

# FCC SAR

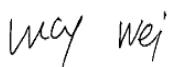
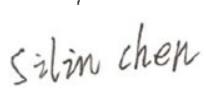
## Measurement and Test Report

### For

Cyrus Technology GmbH

Hergelsbendenstrasse 49, 52080 Aachen, Germany

**FCC ID: 2AI3KCS22SA**

<b>Test Standards:</b>	FCC Part 2.1093 ANSI / IEEE C95.1 ::2005+A1:2010 ANSI / IEEE C95.3 : 2002(R2008) <u>IEEE 1528 :2013</u>
<b>Product Description:</b>	Rugged Phone
<b>Tested Model:</b>	<u>CS22SA</u>
<b>Report No.:</b>	<u>STR17128217H</u>
<b>Sample Received Date:</b>	<u>2018-01-02</u>
<b>Tested Date:</b>	<u>2018-01-02 to 2018-01-08</u>
<b>Issued Date:</b>	<u>2018-01-08</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permission by Shenzhen SEM Test Technology Co., Ltd.

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## 1. General Information

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Cyrus Technology GmbH  
Address of applicant: Hergelsbendenstrasse 49, 52080 Aachen, Germany

Manufacturer: Cyrus Technology GmbH  
Address of manufacturer: Hergelsbendenstrasse 49, 52080 Aachen, Germany

<b>General Description of EUT:</b>	
Product Name:	Rugged Phone
Brand Name:	CYRUS
Model No.:	CS22SA
Adding Model(s):	/
Rated Voltage:	DC 3.8V by Battery
Battery Capacity:	4000mAh
Device Category:	Portable Device
<i>The EUT Main board support GSM850/ PCS1900, WCDMA Band 2/5, LTE Band 2/4/7/13/17 function. It is intended for speech, Multimedia Message Service (MMS) transmission. It is equipped with GPRS/EDGE class 12 for GSM850/900/DCS1800/PCS1900, GPS, FM, Bluetooth, NFC and Wi-Fi functions. For more information see the following datasheet</i>	
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

<b>Technical Characteristics of EUT:</b>	
<b>2G</b>	
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
RF Output Power:	GSM850: 32.64dBm, GSM1900: 30.28dBm EDGE850: 27.65dBm, EDGE1900: 25.65dBm
Type of Modulation:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: -0.65dBi; GSM1900: 1.12dBi
GPRS/EDGE Class:	Class 12
<b>3G</b>	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 23.10dBm, WCDMA Band 5: 23.72dBm
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 5: -0.65dBi, WCDMA Band 2: 1.12dBi
<b>4G</b>	
Support Networks:	FDD-LTE
Support Band:	FDD-LTE Band 2, 4, 7,13,17
Uplink Frequency:	FDD-LTE Band 2: Tx: 1850-1910MHz, FDD-LTE Band 4: Tx: 1710-1755MHz, FDD-LTE Band 7: Tx: 2500-2570MHz, FDD-LTE Band 13: Tx: 777-787MHz, FDD-LTE Band 17: Tx: 704-716MHz,
Downlink Frequency:	FDD-LTE Band 2: Rx: 1930-1990MHz, FDD-LTE Band 4: Rx: 2110-2155MHz, FDD-LTE Band 7: Rx: 2620-2690MHz, FDD-LTE Band 13: Tx: 746-756MHz, FDD-LTE Band 17: Tx: 734-746MHz,
RF Output Power:	FDD-LTE Band 2: 25.35dBm, FDD-LTE Band 4: 22.44dBm,

	FDD-LTE Band 7: 23.99dBm FDD-LTE Band 13: 23.05dBm FDD-LTE Band 17: 22.63dBm
Type of Modulation:	QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	FDD-LTE Band 2: 1.12dBi, FDD-LTE Band 4: -0.65dBi, FDD-LTE Band 7: 0.02dBi, FDD-LTE Band 13: -1.25dBi FDD-LTE Band 17: -2.22dBi
<b>WIFI</b>	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
RF Output Power:	13.11dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20) 7 for 802.11n(HT40)
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	-0.33dBi
<b>Bluetooth</b>	
Bluetooth Version:	V4.0
Frequency Range:	2402-2480MHz
RF Output Power:	2.071dBm (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:	-0.33dBi
<b>NFC</b>	
Support Standards:	NFC
Frequency Range:	13.56MHz
Max. Field Strength:	55.65dBuV/m (at 3m)/ -51.35dBm
Antenna Type:	Integral Antenna
Device Category:	Portable Device

## 1.2 Test Standards

The following report is prepared on behalf of the Cyrus Technology GmbH 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.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### 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.

## 2. Summary of Test Results

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

<b>Frequency Band</b>	<b>Head SAR</b>	<b>Body-worn (10mm Gap)</b>	<b>Hotspot (10mm Gap)</b>	<b>SAR<sub>1g</sub> Limit (W/kg)</b>
	<b>Maximum SAR<sub>1g</sub> (W/kg)</b>	<b>Maximum SAR<sub>1g</sub> (W/kg)</b>	<b>Maximum SAR<sub>1g</sub> (W/kg)</b>	
GSM850	0.059	0.075	0.075	1.6
GSM1900	0.093	0.371	0.371	1.6
WCDMA Band 2	0.174	0.378	0.468	1.6
WCDMA Band 5	0.023	0.078	0.078	1.6
FDD-LTE 2	0.230	0.527	<b>0.743</b>	1.6
FDD-LTE 4	<b>0.295</b>	<b>0.603</b>	0.603	1.6
FDD-LTE 7	0.082	0.204	0.214	1.6
FDD-LTE 13	0.084	0.013	0.013	1.6
FDD-LTE 17	0.079	0.112	0.112	1.6
WLAN 2.4G	0.098	0.121	0.121	1.6
Simultaneous Transmission	0.393	0.724	<b>0.743</b>	1.6

**Remark:**

*The highest reported SAR values for head, body-worn accessory, wireless router(hotspot), and simultaneous transmission conditions are 0.295W/kg, 0.603W/kg , 0.743W/kg, and 0.743W/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)

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#### 3.1 Introduction

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

#### 3.2 SAR Definition

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

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

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

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

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

Where:  $C$  is the specific heat capacity,  $\delta T$  is the temperature rise and  $\delta t$  is the exposure duration, or related to

the

electrical field in the tissue by

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

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  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.

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## 4. SAR Measurement System

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### 4.1 The Measurement System

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

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

The following figure shows the system.



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

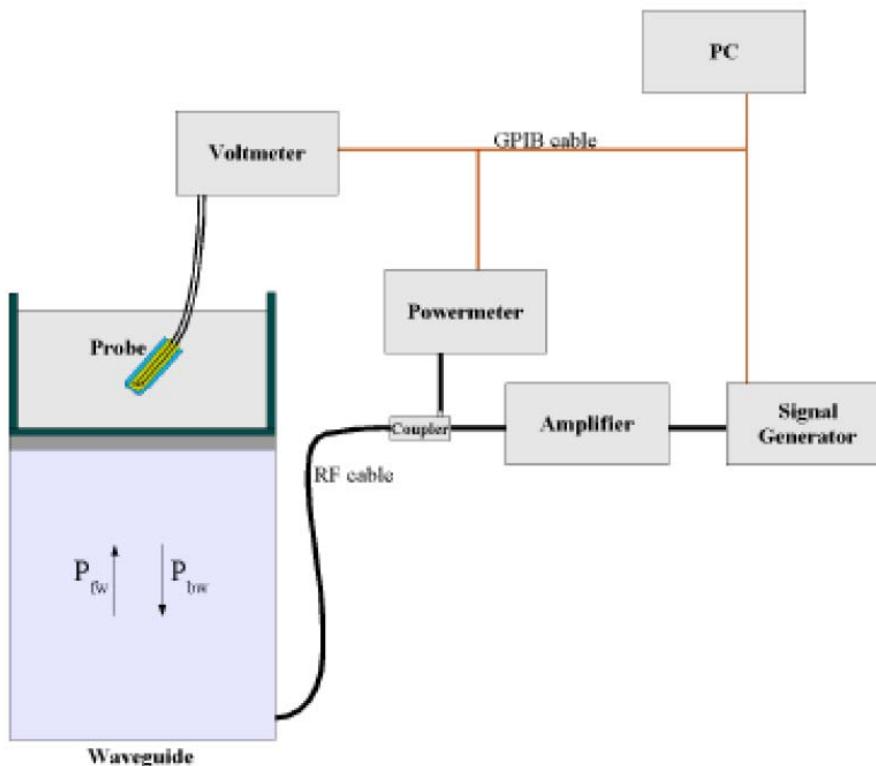
### 4.2 Probe

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

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

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

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

$P_{fw}$  = Forward Power

$P_{bw}$  = 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/cm<sup>2</sup>) 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/cm<sup>2</sup>.

#### Temperature Assessment Procedure

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

Where:

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

$\Delta t$  = exposure time (30 seconds),

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

$\Delta T$  = 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:

$\sigma$  = simulated tissue conductivity,

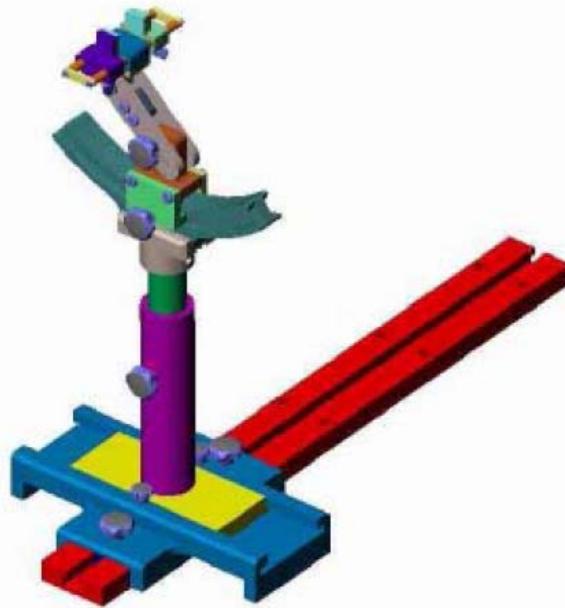
$\rho$  = Tissue density (1.25 g/cm<sup>3</sup> for brain tissue)

#### 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	MVG	SSE5	SN 09/13 EP168	2017-06-01	2018-05-31
750MHz Dipole	MVG	SID750	SN 47/12 DIP 0G750-203	2017-03-16	2018-03-15
835MHz Dipole	MVG	SID835	SN 47/12 DIP 0G835-204	2017-03-16	2018-03-15
1800MHz Dipole	MVG	SID1800	SN 47/12 DIP 1G800-206	2017-03-16	2018-03-15
1900MHz Dipole	MVG	SID1900	SN 47/12 DIP 1G900-207	2017-03-16	2018-03-15
2450MHz Dipole	MVG	SID2450	SN 13/15 DIP 2G450-364	2017-03-16	2018-03-15
2600MHz Dipole	MVG	SID2600	SN 13/15 DIP 2G600-365	2017-03-16	2018-03-15
Dielectric Probe Kit	MVG	SCLMP	SN 47/12 OCPG49	2017-03-16	2018-03-15
SAM Phantom	MVG	SAM	SN/ 47/12 SAM95	N/A	N/A
MULTIMETER	KEITHLEY	Keithley 2000	4006367	2017-06-12	2018-06-11
Signal Generator	Rohde & Schwarz	SMR20	100047	2017-06-12	2018-06-11
Universal Tester	Rohde & Schwarz	CMU200	112012	2017-06-12	2018-06-11
Network Analyzer	HP	8753C	2901A00831	2017-06-12	2018-06-11
Directional Couplers	Agilent	778D	20160	2017-06-12	2018-06-11

## 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 (%)
<b>Head</b>						
750	41.1	1.4	57.0	0.2	0.3	0
835	40.3	1.4	57.9	0.2	0.2	0
1700-1900	55.2	0.3	0	0	0	44.5
2450	55.0	0.1	0	0	0	44.9
2600	54.9	0.1	0	0	0	45.0
<b>Body</b>						
750	50.0	0.8	48.8	0.2	0.2	0
835	50.8	0.9	48.1	0.1	0.1	0
1700-1900	70.2	0.4	0	0	0	29.4
2450	68.6	0.1	0	0	0	31.3
2600	68.2	0.1	0	0	0	31.7

## 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.

<b>Target Frequency (MHz)</b>	<b>Head</b>		<b>Body</b>	
	<b>Conductivity (<math>\sigma</math>)</b>	<b>Permittivity (<math>\epsilon_r</math>)</b>	<b>Conductivity (<math>\sigma</math>)</b>	<b>Permittivity (<math>\epsilon_r</math>)</b>
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
<b>750</b>	<b>0.89</b>	<b>41.9</b>	<b>0.96</b>	<b>55.5</b>
<b>835</b>	<b>0.90</b>	<b>41.5</b>	<b>0.97</b>	<b>55.2</b>
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
<b>1750</b>	<b>1.37</b>	<b>40.1</b>	<b>1.49</b>	<b>53.4</b>
<b>1800-2000</b>	<b>1.40</b>	<b>40.0</b>	<b>1.52</b>	<b>53.3</b>
<b>2450</b>	<b>1.80</b>	<b>39.2</b>	<b>1.95</b>	<b>52.7</b>
3000	2.40	38.5	2.73	52.0
5800	5.27	35.3	6.00	48.2

### 5.3 Tissue Calibration Result

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

#### Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Head Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading ( $\sigma$ )	Target ( $\sigma$ )	Delta (%)	Reading ( $\epsilon_r$ )	Target ( $\epsilon_r$ )	Delta (%)		
750	21.2	0.86	0.89	-3.37	41.32	41.90	-1.38	±5	2018-01-02
835	21.2	0.87	0.90	-3.33	41.11	41.50	-0.94	±5	2018-01-02
1750	21.3	1.37	1.37	0.00	39.02	40.1	-2.69	±5	2018-01-03
1800	21.3	1.37	1.40	-2.14	39.02	40.0	-2.45	±5	2018-01-03
1900	21.3	1.38	1.40	-1.43	38.56	40.00	-3.60	±5	2018-01-03
2450	21.3	1.74	1.80	-3.33	38.15	39.20	-2.68	±5	2018-01-04
2600	21.3	1.93	1.96	-1.53	38.63	39.0	-0.95	±5	2018-01-04

Body Tissue Simulating Liquid									
Freq. MHz.	Temp. (°C)	Conductivity			Permittivity			Limit (%)	Date
		Reading ( $\sigma$ )	Target ( $\sigma$ )	Delta (%)	Reading ( $\epsilon_r$ )	Target ( $\epsilon_r$ )	Delta (%)		
750	21.2	0.93	0.96	-3.12	54.96	55.50	-0.97	±5	2018-01-02
835	21.2	0.95	0.97	-2.06	54.85	55.20	-0.63	±5	2018-01-02
1750	21.3	1.46	1.49	-2.01	51.22	53.40	-4.08	±5	2018-01-03
1800	21.3	1.46	1.52	-3.95	51.22	53.30	-3.90	±5	2018-01-03
1900	21.3	1.50	1.52	-1.32	52.42	53.30	-1.65	±5	2018-01-03
2450	21.3	1.91	1.95	-2.05	52.01	52.70	-1.31	±5	2018-01-04
2600	21.3	2.12	2.16	-1.85	52.24	52.50	-0.50	±5	2018-01-04

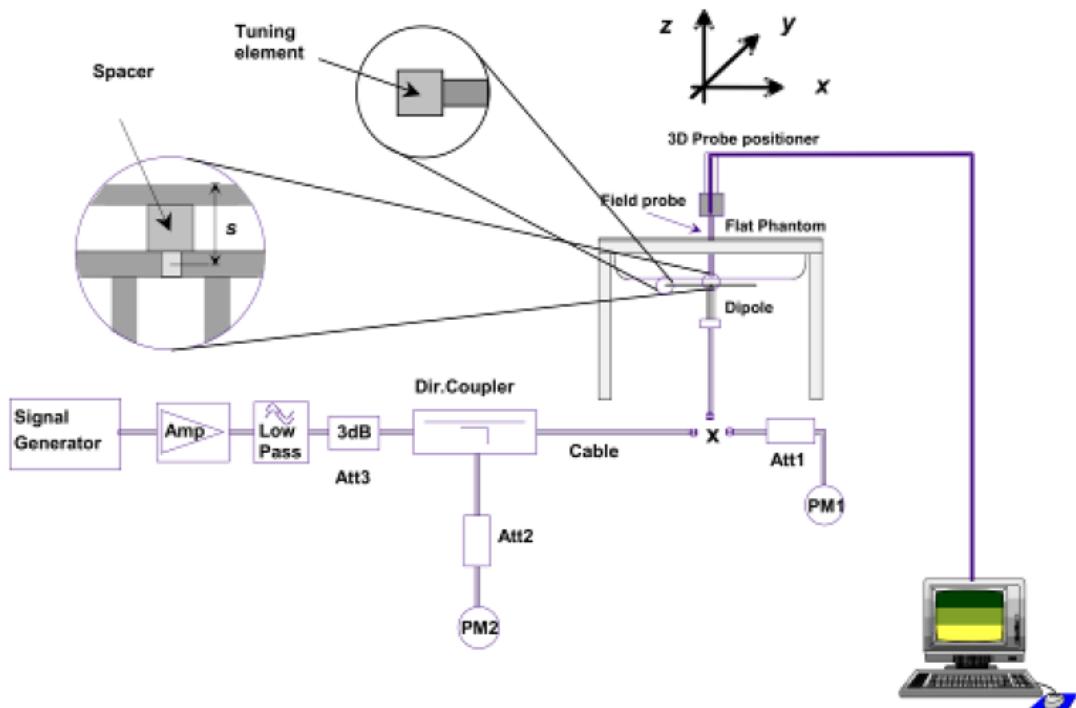
## 6. SAR Measurement Evaluation

### 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 <sub>1g</sub>	Measured SAR <sub>1g</sub>	Normalized SAR <sub>1g</sub>	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
1800	38.49	9.61	38.44	-0.13
1900	39.59	9.91	39.64	0.13
2450	53.76	13.45	53.8	0.07
2600	55.07	13.67	54.68	-0.71
Body				
750	8.40	2.12	8.48	0.95
835	9.36	2.35	9.4	0.43
1800	38.29	9.58	38.32	0.08
1900	39.01	9.78	39.12	0.28
2450	50.33	12.59	50.36	0.06
2600	53.92	13.43	53.72	-0.37

**Remark:** Referring to IEEE 1528-2013, Section 8.2, The system check shall be performed at a test frequency that

is within  $\pm 10\%$  or  $\pm 100$  MHz of the compliance test mid-band frequency, so the 1750 MHz system verification is made of 1800MHz Dipole.

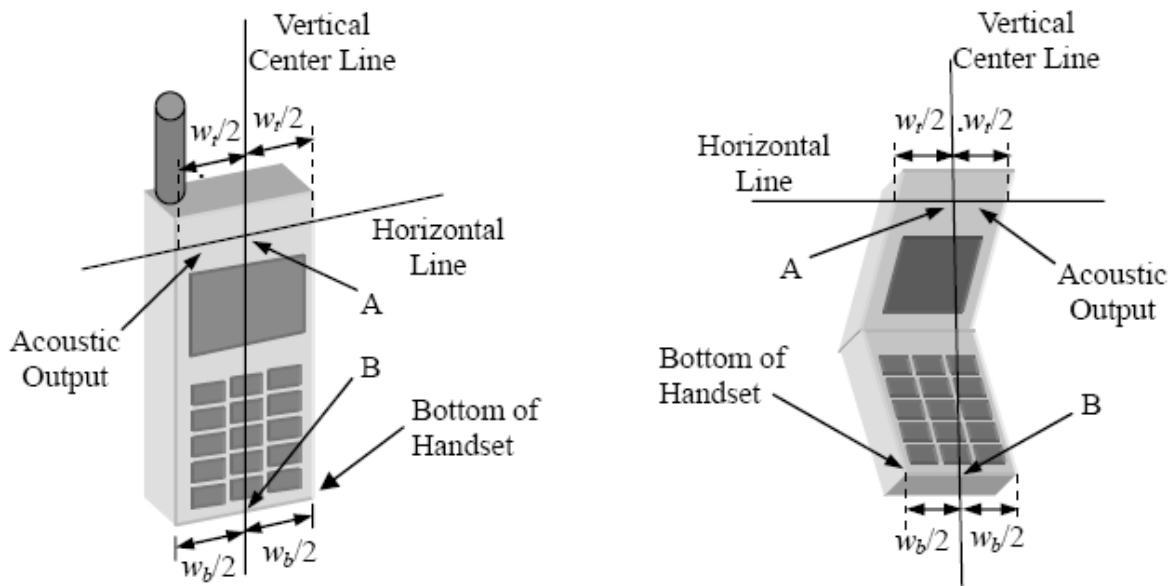
#### Targeted and Measurement SAR

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

## 7. EUT Testing Position

### 7.1 Define Two Imaginary Lines on The Handset

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



**Illustration for Handset Vertical and Horizontal Reference Lines**

## 7.2 Cheek Position

- (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 7.2).

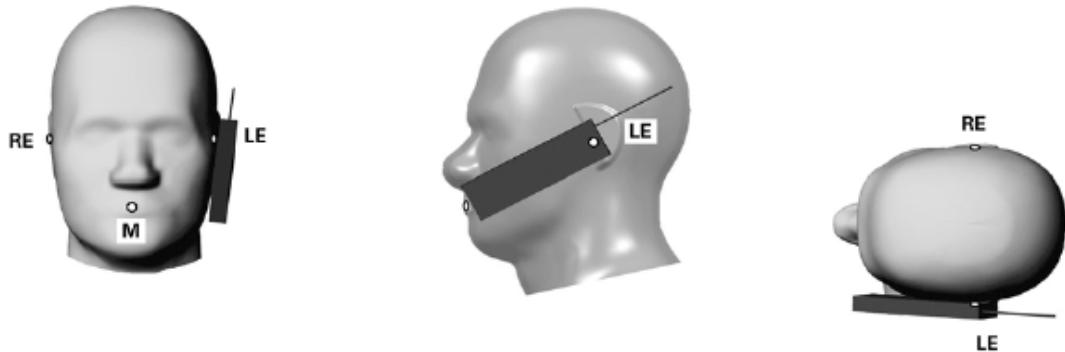


Illustration for Cheek Position

## 7.3 Tilted Position

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

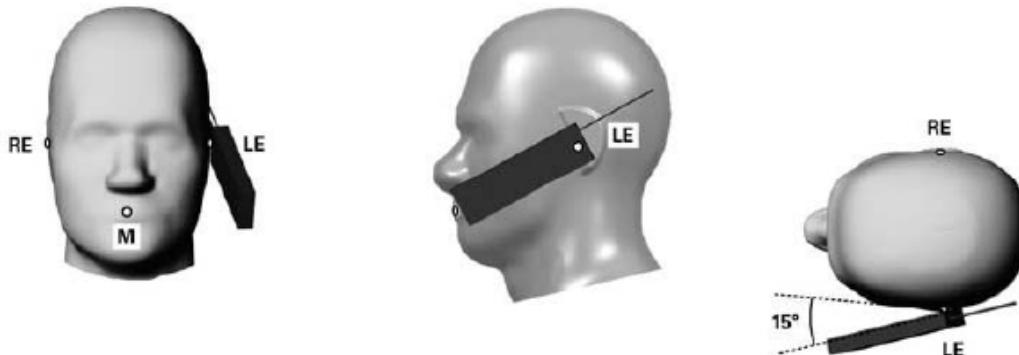


Illustration for Tilted Position

## 7.4 Body Worn Position

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

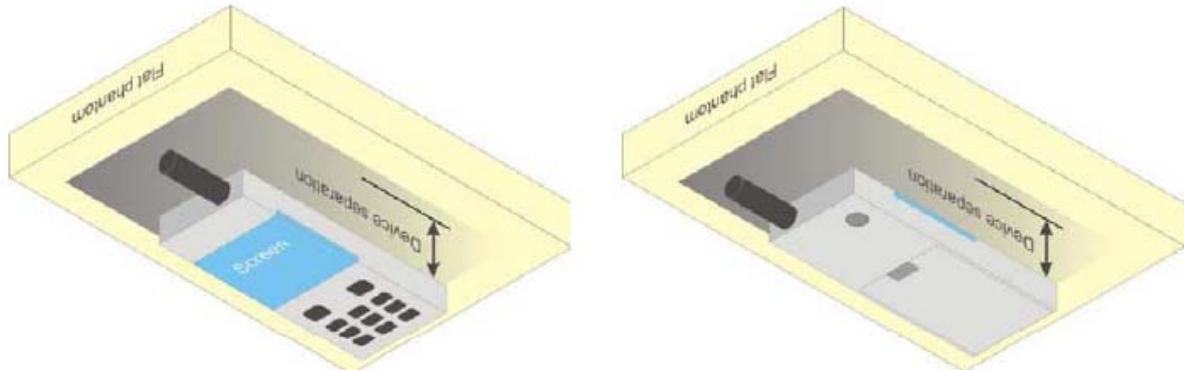
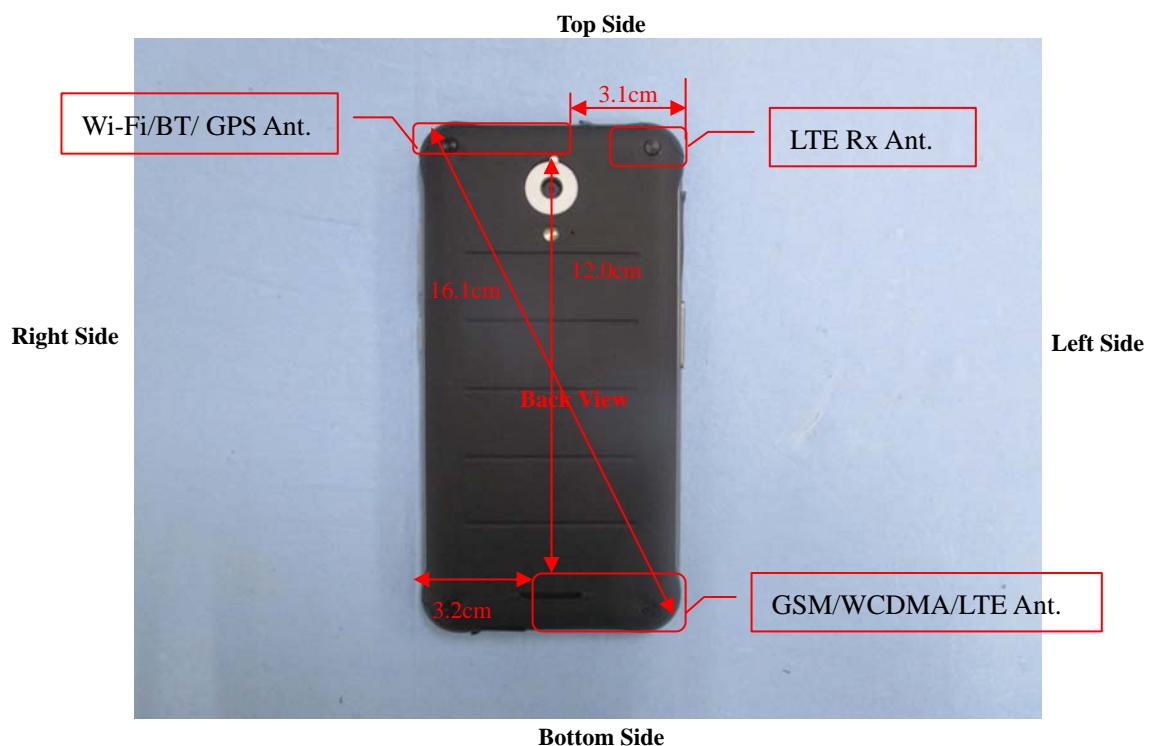


Illustration for Body Worn Position

## 7.5 EUT Antenna Position



Block Diagram for EUT Antenna Position

## 7.6 EUT Testing Position

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

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

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

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

**Remark:**

- Referring to KDB 941225 D06, when the overall device length and width are  $\geq 9\text{cm} \times 5\text{cm}$ , the test separation distances is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
- Referring to KDB 648474 D04 Handset SAR v01r03, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR  $> 1.2 \text{ W/kg}$ ; however ,the highest reported SAR is  $0.743 \text{ W/kg} < 1.2 \text{ W/kg}$ , so 10-g extremity SAR is not required.

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

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## 8. SAR Measurement Procedures

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### 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	32.61	32.64	32.62	33.0	30.27	30.25	30.28	30.5
GPRS (1 slot)	32.61	32.64	32.64	33.0	30.26	30.26	30.27	30.5
GPRS (2 slots)	31.94	31.94	31.92	32.5	29.5	29.5	29.49	30.0
GPRS (3 slots)	30.77	30.78	30.79	31.0	27.69	27.70	27.77	28.0
GPRS (4 slots)	29.85	29.86	29.77	30.0	26.63	26.63	26.69	27.0
EDGE (1 slot)	27.65	27.63	27.6	28.0	25.65	25.57	25.33	26.0
EDGE (2 slots)	27.23	27.21	27.1	27.5	24.68	24.56	24.31	25.0
EDGE (3 slots)	26.34	26.22	26.04	26.5	22.44	22.49	22.21	23.0
EDGE (4 slots)	25.53	25.41	25.26	26.0	21.33	21.33	21.05	21.5

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	23.61	23.64	23.62	24.0	21.27	21.25	21.28	21.5
GPRS (1 slot)	23.61	23.64	23.64	24.0	21.26	21.26	21.27	21.5
GPRS (2 slots)	25.94	25.94	25.92	26.5	23.50	23.50	23.49	24.0
GPRS (3 slots)	26.52	26.53	26.54	27.0	23.44	23.45	23.52	24.0
GPRS (4 slots)	26.85	26.86	26.77	27.0	23.63	23.63	23.69	24.0
EDGE (1 slot)	18.65	18.63	18.60	19.0	16.65	16.57	16.33	17.0
EDGE (2 slots)	21.23	21.21	21.10	21.5	18.68	18.56	18.31	19.0
EDGE (3 slots)	22.09	21.97	21.79	22.5	18.19	18.24	17.96	18.5
EDGE (4 slots)	22.53	22.41	22.26	23.0	18.33	18.33	18.05	18.5

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:

- For Head SAR testing, GSM and GPRS (4TX slots) should be evaluated, therefore the EUT was set in GSM and GPRS (4TX slots) for GSM850 and GSM1900 due to its highest source-based time-average power.
- For Body SAR testing, GPRS should be evaluated, therefore the EUT was set in GPRS (4TX slots) for GSM850 and GSM1900 due to its highest source-based time-average power.

3. Per KDB 447498 D01 v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
4. The DUT do not support DTM function.
5. This device supports VOIP capability through 3rd party apps software.

WCDMA - Average Power (dBm)								
Band	WCDMA Band II				WCDMA Band V			
Channel	9262	9400	9538	Tune-up power (dBm)	4132	4182	4233	Tune-up power (dBm)
Frequency (MHz)	1852.4	1880.0	1907.6		826.4	836.6	846.6	
RMC 12.2k	23.10	22.98	23.03	23.5	23.68	23.72	23.65	24.0
HSDPA Subtest-1	22.05	22.04	22.24	22.5	22.70	22.70	22.74	23.0
HSDPA Subtest-2	22.02	22.03	22.22	22.5	22.68	22.68	22.73	23.0
HSDPA Subtest-3	22.04	22.02	22.23	22.5	22.68	22.65	22.72	23.0
HSDPA Subtest-4	22.03	22.02	22.23	22.5	22.67	22.65	22.73	23.0
HSUPA Subtest-1	22.06	22.00	22.26	22.5	22.69	22.72	22.76	23.0
HSUPA Subtest-2	22.05	21.97	22.25	22.5	22.67	22.71	22.75	23.0
HSUPA Subtest-3	22.01	21.98	22.25	22.5	22.68	22.7	22.74	23.0
HSUPA Subtest-4	22.04	21.96	22.24	22.5	22.67	22.71	22.73	23.0
HSUPA Subtest-5	22.04	21.95	22.22	22.5	22.67	22.71	22.73	23.0

**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  $\leq 1.2\text{W/kg}$ , HSDPA SAR evaluation can be excluded

**FDD-LTE Band 2:**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	24.32	25.5
		1	3	24.15	25.5
		1	5	23.65	25.5
		3	0	23.15	25.5
		3	2	22.26	25.5
		3	3	22.26	25.5
		6	0	22.28	25.5
	MCH	1	0	23.65	25.5
		1	3	23.17	25.5
		1	5	25.26	25.5
		3	0	22.88	25.5
		3	2	22.47	25.5
		3	3	23.36	25.5
		6	0	22.35	25.5
	HCH	1	0	23.66	25.5
		1	3	25.17	25.5
		1	5	24.28	25.5
		3	0	23.68	25.5
		3	2	24.21	25.5
		3	3	24.28	25.5
		6	0	24.32	25.5
16QAM	LCH	1	0	23.69	25.5
		1	3	23.27	25.5
		1	5	22.66	25.5
		3	0	22.47	25.5
		3	2	22.68	25.5
		3	3	22.68	25.5
		6	0	22.75	25.5
	MCH	1	0	22.36	25.5
		1	3	22.85	25.5
		1	5	24.85	25.5
		3	0	22.69	25.5
		3	2	22.36	25.5
		3	3	22.98	25.5
		6	0	22.87	25.5
	HCH	1	0	23.54	25.5

		1	3	24.26	25.5
		1	5	24.36	25.5
		3	0	22.17	25.5
		3	2	23.26	25.5
		3	3	23.97	25.5
		6	0	22.28	25.5

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	<b>Tune-up power (dBm)</b>
		Size	Offset		
QPSK	LCH	1	0	24.35	25.5
		1	7	24.28	25.5
		1	14	24.68	25.5
		8	0	23.31	25.5
		8	4	23.28	25.5
		8	7	23.39	25.5
		15	0	23.37	25.5
	MCH	1	0	23.54	25.5
		1	7	23.25	25.5
		1	14	23.39	25.5
		8	0	22.75	25.5
		8	4	22.71	25.5
		8	7	22.36	25.5
		15	0	22.21	25.5
	HCH	1	0	24.89	25.5
		1	7	24.46	25.5
		1	14	24.35	25.5
		8	0	24.21	25.5
		8	4	24.28	25.5
		8	7	23.73	25.5
		15	0	23.68	25.5
16QAM	LCH	1	0	23.28	25.5
		1	7	23.61	25.5
		1	14	23.39	25.5
		8	0	22.48	25.5
		8	4	22.68	25.5
		8	7	22.39	25.5
		15	0	22.28	25.5
	MCH	1	0	22.79	25.5
		1	7	22.69	25.5
		1	14	22.28	25.5
		8	0	22.69	25.5

		8	4	22.17	25.5
		8	7	22.61	25.5
		15	0	22.18	25.5
HCH		1	0	24.89	25.5
		1	7	24.36	25.5
		1	14	24.28	25.5
		8	0	22.35	25.5
		8	4	22.65	25.5
		8	7	22.17	25.5
		15	0	22.69	25.5

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	24.68	25.5
		1	12	24.87	25.5
		1	24	24.15	25.5
		12	0	23.65	25.5
		12	6	23.17	25.5
		12	13	23.87	25.5
		25	0	23.65	25.5
	MCH	1	0	23.95	25.5
		1	12	23.17	25.5
		1	24	23.28	25.5
		12	0	22.32	25.5
		12	6	22.17	25.5
		12	13	22.26	25.5
		25	0	22.26	25.5
	HCH	1	0	24.28	25.5
		1	12	24.32	25.5
		1	24	25.17	25.5
		12	0	24.21	25.5
		12	6	23.26	25.5
		12	13	23.28	25.5
		25	0	23.65	25.5
16QAM	LCH	1	0	23.75	25.5
		1	12	23.36	25.5
		1	24	23.27	25.5
		12	0	22.58	25.5
		12	6	22.25	25.5
		12	13	22.75	25.5
		25	0	22.39	25.5

	MCH	1	0	22.85	25.5
		1	12	22.65	25.5
		1	24	23.25	25.5
		12	0	22.39	25.5
		12	6	22.27	25.5
		12	13	22.84	25.5
		25	0	22.68	25.5
	HCH	1	0	23.67	25.5
		1	12	23.28	25.5
		1	24	23.36	25.5
		12	0	23.88	25.5
		12	6	22.62	25.5
		12	13	22.28	25.5
		25	0	22.26	25.5

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	23.65	25.5
		1	24	23.28	25.5
		1	49	23.65	25.5
		25	0	23.17	25.5
		25	12	23.26	25.5
		25	25	23.87	25.5
		50	0	23.24	25.5
	MCH	1	0	23.26	25.5
		1	24	23.58	25.5
		1	49	23.36	25.5
		25	0	22.41	25.5
		25	12	22.35	25.5
		25	25	22.25	25.5
		50	0	22.75	25.5
16QAM	LCH	1	0	24.68	25.5
		1	24	24.47	25.5
		1	49	24.66	25.5
		25	0	23.85	25.5
		25	12	23.23	25.5
		25	25	23.35	25.5
		50	0	23.74	25.5

