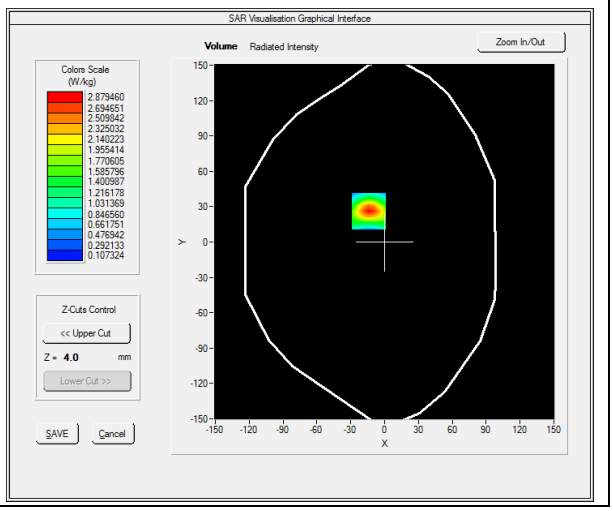
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	GPRS1800_2TX
Channels	Middle
Signal	Duty Cycle: 1:4

B. SAR Measurement Results

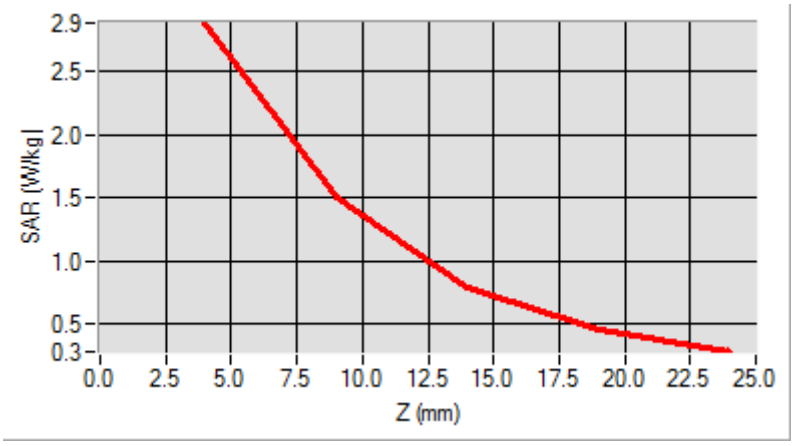
Frequency (MHz)	1747.400000
Relative Permittivity (real part)	39.024890
Conductivity (S/m)	1.371250
Power Variation (%)	0.896490
Ambient Temperature	21.1
Liquid Temperature	21.2

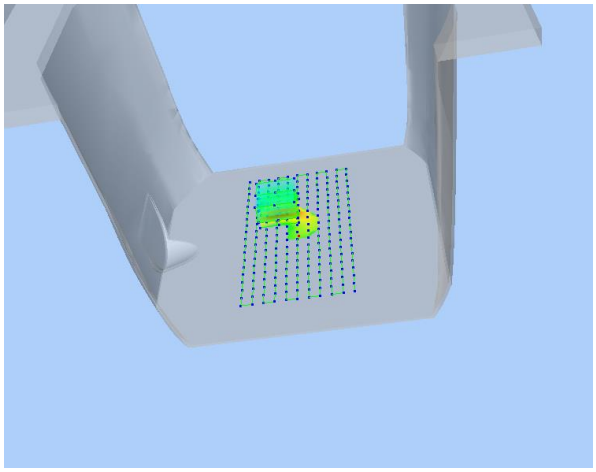
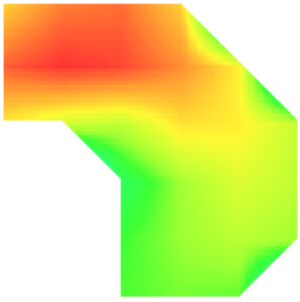
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-14.00, Y=26.00

SAR 10g (W/Kg)	1.289033
SAR 1g (W/Kg)	2.589178

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	2.8795	1.4947	0.7934	0.4637



3D screen shot	Hot spot position
	

MEASUREMENT 55

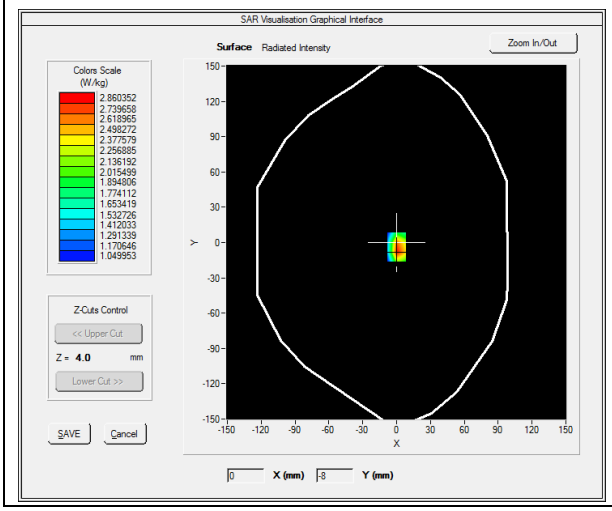
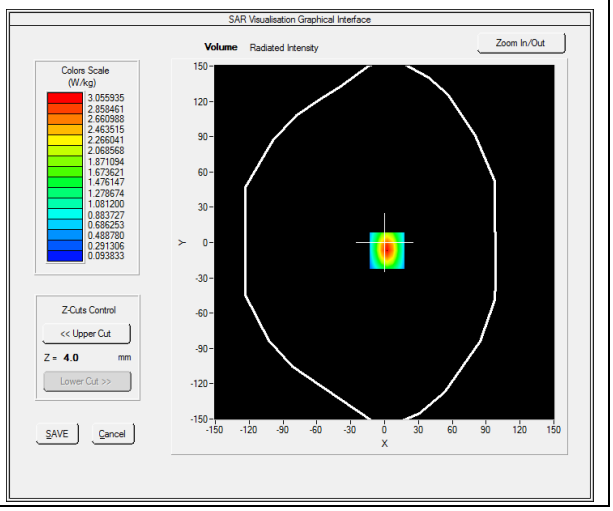
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.76; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Bottom
Band	WCDMA2100_RMC
Channels	Middle
Signal	Duty Cycle: 1:1