		25	0	22.28	25.5
		25	12	22.26	25.5
		25	25	22.36	25.5
		50	0	22.17	25.5
MCH		1	0	22.22	25.5
		1	24	22.39	25.5
		1	49	22.27	25.5
		25	0	22.57	25.5
		25	12	22.39	25.5
		25	25	22.37	25.5
		50	0	22.73	25.5
HCH		1	0	24.21	25.5
		1	24	23.28	25.5
		1	49	23.36	25.5
		25	0	22.84	25.5
		25	12	23.05	25.5
		25	25	22.18	25.5
		50	0	22.28	25.5

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	23.78	25.5
		1	37	23.26	25.5
		1	74	23.21	25.5
		37	0	22.89	25.5
		37	18	22.65	25.5
		37	38	22.28	25.5
		75	0	23.28	25.5
	MCH	1	0	23.17	25.5
		1	37	23.59	25.5
		1	74	24.65	25.5
		37	0	22.36	25.5
		37	18	22.27	25.5
		37	38	23.28	25.5
		75	0	22.65	25.5
	HCH	1	0	24.17	25.5
		1	37	25.14	25.5
		1	74	25.26	25.5
		37	0	24.29	25.5
		37	18	24.38	25.5
		37	38	24.24	25.5

		75	0	23.24	25.5
16QAM	LCH	1	0	23.87	25.5
		1	37	23.26	25.5
		1	74	22.21	25.5
		37	0	22.29	25.5
		37	18	22.28	25.5
		37	38	22.26	25.5
		75	0	22.42	25.5
	MCH	1	0	22.36	25.5
		1	37	22.27	25.5
		1	74	23.98	25.5
		37	0	22.48	25.5
		37	18	22.55	25.5
		37	38	22.26	25.5
		75	0	22.69	25.5
	HCH	1	0	23.72	25.5
		1	37	24.88	25.5
		1	74	24.36	25.5
		37	0	23.58	25.5
		37	18	23.18	25.5
		37	38	23.65	25.5
		75	0	23.15	25.5

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	25.35	25.5
		1	49	24.26	25.5
		1	99	24.65	25.5
		50	0	24.28	25.5
		50	25	24.65	25.5
		50	50	24.28	25.5
		100	0	23.18	25.5
	MCH	1	0	24.26	25.5
		1	49	24.21	25.5
		1	99	23.26	25.5
		50	0	23.35	25.5
		50	25	23.65	25.5
		50	50	23.18	25.5
		100	0	22.32	25.5
	HCH	1	0	24.21	25.5
		1	49	24.54	25.5

		1	99	24.32	25.5
		50	0	24.65	25.5
		50	25	24.47	25.5
		50	50	24.65	25.5
		100	0	24.47	25.5
16QAM	LCH	1	0	23.54	25.5
		1	49	23.65	25.5
		1	99	23.17	25.5
		50	0	23.65	25.5
		50	25	23.17	25.5
		50	50	23.28	25.5
		100	0	22.36	25.5
	MCH	1	0	22.28	25.5
		1	49	22.21	25.5
		1	99	22.75	25.5
		50	0	22.85	25.5
		50	25	22.69	25.5
		50	50	22.28	25.5
		100	0	22.36	25.5
	HCH	1	0	24.26	25.5
		1	49	24.02	25.5
		1	99	24.12	25.5
		50	0	23.58	25.5
		50	25	23.36	25.5
		50	50	23.28	25.5
		100	0	23.69	25.5

**FDD-LTE Band 4:**

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	<b>Tune-up power (dBm)</b>
		Size	Offset		
QPSK	LCH	1	0	20.71	23.0
		1	3	20.76	23.0
		1	5	20.77	23.0
		3	0	20.81	23.0
		3	2	20.74	23.0
		3	3	20.81	23.0
		6	0	20.78	23.0
	MCH	1	0	21.05	23.0
		1	3	21.03	23.0

		1	5	21.04	23.0
		3	0	21.12	23.0
		3	2	21.01	23.0
		3	3	21.08	23.0
		6	0	20.91	23.0
	HCH	1	0	20.41	23.0
		1	3	20.39	23.0
		1	5	20.34	23.0
		3	0	20.48	23.0
		3	2	20.35	23.0
		3	3	20.41	23.0
		6	0	20.35	23.0
16QAM	LCH	1	0	20.38	23.0
		1	3	20.56	23.0
		1	5	20.61	23.0
		3	0	20.85	23.0
		3	2	20.81	23.0
		3	3	20.87	23.0
		6	0	20.75	23.0
	MCH	1	0	20.48	23.0
		1	3	20.50	23.0
		1	5	20.49	23.0
		3	0	20.65	23.0
		3	2	20.78	23.0
		3	3	20.13	23.0
		6	0	20.99	23.0
	HCH	1	0	20.86	23.0
		1	3	20.89	23.0
		1	5	20.78	23.0
		3	0	20.51	23.0
		3	2	20.43	23.0
		3	3	20.48	23.0
		6	0	20.32	23.0

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	20.74	23.0
		1	7	20.85	23.0
		1	14	20.81	23.0
		8	0	20.83	23.0
		8	4	20.84	23.0

16QAM	MCH	8	7	20.87	23.0
		15	0	21.83	23.0
		1	0	21.05	23.0
		1	7	21.09	23.0
		1	14	20.99	23.0
		8	0	20.65	23.0
		8	4	20.85	23.0
		8	7	20.55	23.0
	HCH	15	0	20.64	23.0
		1	0	20.55	23.0
		1	7	20.52	23.0
		1	14	20.35	23.0
		8	0	20.50	23.0
		8	4	20.49	23.0
		8	7	20.46	23.0
		15	0	20.46	23.0
	LCH	1	0	20.07	23.0
		1	7	20.17	23.0
		1	14	20.14	23.0
		8	0	21.89	23.0
		8	4	21.95	23.0
		8	7	21.95	23.0
		15	0	21.83	23.0
	MCH	1	0	20.49	23.0
		1	7	20.54	23.0
		1	14	20.47	23.0
		8	0	21.11	23.0
		8	4	21.07	23.0
		8	7	21.10	23.0
		15	0	22.09	23.0
	HCH	1	0	22.90	23.0
		1	7	22.87	23.0
		1	14	22.70	23.0
		8	0	21.52	23.0
		8	4	21.47	23.0
		8	7	21.43	23.0
		15	0	21.53	23.0

Modulation	Channel	RB Configuration		Average Power [dBm]	<b>Tune-up power (dBm)</b>
		Size	Offset		
QPSK	LCH	1	0	20.84	23.0

		1	12	20.93	23.0
		1	24	20.91	23.0
		12	0	21.92	23.0
		12	6	21.92	23.0
		12	13	21.93	23.0
		25	0	21.85	23.0
16QAM	MCH	1	0	21.16	23.0
		1	12	21.16	23.0
		1	24	21.05	23.0
		12	0	20.55	23.0
		12	6	20.56	23.0
		12	13	20.74	23.0
		25	0	20.59	23.0
		1	0	20.72	23.0
16QAM	HCH	1	12	20.59	23.0
		1	24	20.37	23.0
		12	0	20.71	23.0
		12	6	20.63	23.0
		12	13	20.55	23.0
		25	0	20.62	23.0
		1	0	20.32	23.0
		1	12	20.38	23.0
16QAM	LCH	1	24	20.36	23.0
		12	0	20.40	23.0
		12	6	21.12	23.0
		12	13	21.12	23.0
		25	0	21.90	23.0
		1	0	21.62	23.0
		1	12	21.59	23.0
		1	24	21.50	23.0
16QAM	MCH	12	0	21.37	23.0
		12	6	20.34	23.0
		12	13	20.35	23.0
		25	0	20.18	23.0
		1	0	20.96	23.0
		1	12	20.84	23.0
		1	24	20.61	23.0
		12	0	20.79	23.0
16QAM	HCH	12	6	20.72	23.0
		12	13	20.63	23.0
		25	0	20.69	23.0

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	20.87	23.0
		1	24	20.96	23.0
		1	49	21.09	23.0
		25	0	21.91	23.0
		25	12	21.97	23.0
		25	25	20.36	23.0
		50	0	20.78	23.0
	MCH	1	0	21.15	23.0
		1	24	21.11	23.0
		1	49	21.07	23.0
		25	0	20.48	23.0
		25	12	20.50	23.0
		25	25	20.37	23.0
		50	0	20.36	23.0
16QAM	HCH	1	0	21.03	23.0
		1	24	20.81	23.0
		1	49	20.49	23.0
		25	0	20.85	23.0
		25	12	20.77	23.0
		25	25	20.63	23.0
		50	0	20.76	23.0
	LCH	1	0	20.23	23.0
		1	24	20.30	23.0
		1	49	20.42	23.0
		25	0	20.95	23.0
		25	12	20.41	23.0
		25	25	20.27	23.0
		50	0	20.32	23.0
	MCH	1	0	20.49	23.0
		1	24	20.46	23.0
		1	49	20.42	23.0
		25	0	20.21	23.0
		25	12	20.48	23.0
		25	25	20.35	23.0
		50	0	20.48	23.0
	HCH	1	0	20.37	23.0
		1	24	20.16	23.0
		1	49	20.85	23.0

		25	0	20.87	23.0
		25	12	20.79	23.0
		25	25	20.65	23.0
		50	0	20.81	23.0

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	<b>Tune-up power (dBm)</b>
		Size	Offset		
QPSK	LCH	1	0	20.81	23.0
		1	37	21.10	23.0
		1	74	21.15	23.0
		37	0	21.93	23.0
		37	18	20.04	23.0
		37	38	20.15	23.0
		75	0	20.04	23.0
	MCH	1	0	21.17	23.0
		1	37	21.20	23.0
		1	74	21.05	23.0
		37	0	20.23	23.0
		37	18	20.17	23.0
		37	38	20.13	23.0
		75	0	20.18	23.0
	HCH	1	0	21.30	23.0
		1	37	21.14	23.0
		1	74	20.74	23.0
		37	0	20.25	23.0
		37	18	20.17	23.0
		37	38	21.99	23.0
		75	0	20.12	23.0
16QAM	LCH	1	0	20.18	23.0
		1	37	20.46	23.0
		1	74	20.50	23.0
		37	0	20.96	23.0
		37	18	21.07	23.0
		37	38	21.15	23.0
		75	0	21.06	23.0
	MCH	1	0	20.54	23.0
		1	37	20.54	23.0
		1	74	20.41	23.0
		37	0	21.24	23.0
		37	18	21.21	23.0
		37	38	21.15	23.0

		75	0	21.22	23.0
HCH		1	0	20.65	23.0
		1	37	20.52	23.0
		1	74	20.07	23.0
		37	0	21.27	23.0
		37	18	21.18	23.0
		37	38	21.01	23.0
		75	0	21.14	23.0

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	<b>Tune-up power (dBm)</b>
		Size	Offset		
QPSK	LCH	1	0	21.05	23.0
		1	49	21.32	23.0
		1	99	22.44	23.0
		50	0	20.14	23.0
		50	25	20.27	23.0
		50	50	20.39	23.0
		100	0	20.28	23.0
	MCH	1	0	21.20	23.0
		1	49	21.24	23.0
		1	99	21.21	23.0
		50	0	20.20	23.0
		50	25	20.15	23.0
		50	50	20.12	23.0
		100	0	20.13	23.0
	HCH	1	0	22.21	23.0
		1	49	22.06	23.0
		1	99	21.61	23.0
		50	0	21.62	23.0
		50	25	21.50	23.0
		50	50	21.87	23.0
		100	0	21.71	23.0
16QAM	LCH	1	0	20.32	23.0
		1	49	20.56	23.0
		1	99	20.67	23.0
		50	0	20.45	23.0
		50	25	20.29	23.0
		50	50	20.38	23.0
		100	0	20.30	23.0
	MCH	1	0	20.47	23.0
		1	49	20.45	23.0

		1	99	20.44	23.0
		50	0	20.21	23.0
		50	25	20.35	23.0
		50	50	20.47	23.0
		100	0	20.68	23.0
	HCH	1	0	20.63	23.0
		1	49	20.48	23.0
		1	99	20.45	23.0
		50	0	20.23	23.0
		50	25	20.54	23.0
		50	50	20.92	23.0
		100	0	20.36	23.0

**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	22.47	24.5
		1	12	22.39	24.5
		1	24	23.11	24.5
		12	0	22.49	24.5
		12	6	22.37	24.5
		12	13	23.26	24.5
		25	0	22.35	24.5
	MCH	1	0	23.81	24.5
		1	12	23.84	24.5
		1	24	23.64	24.5
		12	0	23.83	24.5
		12	6	23.78	24.5
		12	13	23.73	24.5
		25	0	23.74	24.5
	HCH	1	0	23.86	24.5
		1	12	22.00	24.5
		1	24	22.00	24.5
		12	0	22.07	24.5
		12	6	22.03	24.5
		12	13	22.09	24.5
		25	0	23.01	24.5
16QAM	LCH	1	0	22.94	24.5
		1	12	22.86	24.5
		1	24	22.58	24.5
		12	0	22.67	24.5
		12	6	22.56	24.5
		12	13	22.46	24.5
		25	0	22.40	24.5
	MCH	1	0	22.28	24.5
		1	12	22.31	24.5
		1	24	22.07	24.5
		12	0	22.99	24.5
		12	6	22.94	24.5
		12	13	23.89	24.5
		25	0	23.54	24.5
	HCH	1	0	23.29	24.5

		1	12	23.52	24.5
		1	24	23.49	24.5
		12	0	22.22	24.5
		12	6	22.22	24.5
		12	13	22.26	24.5
		25	0	22.09	24.5

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	23.55	24.5
		1	24	23.21	24.5
		1	49	23.98	24.5
		25	0	23.37	24.5
		25	12	21.20	24.5
		25	25	21.07	24.5
		50	0	21.19	24.5
	MCH	1	0	22.83	24.5
		1	24	22.77	24.5
		1	49	23.54	24.5
		25	0	21.80	24.5
		25	12	22.75	24.5
		25	25	22.66	24.5
		50	0	22.74	24.5
16QAM	HCH	1	0	21.86	24.5
		1	24	21.00	24.5
		1	49	21.07	24.5
		25	0	21.01	24.5
		25	12	22.04	24.5
		25	25	21.08	24.5
		50	0	21.08	24.5
	LCH	1	0	23.91	24.5
		1	24	21.56	24.5
		1	49	21.30	24.5
		25	0	22.39	24.5
		25	12	22.21	24.5
		25	25	22.07	24.5
		50	0	22.21	24.5
	MCH	1	0	23.18	24.5
		1	24	23.08	24.5
		1	49	21.88	24.5
		25	0	23.83	24.5

		25	12	22.76	24.5
		25	25	22.70	24.5
		50	0	22.74	24.5
HCH	HCH	1	0	23.25	24.5
		1	24	22.37	24.5
		1	49	23.47	24.5
		25	0	22.96	24.5
		25	12	23.02	24.5
		25	25	23.07	24.5
		50	0	22.11	24.5

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	23.54	24.5
		1	37	23.08	24.5
		1	74	23.90	24.5
		37	0	23.29	24.5
		37	18	23.07	24.5
		37	38	23.95	24.5
		75	0	23.14	24.5
	MCH	1	0	21.94	24.5
		1	37	21.94	24.5
		1	74	22.57	24.5
		37	0	21.92	24.5
		37	18	22.85	24.5
		37	38	22.65	24.5
		75	0	22.63	24.5
	HCH	1	0	22.54	24.5
		1	37	21.93	24.5
		1	74	23.95	24.5
		37	0	23.77	24.5
		37	18	23.91	24.5
		37	38	23.02	24.5
		75	0	23.99	24.5
16QAM	LCH	1	0	21.87	24.5
		1	37	21.45	24.5
		1	74	21.25	24.5
		37	0	23.31	24.5
		37	18	21.12	24.5
		37	38	22.99	24.5
		75	0	22.19	24.5

	MCH	1	0	22.31	24.5
	MCH	1	37	22.27	24.5
	MCH	1	74	22.95	24.5
	MCH	37	0	22.77	24.5
	MCH	37	18	23.67	24.5
	MCH	37	38	22.56	24.5
	MCH	75	0	21.65	24.5
	HCH	1	0	22.93	24.5
	HCH	1	37	23.31	24.5
	HCH	1	74	22.32	24.5
	HCH	37	0	22.79	24.5
	HCH	37	18	22.96	24.5
	HCH	37	38	23.05	24.5
	HCH	75	0	21.01	24.5

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	23.99	24.5
		1	49	23.09	24.5
		1	99	23.02	24.5
		50	0	22.23	24.5
		50	25	22.00	24.5
		50	50	22.95	24.5
		100	0	23.10	24.5
	MCH	1	0	23.92	24.5
		1	49	23.78	24.5
		1	99	23.53	24.5
		50	0	22.95	24.5
		50	25	23.82	24.5
		50	50	23.66	24.5
		100	0	22.81	24.5
	HCH	1	0	22.55	24.5
		1	49	22.85	24.5
		1	99	22.10	24.5
		50	0	22.81	24.5
		50	25	22.95	24.5
		50	50	22.12	24.5
		100	0	22.96	24.5
16QAM	LCH	1	0	23.90	24.5
		1	49	22.30	24.5
		1	99	22.27	24.5

		50	0	23.27	24.5
		50	25	21.05	24.5
		50	50	22.97	24.5
		100	0	22.11	24.5
MCH	1	0		22.30	24.5
	1	49		23.12	24.5
	1	99		23.87	24.5
	50	0		21.99	24.5
	50	25		22.85	24.5
	50	50		22.69	24.5
	100	0		22.82	24.5
HCH	1	0		23.94	24.5
	1	49		22.20	24.5
	1	99		22.45	24.5
	50	0		22.84	24.5
	50	25		22.99	24.5
	50	50		22.15	24.5
	100	0		23.00	24.5

**FDD-LTE Band 13:**

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	22.66	23.5
		1	12	20.38	23.5
		1	24	20.23	23.5
		12	0	21.11	23.5
		12	6	20.41	23.5
		12	13	20.29	23.5
		25	0	20.81	23.5
	MCH	/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
16QAM	LCH	1	0	20.71	23.5
		1	12	20.55	23.5
		1	24	22.64	23.5
		12	0	20.25	23.5
		12	6	20.13	23.5
		12	13	21.89	23.5
		25	0	21.71	23.5
	MCH	1	0	22.38	23.5
		1	12	21.61	23.5
		1	24	21.64	23.5
		12	0	21.31	23.5
		12	6	21.63	23.5
		12	13	21.53	23.5
		25	0	20.99	23.5
	HCH	/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		1	0	20.26	23.5
	1	12	20.26	23.5	

		1	24	21.80	23.5
		12	0	21.31	23.5
		12	6	21.17	23.5
		12	13	21.91	23.5
		25	0	21.74	23.5

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		1	0	23.05	23.5
	MCH	1	24	21.65	23.5
		1	49	22.48	23.5
		25	0	20.41	23.5
		25	12	21.00	23.5
		25	25	21.94	23.5
		50	0	21.42	23.5
		/	/	/	/
16QAM	LCH	/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
		/	/	/	/
	MCH	1	0	22.09	23.5
		1	24	20.99	23.5
		1	49	21.94	23.5
		25	0	20.59	23.5
		25	12	21.11	23.5
		/	/	/	/
		/	/	/	/

		25	25	21.48	23.5
		50	0	21.49	23.5
HCH	/	/	/	/	/
	/	/	/	/	/
	/	/	/	/	/
	/	/	/	/	/
	/	/	/	/	/
	/	/	/	/	/
	/	/	/	/	/

**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	21.68	23.0
		1	12	21.35	23.0
		1	24	21.62	23.0
		12	0	20.54	23.0
		12	6	20.12	23.0
		12	13	20.08	23.0
		25	0	20.11	23.0
	MCH	1	0	21.23	23.0
		1	12	21.52	23.0
		1	24	22.19	23.0
		12	0	20.14	23.0
		12	6	20.40	23.0
		12	13	20.77	23.0
		25	0	20.41	23.0
16QAM	HCH	1	0	22.14	23.0
		1	12	21.97	23.0
		1	24	22.10	23.0
		12	0	20.95	23.0
		12	6	20.95	23.0
		12	13	20.97	23.0
		25	0	20.94	23.0
	LCH	1	0	21.57	23.0
		1	12	20.64	23.0
		1	24	21.04	23.0
		12	0	20.60	23.0
		12	6	20.22	23.0
		12	13	20.21	23.0
		25	0	20.15	23.0
	MCH	1	0	20.33	23.0
		1	12	20.67	23.0
		1	24	21.33	23.0
		12	0	20.17	23.0
		12	6	20.46	23.0
		12	13	20.83	23.0
		25	0	20.44	23.0
	HCH	1	0	21.37	23.0
		1	12	21.28	23.0

		1	24	21.39	23.0
		12	0	20.04	23.0
		12	6	20.05	23.0
		12	13	20.09	23.0
		25	0	20.03	23.0

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Average Power [dBm]	Tune-up power (dBm)
		Size	Offset		
QPSK	LCH	1	0	22.63	23.0
		1	24	20.87	23.0
		1	49	21.68	23.0
		25	0	21.94	23.0
		25	12	21.37	23.0
		25	25	21.78	23.0
		50	0	21.44	23.0
	MCH	1	0	21.06	23.0
		1	24	21.22	23.0
		1	49	21.66	23.0
		25	0	20.78	23.0
		25	12	20.14	23.0
		25	25	20.79	23.0
		50	0	20.23	23.0
	HCH	1	0	20.78	23.0
		1	24	21.42	23.0
		1	49	21.50	23.0
		25	0	20.89	23.0
		25	12	20.34	23.0
		25	25	20.67	23.0
		50	0	20.14	23.0
16QAM	LCH	1	0	20.82	23.0
		1	24	20.30	23.0
		1	49	21.11	23.0
		25	0	20.84	23.0
		25	12	20.96	23.0
		25	25	20.57	23.0
		50	0	20.22	23.0
	MCH	1	0	20.41	23.0
		1	24	20.63	23.0
		1	49	21.07	23.0
		25	0	21.81	23.0
		25	12	21.20	23.0

		25	25	21.73	23.0
		50	0	21.31	23.0
HCH		1	0	20.26	23.0
		1	24	20.99	23.0
		1	49	21.04	23.0
		25	0	20.80	23.0
		25	12	20.92	23.0
		25	25	20.50	23.0
		50	0	20.16	23.0

**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  $\leq 0.8 \text{ W/kg}$ , 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  $> 1.45 \text{ W/kg}$ , 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  $\leq 0.8 \text{ W/kg}$ . Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45 \text{ W/kg}$ , 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  $> \frac{1}{2} \text{ dB}$  higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is  $> 1.45 \text{ W/kg}$ .

WLAN - Maximum Average Power					
Test Mode	Data Rate	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up power (dBm)
802.11b	1Mbps	CH 01	2412	13.11	13.5
		CH 06	2437	13.08	13.5
		CH 11	2462	13.06	13.5
802.11g	54Mbps	CH 01	2412	10.35	11.0
		CH 06	2437	10.47	11.0
		CH 11	2462	10.27	11.0
802.11n (20MHz)	MCS7	CH 01	2412	10.58	11.0
		CH 06	2437	10.1	11.0
		CH 11	2462	10.03	11.0
802.11n (40MHz)	MCS7	CH 03	2422	9.64	10.0
		CH 06	2437	9.64	10.0
		CH 09	2452	9.56	10.0

**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  $\leq 0.8 \text{ W/kg}$ , no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is  $> 0.8 \text{ W/kg}$ , SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is  $> 1.2 \text{ W/kg}$ , 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  $\leq 1.2\text{W/kg}$ .

<b>Bluetooth - Maximum Average Power</b>			
<b>Test Mode</b>	<b>Data Rate</b>	<b>Average Power(dBm)</b>	<b>Tune-up power (dBm)</b>
GFSK	1Mbps	2.071	2.5
Pi/4 QDPSK	2Mbps	1.462	2.5
8DPSK	3Mbps	1.587	2.5

<b>Bluetooth - Maximum Average Power</b>					
<b>Test Mode</b>	<b>Data Rate</b>	<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Average Power (dBm)</b>	<b>Tune-up power (dBm)</b>
BLE	1Mbps	CH 00	2402	1.897	2.0
		CH 19	2440	1.43	2.0
		CH 39	2480	1.26	2.0

<b>NFC - Maximum Average Power</b>			
<b>Test Mode</b>	<b>Frequency (MHz)</b>	<b>Average Power(dBm)</b>	<b>Tune-up power (dBm)</b>
NFC	13.56	-51.35	-50

**Remark:**

Bluetooth and NFC maximum output power is 2.071dBm and -51.35dBm *respectively*, and Maximum Tune-Up output power is 1.5dBm and -50dBm. 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  $\leq$  50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, } 4.87\text{mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for}$$

1-g SAR and  $\leq$  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

Bluetooth:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	Result	Limit
2.5	1.78	5	2.402	0.55	3

The exclusion thresholds is 0.55< 3, therefore, the RF exposure evaluation is not required.

NFC:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	Result	Limit
-50	0.00001	5	0.01356	0.0000002	3

The exclusion thresholds is 0.0000002< 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	32.64	33.0	1.086	0.033	0.036
2.	GSM	Right Tilted	190	836.6	32.64	33.0	1.086	0.005	0.005
3.	GSM	Left Cheek	190	836.6	32.64	33.0	1.086	0.029	0.032
4.	GSM	Left Tilted	190	836.6	32.64	33.0	1.086	0.004	0.004

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	30.28	30.5	1.052	0.056	0.059
6.	GSM	Right Tilted	810	1909.8	30.28	30.5	1.052	0.034	0.036
7.	GSM	Left Cheek	810	1909.8	30.28	30.5	1.052	0.088	0.093
8.	GSM	Left Tilted	810	1909.8	30.28	30.5	1.052	0.044	0.046

GPRS850 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
9.	GPRS_4TX	Right Cheek	190	836.6	29.86	30.0	1.033	0.057	0.059
10.	GPRS_4TX	Right Tilted	190	836.6	29.86	30.0	1.033	0.031	0.032
11.	GPRS_4TX	Left Cheek	190	836.6	29.86	30.0	1.033	0.054	0.056
12.	GPRS_4TX	Left Tilted	190	836.6	29.86	30.0	1.033	0.026	0.027

GPRS1900 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	M Hz					
13.	GPRS_4TX	Right Cheek	810	1909.8	26.69	27.0	1.074	0.058	0.062
14.	GPRS_4TX	Right Tilted	810	1909.8	26.69	27.0	1.074	0.061	0.066
15.	GPRS_4TX	Left Cheek	810	1909.8	26.69	27.0	1.074	0.076	0.082
16.	GPRS_4TX	Left Tilted	810	1909.8	26.69	27.0	1.074	0.047	0.050

WCDMA Band 2 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
17.	RMC	Right Cheek	9262	1852.4	23.10	23.5	1.096	0.100	0.110
18.	RMC	Right Tilted	9262	1852.4	23.10	23.5	1.096	0.024	0.026
19.	RMC	Left Cheek	9262	1852.4	23.10	23.5	1.096	0.159	0.174
20.	RMC	Left Tilted	9262	1852.4	23.10	23.5	1.096	0.035	0.038

WCDMA Band 5 – Head SAR Test									
Plot No.	Mode	Test Position Head	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
21.	RMC	Right Cheek	4182	836.6	23.72	24.0	1.067	0.022	0.023
22.	RMC	Right Tilted	4182	836.6	23.72	24.0	1.067	0.014	0.015
23.	RMC	Left Cheek	4182	836.6	23.72	24.0	1.067	0.022	0.023
24.	RMC	Left Tilted	4182	836.6	23.72	24.0	1.067	0.011	0.012

LTE Band 2 – Head SAR Test									
Plot No.	Mode	Test Position Head	Freque	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)	
			nCY						
	Modulation, Bandwidth, RB		MHz						
25.	RMC QPSK 20MHz 1RB	Right Cheek	1860.0	25.35	25.5	1.035	0.148	0.153	
26.	RMC QPSK 20MHz 1RB	Right Tilted	1860.0	25.35	25.5	1.035	0.035	0.036	
27.	RMC QPSK 20MHz 1RB	Left Cheek	1860.0	25.35	25.5	1.035	0.222	0.230	
28.	RMC QPSK 20MHz 1RB	Left Tilted	1860.0	25.35	25.5	1.035	0.021	0.022	
29.	RMC QPSK 20MHz 50%RB	Right Cheek	1860.0	24.65	25.0	1.084	0.123	0.133	
30.	RMC QPSK 20MHz 50%RB	Right Tilted	1860.0	24.65	25.0	1.084	0.028	0.030	
31.	RMC QPSK 20MHz 50%RB	Left Cheek	1860.0	24.65	25.0	1.084	0.205	0.222	
32.	RMC QPSK 20MHz 50%RB	Left Tilted	1860.0	24.65	25.0	1.084	0.018	0.020	

LTE Band 4– Head SAR Test								
Plot No.	Mode	Test Position	Freque	Output	Rated	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			nny	Power (dBm)	Limit (dBm)			
33.	RMC QPSK 20MHz 1RB	Right Cheek	1720.0	22.44	23.0	1.138	0.149	0.170
34.	RMC QPSK 20MHz 1RB	Right Tilted	1720.0	22.44	23.0	1.138	0.033	0.038
35.	RMC QPSK 20MHz 1RB	Left Cheek	1720.0	22.44	23.0	1.138	0.259	0.295
36.	RMC QPSK 20MHz 1RB	Left Tilted	1720.0	22.44	23.0	1.138	0.041	0.047
37.	RMC QPSK 20MHz 50%RB	Right Cheek	1745.0	21.87	22.0	1.030	0.117	0.121
38.	RMC QPSK 20MHz 50%RB	Right Tilted	1745.0	21.87	22.0	1.030	0.026	0.027
39.	RMC QPSK 20MHz 50%RB	Left Cheek	1745.0	21.87	22.0	1.030	0.239	0.246
40.	RMC QPSK 20MHz 50%RB	Left Tilted	1745.0	21.87	22.0	1.030	0.032	0.033

LTE Band 7– Head SAR Test								
Plot No.	Mode	Test Position	Freque	Output	Rated	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			nny	Power (dBm)	Limit (dBm)			
41.	RMC QPSK 20MHz 1RB	Right Cheek	2510.0	23.99	24.5	1.125	0.056	0.063
42.	RMC QPSK 20MHz 1RB	Right Tilted	2510.0	23.99	24.5	1.125	0.026	0.029
43.	RMC QPSK 20MHz 1RB	Left Cheek	2510.0	23.99	24.5	1.125	0.073	0.082
44.	RMC QPSK 20MHz 1RB	Left Tilted	2510.0	23.99	24.5	1.125	0.031	0.035
45.	RMC QPSK 20MHz 50%RB	Right Cheek	2535.0	23.82	24.0	1.042	0.041	0.043
46.	RMC QPSK 20MHz 50%RB	Right Tilted	2535.0	23.82	24.0	1.042	0.018	0.019
47.	RMC QPSK 20MHz 50%RB	Left Cheek	2535.0	23.82	24.0	1.042	0.067	0.070
48.	RMC QPSK 20MHz 50%RB	Left Tilted	2535.0	23.82	24.0	1.042	0.021	0.022

LTE Band 13– Head SAR Test								
Plot No.	Mode	Test Position	Freque	Output	Rated	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			nny	Power (dBm)	Limit (dBm)			
49.	RMC QPSK 10MHz 1RB	Right Cheek	782.0	23.05	23.5	1.109	0.072	0.080
50.	RMC QPSK 10MHz 1RB	Right Tilted	782.0	23.05	23.5	1.109	0.046	0.051
51.	RMC QPSK 10MHz 1RB	Left Cheek	782.0	23.05	23.5	1.109	0.076	0.084
52.	RMC QPSK 10MHz 1RB	Left Tilted	782.0	23.05	23.5	1.109	0.051	0.057
53.	RMC QPSK 10MHz 50%RB	Right Cheek	782.0	21.94	22.5	1.138	0.051	0.058
54.	RMC QPSK 10MHz 50%RB	Right Tilted	782.0	21.94	22.5	1.138	0.02	0.023
55.	RMC QPSK 10MHz 50%RB	Left Cheek	782.0	21.94	22.5	1.138	0.069	0.078
56.	RMC QPSK 10MHz 50%RB	Left Tilted	782.0	21.94	22.5	1.138	0.043	0.049

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	(dBm)	(dBm)			
57.	RMC QPSK 10MHz 1RB		Right Cheek	709.0	22.63	23.0	1.089	0.073	0.079
58.	RMC QPSK 10MHz 1RB		Right Tilted	709.0	22.63	23.0	1.089	0.043	0.047
59.	RMC QPSK 10MHz 1RB		Left Cheek	709.0	22.63	23.0	1.089	0.072	0.078
60.	RMC QPSK 10MHz 1RB		Left Tilted	709.0	22.63	23.0	1.089	0.055	0.060
61.	RMC QPSK 10MHz 50%RB		Right Cheek	709.0	21.94	22.5	1.138	0.065	0.074
62.	RMC QPSK 10MHz 50%RB		Right Tilted	709.0	21.94	22.5	1.138	0.037	0.042
63.	RMC QPSK 10MHz 50%RB		Left Cheek	709.0	21.94	22.5	1.138	0.068	0.077
64.	RMC QPSK 10MHz 50%RB		Left Tilted	709.0	21.94	22.5	1.138	0.042	0.048

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					
65.	802.11b	Right Cheek	01	2412	13.11	13.5	1.094	0.046	0.050
66.	802.11b	Right Tilted	01	2412	13.11	13.5	1.094	0.037	0.040
67.	802.11b	Left Cheek	01	2412	13.11	13.5	1.094	0.090	0.098
68.	802.11b	Left Tilted	01	2412	13.11	13.5	1.094	0.031	0.034

**Remark:** Per KDB 447498 D01 v06, if the highest output channel SAR for each exposure position  $\leq 0.8 \text{ W/kg}$  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					
69.	GSM	Back	190	836.6	32.64	33.0	1.086	0.032	0.035
70.	GSM	Front	190	836.6	32.64	33.0	1.086	0.036	0.039

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					
71.	GSM	Back	810	1909.8	30.28	30.5	1.052	0.191	0.201
72.	GSM	Front	810	1909.8	30.28	30.5	1.052	0.173	0.182

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
81	RMC 12.2k	Back Side	9262	1852.4	23.10	23.5	1.096	0.345	0.378
82	RMC 12.2k	Front Side	9262	1852.4	23.10	23.5	1.096	0.306	0.336

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					
85	RMC 12.2k	Back Side	4182	836.6	23.72	24.0	1.067	0.073	0.078
86	RMC 12.2k	Front Side	4182	836.6	23.72	24.0	1.067	0.053	0.057

LTE Band 2–Body SAR Test (Gap: 10mm)									
Plot No.	Mode		Test Position Body	Frequency	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
	Modulation, Bandwidth, RB	MHz							
89	RMC QPSK 20MHz 1RB	Back Side	1860.0	25.35	25.5	1.035	0.403	0.417	
90	RMC QPSK 20MHz 1RB	Front Side	1860.0	25.35	25.5	1.035	0.509	0.527	
93	RMC QPSK 20MHz 50% RB	Back Side	1860.0	24.65	25.0	1.084	0.385	0.417	
94	RMC QPSK 20MHz 50% RB	Front Side	1860.0	24.65	25.0	1.084	0.467	0.506	

LTE Band 4–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position	Frequency	Output Power	Rated Limit	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g

	<b>Modulation, Bandwidth, RB</b>	<b>Body</b>	<b>MHz</b>	<b>(dBm)</b>	<b>(dBm)</b>			<b>(W/kg)</b>
97	RMC QPSK 20MHz 1RB	Back Side	1720.0	22.44	23.0	1.138	0.530	0.603
98	RMC QPSK 20MHz 1RB	Front Side	1720.0	22.44	23.0	1.138	0.441	0.502
101	RMC QPSK 20MHz 50%RB	Back Side	1745.0	21.87	22.0	1.030	0.496	0.511
102	RMC QPSK 20MHz 50%RB	Front Side	1745.0	21.87	22.0	1.030	0.427	0.440

<b>LTE Band 7–Body SAR Test (Gap: 10mm)</b>									
<b>Plot No.</b>	<b>Mode</b>	<b>Test Position</b>		<b>Frequency</b>	<b>Output Power (dBm)</b>	<b>Rated Limit (dBm)</b>	<b>Scaling Factor</b>	<b>SAR1g (W/kg)</b>	<b>Scaled SAR1g (W/kg)</b>
		<b>Body</b>	<b>MHz</b>						
105	RMC QPSK 20MHz 1RB	Back Side	2510.0	23.99	24.5	1.125	0.065	0.073	
106	RMC QPSK 20MHz 1RB	Front Side	2510.0	23.99	24.5	1.125	0.181	0.204	
109	RMC QPSK 20MHz 50%RB	Back Side	2535.0	23.82	24.0	1.042	0.051	0.053	
110	RMC QPSK 20MHz 50%RB	Front Side	2535.0	23.82	24.0	1.042	0.162	0.169	

<b>LTE Band 13–Body SAR Test (Gap: 10mm)</b>									
<b>Plot No.</b>	<b>Mode</b>	<b>Test Position</b>		<b>Frequency</b>	<b>Output Power (dBm)</b>	<b>Rated Limit (dBm)</b>	<b>Scaling Factor</b>	<b>SAR1g (W/kg)</b>	<b>Scaled SAR1g (W/kg)</b>
		<b>Body</b>	<b>MHz</b>						
113	RMC QPSK 10MHz 1RB	Back Side	782.0	23.05	23.5	1.109	0.012	0.013	
114	RMC QPSK 10MHz 1RB	Front Side	782.0	23.05	23.5	1.109	0.007	0.008	
117	RMC QPSK 10MHz 50%RB	Back Side	782.0	21.94	22.5	1.138	0.008	0.009	
118	RMC QPSK 10MHz 50%RB	Front Side	782.0	21.94	22.5	1.138	0.004	0.005	

<b>LTE Band 17–Body SAR Test (Gap: 10mm)</b>									
<b>Plot No.</b>	<b>Mode</b>	<b>Test Position</b>		<b>Frequency</b>	<b>Output Power (dBm)</b>	<b>Rated Limit (dBm)</b>	<b>Scaling Factor</b>	<b>SAR1g (W/kg)</b>	<b>Scaled SAR1g (W/kg)</b>
		<b>Body</b>	<b>MHz</b>						
121	RMC QPSK 10MHz 1RB	Back Side	709.0	22.63	23.0	1.089	0.103	0.112	
122	RMC QPSK 10MHz 1RB	Front Side	709.0	22.63	23.0	1.089	0.093	0.101	
125	RMC QPSK 10MHz 50%RB	Back Side	709.0	21.94	22.5	1.138	0.095	0.108	
126	RMC QPSK 10MHz 50%RB	Front Side	709.0	21.94	22.5	1.138	0.027	0.031	

<b>WLAN 2.4GHz –Body SAR Test</b>									
<b>Plot No.</b>	<b>Mode</b>	<b>Test Position Body</b>	<b>Frequency</b>		<b>Output Power (dBm)</b>	<b>Rated Limit (dBm)</b>	<b>Scaling Factor</b>	<b>SAR1g (W/kg)</b>	<b>Scaled SAR1g (W/kg)</b>
			<b>CH.</b>	<b>MHz</b>					
129	802.11b	Back Side	01	2412	13.11	13.5	1.094	0.111	0.121
130	802.11b	Front Side	01	2412	13.11	13.5	1.094	0.029	0.032

**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					
73.	GPRS_4TX	Back Side	190	836.6	29.86	30.0	1.033	0.046	0.048
74.	GPRS_4TX	Front Side	190	836.6	29.86	30.0	1.033	0.073	0.075
75.	GPRS_4TX	Bottom side	190	836.6	29.86	30.0	1.033	0.015	0.015
76.	GPRS_4TX	Left side	190	836.6	29.86	30.0	1.033	0.033	0.034

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					
77.	GPRS_4TX	Back Side	810	1909.8	26.69	27.0	1.074	0.345	0.371
78.	GPRS_4TX	Front Side	810	1909.8	26.69	27.0	1.074	0.233	0.250
79.	GPRS_4TX	Bottom side	810	1909.8	26.69	27.0	1.074	0.341	0.366
80.	GPRS_4TX	Left side	810	1909.8	26.69	27.0	1.074	0.124	0.133

WCDMA Band 2 – Body SAR Test (Gap: 10mm)									
Plot No.	Mode	Test Position Body	Frequency		Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			CH.	MHz					
81.	RMC 12.2k	Back Side	9262	1852.4	23.10	23.5	1.096	0.345	0.378
82.	RMC 12.2k	Front Side	9262	1852.4	23.10	23.5	1.096	0.306	0.336
83.	RMC 12.2k	Bottom side	9262	1852.4	23.10	23.5	1.096	0.427	0.468
84.	RMC 12.2k	Left side	9262	1852.4	23.10	23.5	1.096	0.036	0.039

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					
85.	RMC 12.2k	Back Side	4182	836.6	23.72	24.0	1.067	0.073	0.078
86.	RMC 12.2k	Front Side	4182	836.6	23.72	24.0	1.067	0.053	0.057
87.	RMC 12.2k	Bottom side	4182	836.6	23.72	24.0	1.067	0.024	0.026
88.	RMC 12.2k	Left side	4182	836.6	23.72	24.0	1.067	0.019	0.020

LTE Band 2–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Freque	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			ncy					
	Modulation, Bandwidth, RB		MHz					
89.	RMC QPSK 20MHz 1RB	Back Side	1860.0	25.35	25.5	1.035	0.403	0.417
90.	RMC QPSK 20MHz 1RB	Front Side	1860.0	25.35	25.5	1.035	0.509	0.527
91.	RMC QPSK 20MHz 1RB	Bottom side	1860.0	25.35	25.5	1.035	0.718	0.743
92.	RMC QPSK 20MHz 1RB	Left side	1860.0	25.35	25.5	1.035	0.141	0.146
93.	RMC QPSK 20MHz 50%RB	Back Side	1860.0	24.65	25.0	1.084	0.385	0.417
94.	RMC QPSK 20MHz 50%RB	Front Side	1860.0	24.65	25.0	1.084	0.467	0.506
95.	RMC QPSK 20MHz 50%RB	Bottom side	1860.0	24.65	25.0	1.084	0.65	0.705
96.	RMC QPSK 20MHz 50%RB	Left side	1860.0	24.65	25.0	1.084	0.127	0.138

LTE Band 4–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Freque	Outp ut Powe r (dBm )	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			ncy					
	Modulation, Bandwidth, RB		MHz					
97.	RMC QPSK 20MHz 1RB	Back Side	1720.0	22.44	23.0	1.138	0.530	0.603
98.	RMC QPSK 20MHz 1RB	Front Side	1720.0	22.44	23.0	1.138	0.441	0.502
99.	RMC QPSK 20MHz 1RB	Bottom side	1720.0	22.44	23.0	1.138	0.363	0.413
100.	RMC QPSK 20MHz 1RB	Left side	1720.0	22.44	23.0	1.138	0.117	0.133
101.	RMC QPSK 20MHz 50%RB	Back Side	1745.0	21.87	22.0	1.030	0.496	0.511
102.	RMC QPSK 20MHz 50%RB	Front Side	1745.0	21.87	22.0	1.030	0.427	0.440
103.	RMC QPSK 20MHz 50%RB	Bottom side	1745.0	21.87	22.0	1.030	0.294	0.303
104.	RMC QPSK 20MHz 50%RB	Left side	1745.0	21.87	22.0	1.030	0.105	0.108

LTE Band 7–Body SAR Test (Gap: 10mm)								
Plot No.	Mode	Test Position Body	Freque	Output Power (dBm)	Rated Limit (dBm)	Scaling Factor	SAR1g (W/kg)	Scaled SAR1g (W/kg)
			ncy					
	Modulation, Bandwidth, RB		MHz					
105.	RMC QPSK 20MHz 1RB	Back Side	2510.0	23.99	24.5	1.125	0.065	0.073
106.	RMC QPSK 20MHz 1RB	Front Side	2510.0	23.99	24.5	1.125	0.181	0.204
107.	RMC QPSK 20MHz 1RB	Bottom side	2510.0	23.99	24.5	1.125	0.190	0.214
108.	RMC QPSK 20MHz 1RB	Left side	2510.0	23.99	24.5	1.125	0.087	0.098
109.	RMC QPSK 20MHz 50%RB	Back Side	2535.0	23.82	24.0	1.042	0.051	0.053
110.	RMC QPSK 20MHz 50%RB	Front Side	2535.0	23.82	24.0	1.042	0.162	0.169
111.	RMC QPSK 20MHz 50%RB	Bottom side	2535.0	23.82	24.0	1.042	0.175	0.182
112.	RMC QPSK 20MHz 50%RB	Left side	2535.0	23.82	24.0	1.042	0.059	0.061

LTE Band 13–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					
113.	RMC QPSK 10MHz 1RB		Back Side	782.0	23.05	23.5	1.109	0.012	0.013
114.	RMC QPSK 10MHz 1RB		Front Side	782.0	23.05	23.5	1.109	0.007	0.008
115.	RMC QPSK 10MHz 1RB		Bottom side	782.0	23.05	23.5	1.109	0.003	0.003
116.	RMC QPSK 10MHz 1RB		Left side	782.0	23.05	23.5	1.109	0.002	0.002
117.	RMC QPSK 10MHz 50%RB		Back Side	782.0	21.94	22.5	1.138	0.008	0.009
118.	RMC QPSK 10MHz 50%RB		Front Side	782.0	21.94	22.5	1.138	0.004	0.005
119.	RMC QPSK 10MHz 50%RB		Bottom side	782.0	21.94	22.5	1.138	0.002	0.002
120.	RMC QPSK 10MHz 50%RB		Left side	782.0	21.94	22.5	1.138	0.002	0.002

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, RB			MHz					
121.	RMC QPSK 10MHz 1RB		Back Side	709.0	22.63	23.0	1.089	0.103	0.112
122.	RMC QPSK 10MHz 1RB		Front Side	709.0	22.63	23.0	1.089	0.093	0.101
123.	RMC QPSK 10MHz 1RB		Bottom side	709.0	22.63	23.0	1.089	0.016	0.017
124.	RMC QPSK 10MHz 1RB		Left side	709.0	22.63	23.0	1.089	0.055	0.060
125.	RMC QPSK 10MHz 50%RB		Back Side	709.0	21.94	22.5	1.138	0.095	0.108
126.	RMC QPSK 10MHz 50%RB		Front Side	709.0	21.94	22.5	1.138	0.027	0.031
127.	RMC QPSK 10MHz 50%RB		Bottom side	709.0	21.94	22.5	1.138	0.012	0.014
128.	RMC QPSK 10MHz 50%RB		Left side	709.0	21.94	22.5	1.138	0.043	0.049

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					
129.	802.11b	Back Side	01	2412	13.11	13.5	1.094	0.111	0.121
130.	802.11b	Front Side	01	2412	13.11	13.5	1.094	0.029	0.032
131.	802.11b	Right side	01	2412	13.11	13.5	1.094	0.017	0.019
132.	802.11b	Top Side	01	2412	13.11	13.5	1.094	0.053	0.058

### 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	<b>GSM(Voice) + WLAN(Data)</b>	Yes	Yes	-
2	<b>GPRS/ EDGE(Data) + WLAN(Data)</b>	Yes	-	Yes
3	<b>WCDMA (Voice)+ WLAN(Data)</b>	Yes	Yes	-
4	<b>HSDPA(Data) + WLAN(Data)</b>	-	-	Yes
5	<b>HSUPA(Data) + WLAN(Data)</b>	-	-	Yes
6	<b>LTE(Data) + WLAN(Data)</b>	-	-	Yes
7	<b>GSM(Voice) + Bluetooth(Data)</b>	Yes	Yes	-
8	<b>GPRS/ EDGE(Data) + Bluetooth(Data)</b>	Yes	-	Yes
9	<b>WCDMA (Voice) + Bluetooth(Data)</b>	Yes	Yes	-
10	<b>HSDPA(Data)+ Bluetooth(Data)</b>	-	-	Yes
11	<b>HSUPA(Data) + Bluetooth(Data)</b>	-	-	Yes
12	<b>LTE(Data) + Bluetooth(Data)</b>	-	-	Yes

#### Remark:

1. GSM ,WCDMA and LTE 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
2.5	1.78	5/10	2.402	7.5	0.074	0.037

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

**Head SAR****WWAN and WLAN**

<b>Position</b>	<b>WWAN</b>		<b>WLAN</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Right Cheek	GSM850	0.036	0.050	0.086
Right Tilted	GSM850	0.005	0.040	0.045
Left Cheek	GSM850	0.032	0.098	0.13
Left Tilted	GSM850	0.004	0.034	0.038
Right Cheek	GSM1900	0.059	0.050	0.109
Right Tilted	GSM1900	0.036	0.040	0.076
Left Cheek	GSM1900	0.093	0.098	0.191
Left Tilted	GSM1900	0.046	0.034	0.08
Right Cheek	GPRS850	0.059	0.050	0.109
Right Tilted	GPRS850	0.032	0.040	0.072
Left Cheek	GPRS850	0.056	0.098	0.154
Left Tilted	GPRS850	0.027	0.034	0.061
Right Cheek	GPRS1900	0.062	0.050	0.112
Right Tilted	GPRS1900	0.066	0.040	0.106
Left Cheek	GPRS1900	0.082	0.098	0.18
Left Tilted	GPRS1900	0.050	0.034	0.084
Right Cheek	WCDMA Band 2	0.110	0.050	0.16
Right Tilted	WCDMA Band 2	0.026	0.040	0.066
Left Cheek	WCDMA Band 2	0.174	0.098	0.272
Left Tilted	WCDMA Band 2	0.038	0.034	0.072
Right Cheek	WCDMA Band 5	0.023	0.050	0.073
Right Tilted	WCDMA Band 5	0.015	0.040	0.055
Left Cheek	WCDMA Band 5	0.023	0.098	0.121
Left Tilted	WCDMA Band 5	0.012	0.034	0.046
Right Cheek	LTE Band 2	0.153	0.050	0.203
Right Tilted	LTE Band 2	0.036	0.040	0.076
Left Cheek	LTE Band 2	0.230	0.098	0.328
Left Tilted	LTE Band 2	0.022	0.034	0.056
Right Cheek	LTE Band 4	0.170	0.050	0.22
Right Tilted	LTE Band 4	0.038	0.040	0.078
Left Cheek	LTE Band 4	0.295	0.098	<b>0.393</b>
Left Tilted	LTE Band 4	0.047	0.034	0.081
Right Cheek	LTE Band 7	0.063	0.050	0.113
Right Tilted	LTE Band 7	0.029	0.040	0.069
Left Cheek	LTE Band 7	0.082	0.098	0.18
Left Tilted	LTE Band 7	0.035	0.034	0.069
Right Cheek	LTE Band 13	0.080	0.050	0.13

Right Tilted	LTE Band 13	0.051	0.040	0.091
Left Cheek	LTE Band 13	0.084	0.098	0.182
Left Tilted	LTE Band 13	0.057	0.034	0.091
Right Cheek	LTE Band 17	0.079	0.050	0.129
Right Tilted	LTE Band 17	0.047	0.040	0.087
Left Cheek	LTE Band 17	0.078	0.098	0.176
Left Tilted	LTE Band 17	0.060	0.034	0.094

**WWAN and Bluetooth**

<b>Position</b>	<b>WWAN</b>		<b>Bluetooth</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Right Cheek	GSM850	0.036	0.074	0.110
Right Tilted	GSM850	0.005	0.074	0.079
Left Cheek	GSM850	0.032	0.074	0.106
Left Tilted	GSM850	0.004	0.074	0.078
Right Cheek	GSM1900	0.059	0.074	0.133
Right Tilted	GSM1900	0.036	0.074	0.11
Left Cheek	GSM1900	0.093	0.074	0.167
Left Tilted	GSM1900	0.046	0.074	0.12
Right Cheek	GPRS850	0.059	0.074	0.133
Right Tilted	GPRS850	0.032	0.074	0.106
Left Cheek	GPRS850	0.056	0.074	0.13
Left Tilted	GPRS850	0.027	0.074	0.101
Right Cheek	GPRS1900	0.062	0.074	0.136
Right Tilted	GPRS1900	0.066	0.074	0.14
Left Cheek	GPRS1900	0.082	0.074	0.156
Left Tilted	GPRS1900	0.050	0.074	0.124
Right Cheek	WCDMA Band 2	0.110	0.074	0.184
Right Tilted	WCDMA Band 2	0.026	0.074	0.1
Left Cheek	WCDMA Band 2	0.174	0.074	0.248
Left Tilted	WCDMA Band 2	0.038	0.074	0.112
Right Cheek	WCDMA Band 5	0.023	0.074	0.097
Right Tilted	WCDMA Band 5	0.015	0.074	0.089
Left Cheek	WCDMA Band 5	0.023	0.074	0.097
Left Tilted	WCDMA Band 5	0.012	0.074	0.086
Right Cheek	LTE Band 2	0.153	0.074	0.227
Right Tilted	LTE Band 2	0.036	0.074	0.11
Left Cheek	LTE Band 2	0.230	0.074	0.304
Left Tilted	LTE Band 2	0.022	0.074	0.096
Right Cheek	LTE Band 4	0.170	0.074	0.244
Right Tilted	LTE Band 4	0.038	0.074	0.112
Left Cheek	LTE Band 4	0.295	0.074	<b>0.369</b>
Left Tilted	LTE Band 4	0.047	0.074	0.121
Right Cheek	LTE Band 7	0.063	0.074	0.137
Right Tilted	LTE Band 7	0.029	0.074	0.103
Left Cheek	LTE Band 7	0.082	0.074	0.156
Left Tilted	LTE Band 7	0.035	0.074	0.109
Right Cheek	LTE Band 13	0.080	0.074	0.154
Right Tilted	LTE Band 13	0.051	0.074	0.125

Left Cheek	LTE Band 13	0.084	0.074	0.158
Left Tilted	LTE Band 13	0.057	0.074	0.131
Right Cheek	LTE Band 17	0.079	0.074	0.153
Right Tilted	LTE Band 17	0.047	0.074	0.121
Left Cheek	LTE Band 17	0.078	0.074	0.152
Left Tilted	LTE Band 17	0.060	0.074	0.134

**Body-worn SAR****WWAN and WLAN**

<b>Position</b>	<b>WWAN</b>		<b>WLAN</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Back	GSM850	0.048	0.121	0.169
Front	GSM850	0.075	0.032	0.107
Back	GSM1900	0.371	0.121	0.492
Front	GSM1900	0.250	0.032	0.282
Back	WCDMA Band 2	0.378	0.121	0.499
Front	WCDMA Band 2	0.336	0.032	0.368
Back	WCDMA Band 5	0.078	0.121	0.199
Front	WCDMA Band 5	0.057	0.032	0.089
Back	LTE Band 2	0.417	0.121	0.538
Front	LTE Band 2	0.527	0.032	0.559
Back	LTE Band 4	0.603	0.121	<b>0.724</b>
Front	LTE Band 4	0.502	0.032	0.534
Back	LTE Band 7	0.073	0.121	0.194
Front	LTE Band 7	0.204	0.032	0.236
Back	LTE Band 13	0.013	0.121	0.134
Front	LTE Band 13	0.008	0.032	0.04
Back	LTE Band 17	0.112	0.121	0.233
Front	LTE Band 17	0.101	0.032	0.133

**WWAN and Bluetooth**

<b>Position</b>	<b>WWAN</b>		<b>Bluetooth</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Back	GSM850	0.048	0.037	0.085
Front	GSM850	0.075	0.037	0.112
Back	GSM1900	0.371	0.037	0.408
Front	GSM1900	0.250	0.037	0.287
Back	WCDMA Band 2	0.378	0.037	0.415
Front	WCDMA Band 2	0.336	0.037	0.373
Back	WCDMA Band 5	0.078	0.037	0.115
Front	WCDMA Band 5	0.057	0.037	0.094
Back	LTE Band 2	0.417	0.037	0.454
Front	LTE Band 2	0.527	0.037	0.564
Back	LTE Band 4	0.603	0.037	<b>0.640</b>
Front	LTE Band 4	0.502	0.037	0.539
Back	LTE Band 7	0.073	0.037	0.11
Front	LTE Band 7	0.204	0.037	0.241

Back	LTE Band 13	0.013	0.037	0.05
Front	LTE Band 13	0.008	0.037	0.045
Back	LTE Band 17	0.112	0.037	0.149
Front	LTE Band 17	0.101	0.037	0.138

**Hotspot SAR****WWAN and WLAN**

<b>Position</b>	<b>WWAN</b>		<b>WLAN</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Back	GSM850	0.048	0.121	0.169
Front	GSM850	0.075	0.032	0.107
Top side	GSM850	--	0.058	0.058
Bottom side	GSM850	0.015	--	0.015
Right side	GSM850	--	0.019	0.019
Left side	GSM850	0.034	--	0.034
Back	GSM1900	0.371	0.121	0.492
Front	GSM1900	0.250	0.032	0.282
Top side	GSM1900	--	0.058	0.058
Bottom side	GSM1900	0.366	--	0.366
Right side	GSM1900	--	0.019	0.019
Left side	GSM1900	0.133	--	0.133
Back	WCDMA Band 2	0.378	0.121	0.499
Front	WCDMA Band 2	0.336	0.032	0.368
Top side	WCDMA Band 2	--	0.058	0.058
Bottom side	WCDMA Band 2	0.468	--	0.468
Right side	WCDMA Band 2	--	0.019	0.019
Left side	WCDMA Band 2	0.039	--	0.039
Back	WCDMA Band 5	0.078	0.121	0.199
Front	WCDMA Band 5	0.057	0.032	0.089
Top side	WCDMA Band 5	--	0.058	0.058
Bottom side	WCDMA Band 5	0.026	--	0.026
Right side	WCDMA Band 5	--	0.019	0.019
Left side	WCDMA Band 5	0.020	--	0.020
Back	LTE Band 2	0.417	0.121	0.538
Front	LTE Band 2	0.527	0.032	0.559
Top side	LTE Band 2	--	0.058	0.058
Bottom side	LTE Band 2	0.743	--	<b>0.743</b>
Right side	LTE Band 2	--	0.019	0.019
Left side	LTE Band 2	0.146	--	0.146
Back	LTE Band 4	0.603	0.121	0.724
Front	LTE Band 4	0.502	0.032	0.534
Top side	LTE Band 4	--	0.058	0.058
Bottom side	LTE Band 4	0.413	--	0.413
Right side	LTE Band 4	--	0.019	0.019
Left side	LTE Band 4	0.133	--	0.133
Back	LTE Band 7	0.073	0.121	0.194

Front	LTE Band 7	0.204	0.032	0.236
Top side	LTE Band 7	--	0.058	0.058
Bottom side	LTE Band 7	0.214	--	0.214
Right side	LTE Band 7	--	0.019	0.019
Left side	LTE Band 7	0.098	--	0.098
Back	LTE Band 13	0.013	0.121	0.134
Front	LTE Band 13	0.008	0.032	0.04
Top side	LTE Band 13	--	0.058	0.058
Bottom side	LTE Band 13	0.003	--	0.003
Right side	LTE Band 13	--	0.019	0.019
Left side	LTE Band 13	0.002	--	0.002
Back	LTE Band 17	0.112	0.121	0.233
Front	LTE Band 17	0.101	0.032	0.133
Top side	LTE Band 17	--	0.058	0.058
Bottom side	LTE Band 17	0.017	--	0.017
Right side	LTE Band 17	--	0.019	0.019
Left side	LTE Band 17	0.060	--	0.060

### WWAN and Bluetooth

<b>Position</b>	<b>WWAN</b>		<b>Bluetooth</b>	<b>Summed SAR (W/kg)</b>
	<b>Band</b>	<b>Scaled SAR (W/kg)</b>	<b>Scaled SAR (W/kg)</b>	
Back	GSM850	0.048	0.037	0.085
Front	GSM850	0.075	0.037	0.112
Top side	GSM850	--	0.037	0.037
Bottom side	GSM850	0.015	--	0.015
Right side	GSM850	--	0.037	0.037
Left side	GSM850	0.034	--	0.034
Back	GSM1900	0.371	0.037	0.408
Front	GSM1900	0.250	0.037	0.287
Top side	GSM1900	--	0.037	0.037
Bottom side	GSM1900	0.366	--	0.366
Right side	GSM1900	--	0.037	0.037
Left side	GSM1900	0.133	--	0.133
Back	WCDMA Band 2	0.378	0.037	0.415
Front	WCDMA Band 2	0.336	0.037	0.373
Top side	WCDMA Band 2	--	0.037	0.037
Bottom side	WCDMA Band 2	0.468	--	0.468
Right side	WCDMA Band 2	--	0.037	0.037
Left side	WCDMA Band 2	0.039	--	0.039
Back	WCDMA Band 5	0.078	0.037	0.115
Front	WCDMA Band 5	0.057	0.037	0.094

Top side	WCDMA Band 5	--	0.037	0.037
Bottom side	WCDMA Band 5	0.026	--	0.026
Right side	WCDMA Band 5	--	0.037	0.037
Left side	WCDMA Band 5	0.020	--	0.020
Back	LTE Band 2	0.417	0.037	0.454
Front	LTE Band 2	0.527	0.037	0.564
Top side	LTE Band 2	--	0.037	0.037
Bottom side	LTE Band 2	0.743	--	<b>0.743</b>
Right side	LTE Band 2	--	0.037	0.037
Left side	LTE Band 2	0.146	--	0.146
Back	LTE Band 4	0.603	0.037	0.64
Front	LTE Band 4	0.502	0.037	0.539
Top side	LTE Band 4	--	0.037	0.037
Bottom side	LTE Band 4	0.413	--	0.413
Right side	LTE Band 4	--	0.037	0.037
Left side	LTE Band 4	0.133	--	0.133
Back	LTE Band 7	0.073	0.037	0.11
Front	LTE Band 7	0.204	0.037	0.241
Top side	LTE Band 7	--	0.037	0.037
Bottom side	LTE Band 7	0.214	--	0.214
Right side	LTE Band 7	--	0.037	0.037
Left side	LTE Band 7	0.098	--	0.098
Back	LTE Band 13	0.013	0.037	0.05
Front	LTE Band 13	0.008	0.037	0.045
Top side	LTE Band 13	--	0.037	0.037
Bottom side	LTE Band 13	0.003	--	0.003
Right side	LTE Band 13	--	0.037	0.037
Left side	LTE Band 13	0.002	--	0.002
Back	LTE Band 17	0.112	0.037	0.149
Front	LTE Band 17	0.101	0.037	0.138
Top side	LTE Band 17	--	0.037	0.037
Bottom side	LTE Band 17	0.017	--	0.017
Right side	LTE Band 17	--	0.037	0.037
Left side	LTE Band 17	0.060	--	0.060

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

from target value									
Liquid conductivity - measurement uncertainty	E.3.3	5.00	N	1	0.64	0.43	3.20	2.15	$\infty$
Liquid permittivity - deviation from target value	E.3.2	0.37	R	$\sqrt{3}$	0.6	0.49	0.13	0.10	$\infty$
Liquid permittivity - measurement uncertainty	E.3.3	10.00	N	1	0.6	0.49	6.00	4.90	$\infty$
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
<b>Measurement System</b>									
Probe calibration	E.2.1	7.0	N	1	1	1	7.00	7.00	$\infty$
Axial Isotropy	E.2.2	2.5	R	$\sqrt{3}$	$(1_{Cp})^{1/2}$	$(1_{Cp})^{1/2}$	1.02	1.02	$\infty$
Hemispherical Isotropy	E.2.2	4.0	R	$\sqrt{3}$	$(Cp)^{1/2}$	$(Cp)^{1/2}$	1.63	1.63	$\infty$
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Linearity	E.2.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	$\infty$
System detection limits	E.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Modulation response	E.2.5	0	R	$\sqrt{3}$	0	0	0.0	0.0	$\infty$
Readout Electronics	E.2.6	0.02	N	1	1	1	0.02	0.02	$\infty$
Reponse Time	E.2.7	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
Integration Time	E.2.8	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	$\infty$
RF ambient Conditions – Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
RF ambient Conditions - Reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
Probe positioner Mechanical Tolerance	E.6.2	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	$\infty$
Probe positioning with respect to Phantom Shell	E.6.3	0.05	R	$\sqrt{3}$	1	1	0.03	0.03	$\infty$
Extrapolation, interpolation and integration Algorithms for Max.	E.5.2	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	$\infty$

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

## Annex A. Plots of System Performance Check

# MEASUREMENT 1

### For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/02/2018

Measurement duration: 7 minutes 21 seconds

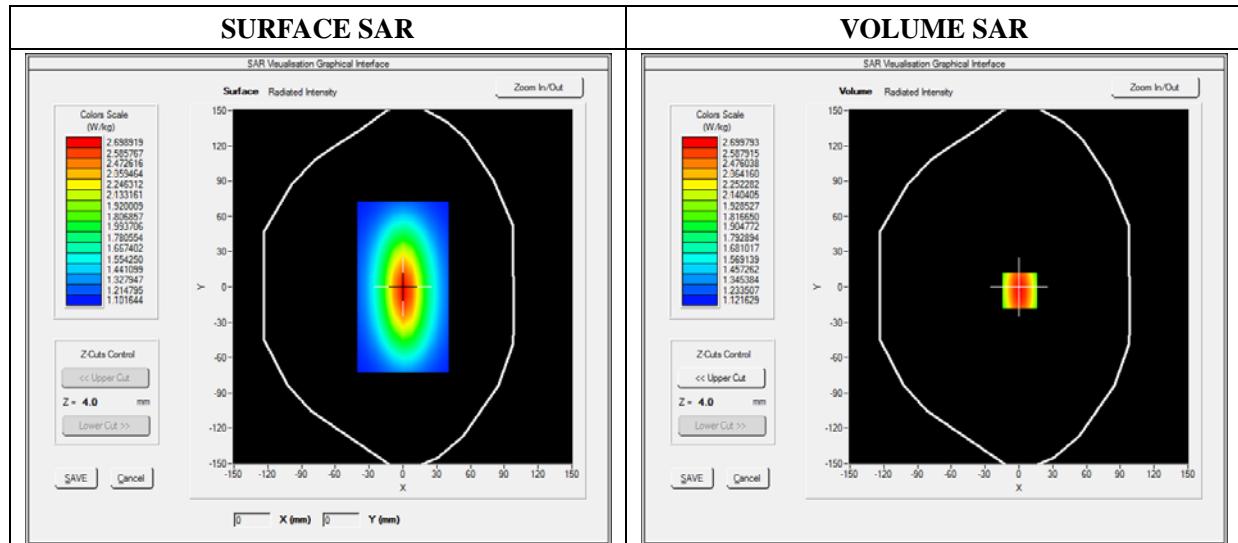
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2017

### A. Experimental conditions

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

### B. SAR Measurement Results

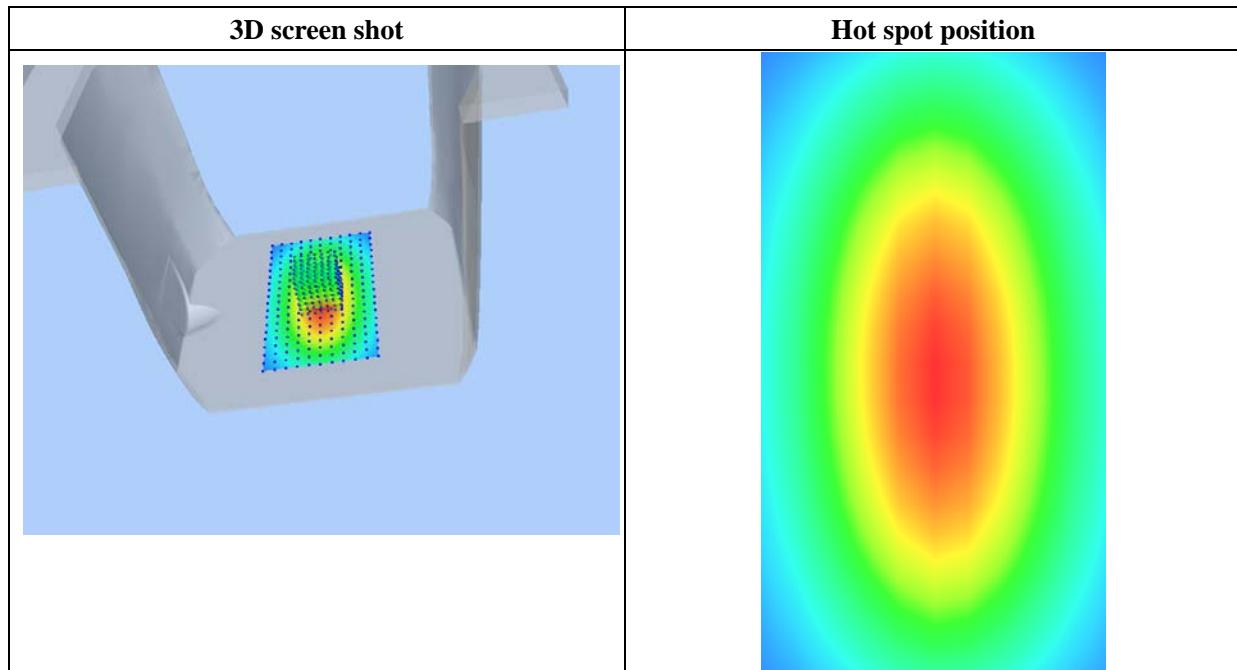
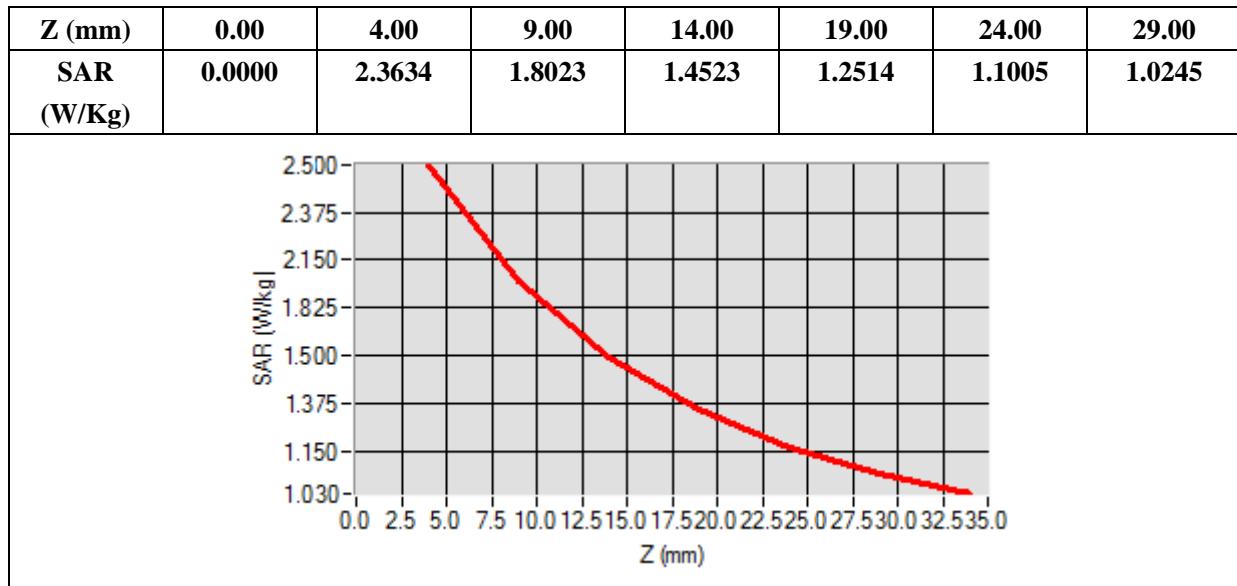
<b>Frequency (MHz)</b>	750.000000
<b>Relative Permittivity (real part)</b>	41.320574
<b>Conductivity (S/m)</b>	0.862373
<b>Power Variation (%)</b>	0.038363
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