B. SAR Measurement Results

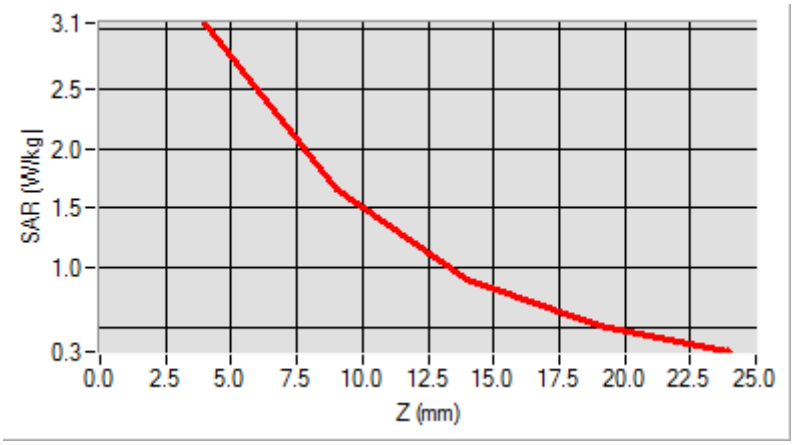
Frequency (MHz)	1950.000000
Relative Permittivity (real part)	38.912500
Conductivity (S/m)	1.381250
Power Variation (%)	0.989950
Ambient Temperature	21.1
Liquid Temperature	21.2

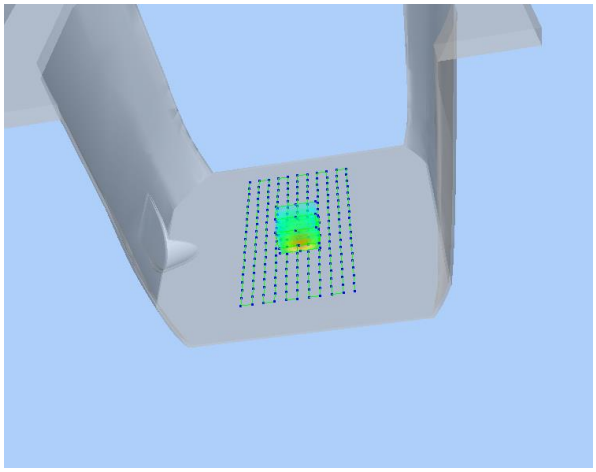
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=-7.00

SAR 10g (W/Kg)	1.461721
SAR 1g (W/Kg)	2.966118

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	3.0559	1.6545	0.9001	0.5152



3D screen shot	Hot spot position
	

MEASUREMENT 58

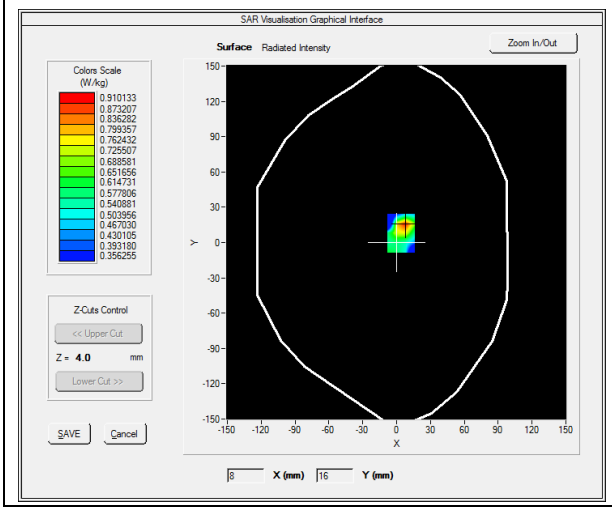
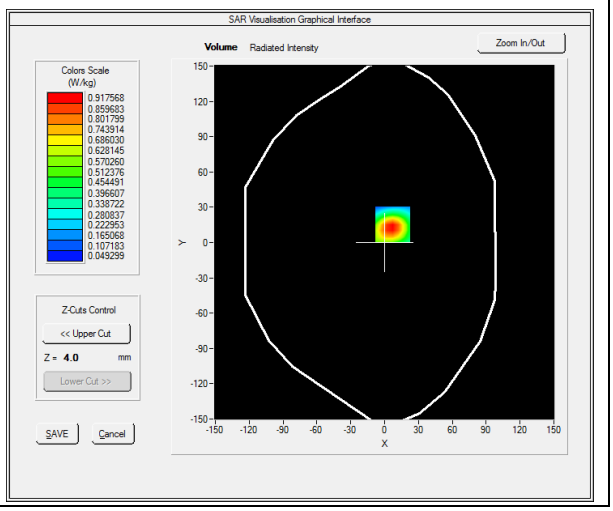
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.18; Calibrated: 2016/06/01

A. Experimental conditions

Area Scan	sam_direct_droit2_surf8mm.txt
Phantom	Flat Plane
Device Position	Back
Band	WCDMA900_RMC
Channels	Middle
Signal	Duty Cycle: 1:1