## Z Axis Scan



# MEASUREMENT 2

## For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/02/2018

Measurement duration: 7 minutes 21 seconds

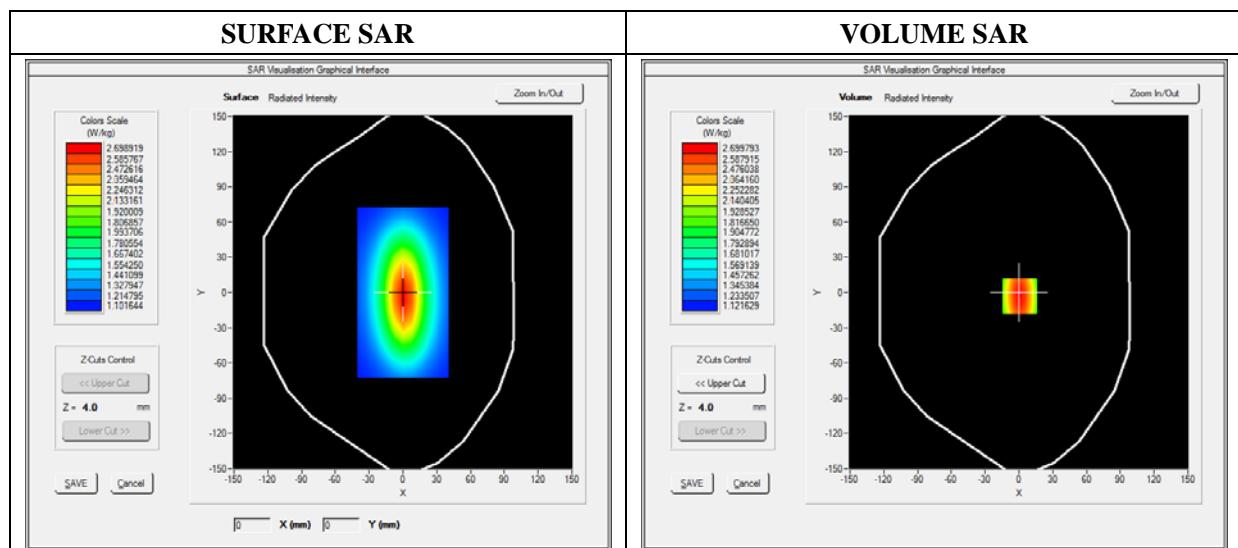
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

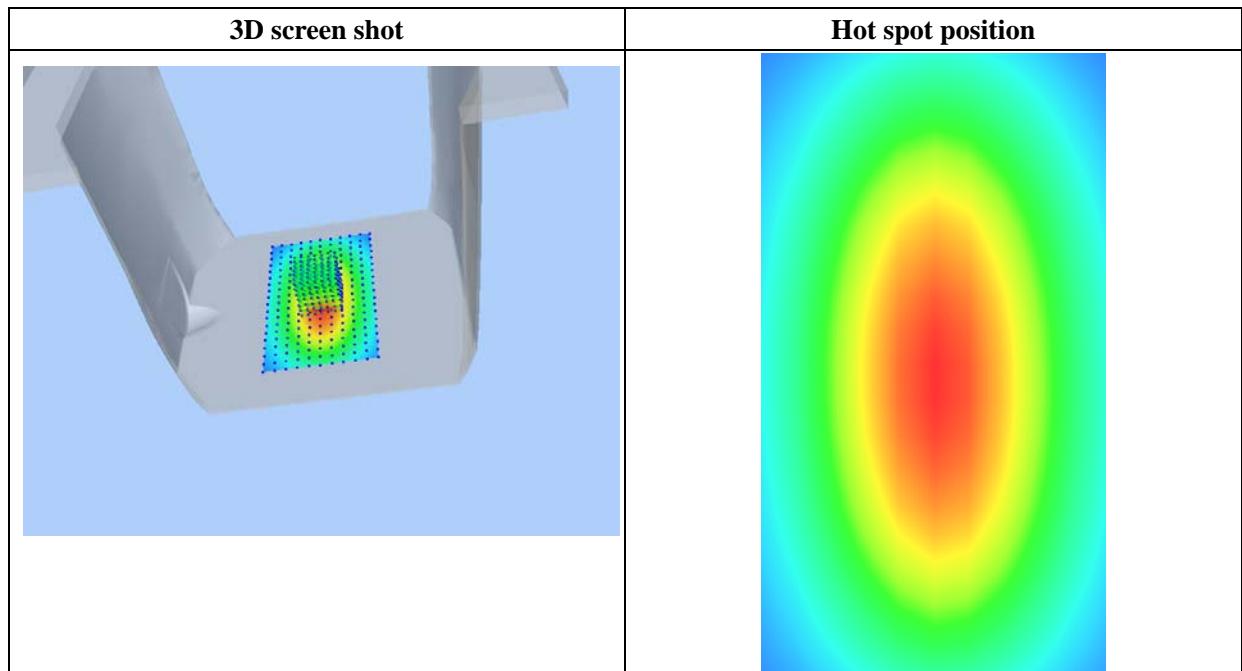
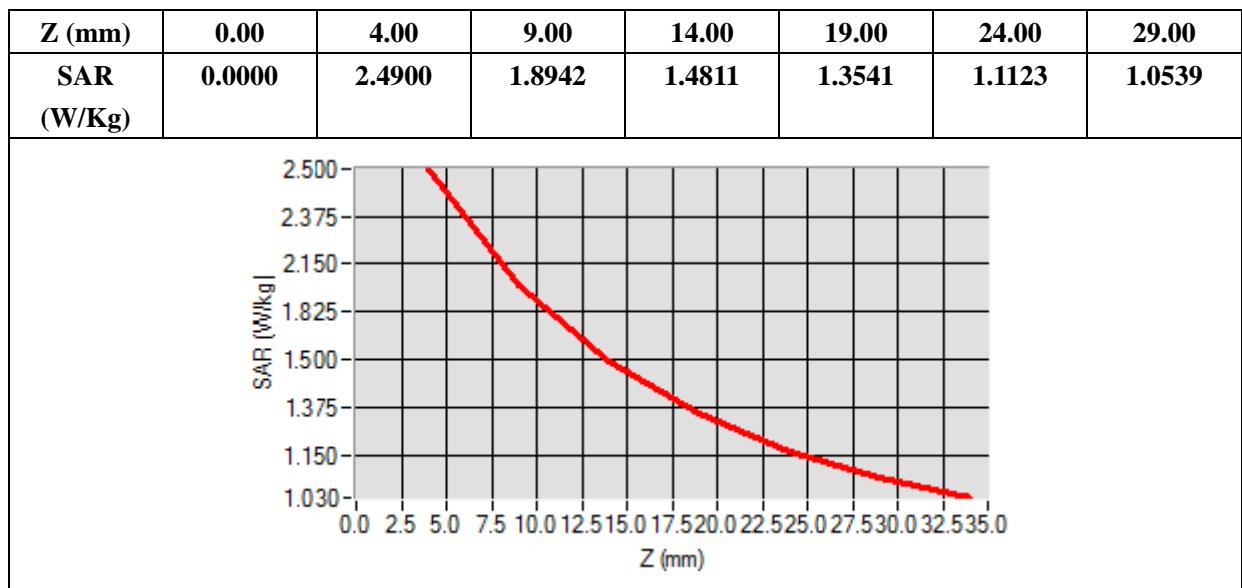
<b>Frequency (MHz)</b>	835.000000
<b>Relative Permittivity (real part)</b>	41.110245
<b>Conductivity (S/m)</b>	0.871245
<b>Power Variation (%)</b>	0.038437
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

Z Axis Scan



# MEASUREMENT 3

## For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 21 seconds

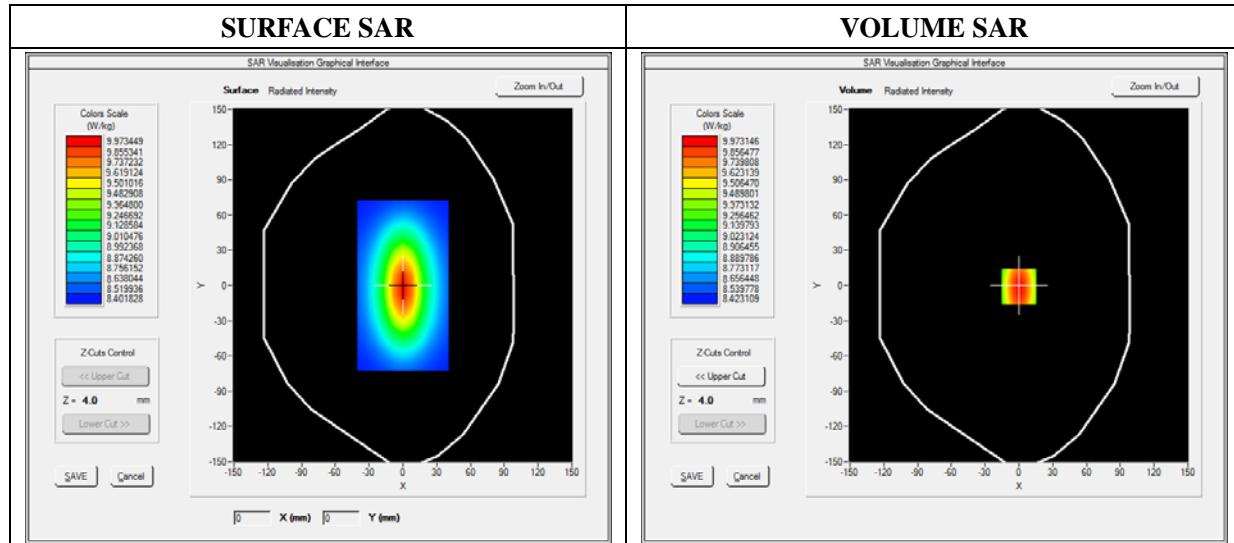
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

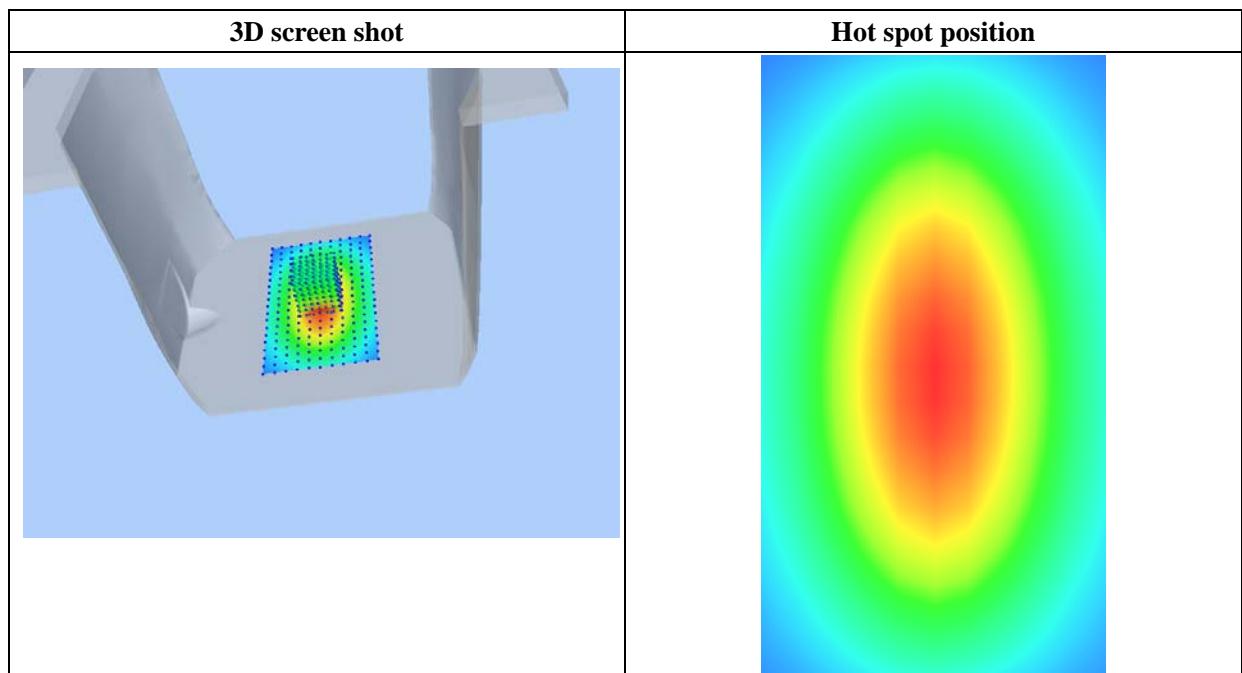
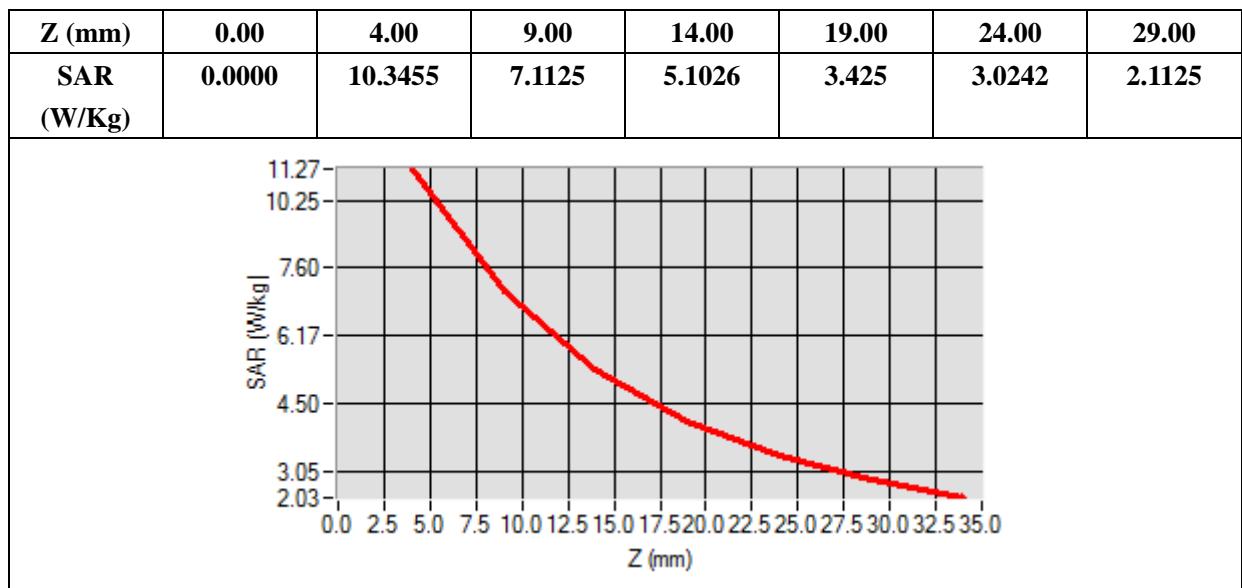
<b>Frequency (MHz)</b>	1800.000000
<b>Relative Permittivity (real part)</b>	39.024890
<b>Conductivity (S/m)</b>	1.371250
<b>Power Variation (%)</b>	1.401232
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=0.00, Y=0.00

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

Z Axis Scan



# MEASUREMENT 4

## For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 21 seconds

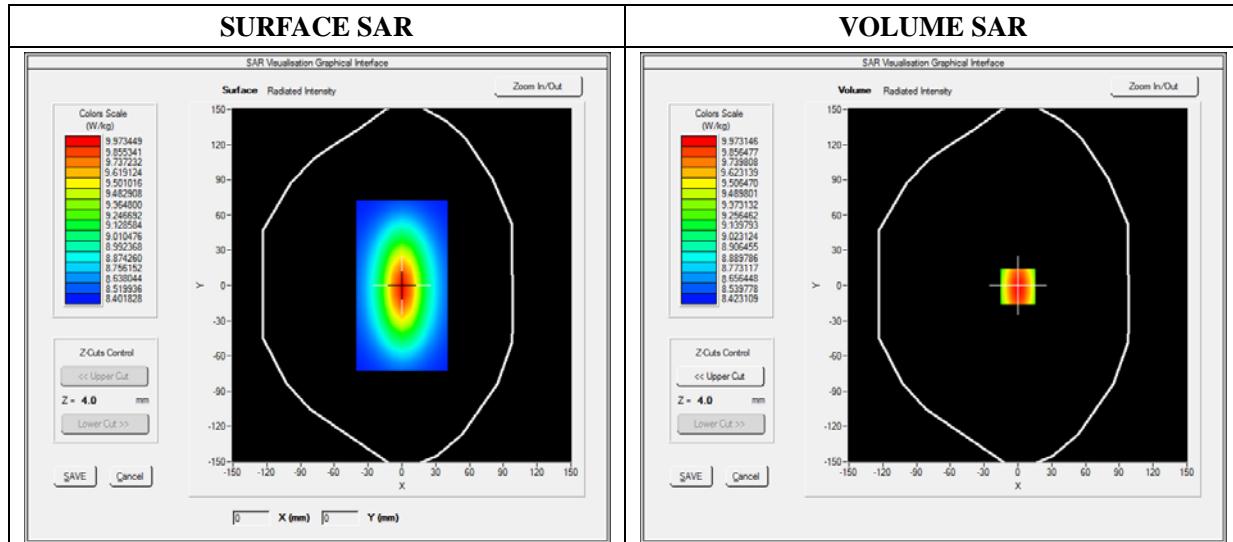
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

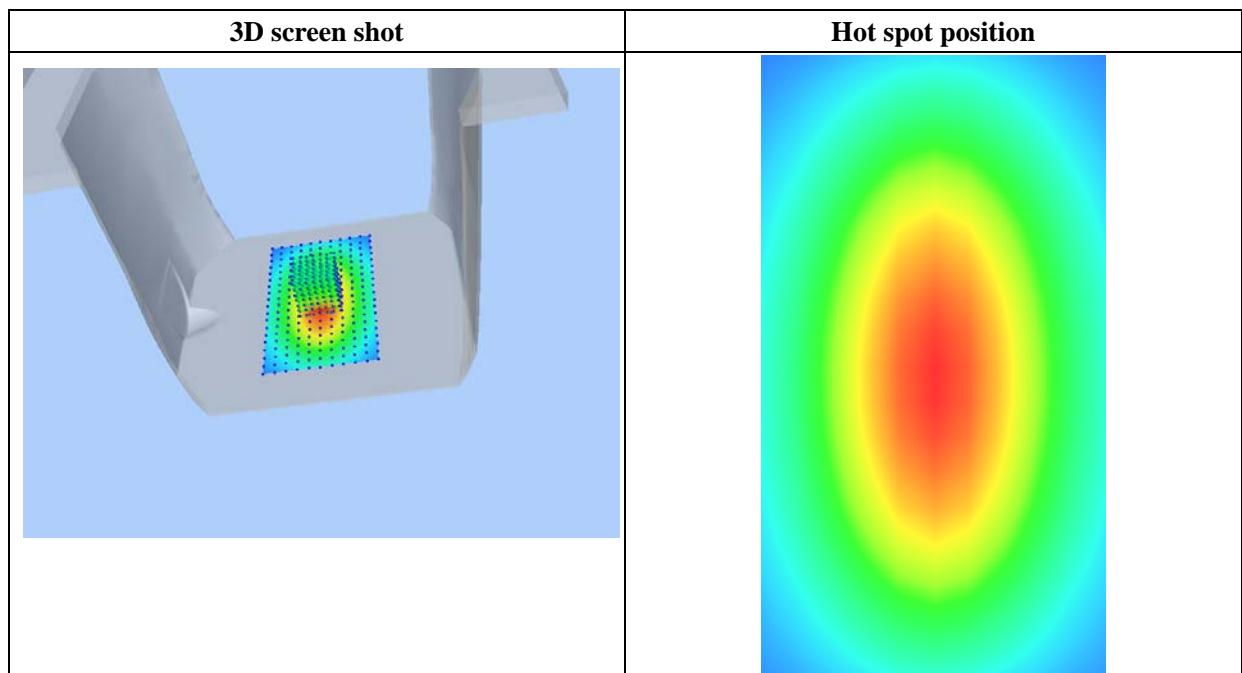
<b>Frequency (MHz)</b>	1900.000000
<b>Relative Permittivity (real part)</b>	38.560124
<b>Conductivity (S/m)</b>	1.380369
<b>Power Variation (%)</b>	1.022540
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

Z Axis Scan



# MEASUREMENT 5

## For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 21 seconds

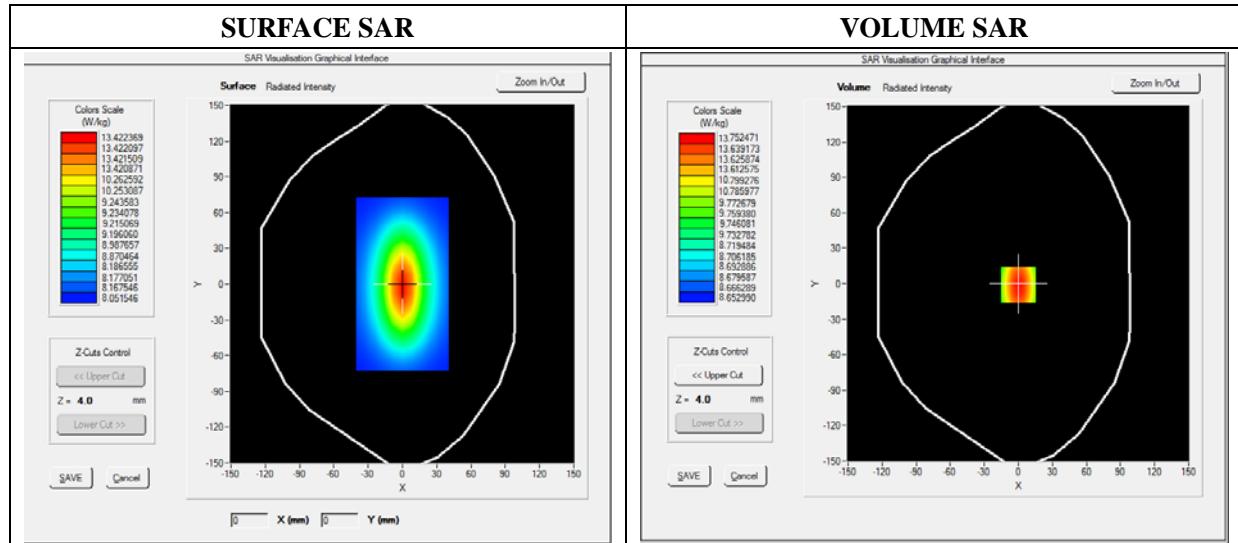
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2017

## A. Experimental conditions

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

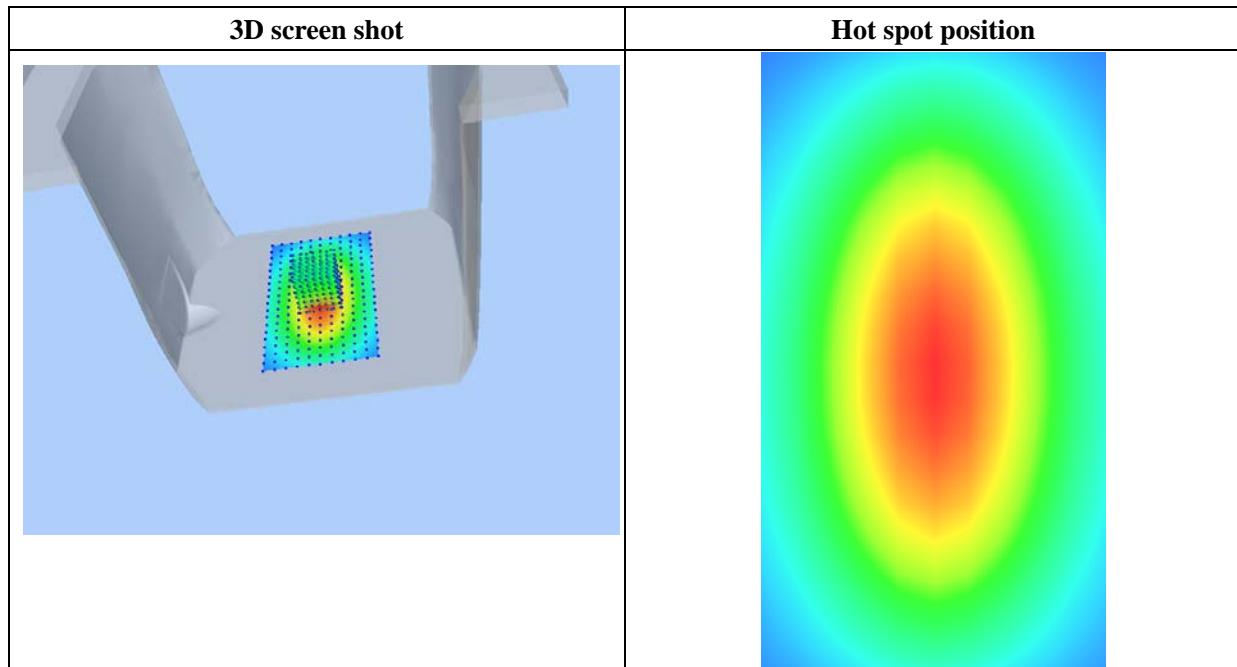
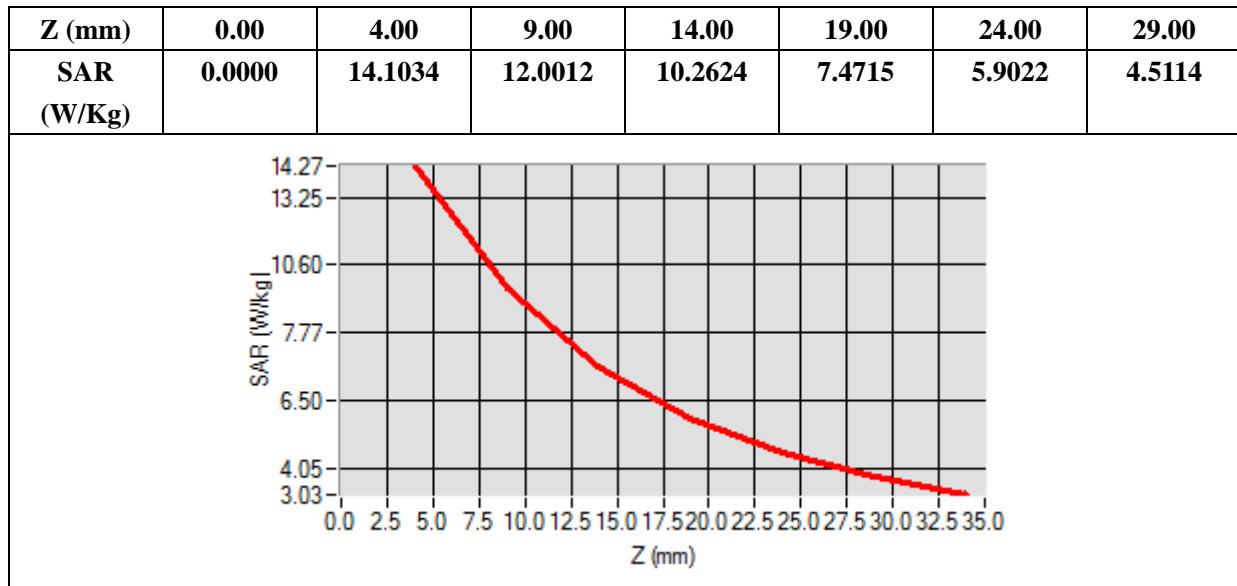
## B. SAR Measurement Results

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



Maximum location: X=0.00, Y=0.00

<b>SAR 10g (W/Kg)</b>	<b>8.020427</b>
<b>SAR 1g (W/Kg)</b>	<b>13.452457</b>

**Z Axis Scan**


# MEASUREMENT 6

## For Head Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 21 seconds

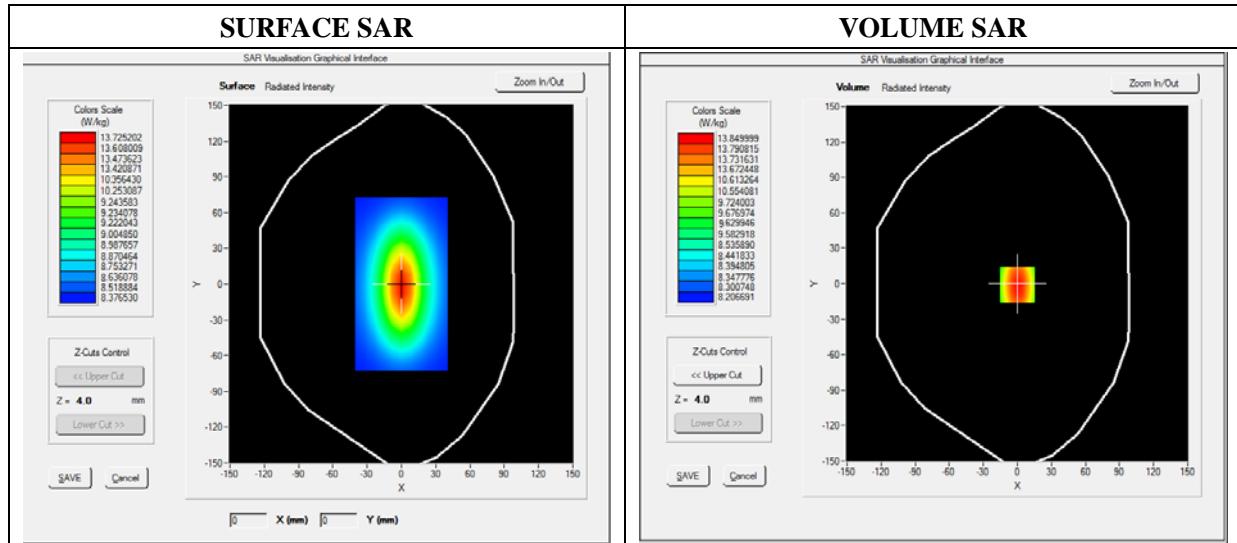
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.37; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	dx=8mm dy=8mm
<b>Phantom</b>	Validation plane
<b>Device Position</b>	Dipole
<b>Band</b>	CW2600
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

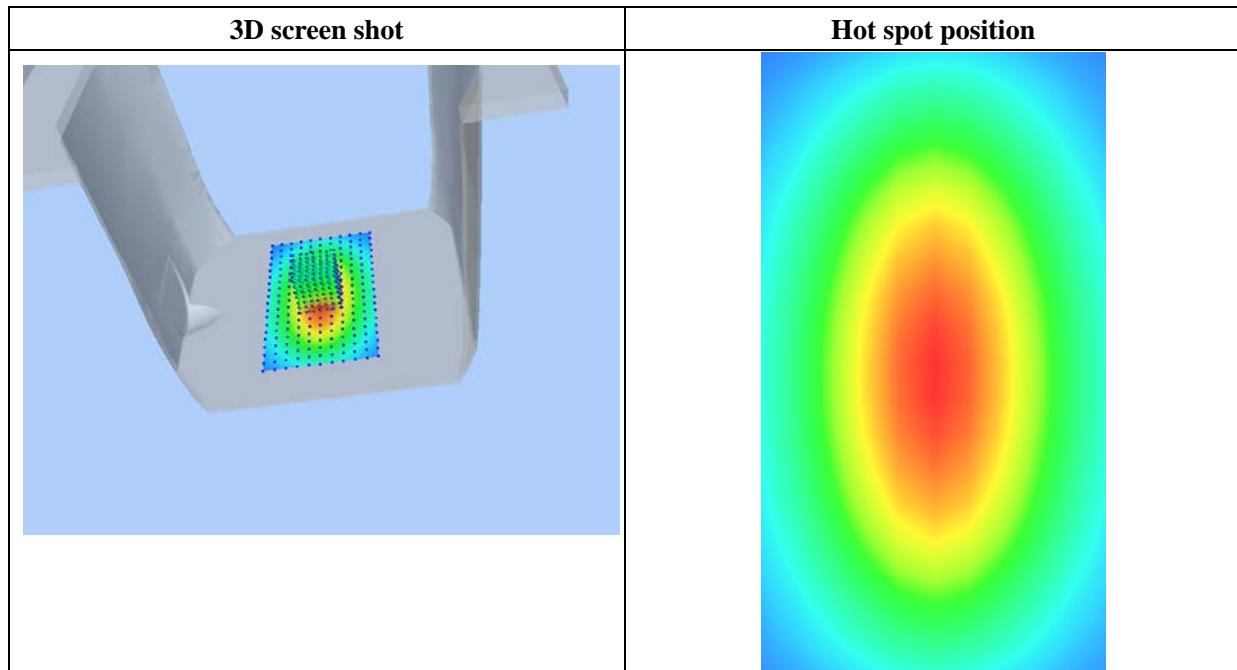
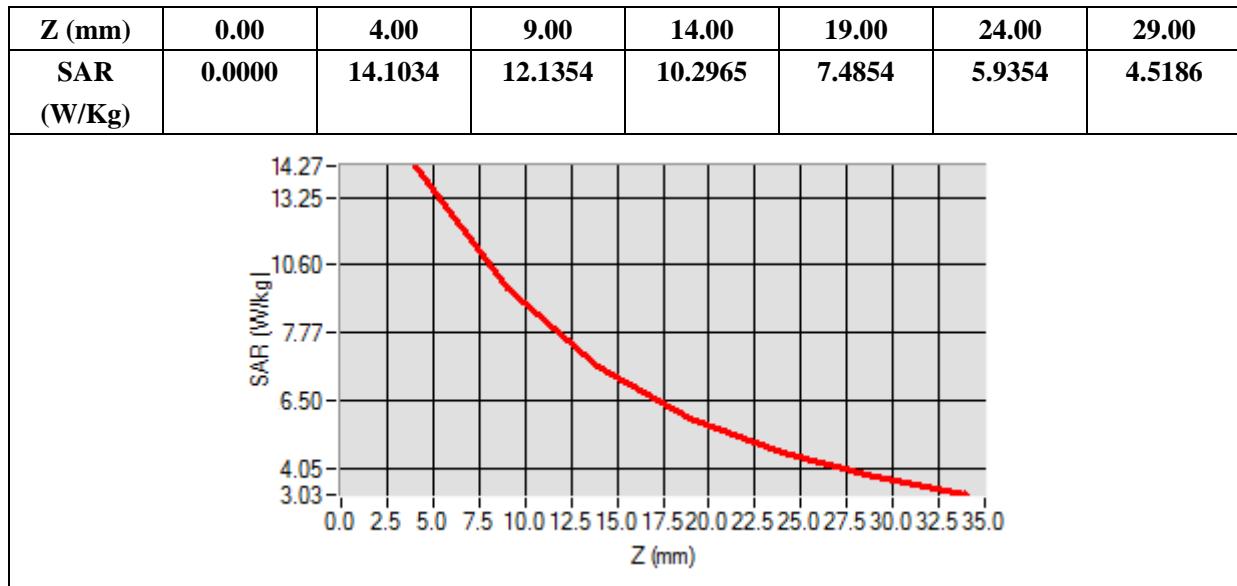
<b>Frequency (MHz)</b>	2600.000000
<b>Relative Permittivity (real part)</b>	38.631092
<b>Conductivity (S/m)</b>	1.930182
<b>Power Variation (%)</b>	1.028221
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	8.270822
SAR 1g (W/Kg)	13.670282

## Z Axis Scan



# MEASUREMENT 7

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 21 seconds

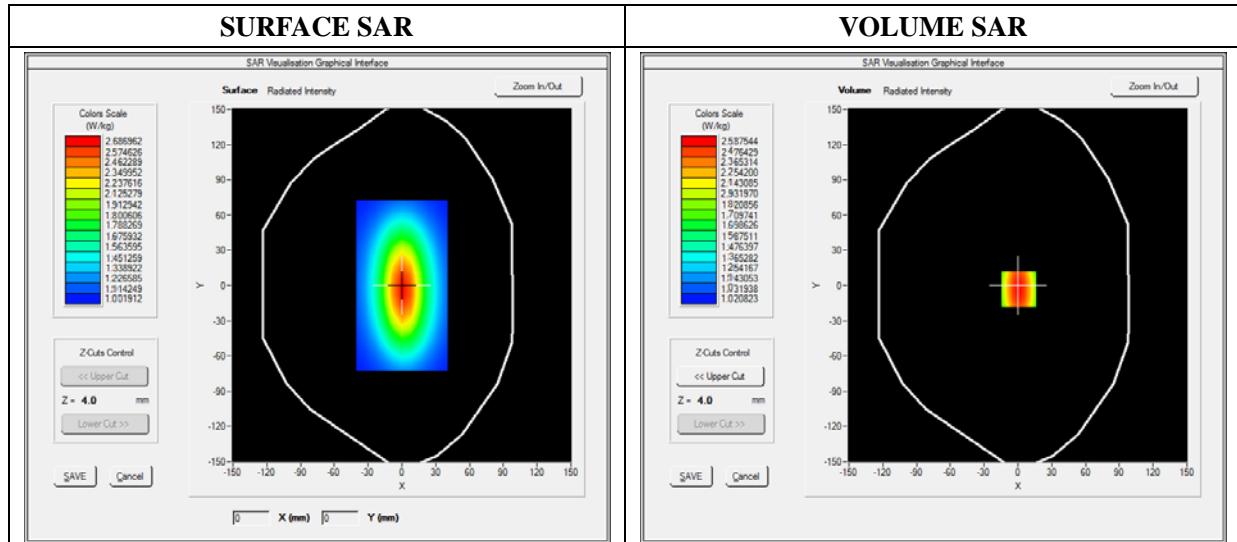
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