B. SAR Measurement Results

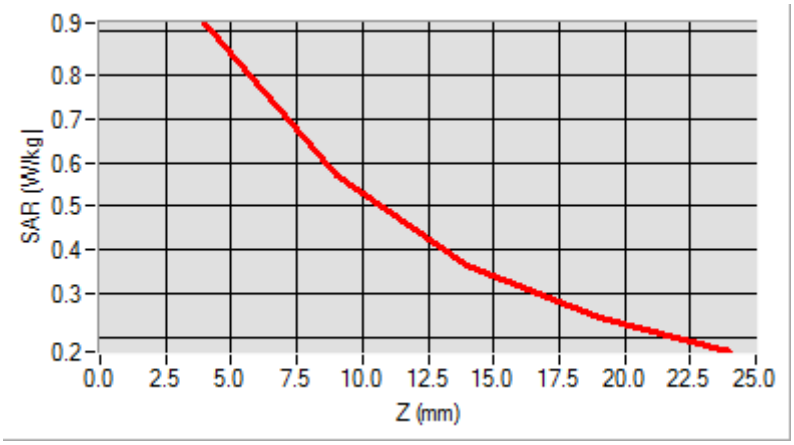
Frequency (MHz)	897.600000
Relative permittivity (real part)	39.512501
Conductivity (S/m)	1.010456
Variation (%)	-1.175989
Ambient Temperature	21.1
Liquid Temperature	21.2

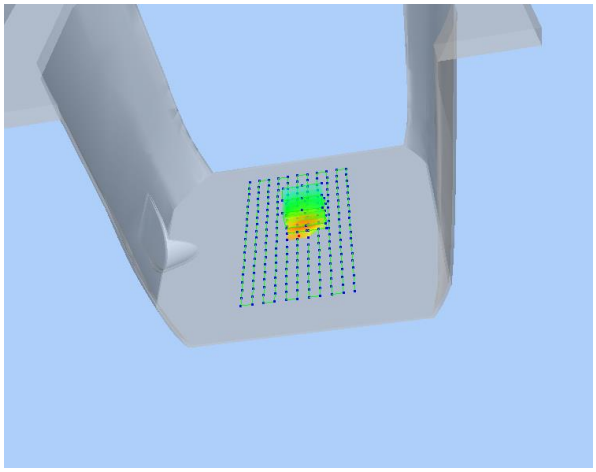
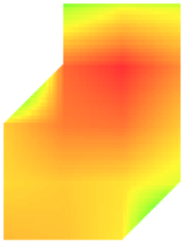
SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=15.00

SAR 10g (W/Kg)	0.487339
SAR 1g (W/Kg)	0.851459

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.9176	0.5708	0.3649	0.2463



3D screen shot	Hot spot position
	

MEASUREMENT 70

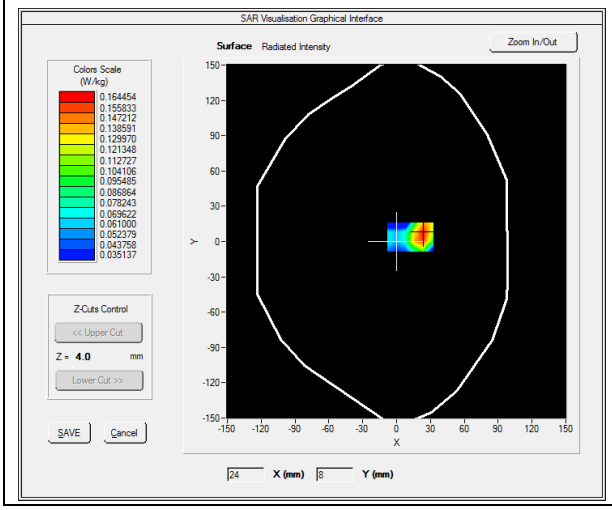
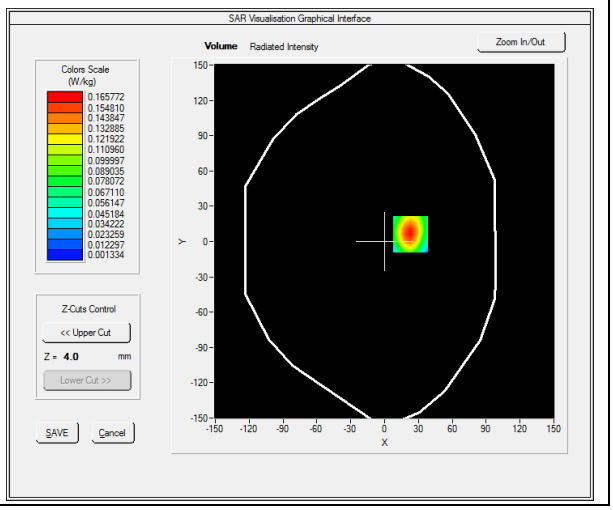
Type: Phone measurement (Complete)
Date of measurement: 09/26/2016
Measurement duration: 12 minutes 3 seconds
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 2016/06/01