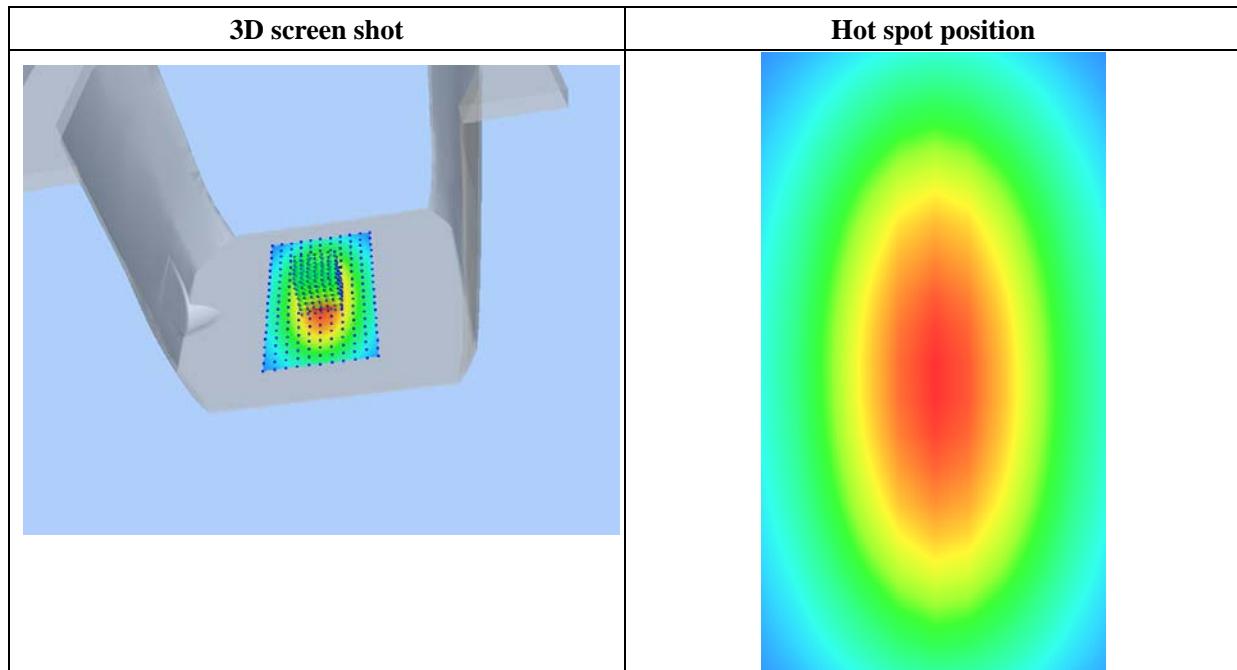
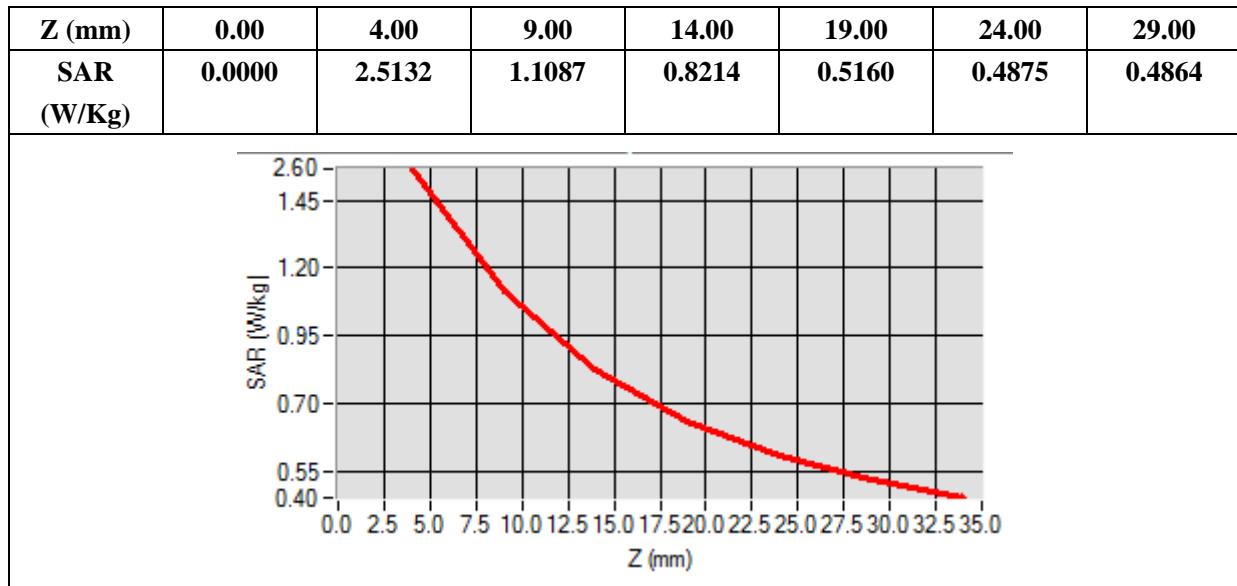
<b>Frequency (MHz)</b>	750.000000
<b>Relative Permittivity (real part)</b>	54.964739
<b>Conductivity (S/m)</b>	0.931048
<b>Power Variation (%)</b>	0.034745
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

## Z Axis Scan



# MEASUREMENT 8

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 21 seconds

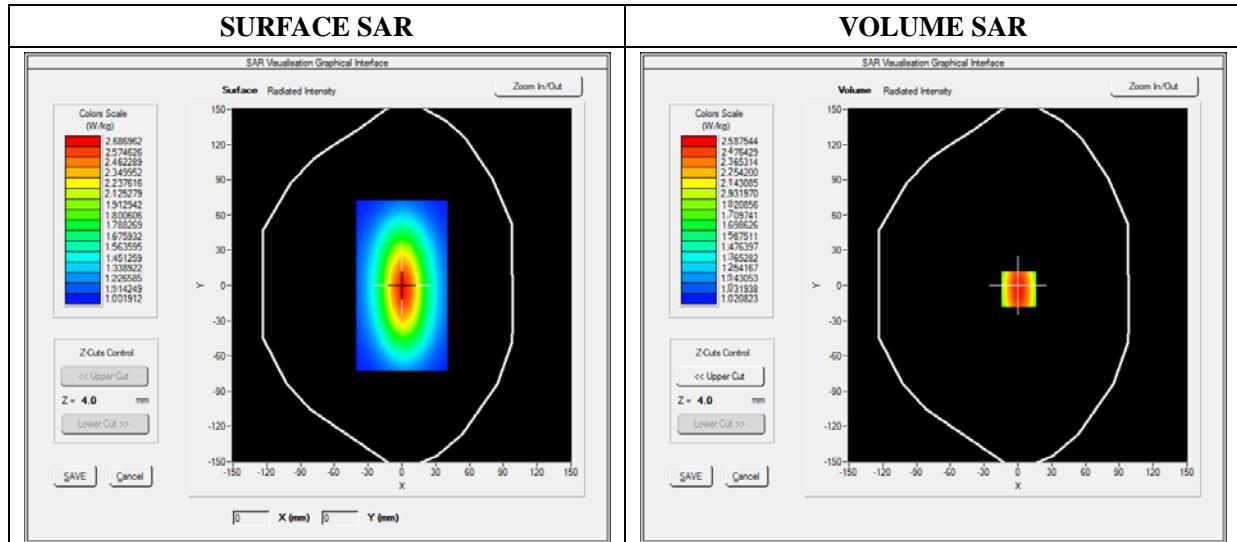
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

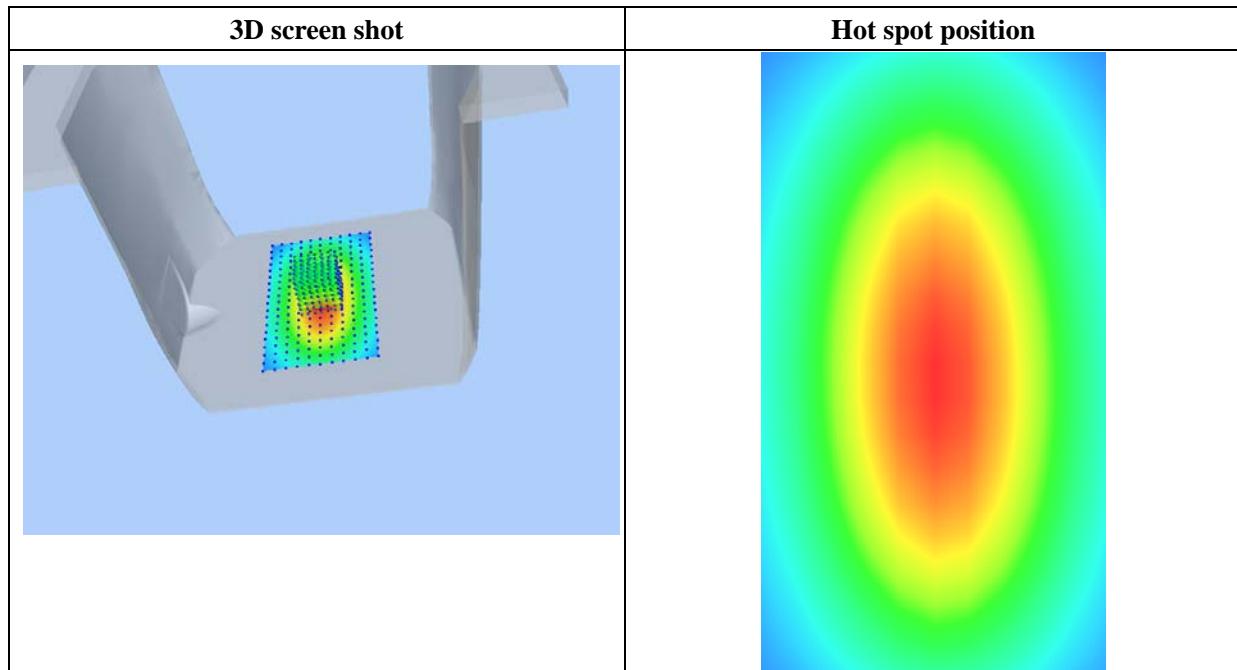
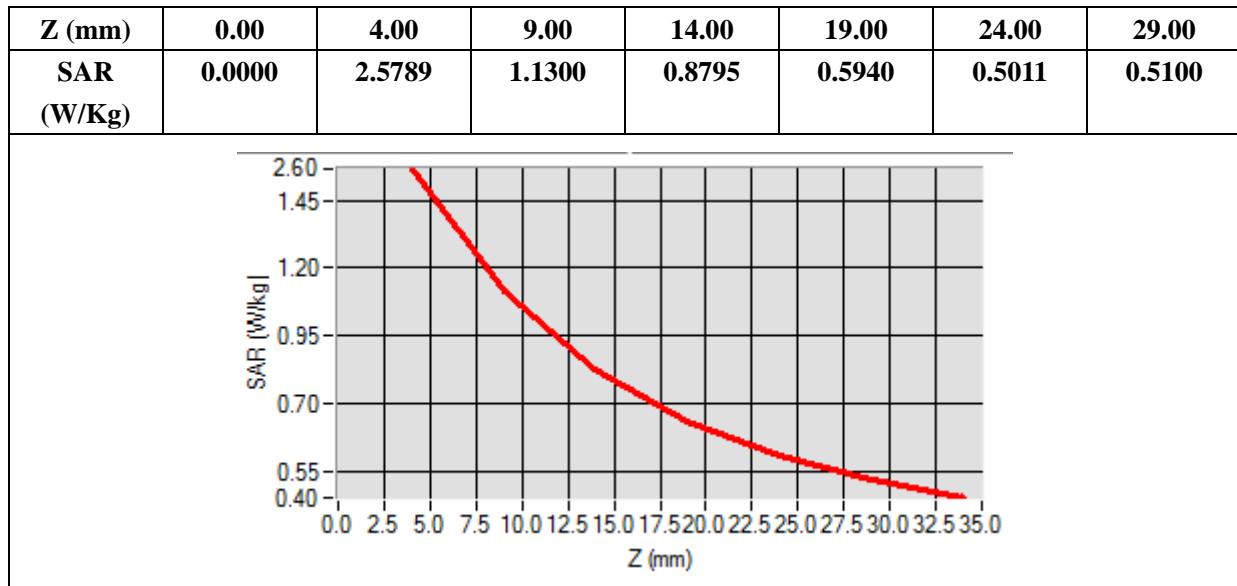
<b>Frequency (MHz)</b>	835.000000
<b>Relative Permittivity (real part)</b>	54.851214
<b>Conductivity (S/m)</b>	0.951454
<b>Power Variation (%)</b>	0.901472
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

#### Z Axis Scan



# MEASUREMENT 9

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 21 seconds

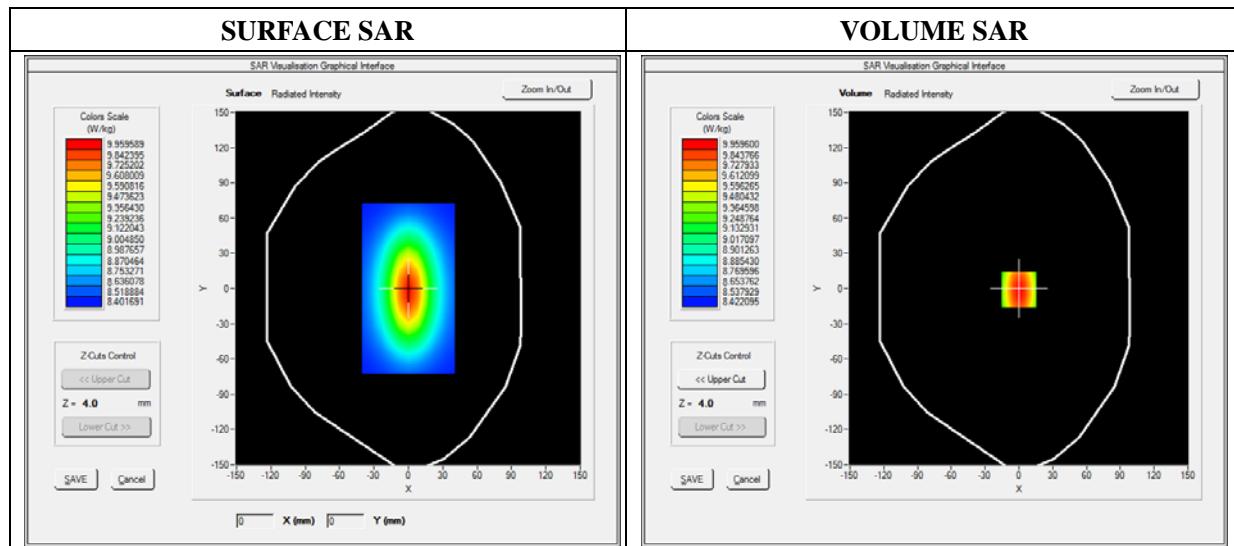
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.06; Calibrated: 06/01/2017

## A. Experimental conditions

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

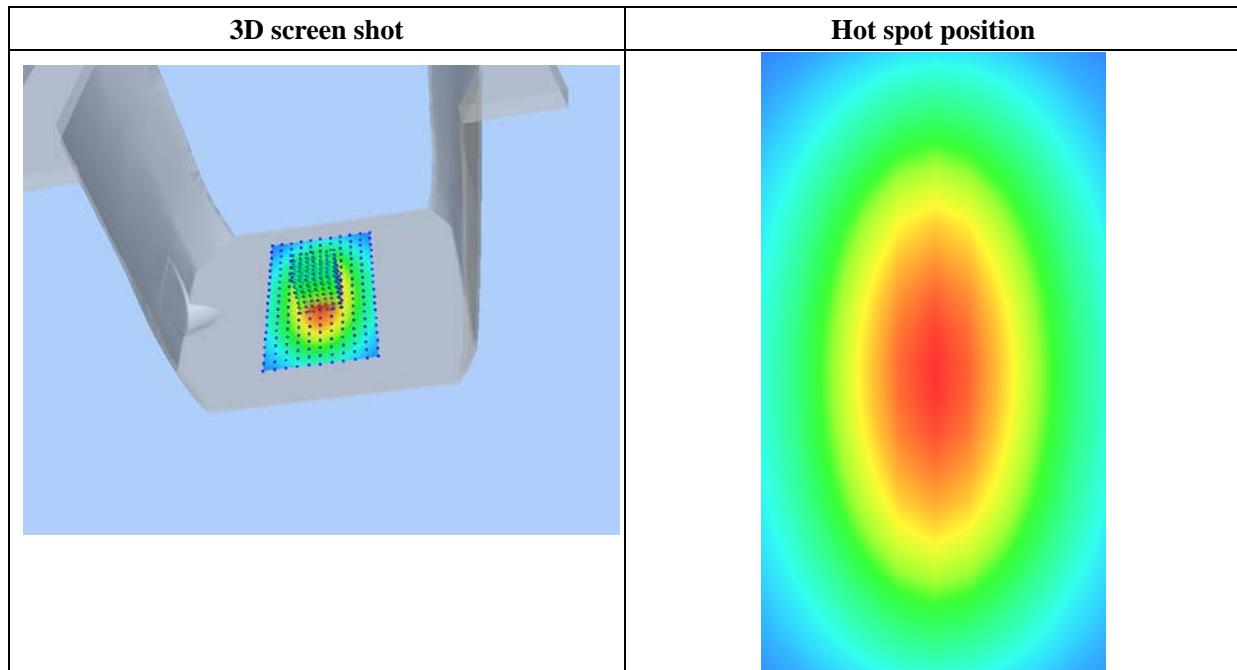
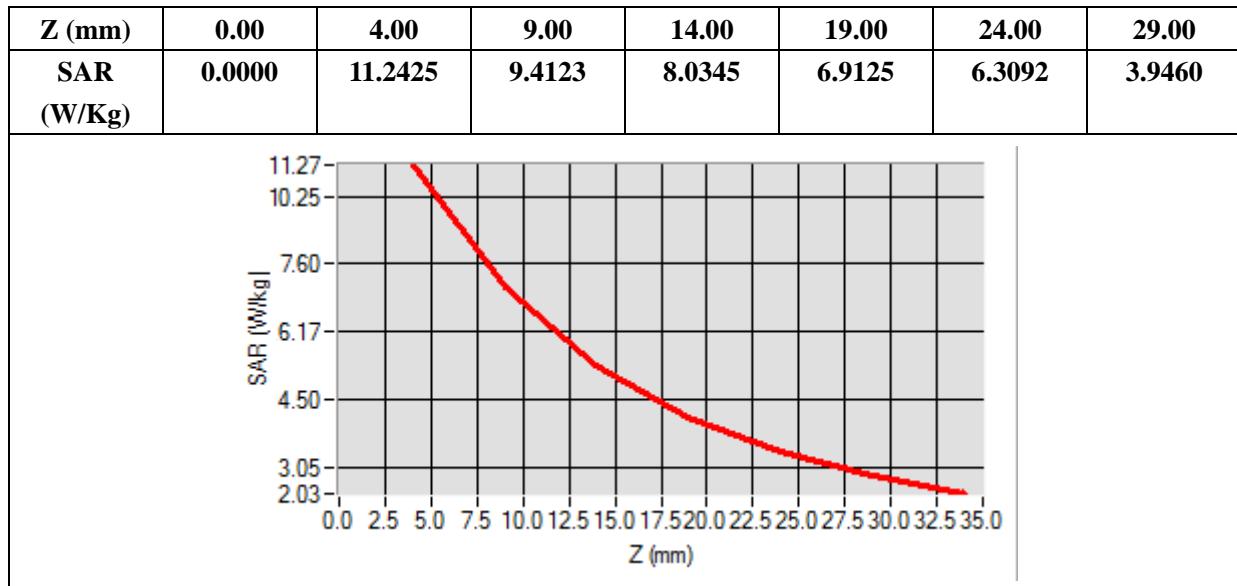
## B. SAR Measurement Results

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



Maximum location: X=0.00, Y=0.00

<b>SAR 10g (W/Kg)</b>	<b>5.221202</b>
<b>SAR 1g (W/Kg)</b>	<b>9.582560</b>

**Z Axis Scan**


# MEASUREMENT 10

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 21 seconds

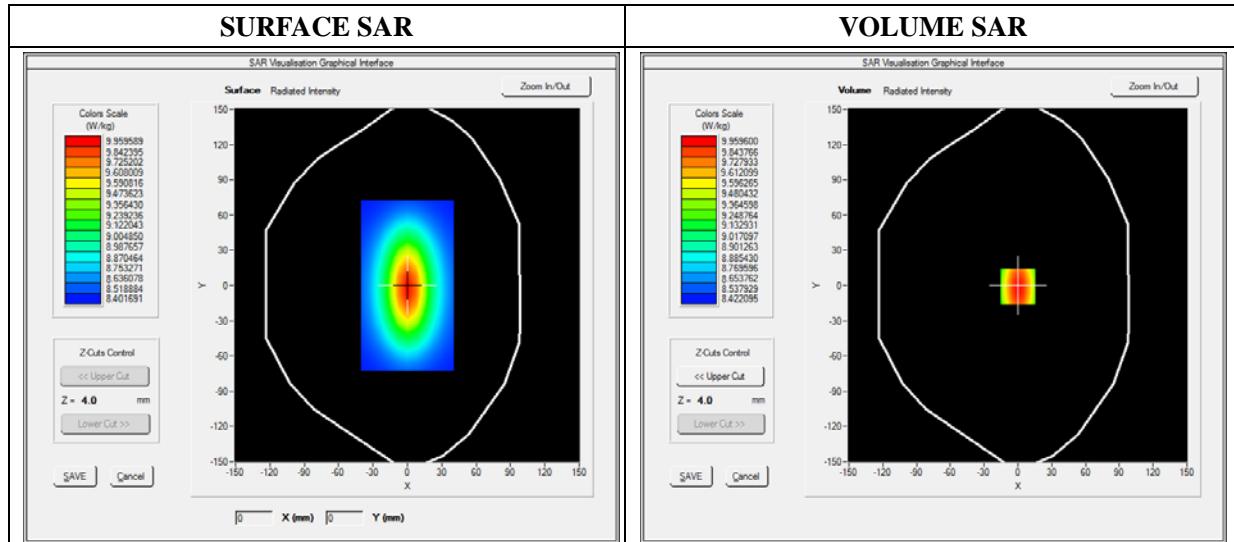
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

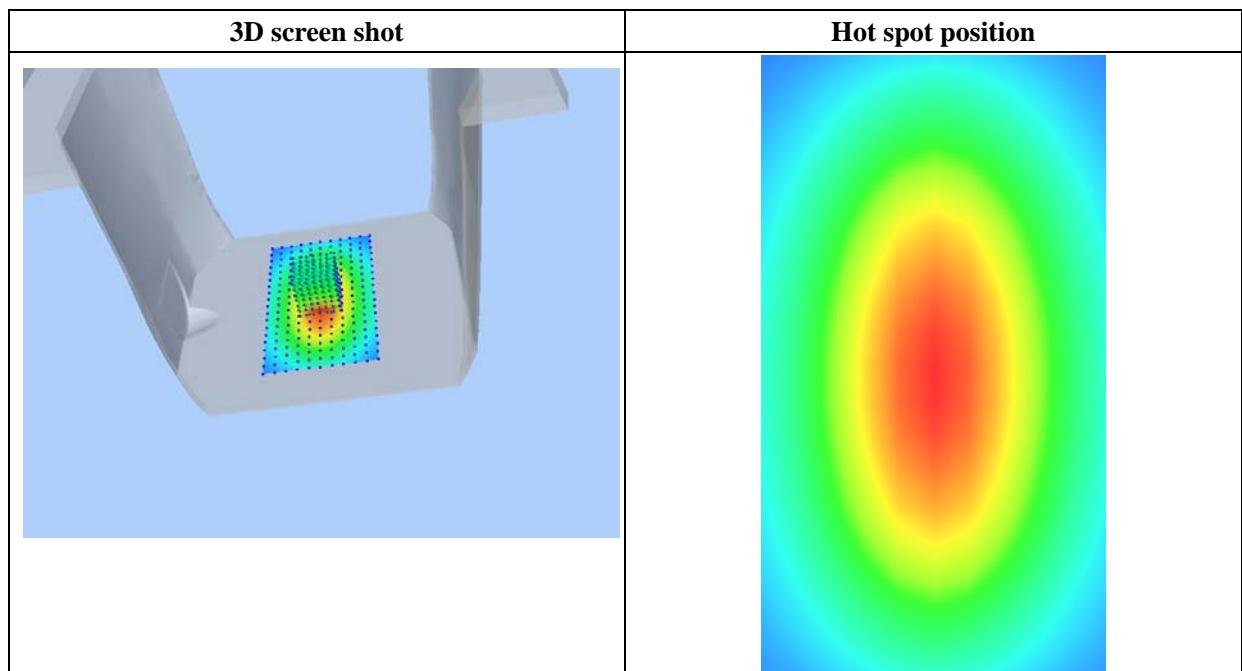
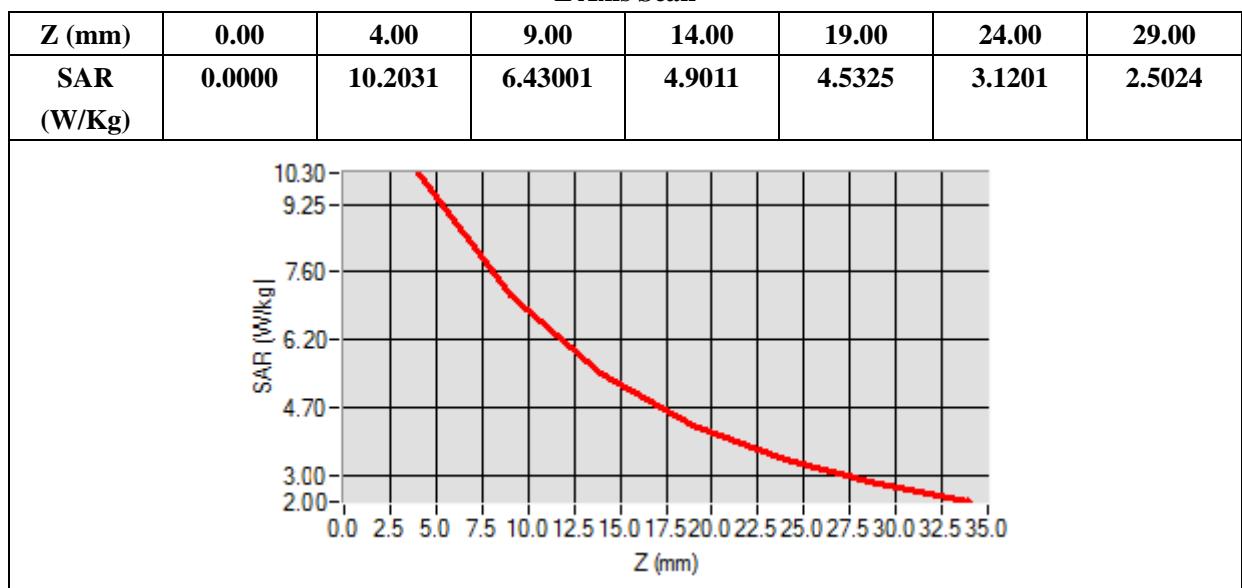
<b>Frequency (MHz)</b>	1900.000000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	0.541872
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=0.00

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

Z Axis Scan



# MEASUREMENT 11

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 21 seconds

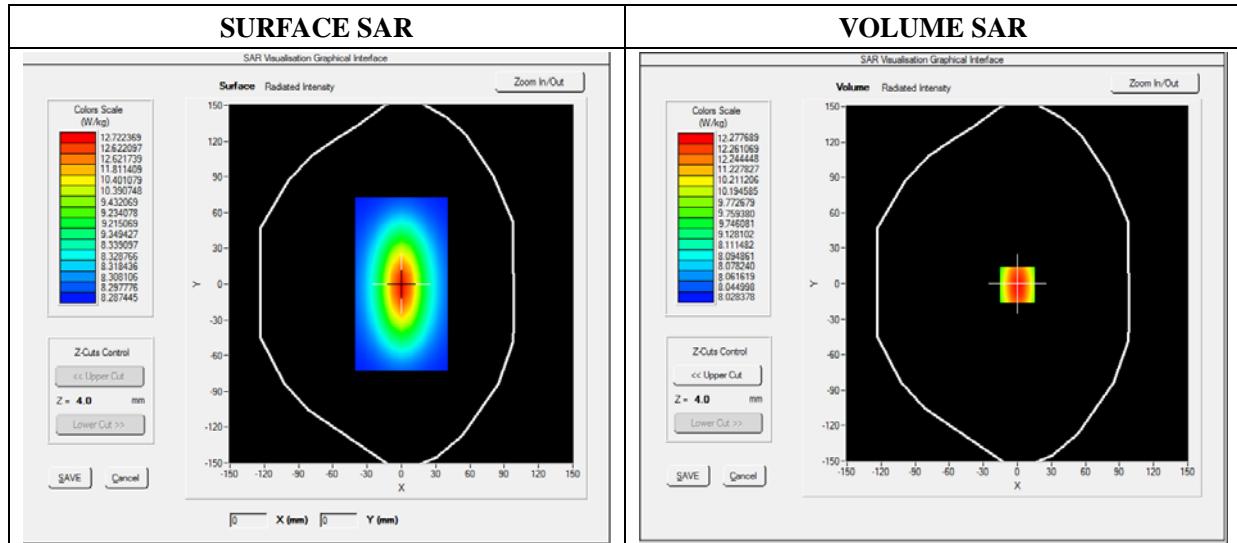
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

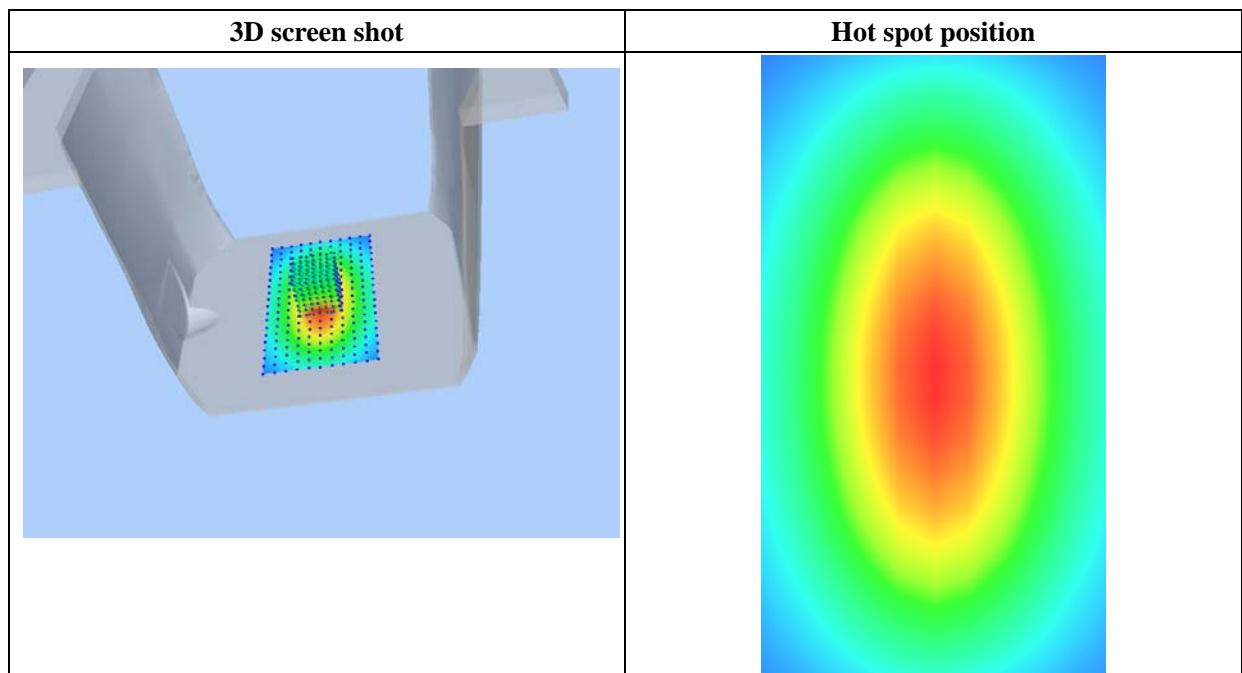
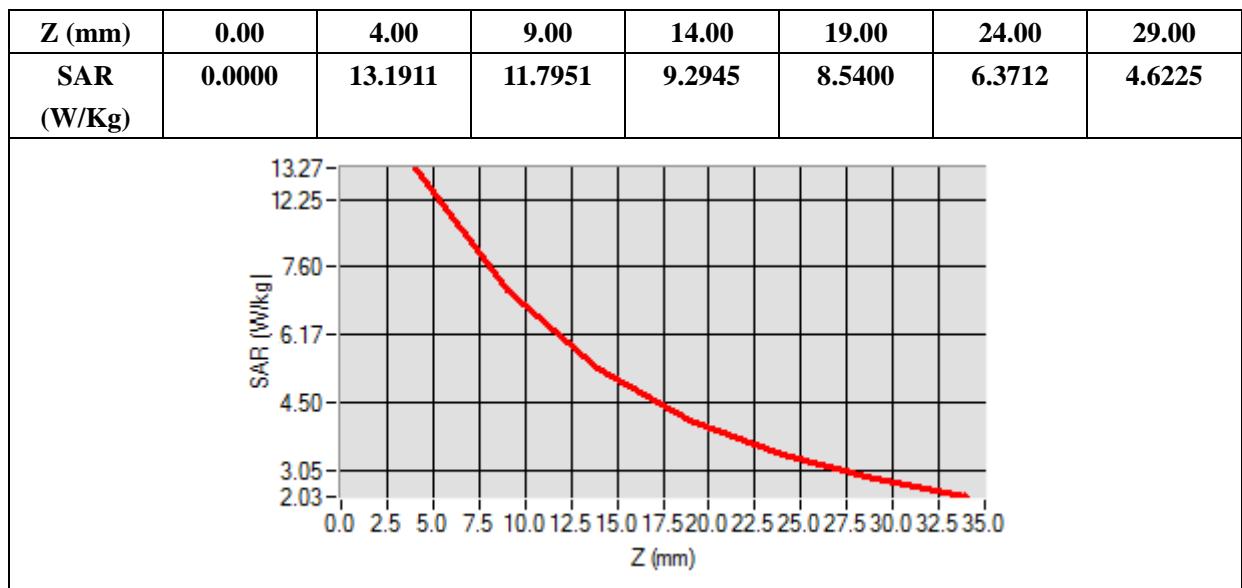
<b>Frequency (MHz)</b>	2450.000000
<b>Relative Permittivity (real part)</b>	52.010212
<b>Conductivity (S/m)</b>	1.910255
<b>Power Variation (%)</b>	1.369745
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=0.00, Y=0.00

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

Z Axis Scan



# MEASUREMENT 12

## For Body Liquid

Type: Validation measurement (Fast, 75.00 %)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 21 seconds

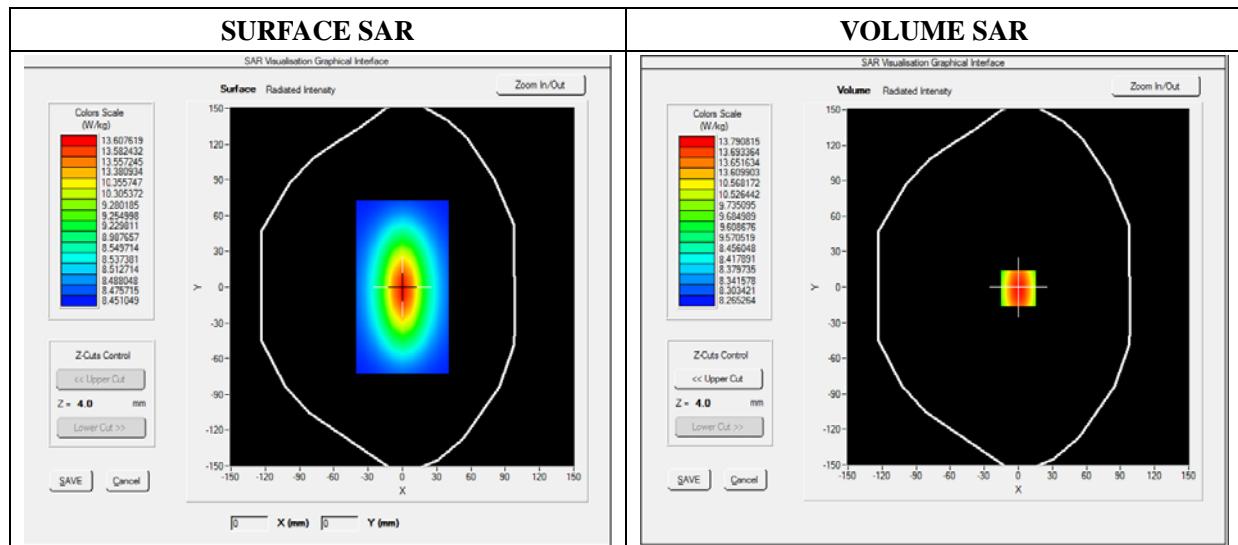
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.58; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	dx=8mm dy=8mm
<b>Phantom</b>	Validation plane
<b>Device Position</b>	Dipole
<b>Band</b>	CW2600
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