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

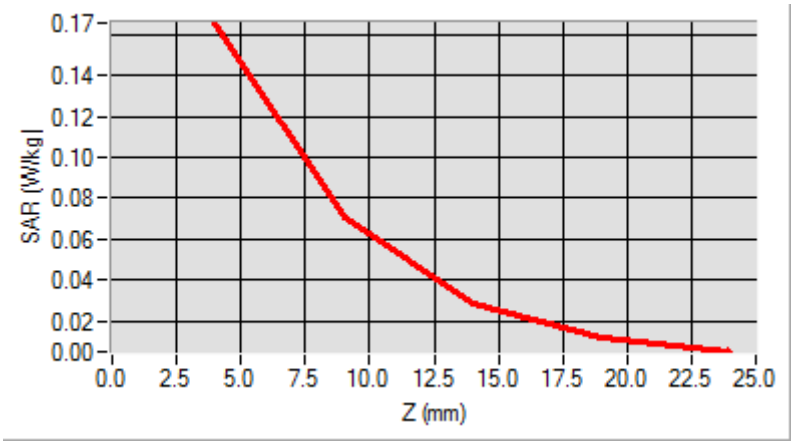
Frequency (MHz)	2472.000000
Relative Permittivity (real part)	38.611212
Conductivity (S/m)	1.761202
Power Variation (%)	0.568374
Ambient Temperature	21.1
Liquid Temperature	21.2

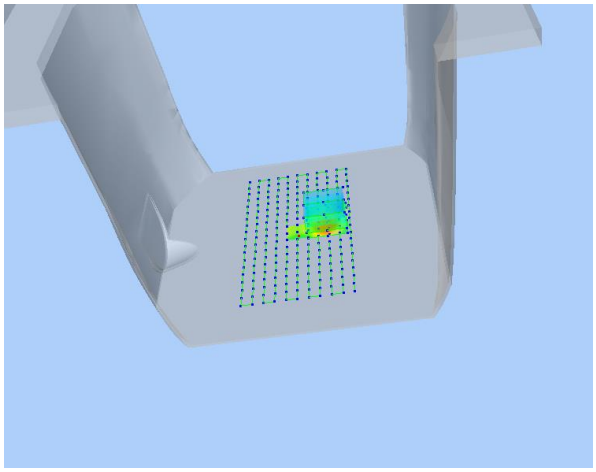
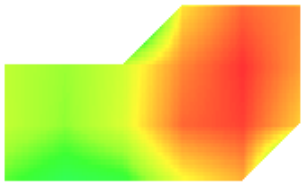
SURFACE SAR	VOLUME SAR
	

Maximum location: X=23.00, Y=6.00

SAR 10g (W/Kg)	**0.071628**
SAR 1g (W/Kg)	**0.153114**

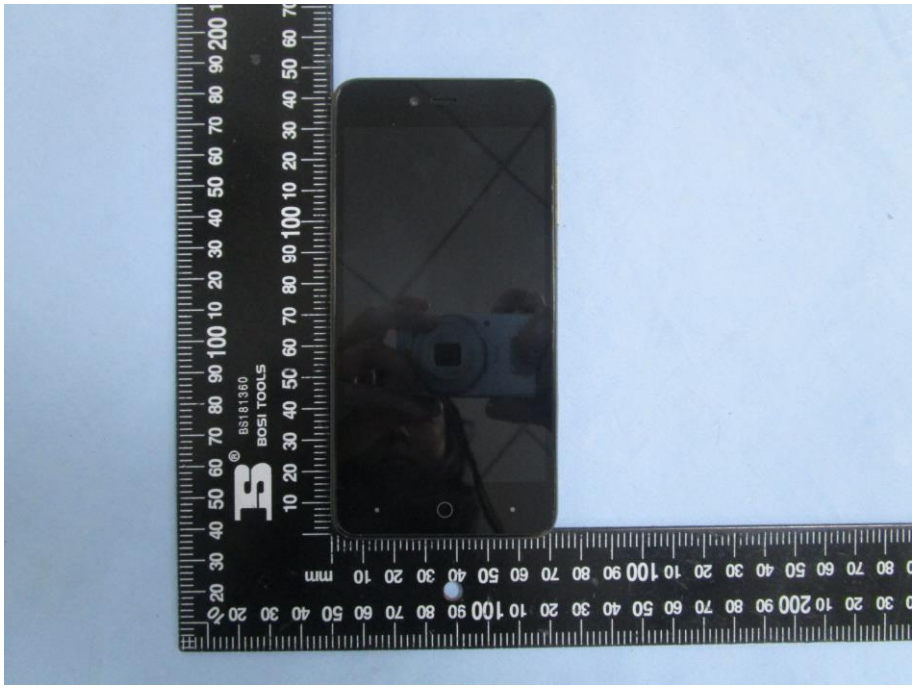
Z (mm)	**0.00**	**4.00**	**9.00**	**14.00**	**19.00**
SAR (W/Kg)	**0.0000**	**0.1658**	**0.0703**	**0.0282**	**0.0119**