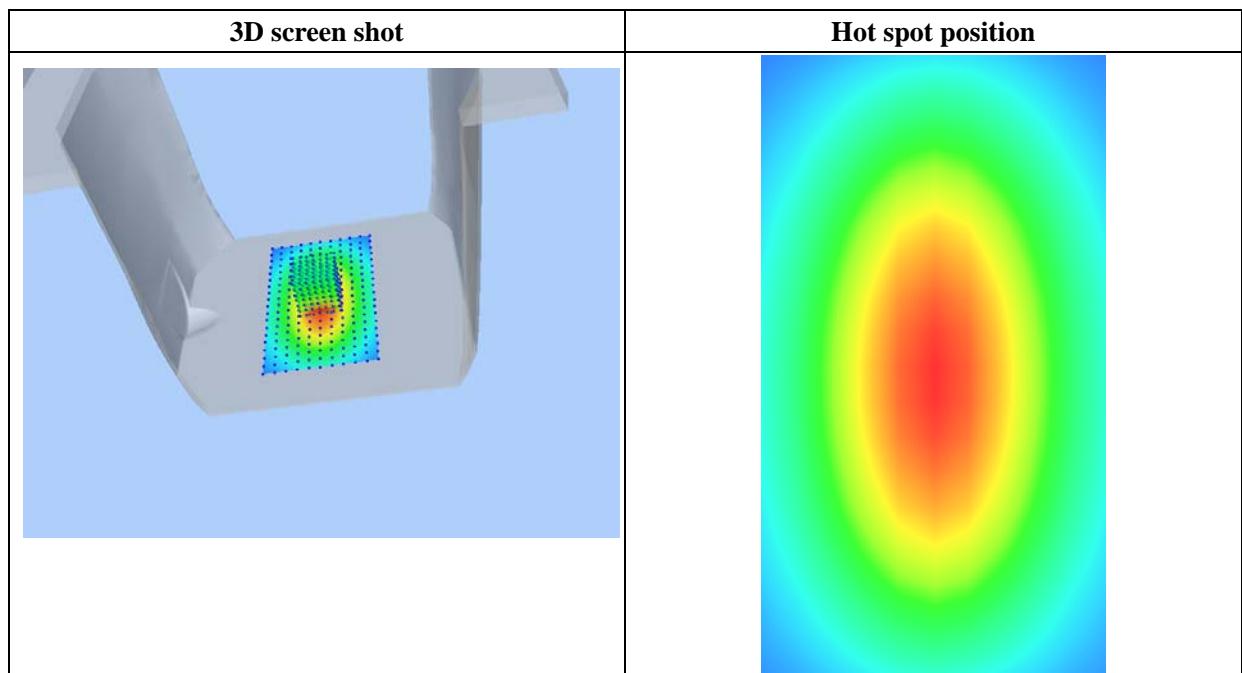
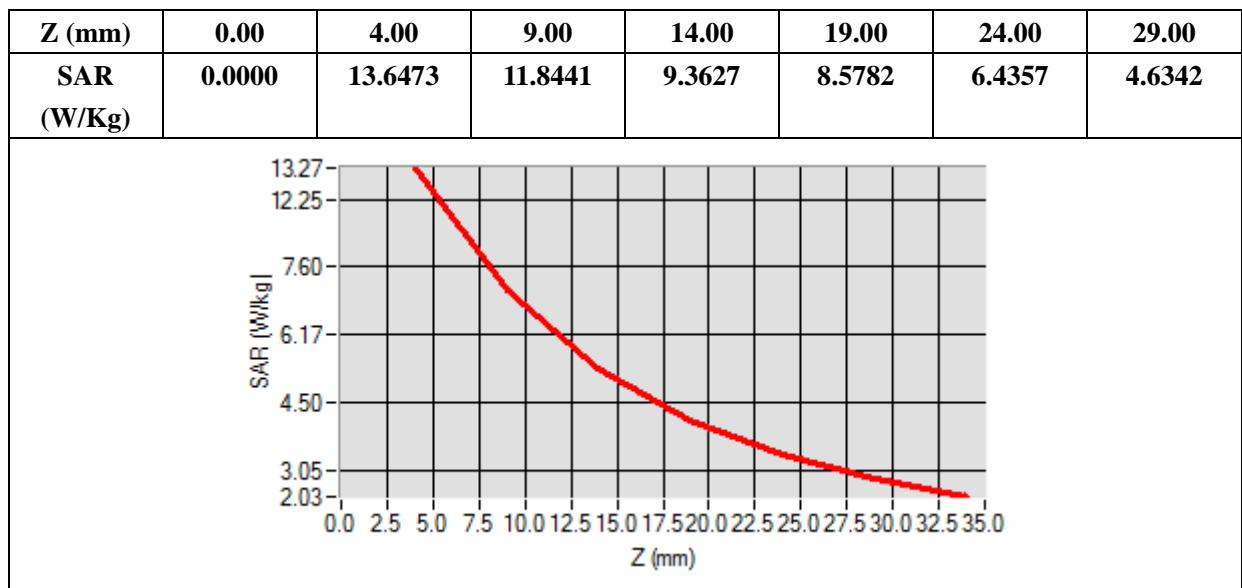
<b>Frequency (MHz)</b>	2600.000000
<b>Relative Permittivity (real part)</b>	52.241202
<b>Conductivity (S/m)</b>	2.120943
<b>Power Variation (%)</b>	1.038832
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	6.083781
SAR 1g (W/Kg)	13.430481

Z Axis Scan



## Annex B. Plots of SAR Measurement

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<b><u>TYPE</u></b>	<b><u>BAND</u></b>	<b><u>PARAMETERS</u></b>
Phone	<b>GSM850</b>	<u>Measurement 1:</u> Right Head with Cheek device position on Middle Channel in GSM mode
Phone	<b>GSM1900</b>	<u>Measurement 7:</u> Left Head with Cheek device position on High Channel in GSM mode
Phone	<b>GPRS850_4TX</b>	<u>Measurement 9:</u> Right Head with Cheek device position on Middle Channel in GPRS mode
Phone	<b>GPRS1900_4TX</b>	<u>Measurement 15:</u> Left Head with Cheek device position on High Channel in GPRS mode
Phone	<b>WCDMA1900_RMC</b>	<u>Measurement 19:</u> Left Head with Cheek device position on Low Channel in WCDMA mode
Phone	<b>WCDMA850_RMC</b>	<u>Measurement 21:</u> Right Head with Cheek device position on Middle Channel in WCDMA mode
Phone	<b>LTE Band 2_RMC</b>	<u>Measurement 27:</u> Left Head with Cheek device position on Low Channel in LTE mode
Phone	<b>LTE Band 4_RMC</b>	<u>Measurement 35:</u> Left Head with Cheek device position on Low Channel in LTE mode
Phone	<b>LTE Band 7_RMC</b>	<u>Measurement 43:</u> Left Head with Cheek device position on Low Channel in LTE mode
Phone	<b>LTE Band 13_RMC</b>	<u>Measurement 51:</u> Left Head with Cheek device position on Middle Channel in LTE mode
Phone	<b>LTE Band 17_RMC</b>	<u>Measurement 57:</u> Right Head with Cheek device position on Low Channel in LTE mode
Phone	<b>WiFi_802.11b</b>	<u>Measurement 67:</u> Left Head with Cheek device position on Low Channel in 802.11b mode
Phone	<b>GSM850</b>	<u>Measurement 70:</u> Flat Plane with Front(Body-worn) device position on Middle Channel in GSM mode
Phone	<b>GSM1900</b>	<u>Measurement 71:</u> Flat Plane with Back(Body-worn) device position on High Channel in GSM mode
Phone	<b>GPRS850_4TX</b>	<u>Measurement 74:</u> Flat Plane with Front device position on Middle Channel in GPRS mode
Phone	<b>GPRS1900_4TX</b>	<u>Measurement 77:</u> Flat Plane with Back device position on High Channel in GPRS mode
Phone	<b>WCDMA1900_RMC</b>	<u>Measurement 81:</u> Flat Plane with Back side device position on Low Channel in WCDMA mode
Phone	<b>WCDMA1900_RMC</b>	<u>Measurement 83:</u> Flat Plane with Bottom side device position on Low Channel in WCDMA mode
Phone	<b>WCDMA850_RMC</b>	<u>Measurement 85:</u> Flat Plane with Back device position on Middle Channel in WCDMA mode

<b>Phone</b>	<b>LTE Band 2_RMC</b>	Measurement 89: Flat Plane with Back device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 2_RMC</b>	Measurement 90: Flat Plane with Front device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 2_RMC</b>	Measurement 91: Flat Plane with Bottom device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 4_RMC</b>	Measurement 97: Flat Plane with Back device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 7_RMC</b>	Measurement 106: Flat Plane with Front device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 7_RMC</b>	Measurement 107: Flat Plane with Bottom device position on Low Channel in LTE mode
<b>Phone</b>	<b>LTE Band 13_RMC</b>	Measurement 113: Flat Plane with Back device position on Middle Channel in LTE mode
<b>Phone</b>	<b>LTE Band 17_RMC</b>	Measurement 121: Flat Plane with Back device position on Low Channel in LTE mode
<b>Phone</b>	<b>WiFi_802.11b</b>	Measurement 129: Flat Plane with Back side device position on Low 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: 01/02/2018

Measurement duration: 11 minutes 48 seconds

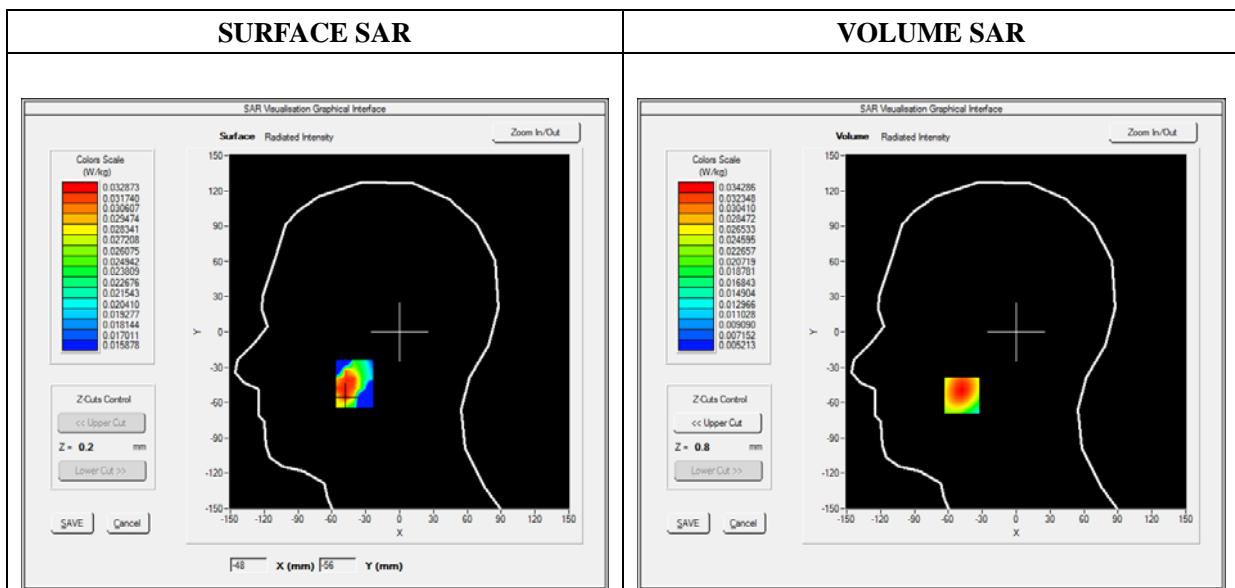
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

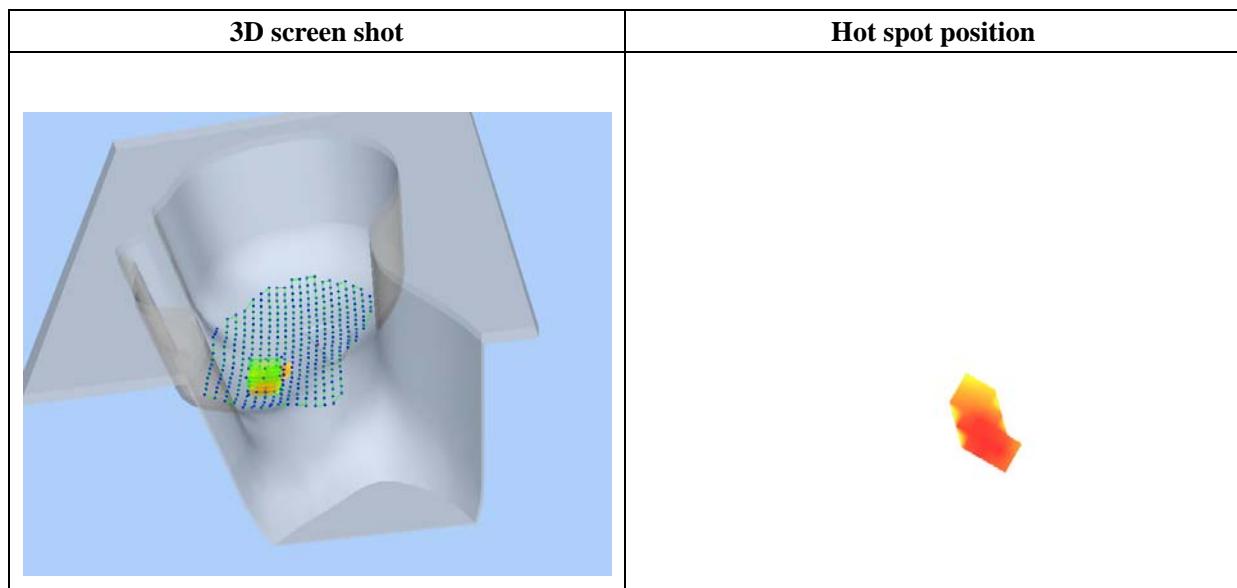
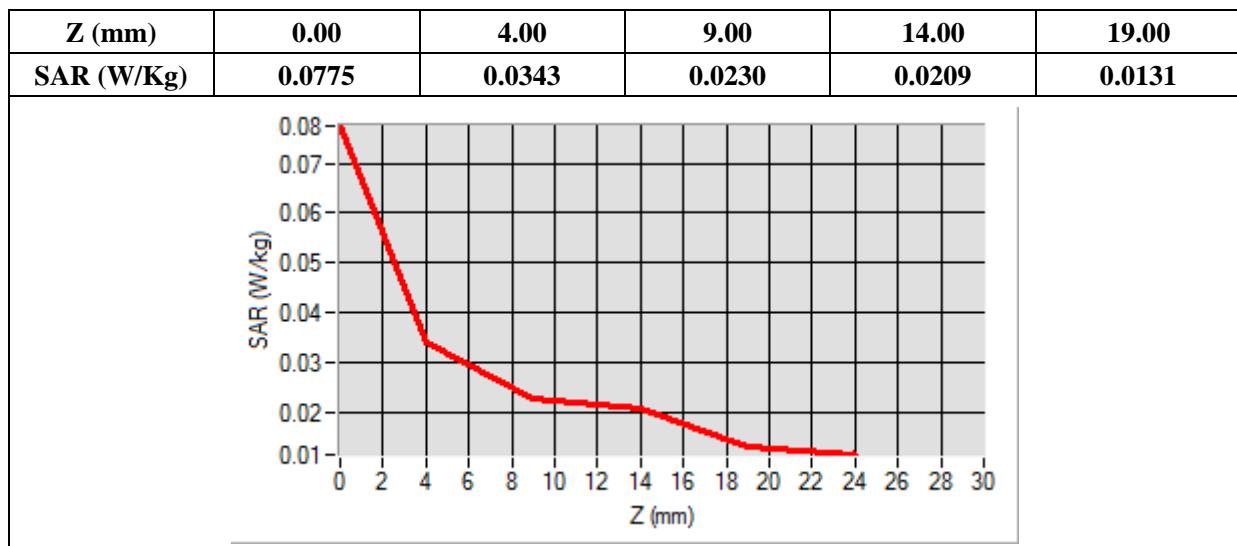
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	41.110245
<b>Conductivity (S/m)</b>	0.871245
<b>Power Variation (%)</b>	1.144536
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-48.00, Y=-54.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.023862
SAR 1g (W/Kg)	0.032614



# MEASUREMENT 7

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 11 minutes 48 seconds

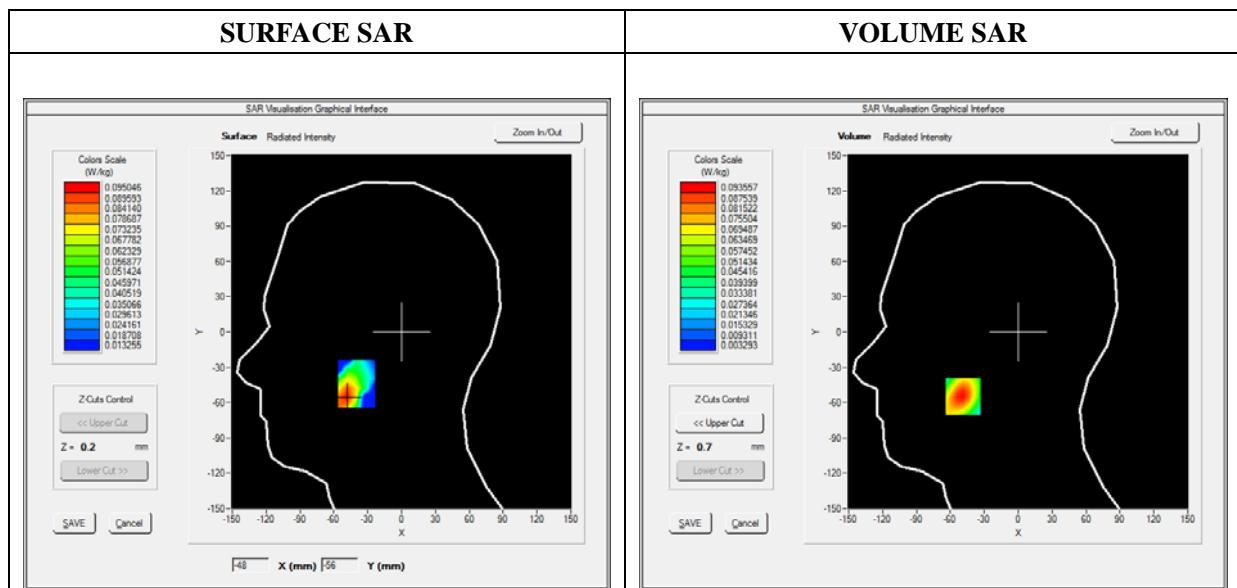
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Left head
<b>Device Position</b>	Cheek
<b>Band</b>	GSM1900
<b>Channels</b>	High
<b>Signal</b>	TDMA (Crest factor: 8.0)

## B. SAR Measurement Results

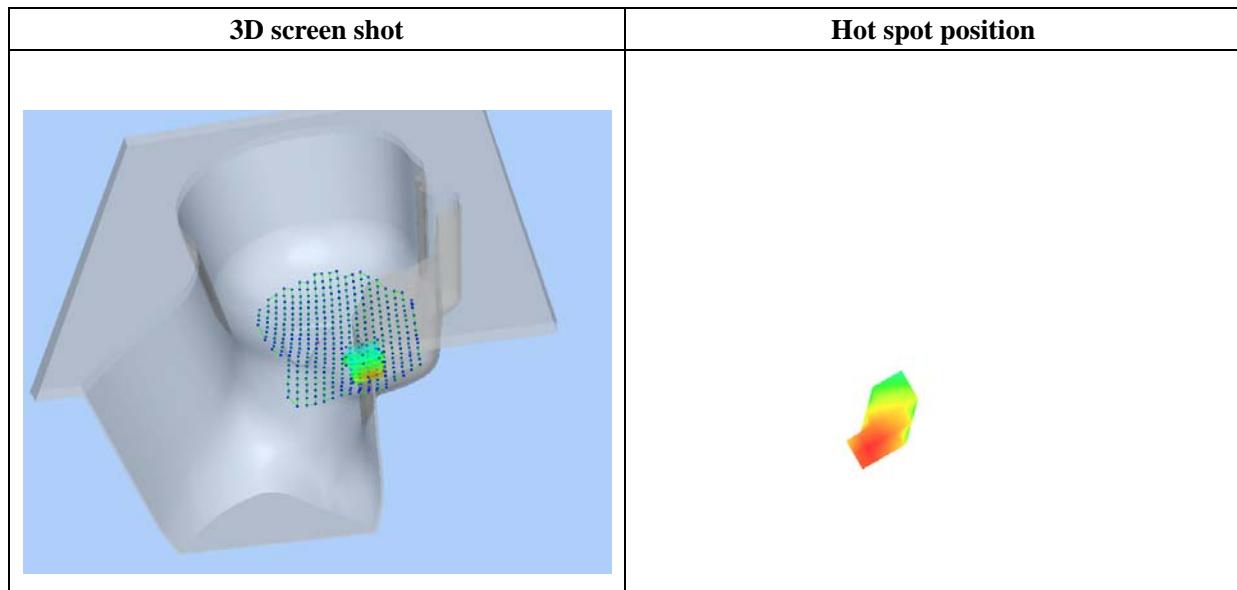
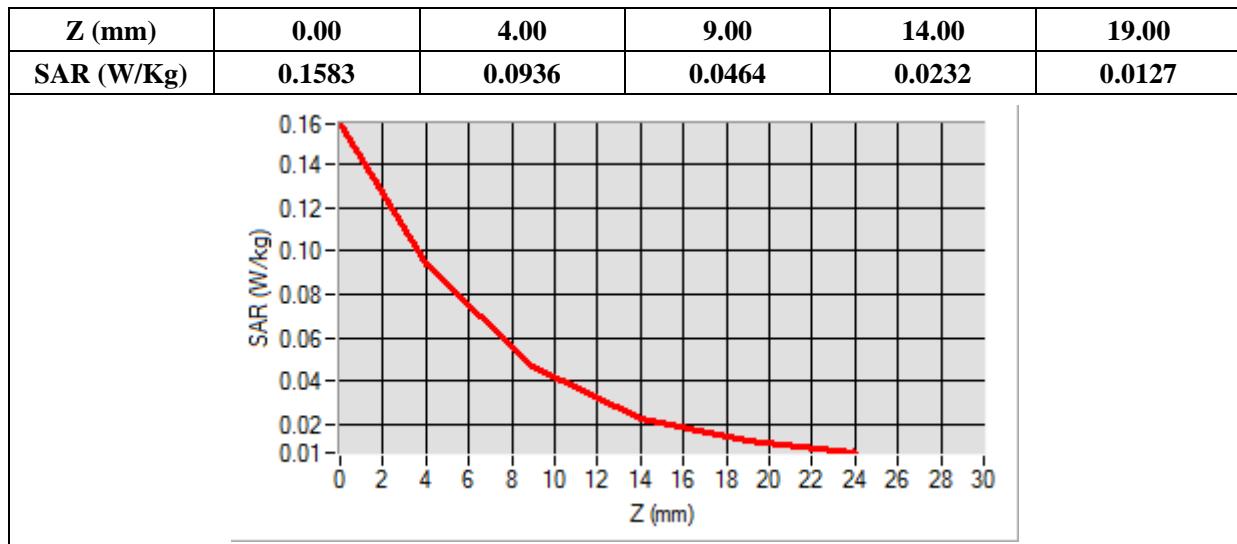
<b>Frequency (MHz)</b>	1909.800000
<b>Relative Permittivity (real part)</b>	38.560124
<b>Conductivity (S/m)</b>	1.380369
<b>Power Variation (%)</b>	1.442440
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



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

SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.045500
SAR 1g (W/Kg)	0.087505



# MEASUREMENT 9

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

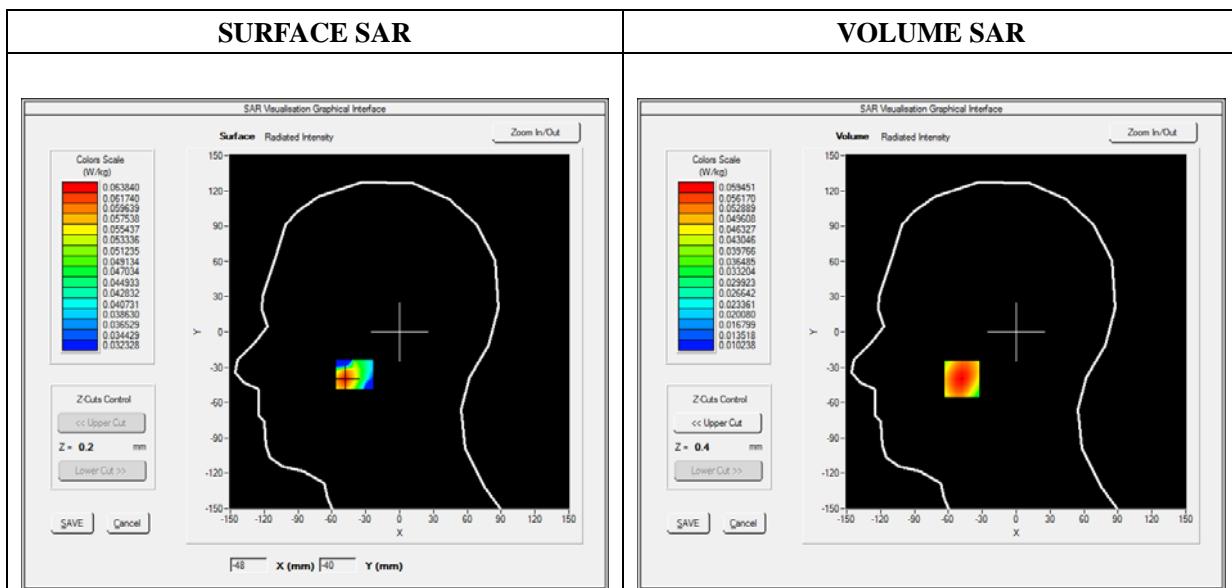
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

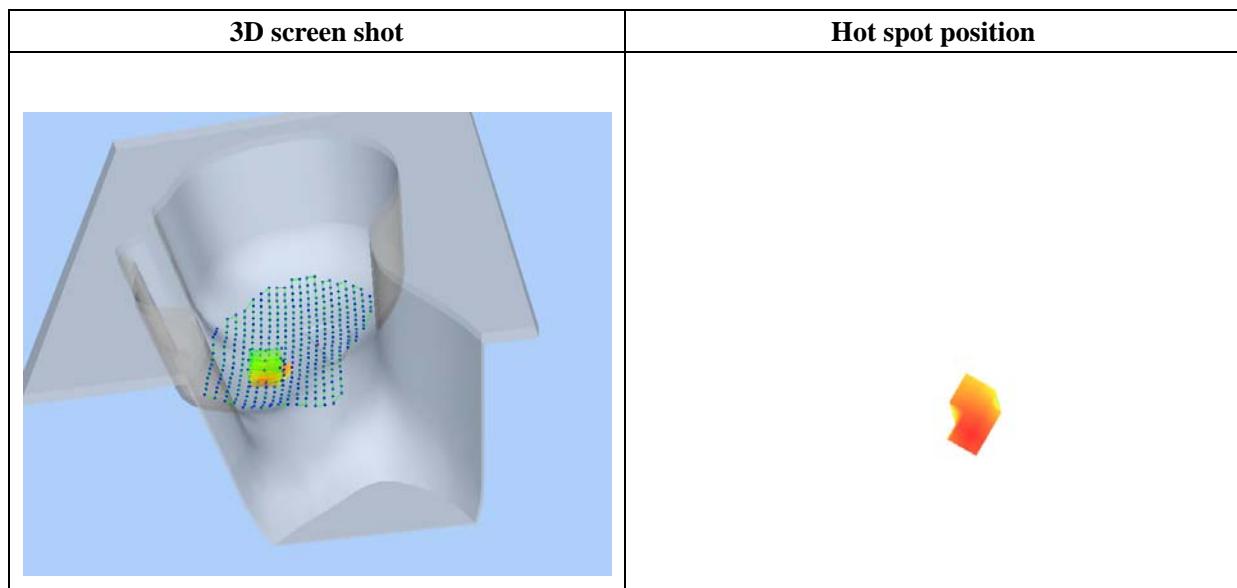
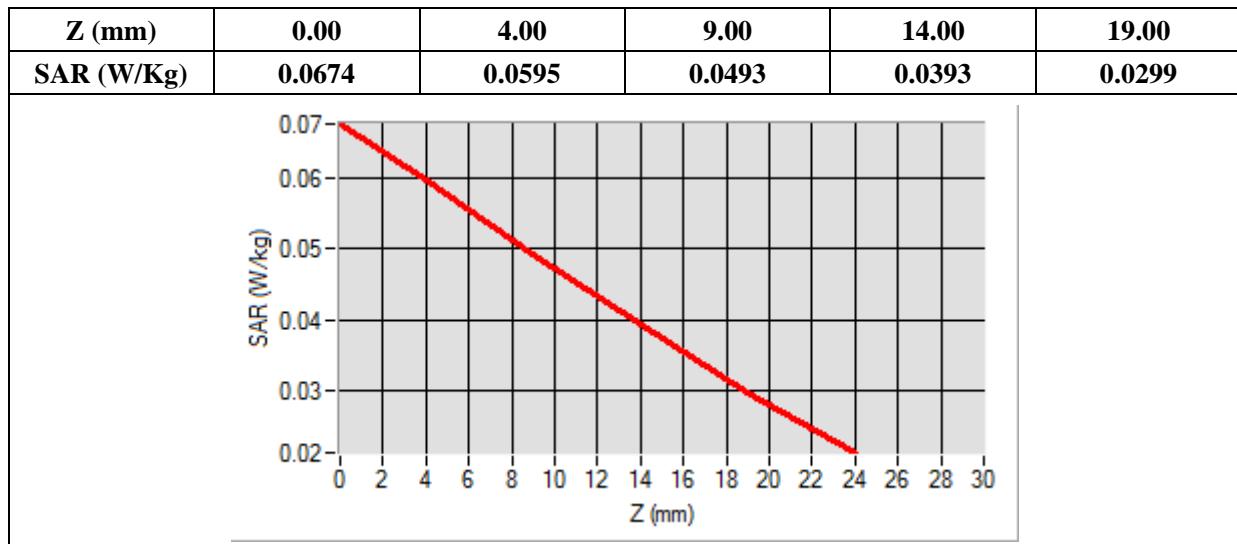
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	41.110245
<b>Conductivity (S/m)</b>	0.871245
<b>Power Variation (%)</b>	1.536272
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-48.00, Y=-40.00

SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.042622
SAR 1g (W/Kg)	0.056989



# MEASUREMENT 15

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

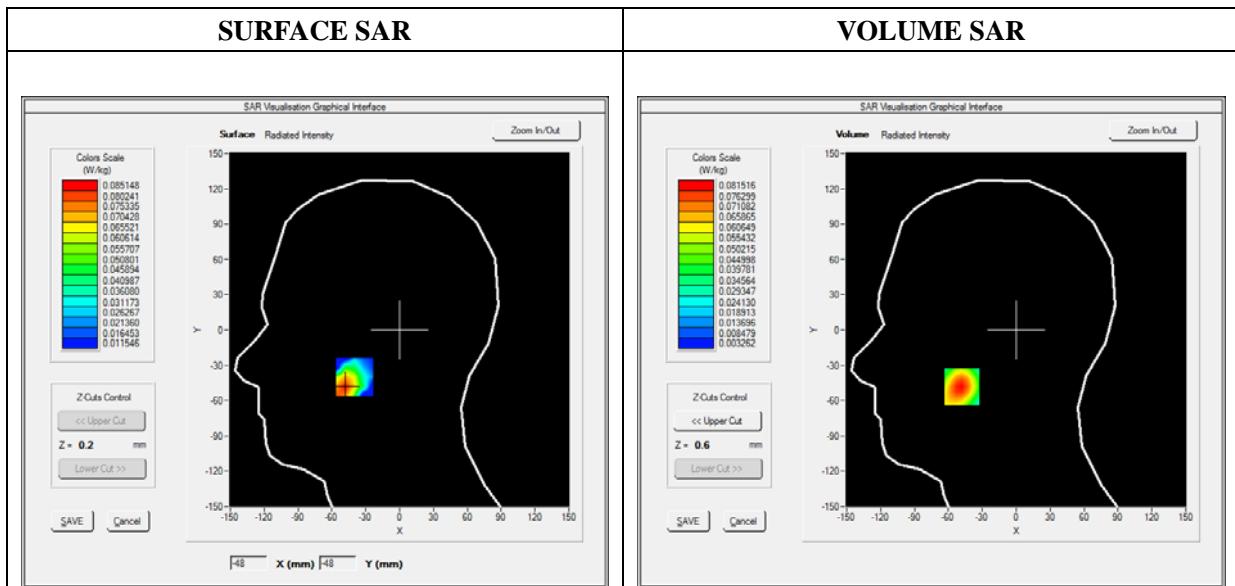
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

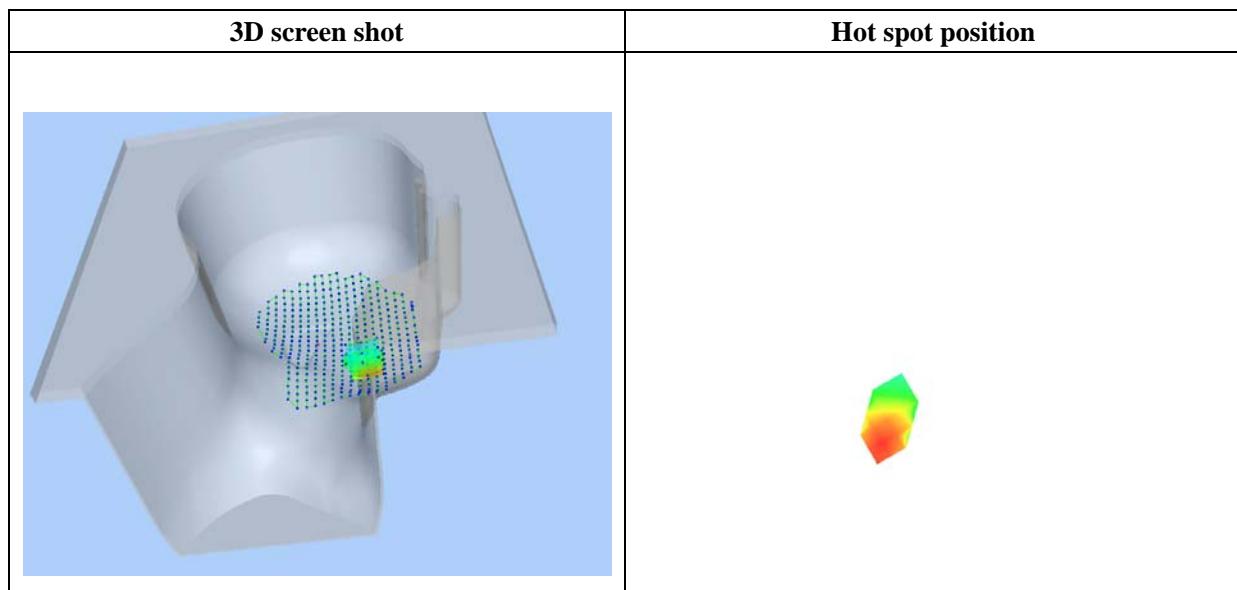
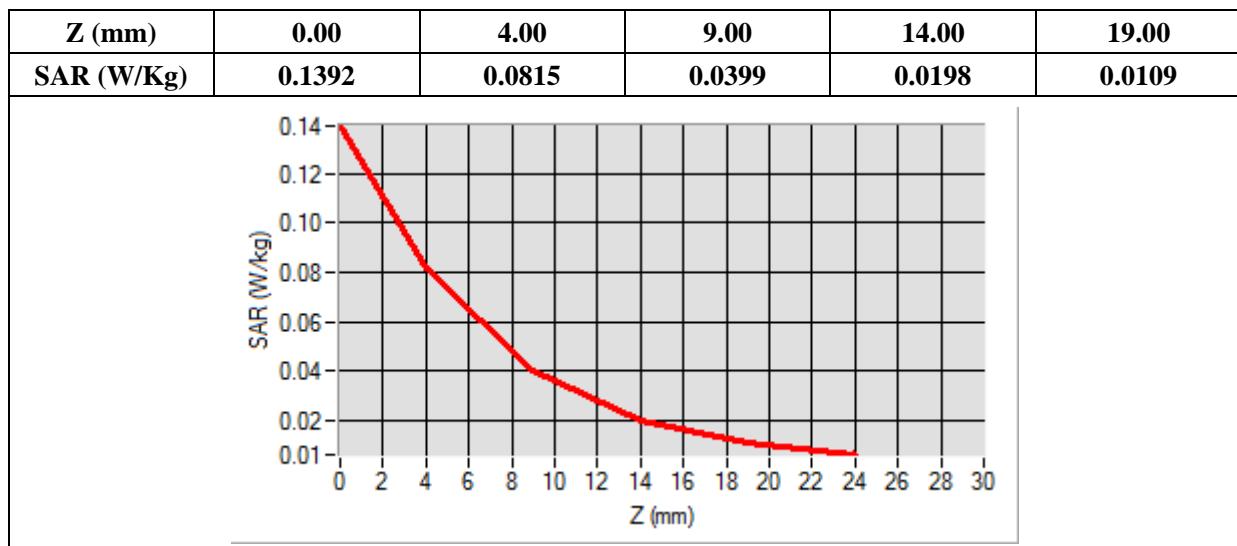
<b>Frequency (MHz)</b>	1909.800000
<b>Relative Permittivity (real part)</b>	38.560124
<b>Conductivity (S/m)</b>	1.380369
<b>Power Variation (%)</b>	1.536272
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