3D screen shot	**Hot spot position**
	

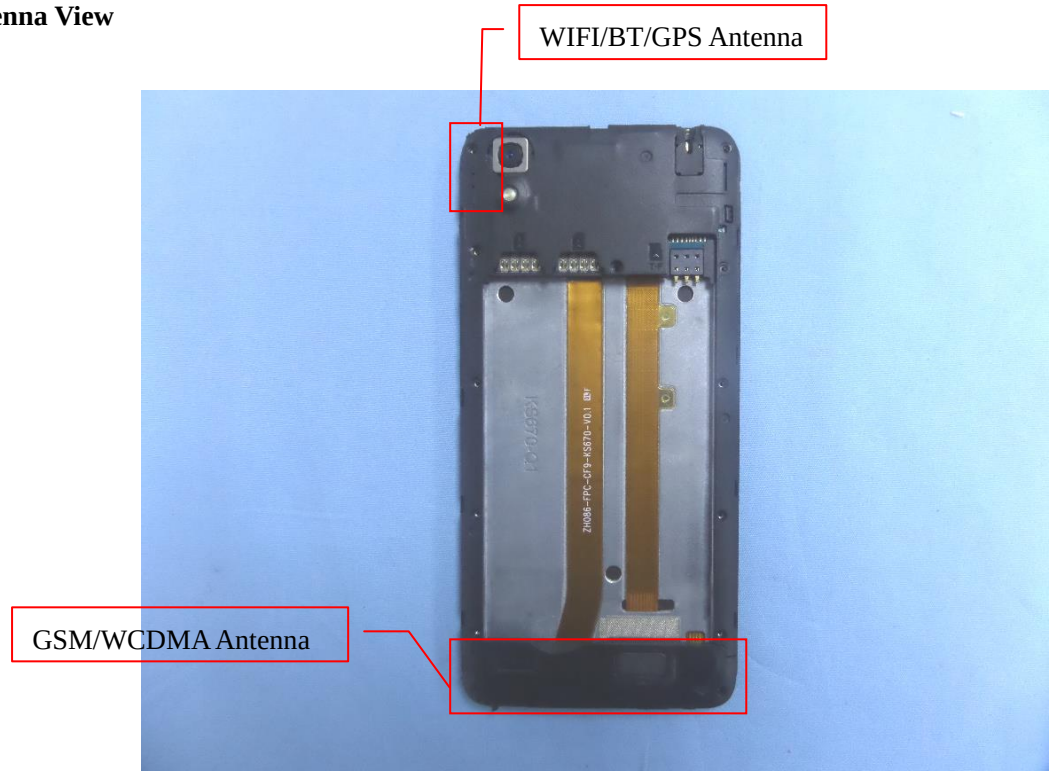
Annex C. EUT Photos

EUT View Front



EUT View Back

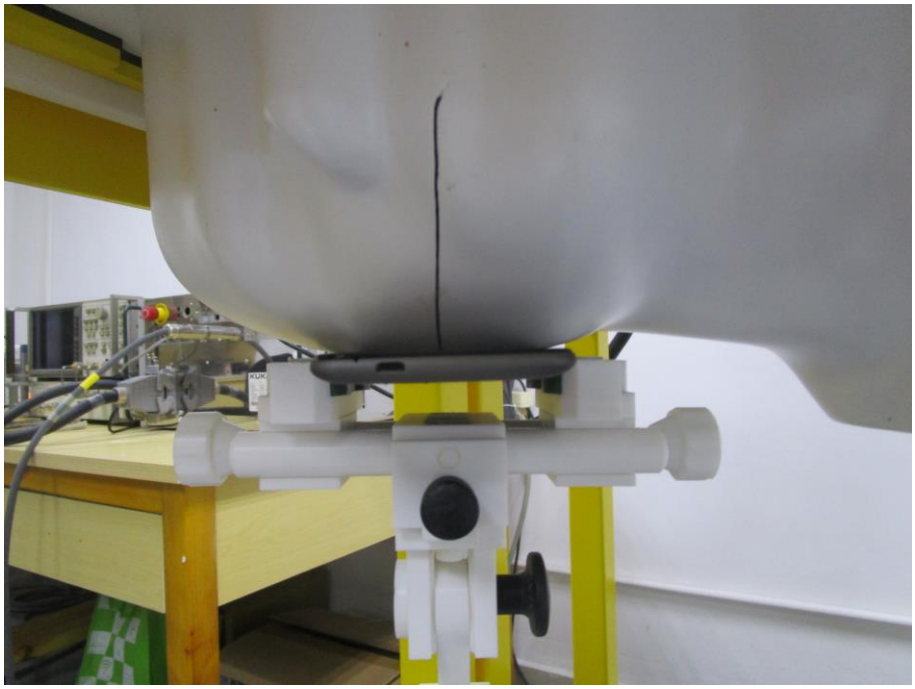
Antenna View



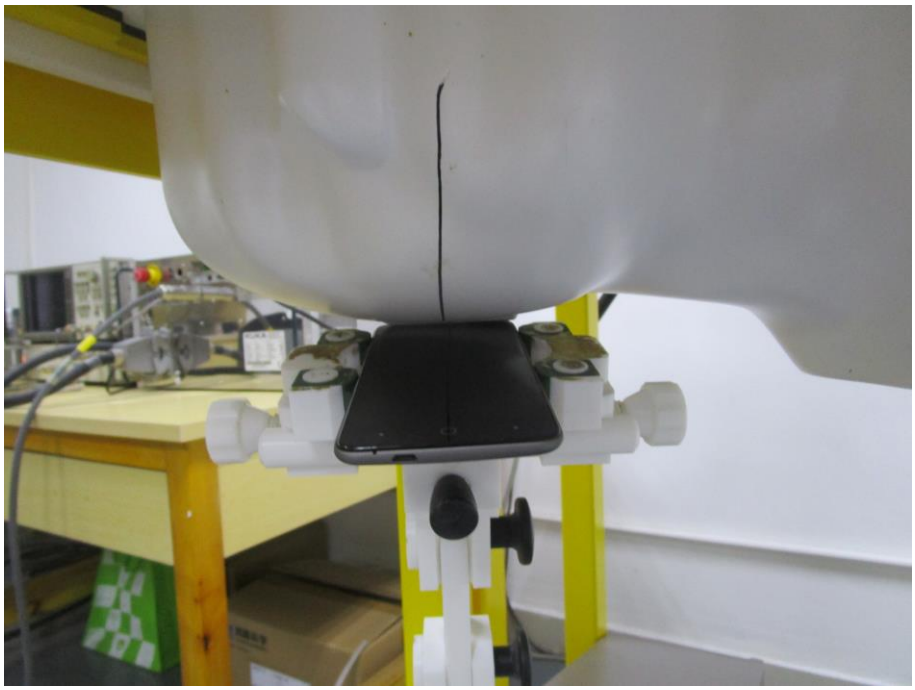
Annex D. Test Setup Photos

Head Exposure Conditions

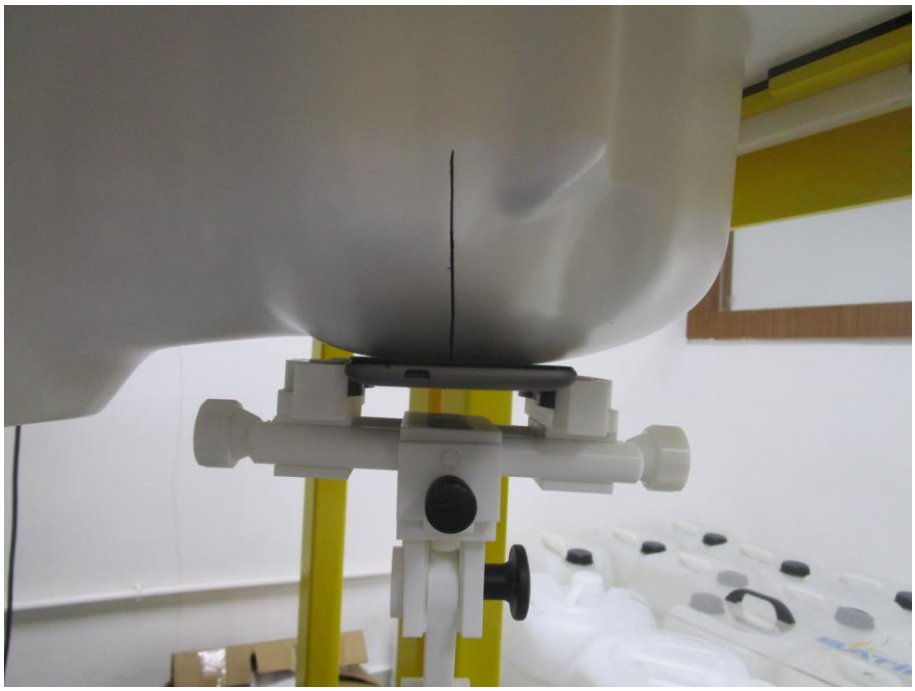
Cheek



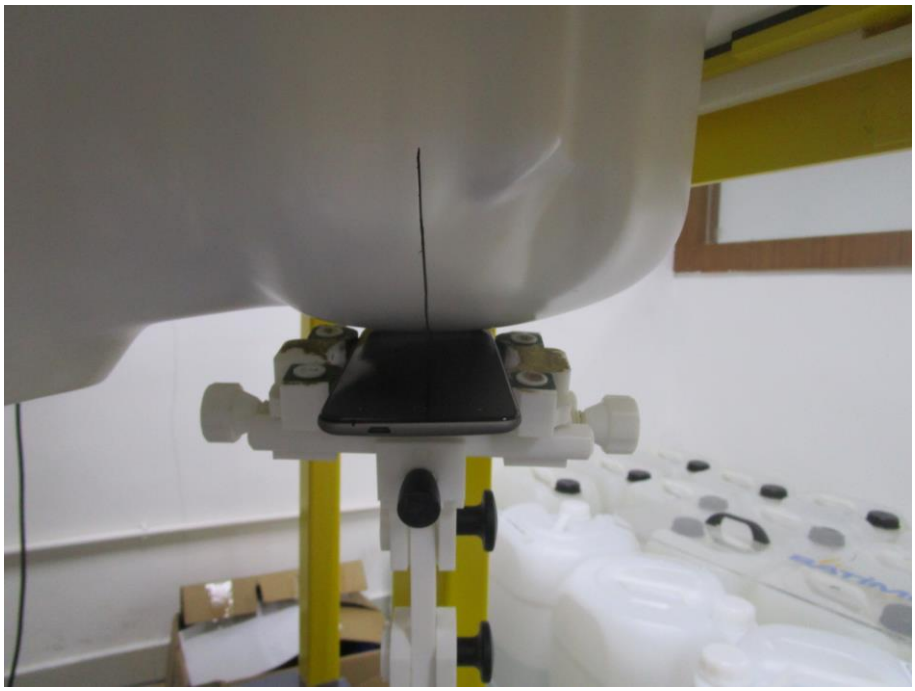
Tilt



Cheek

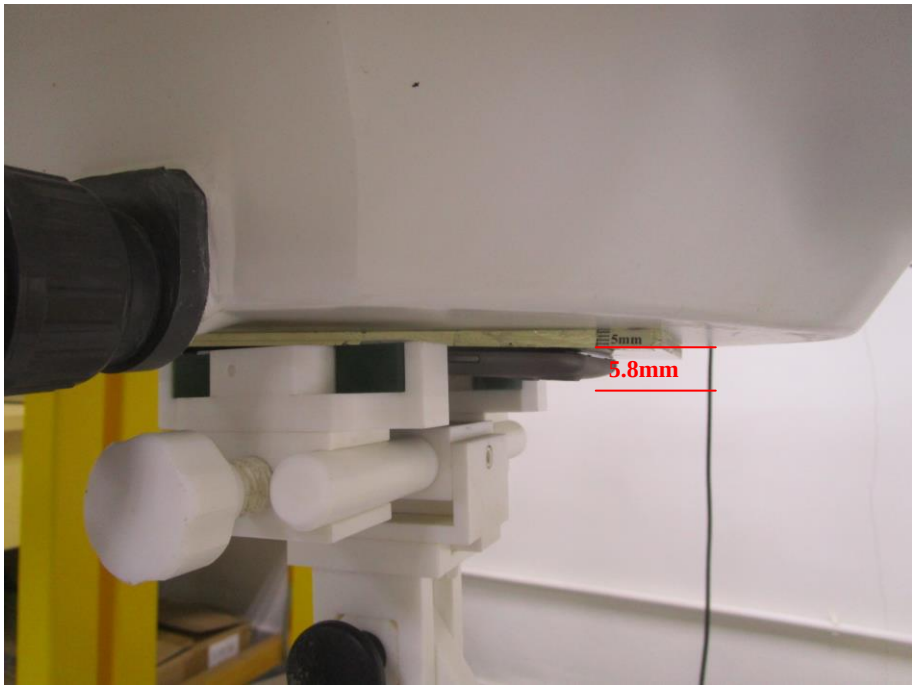


Tilt

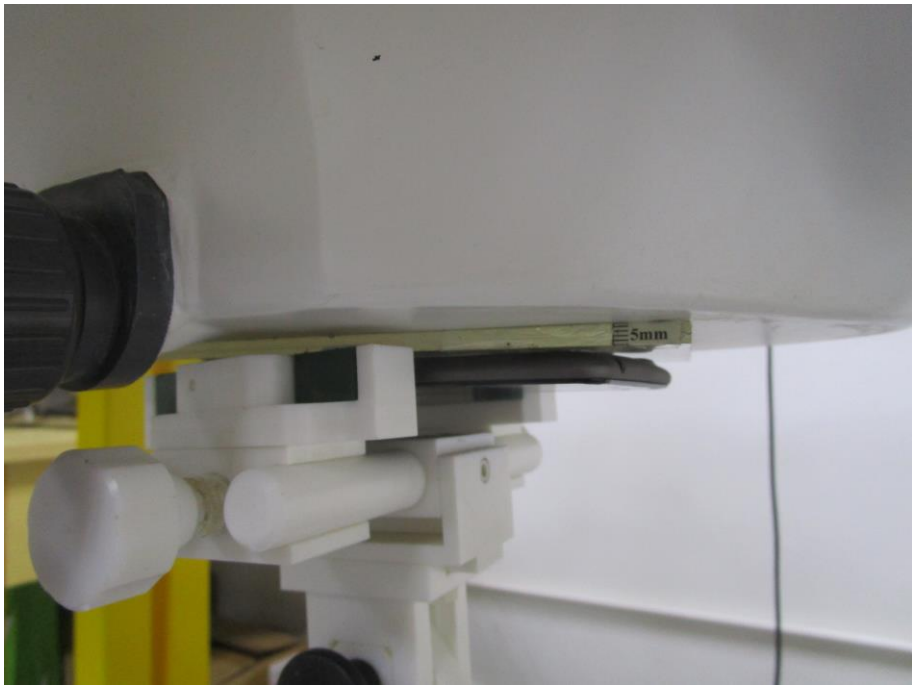