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

SAR Peak: 0.14 W/kg

SAR 10g (W/Kg)	0.039570
SAR 1g (W/Kg)	0.076102



# MEASUREMENT 19

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

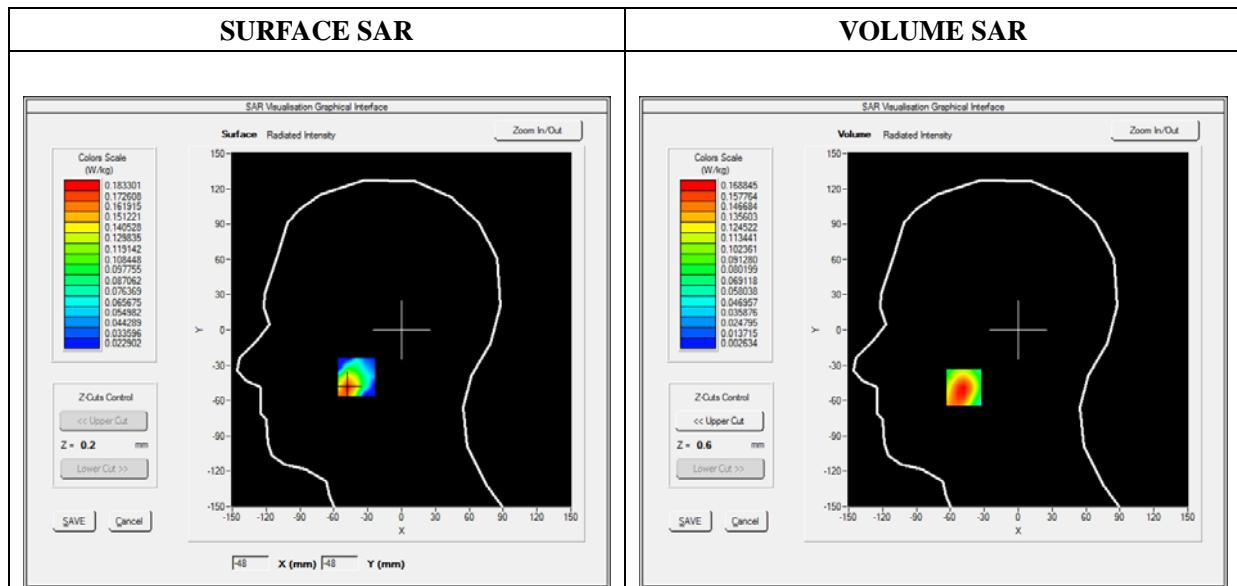
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Left head
<b>Device Position</b>	Cheek
<b>Band</b>	WCDMA1900_RMC
<b>Channels</b>	Low
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

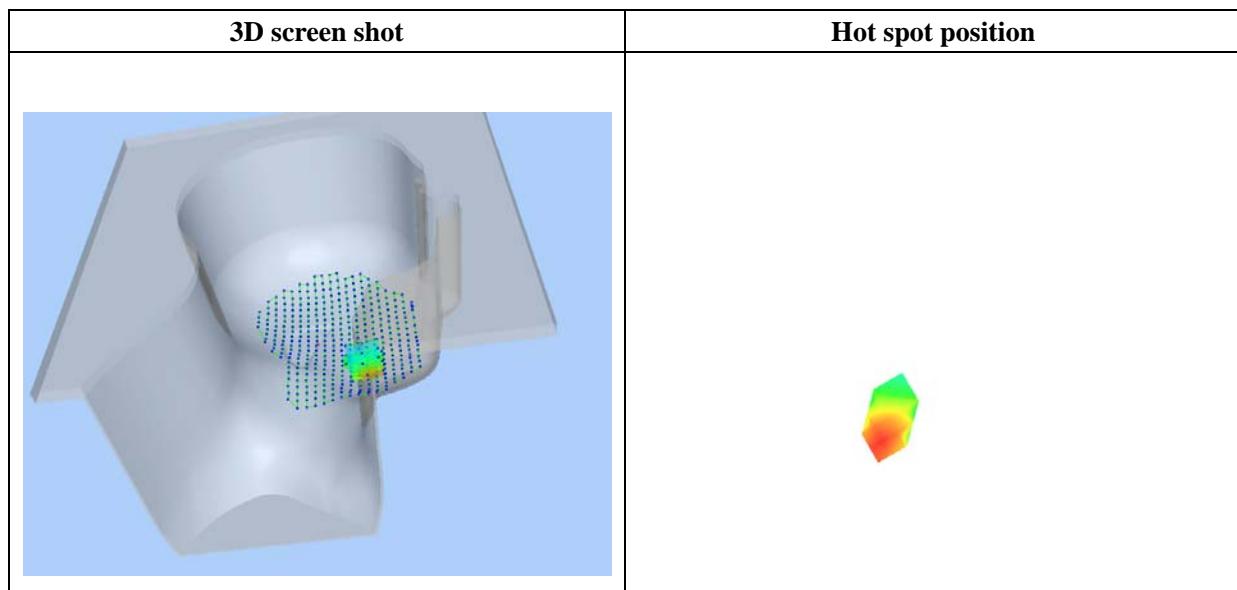
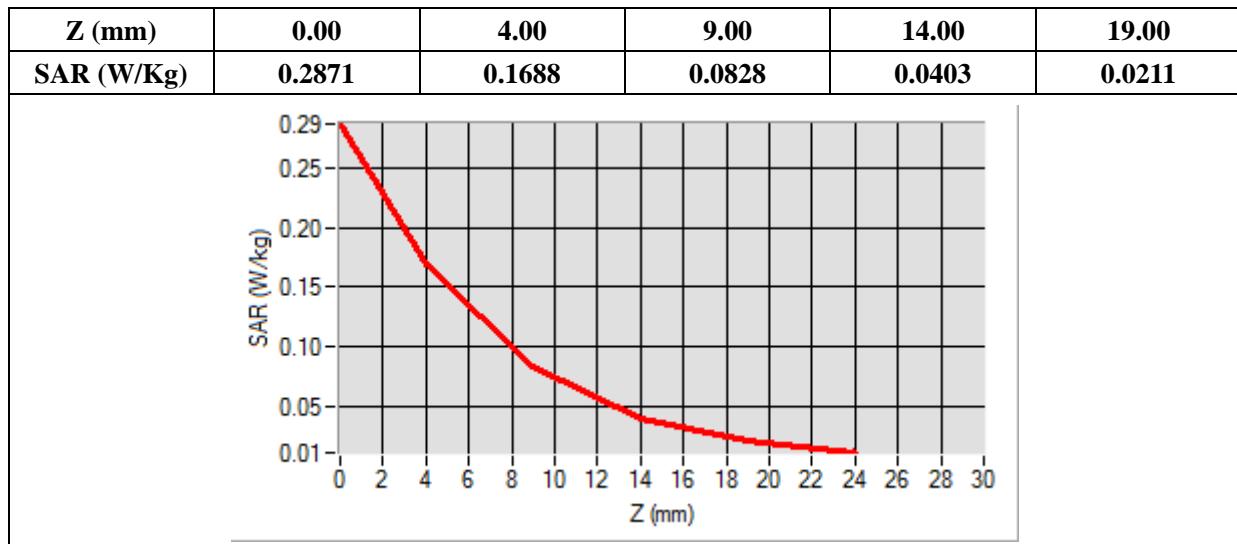
<b>Frequency (MHz)</b>	1852.400000
<b>Relative Permittivity (real part)</b>	38.560124
<b>Conductivity (S/m)</b>	1.380369
<b>Power Variation (%)</b>	1.524540
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



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

SAR Peak: 0.29 W/kg

SAR 10g (W/Kg)	0.082349
SAR 1g (W/Kg)	0.159105



# MEASUREMENT 21

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

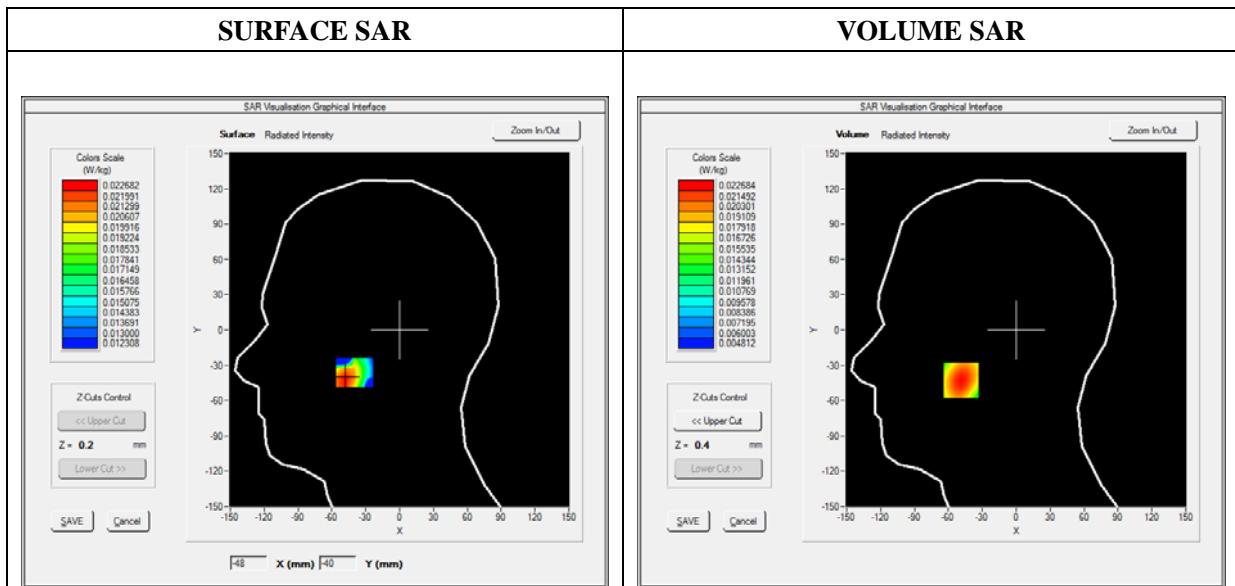
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.93; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

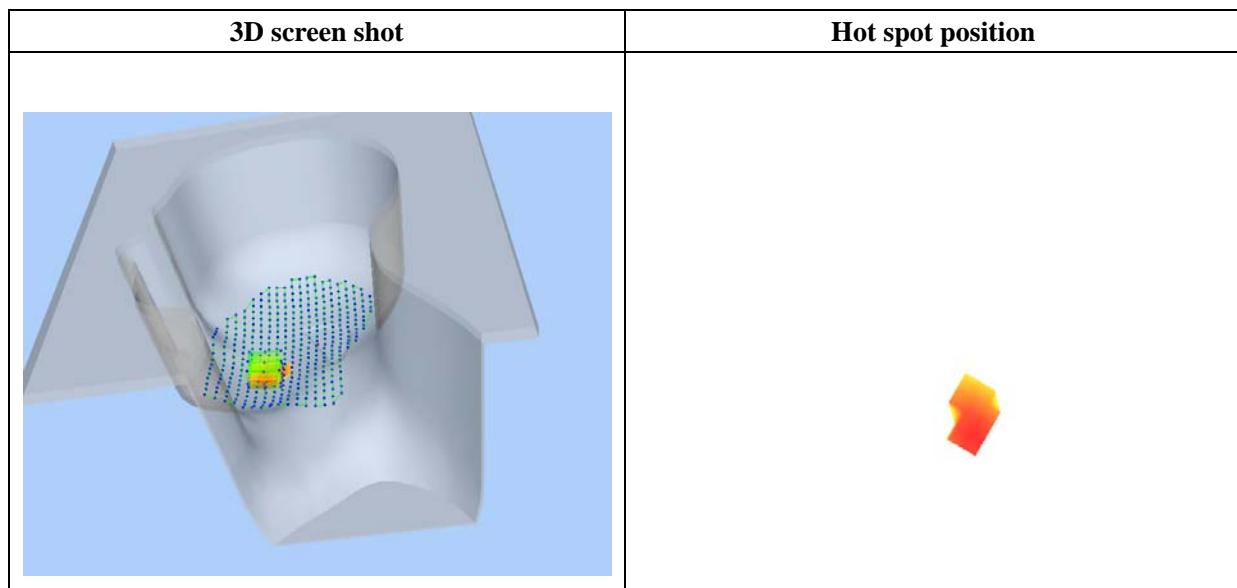
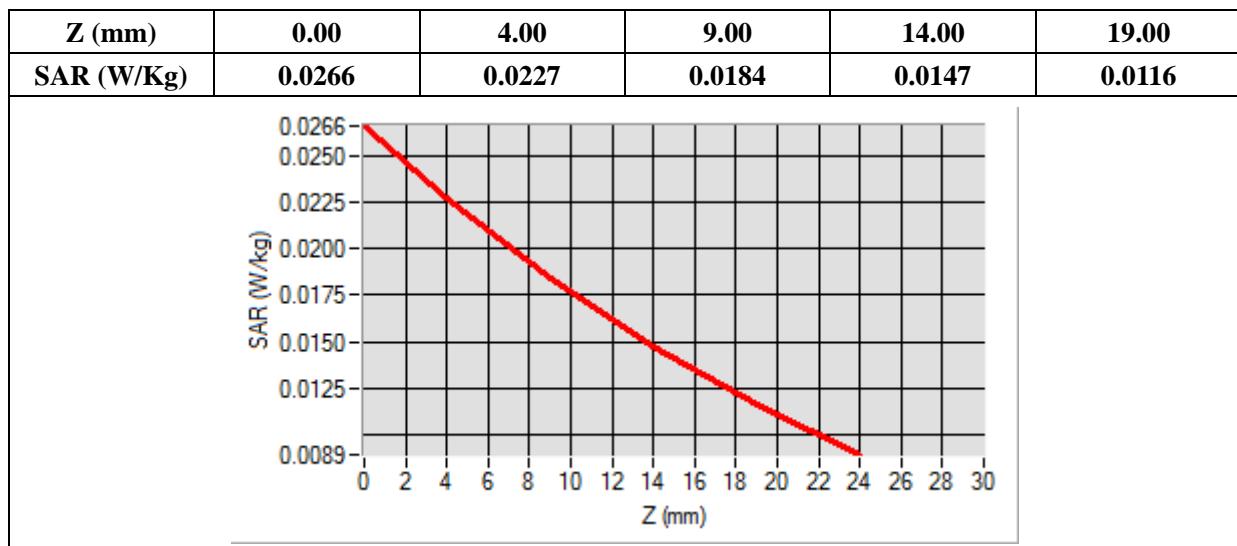
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	41.110245
<b>Conductivity (S/m)</b>	0.871245
<b>Power Variation (%)</b>	1.342427
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-49.00, Y=-43.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.016224
SAR 1g (W/Kg)	0.021679



# MEASUREMENT 27

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

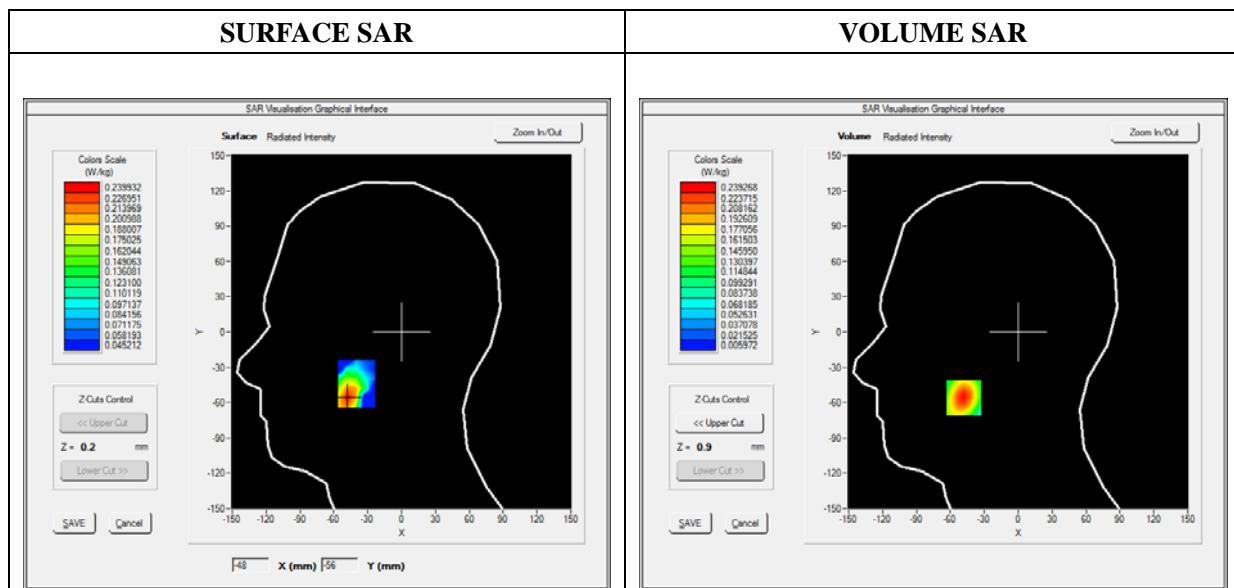
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.35; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Left head
<b>Device Position</b>	Cheek
<b>Band</b>	LTE Band 2_RMC
<b>Channels</b>	QPSK, 20MHz, 1RB, Low
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

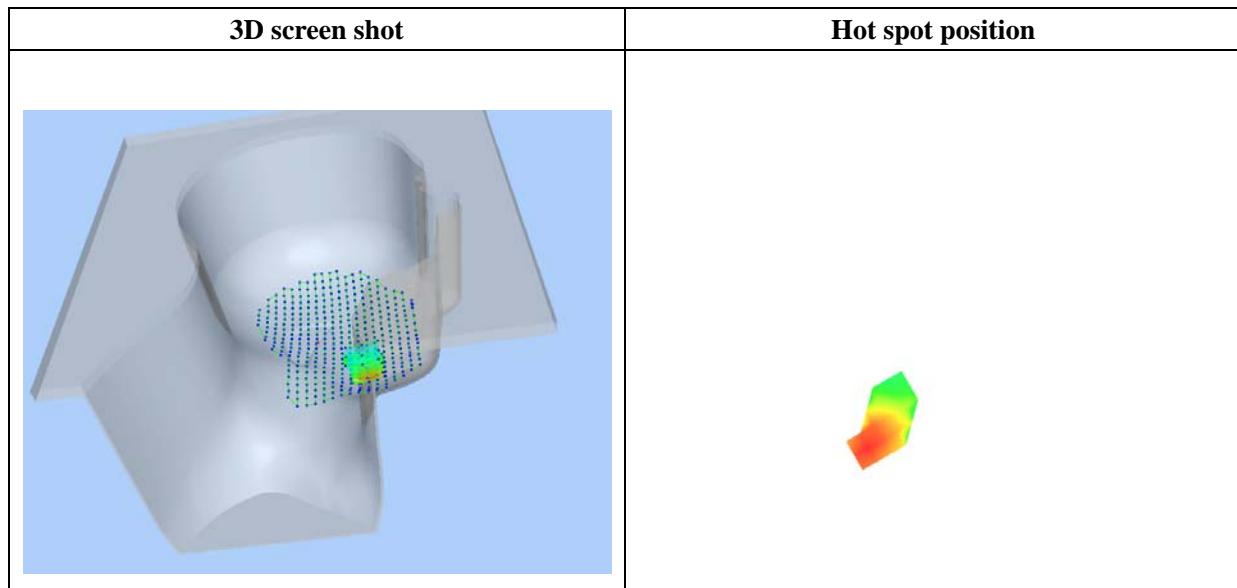
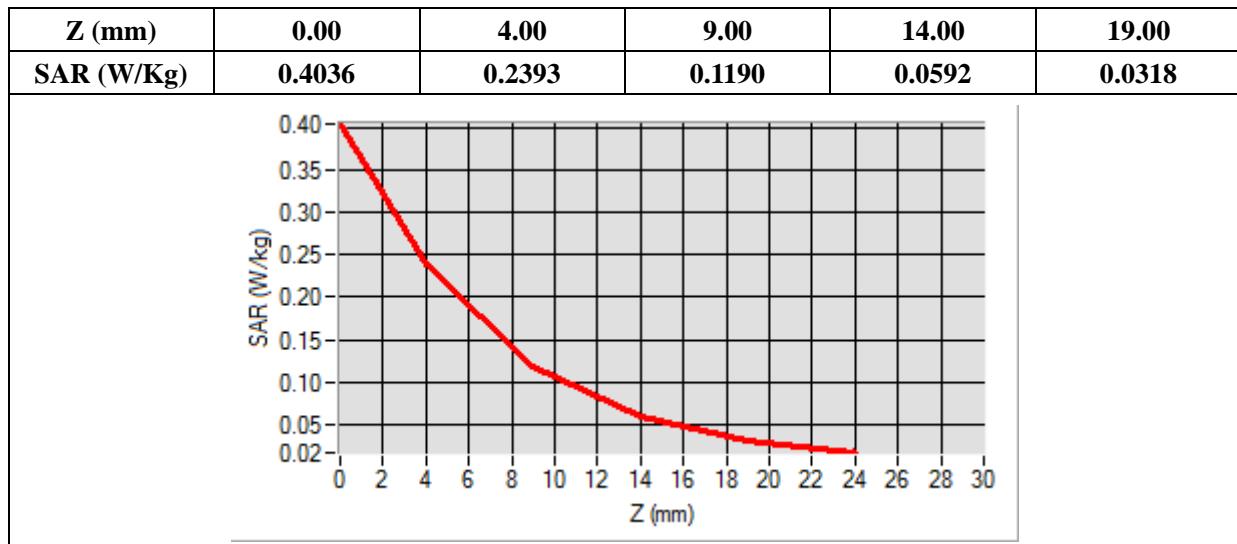
<b>Frequency (MHz)</b>	1860.000000
<b>Relative Permittivity (real part)</b>	38.560124
<b>Conductivity (S/m)</b>	1.380369
<b>Power Variation (%)</b>	1.743564
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-48.00, Y=-56.00

SAR Peak: 0.40 W/kg

SAR 10g (W/Kg)	0.114413
SAR 1g (W/Kg)	0.222011



# MEASUREMENT 35

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

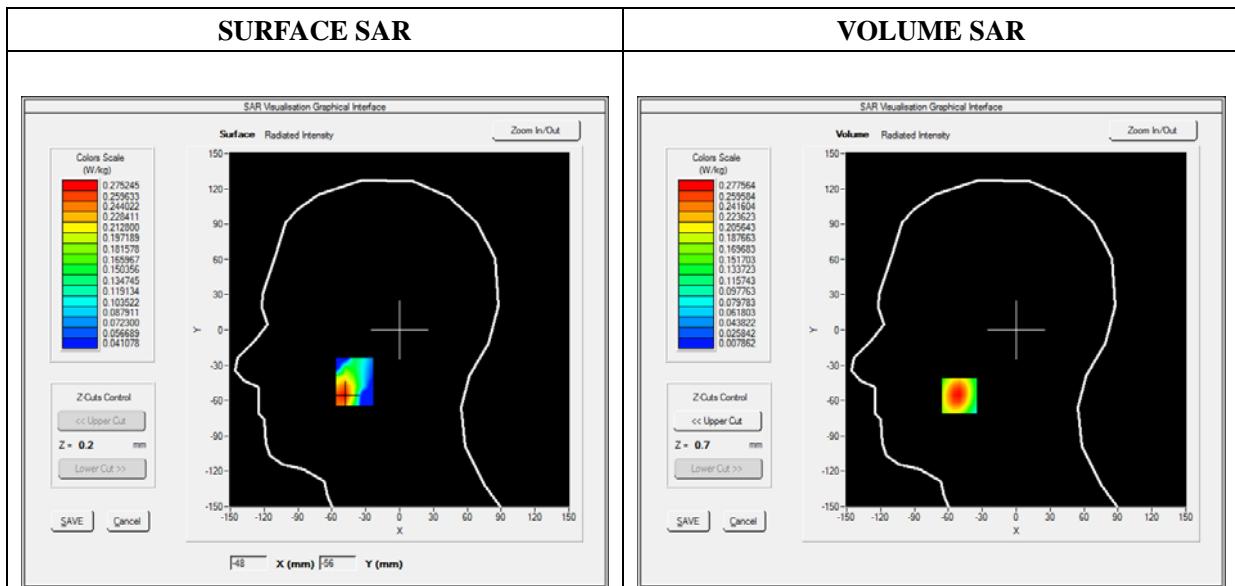
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.84; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

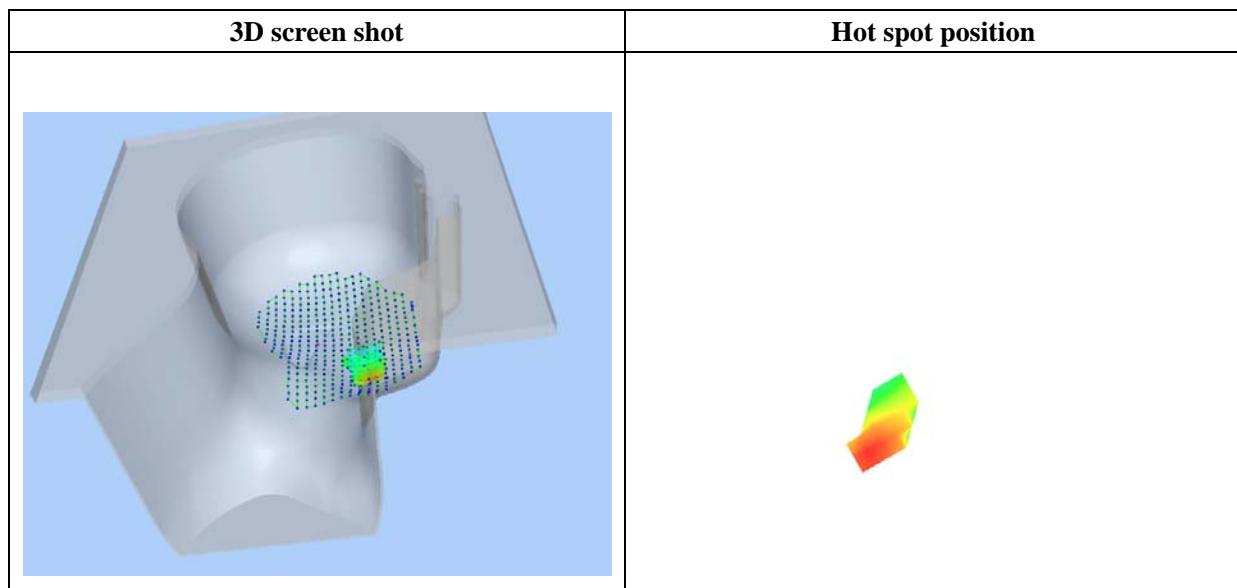
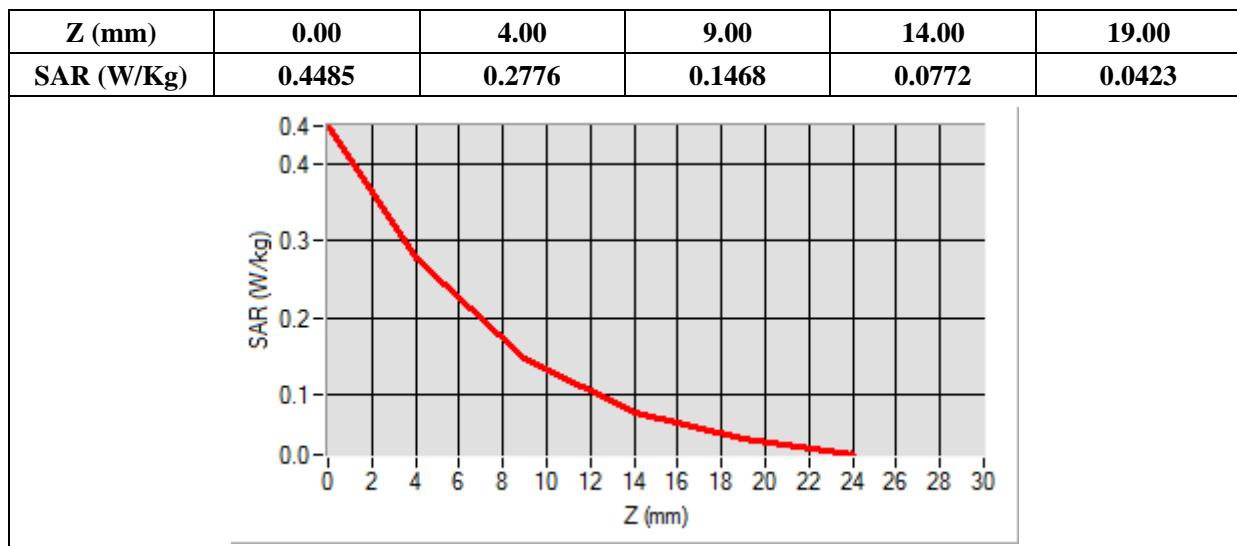
<b>Frequency (MHz)</b>	1720.000000
<b>Relative Permittivity (real part)</b>	39.024890
<b>Conductivity (S/m)</b>	1.371250
<b>Power Variation (%)</b>	1.374628
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-50.00, Y=-56.00

SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.138097
SAR 1g (W/Kg)	0.259292



# MEASUREMENT 43

Type: Phone measurement (Complete)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 3 seconds

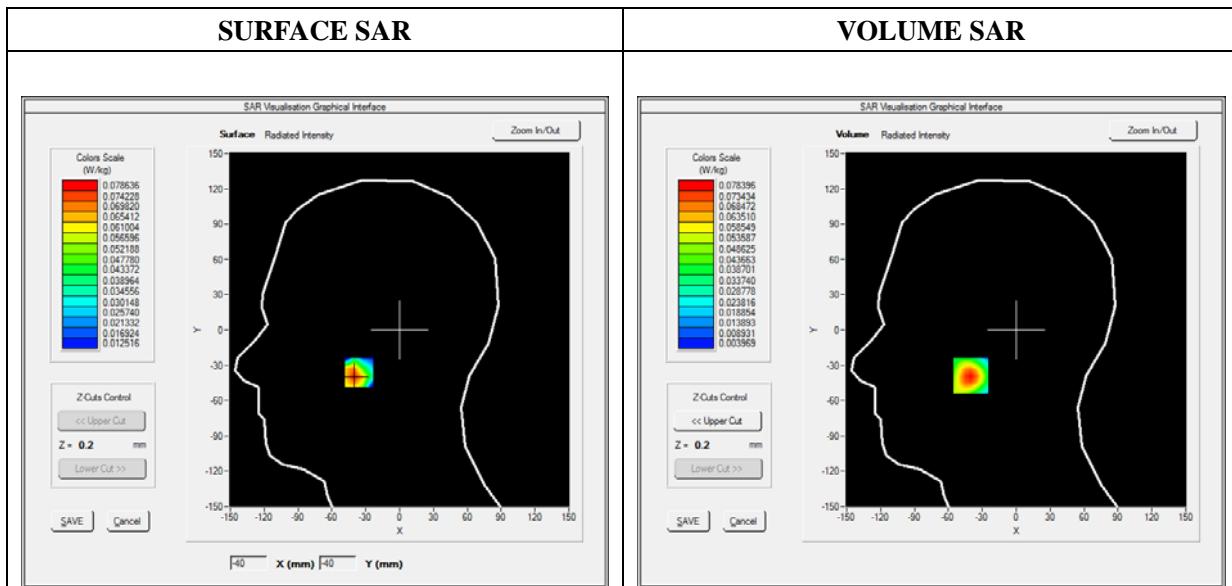
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.37; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

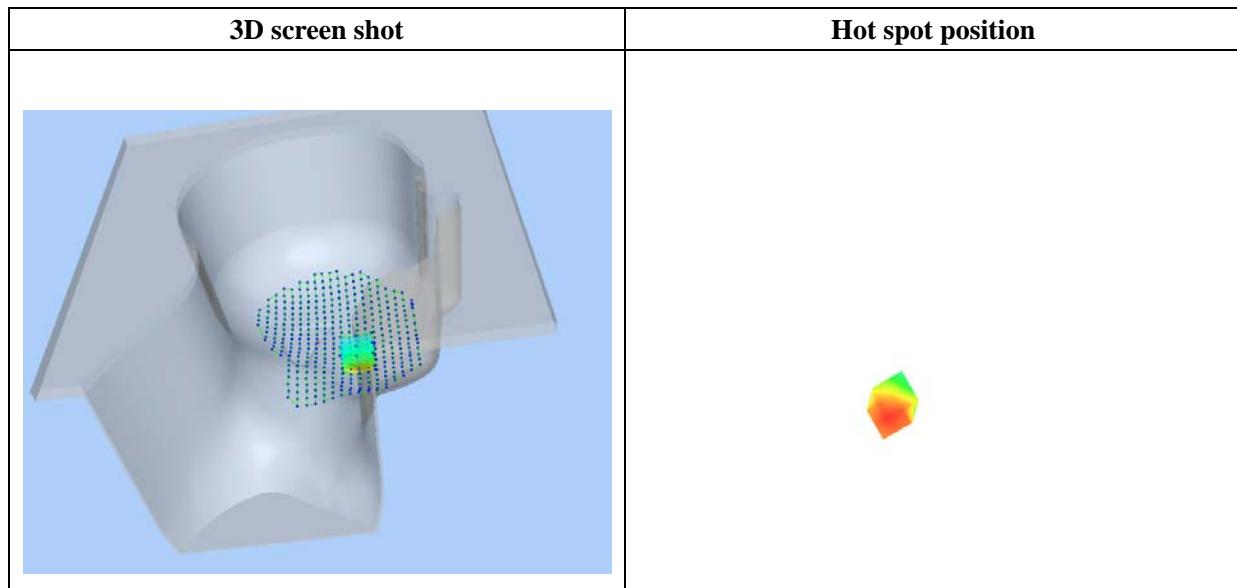
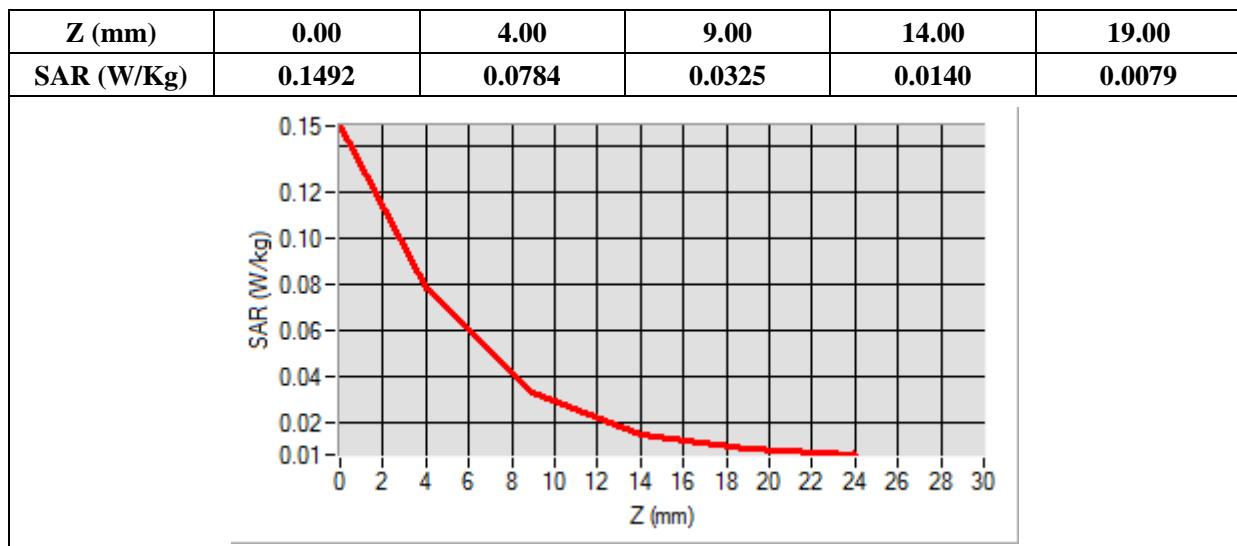
<b>Frequency (MHz)</b>	2510.000000
<b>Relative Permittivity (real part)</b>	38.631092
<b>Conductivity (S/m)</b>	1.930182
<b>Power Variation (%)</b>	0.924535
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-40.00, Y=-39.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.034671
SAR 1g (W/Kg)	0.072805