Body-worn & Hotspot mode Exposure Conditions

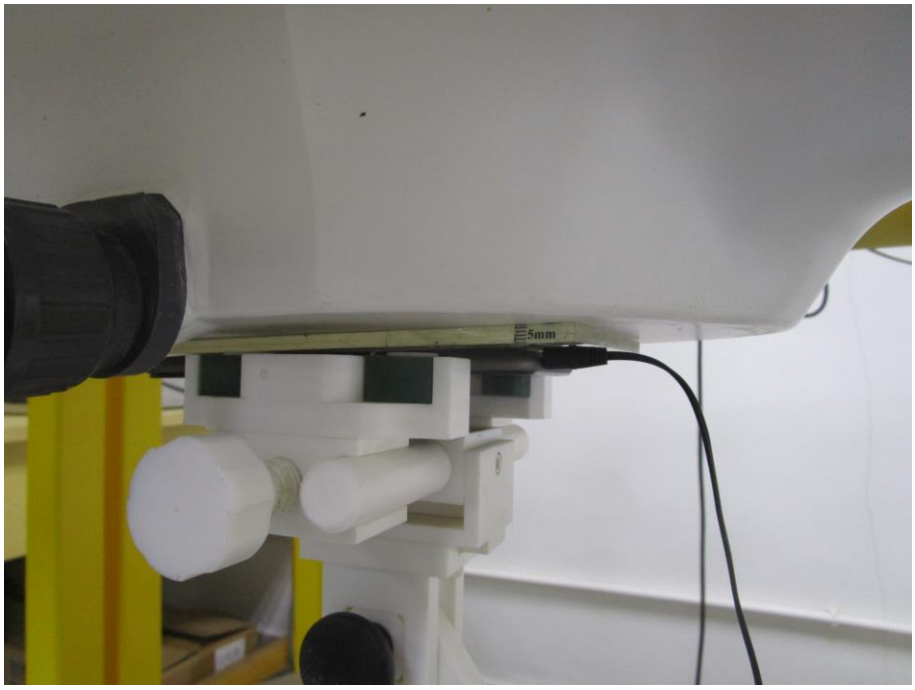
Body Front



Body Back 1



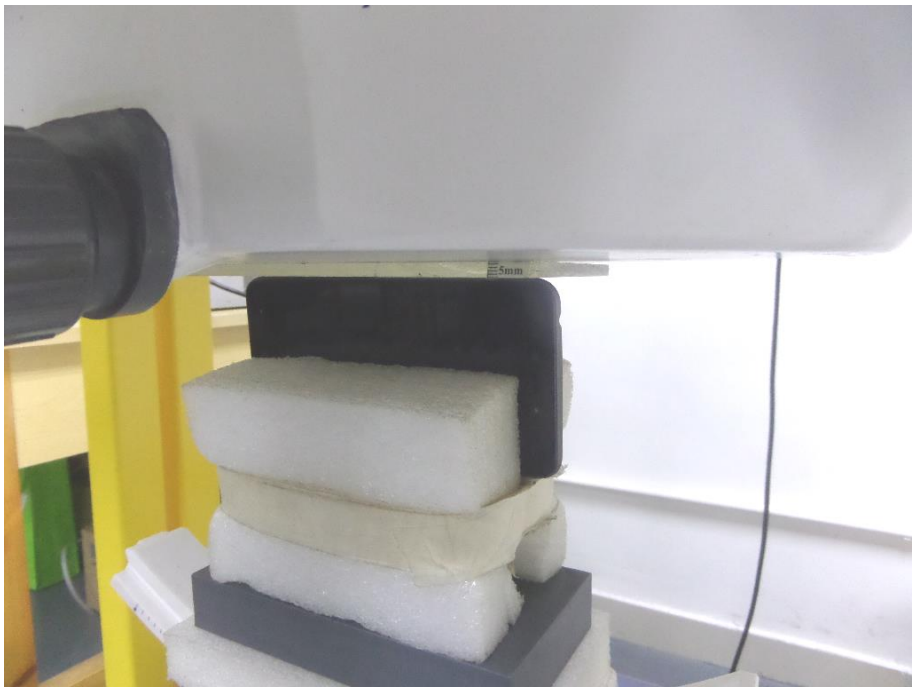
Body Back 2



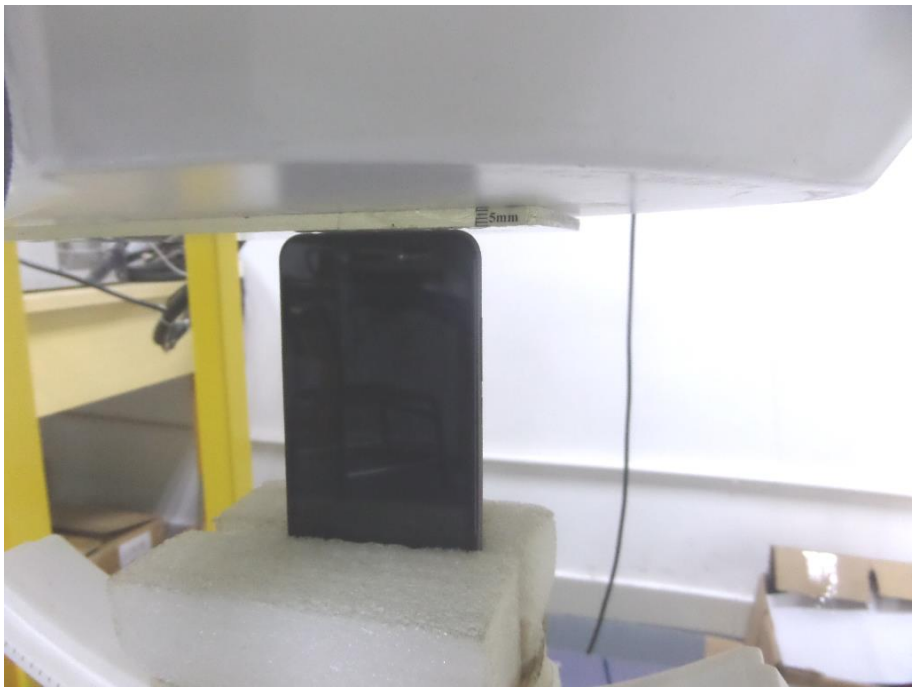
Hotspot Exposure Conditions

Body Right

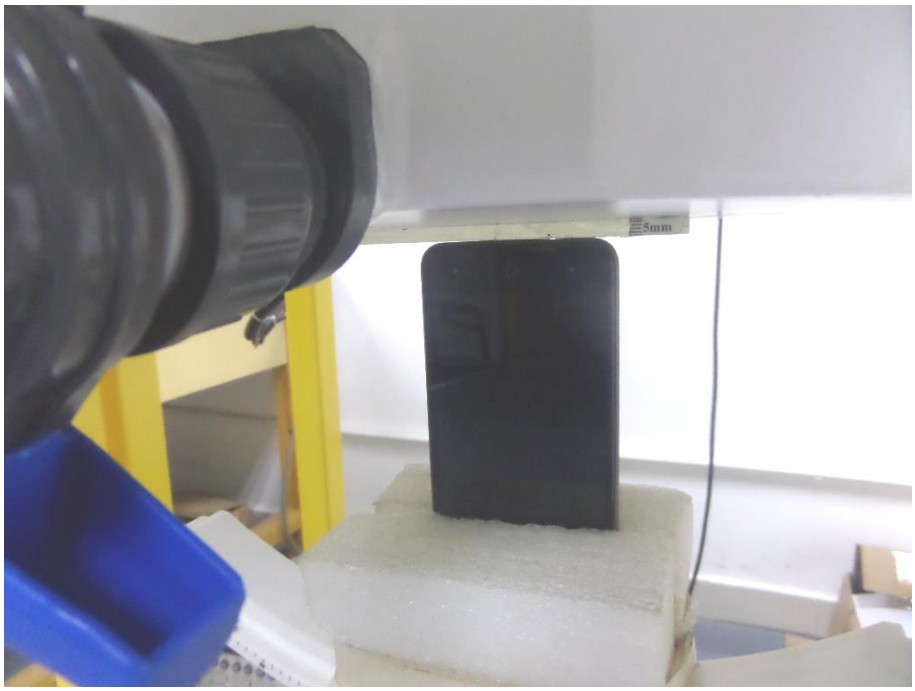
Body Left



Body Top



Body Bottom



Annex E. Calibration Certificate

Please refer to the exhibit for the calibration certificate

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