# MEASUREMENT 51

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

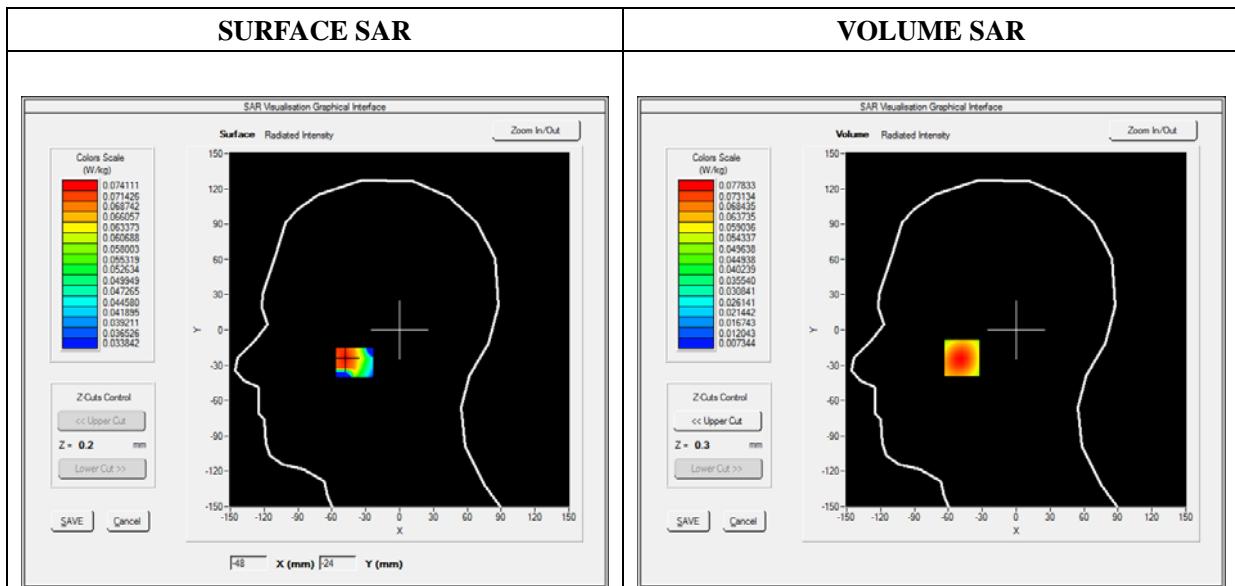
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Left head
<b>Device Position</b>	Cheek
<b>Band</b>	LTE Band 13_RMC
<b>Channels</b>	QPSK, 10MHz, 1RB, Middle
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

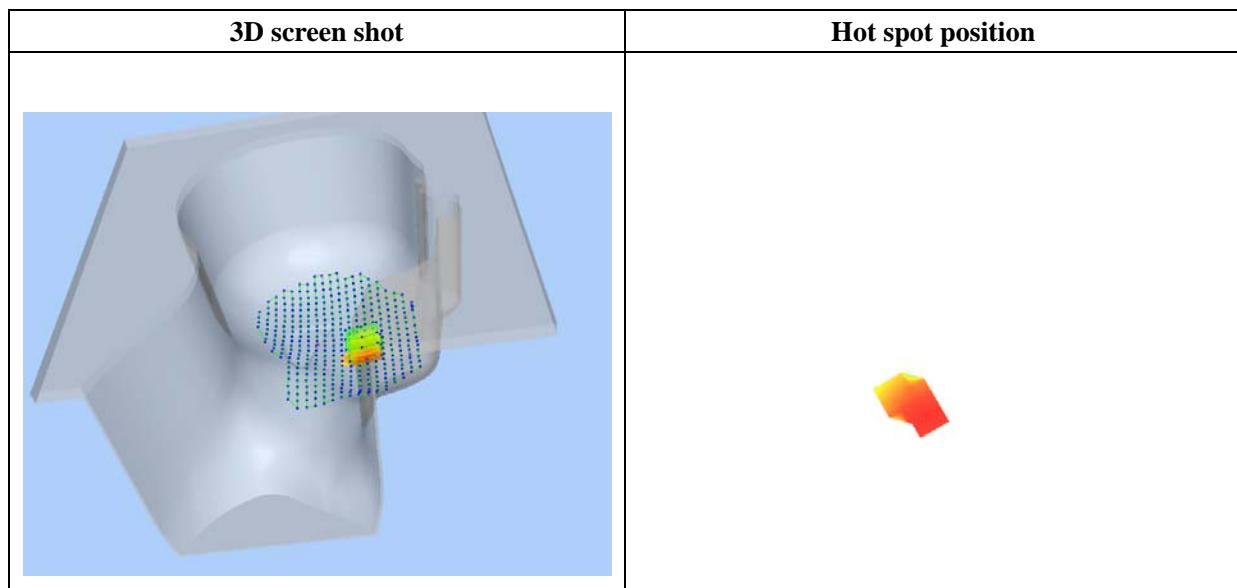
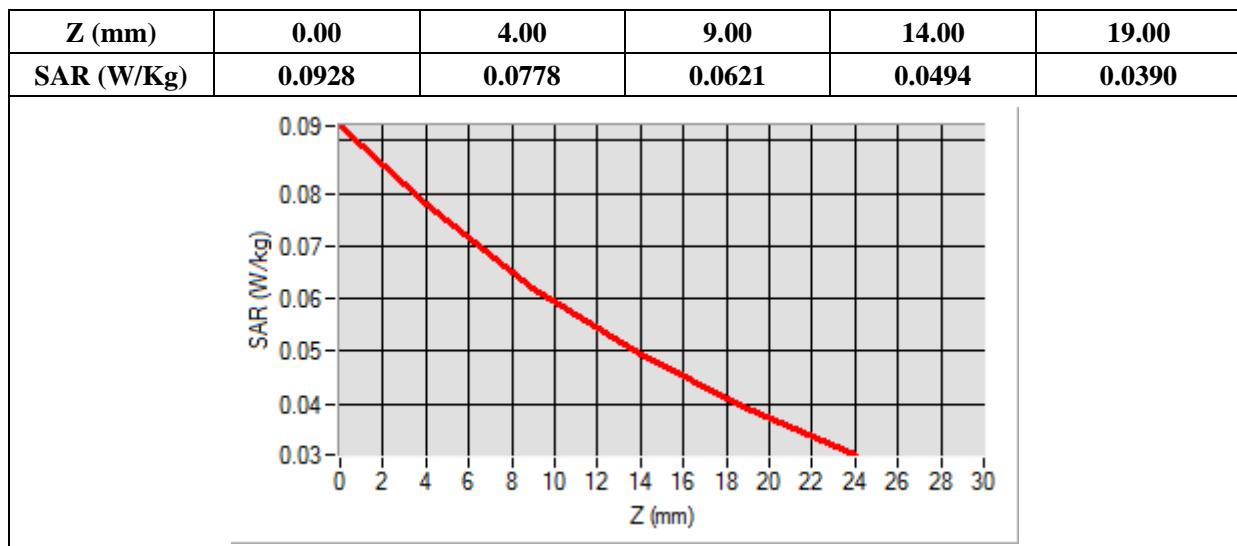
<b>Frequency (MHz)</b>	782.000000
<b>Relative Permittivity (real part)</b>	41.320574
<b>Conductivity (S/m)</b>	0.862373
<b>Power Variation (%)</b>	0.924535
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-48.00, Y=-24.00

SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.056106
SAR 1g (W/Kg)	0.075787



# MEASUREMENT 57

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

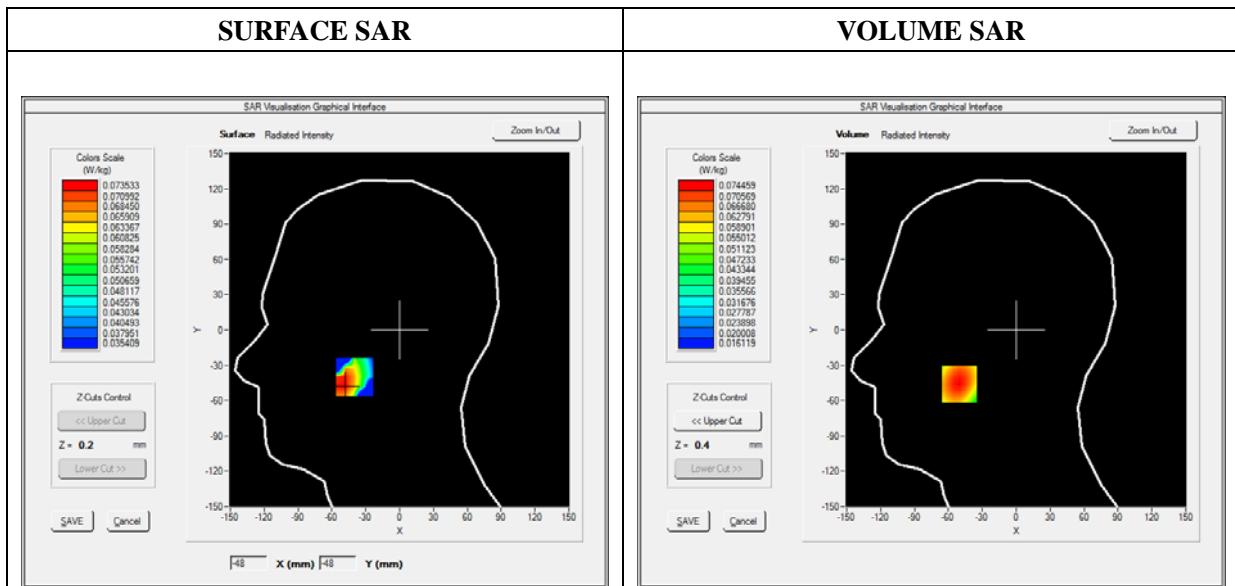
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.99; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

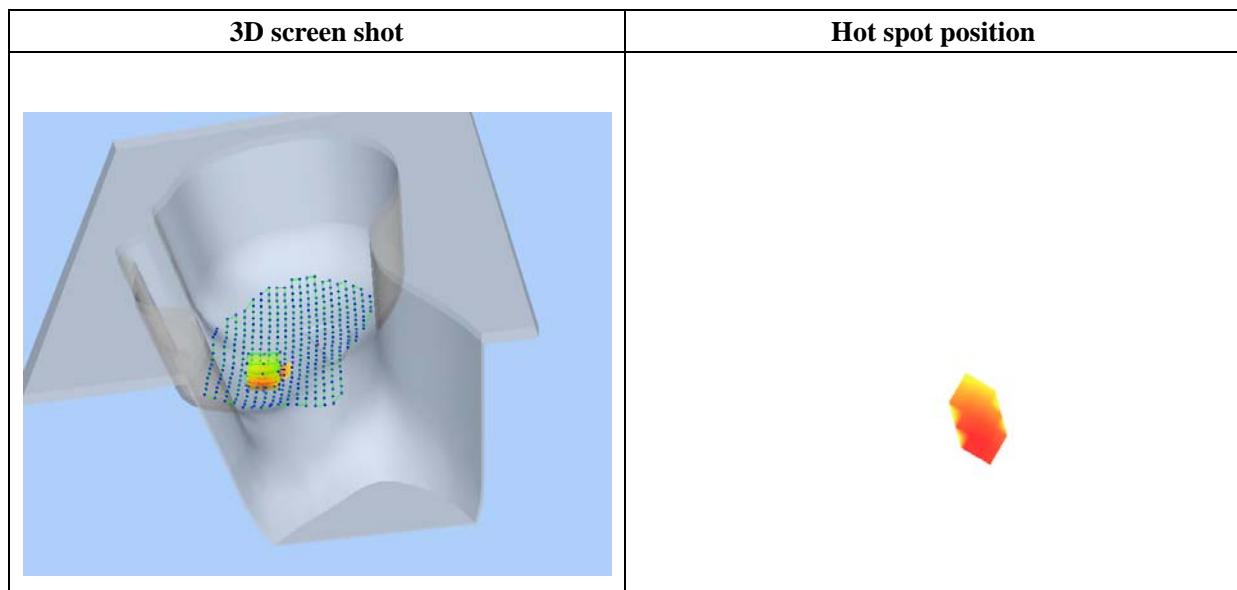
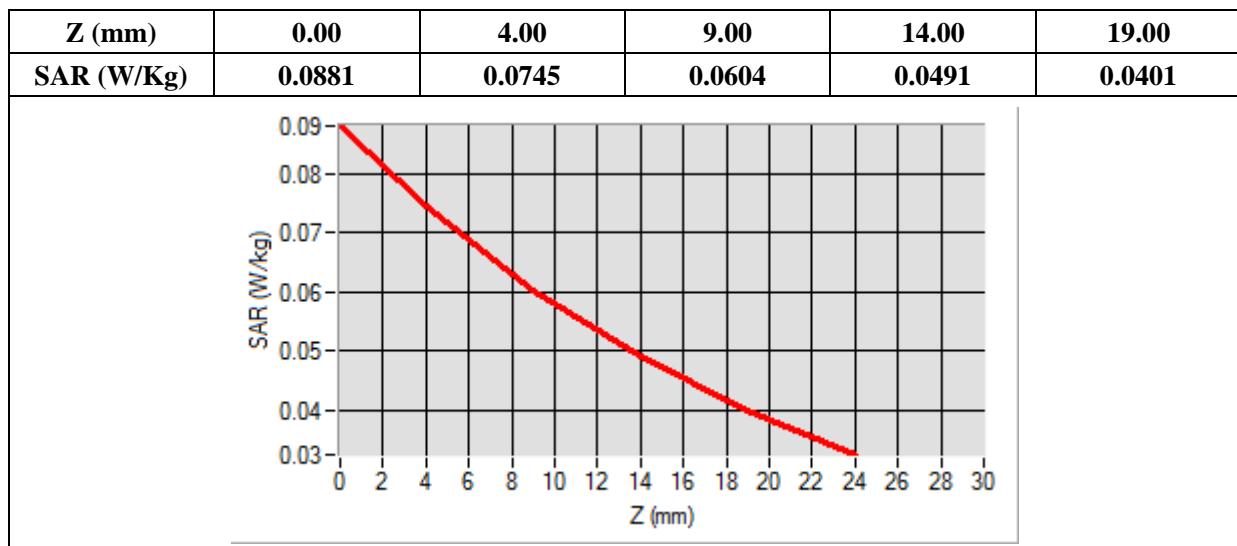
<b>Frequency (MHz)</b>	709.000000
<b>Relative Permittivity (real part)</b>	41.320574
<b>Conductivity (S/m)</b>	0.862373
<b>Power Variation (%)</b>	0.924535
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-50.00, Y=-46.00

SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.055645
SAR 1g (W/Kg)	0.073005



# MEASUREMENT 67

Type: Phone measurement (Complete)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 3 seconds

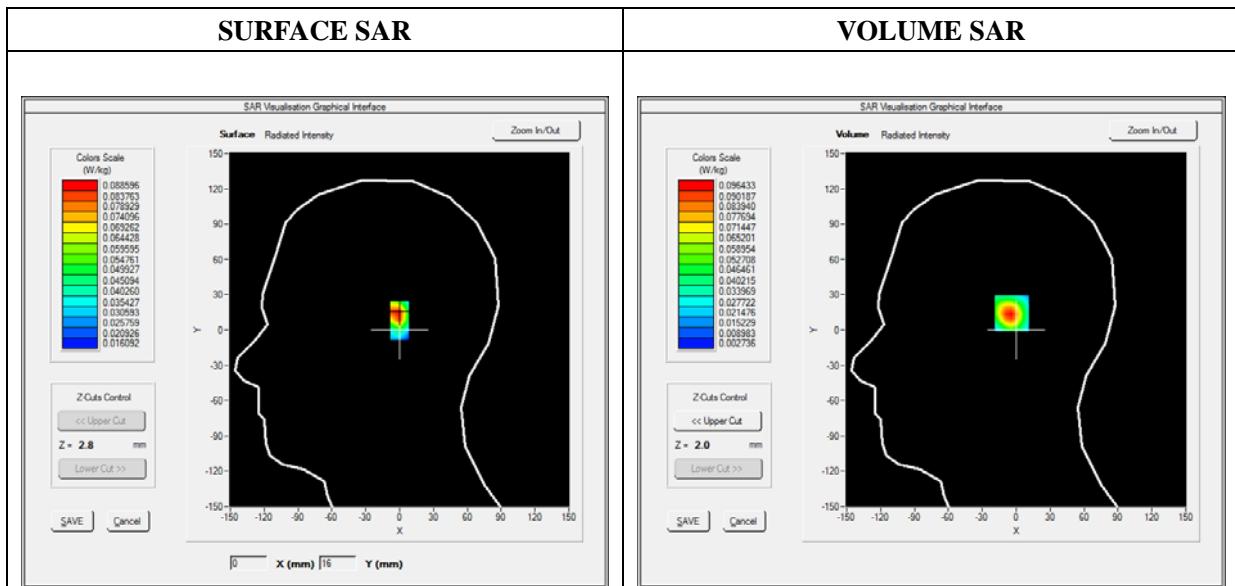
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.64; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

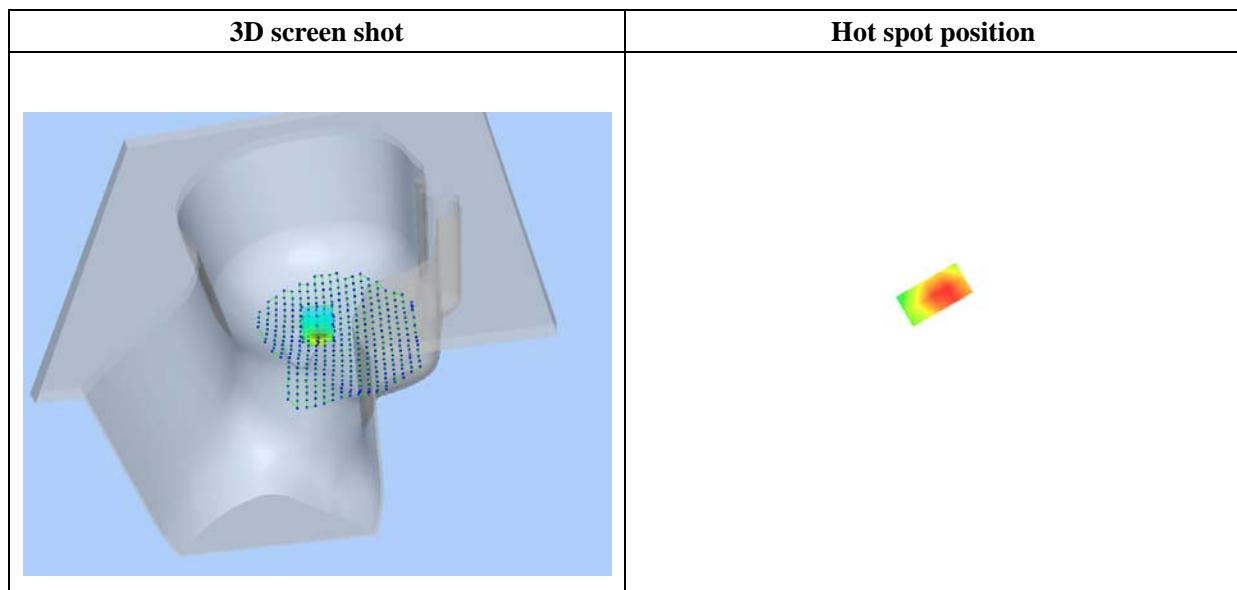
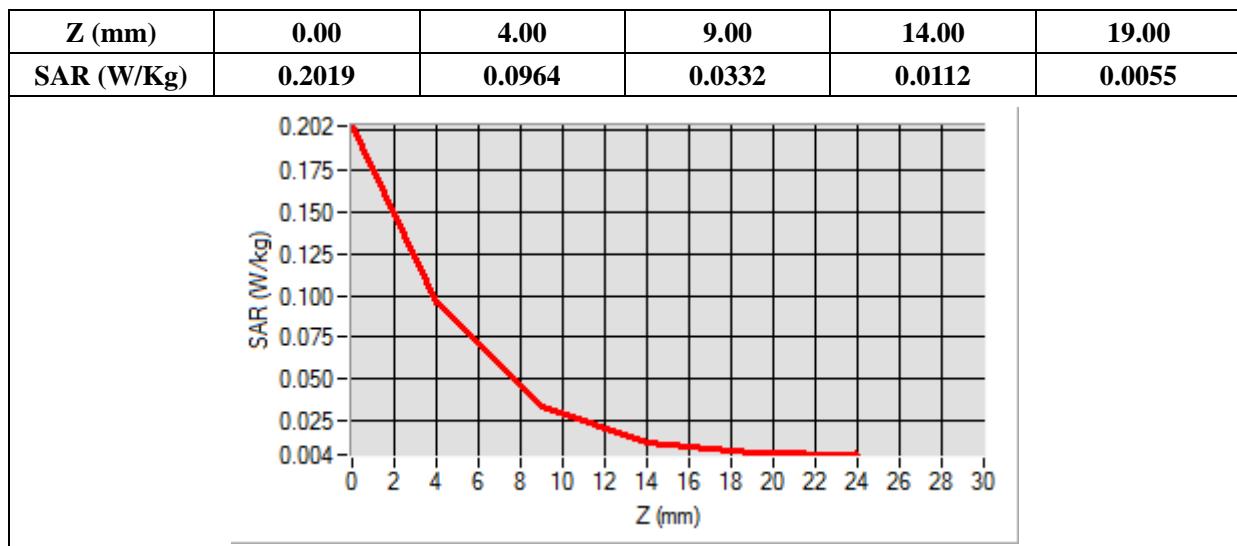
<b>Frequency (MHz)</b>	2412.000000
<b>Relative Permittivity (real part)</b>	38.153660
<b>Conductivity (S/m)</b>	1.740236
<b>Power Variation (%)</b>	3.234772
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



**Maximum location: X=-2.00, Y=14.00**

**SAR Peak: 0.20 W/kg**

<b>SAR 10g (W/Kg)</b>	<b>0.038288</b>
<b>SAR 1g (W/Kg)</b>	<b>0.089752</b>



# MEASUREMENT 70

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

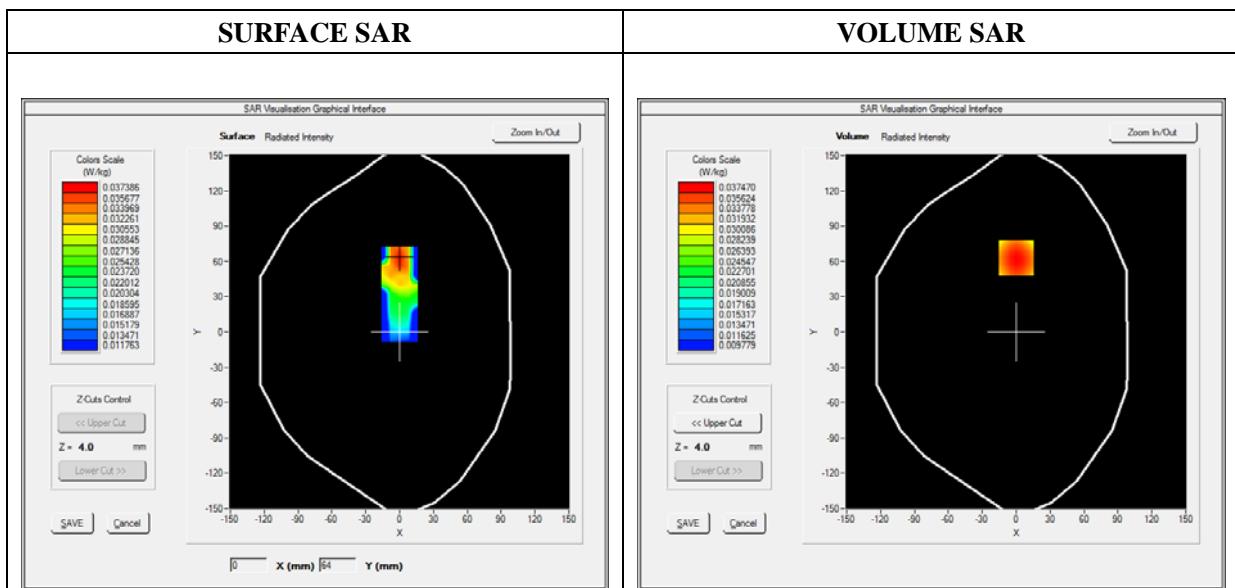
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat Plane
<b>Device Position</b>	Front(Body-worn)
<b>Band</b>	GSM850
<b>Channels</b>	Middle
<b>Signal</b>	TDMA (Crest factor: 8.0)

## B. SAR Measurement Results

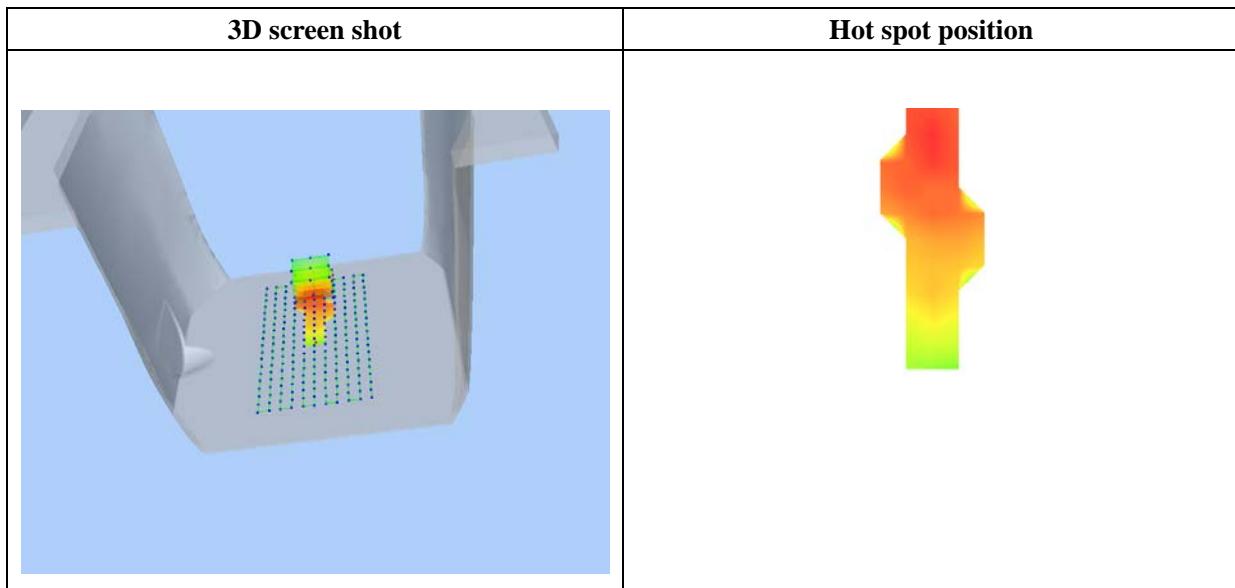
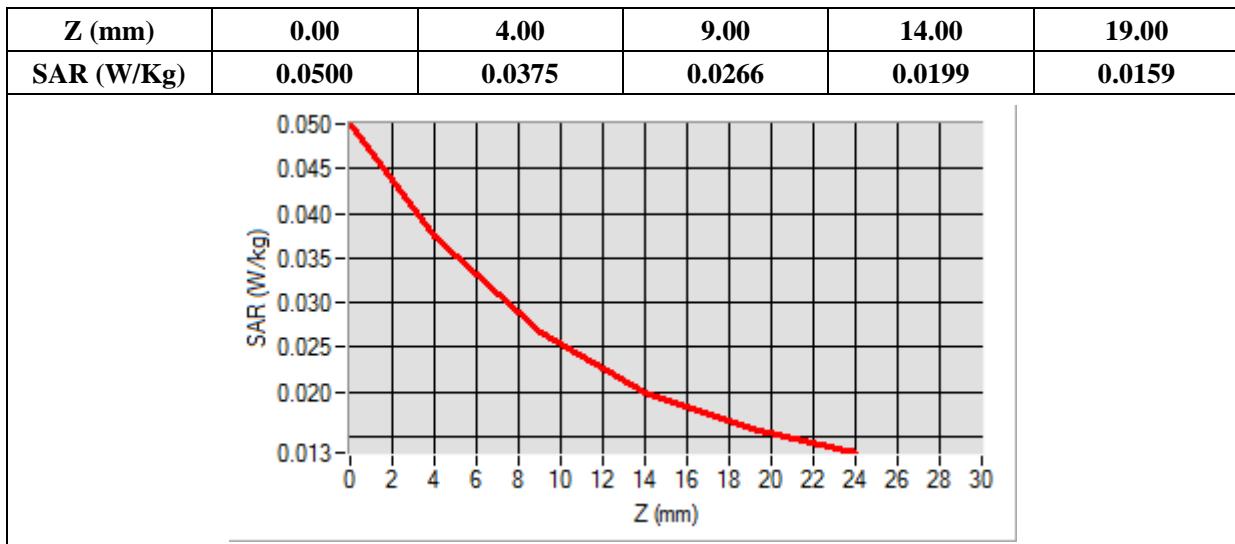
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	54.851214
<b>Conductivity (S/m)</b>	0.951454
<b>Power Variation (%)</b>	0.901472
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=0.00, Y=63.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.026111
SAR 1g (W/Kg)	0.036092



# MEASUREMENT 71

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

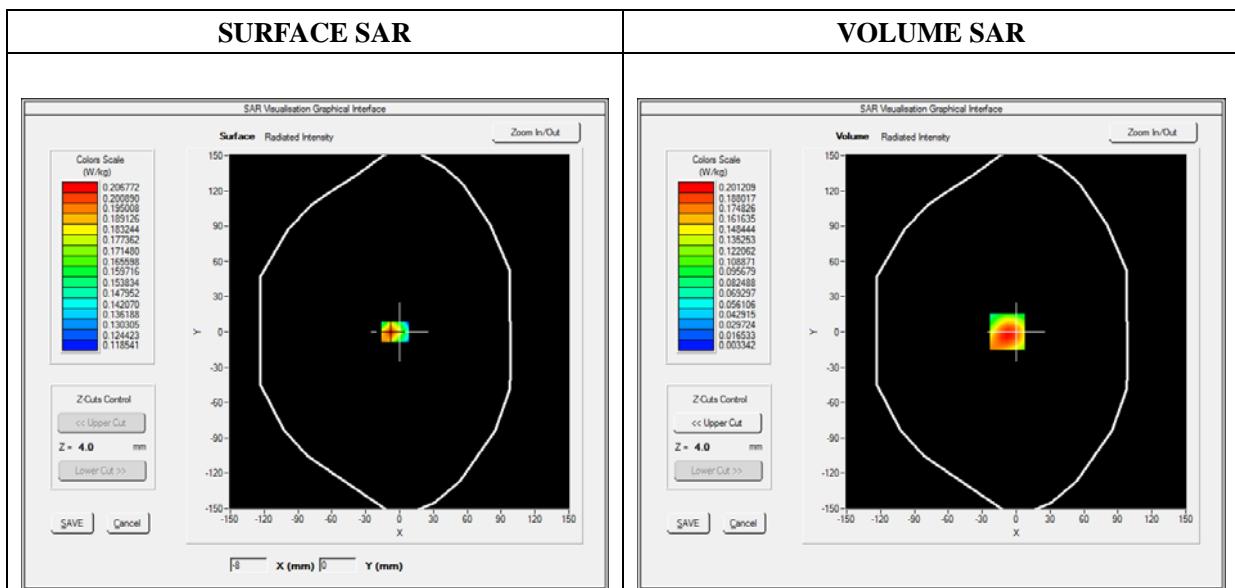
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

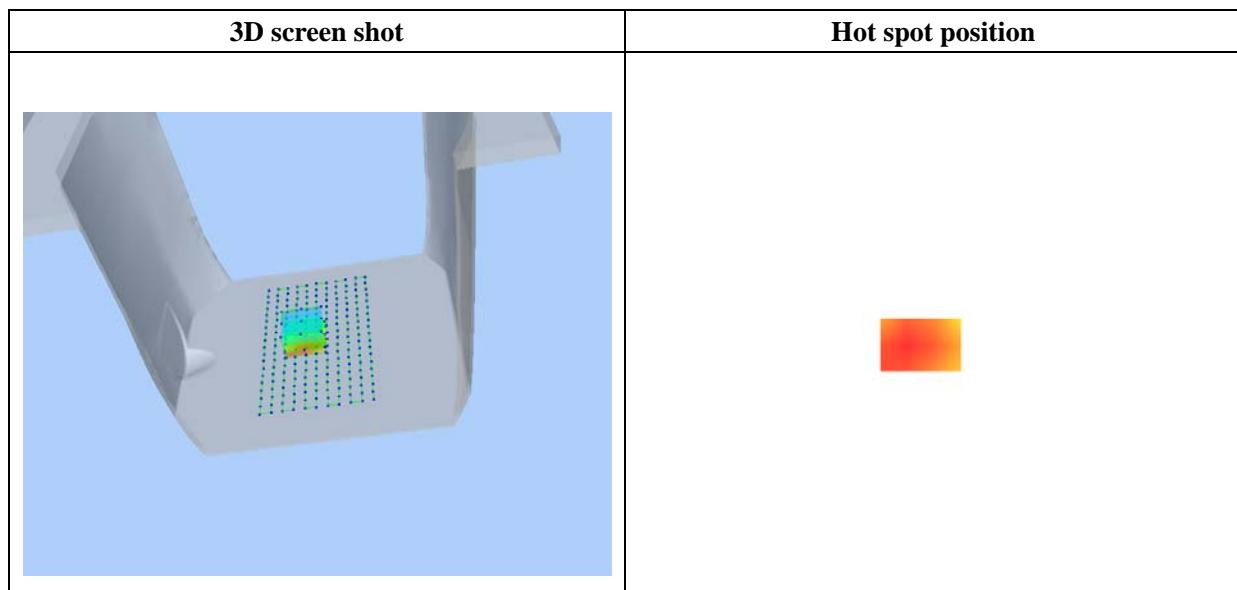
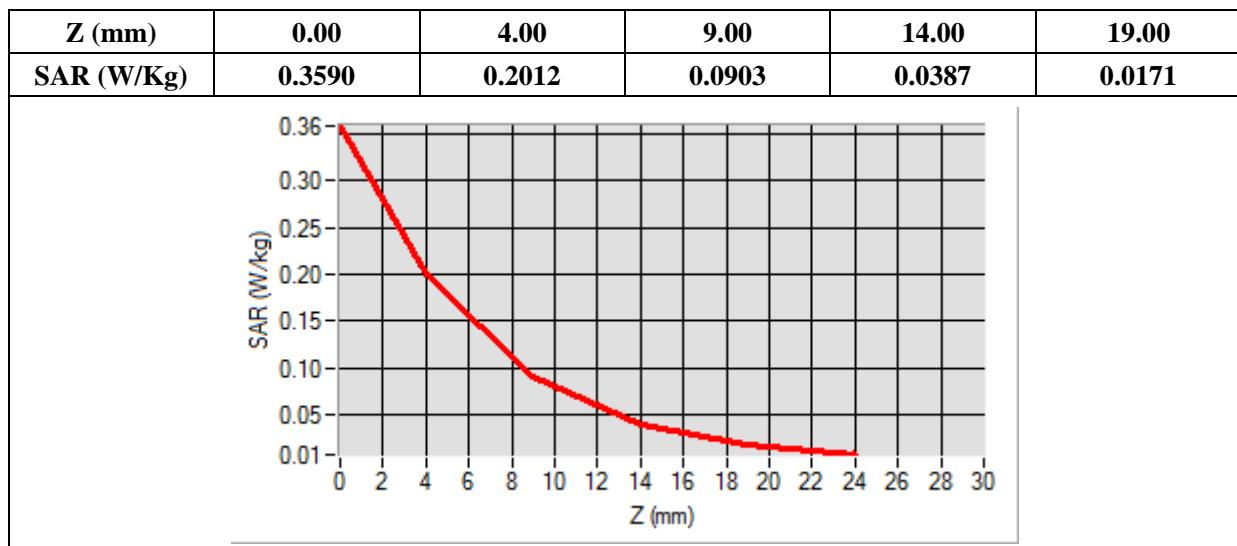
<b>Frequency (MHz)</b>	1909.800000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.474622
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-8.00, Y=0.00

SAR Peak: 0.36 W/kg

SAR 10g (W/Kg)	0.095392
SAR 1g (W/Kg)	0.190743



# MEASUREMENT 74

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

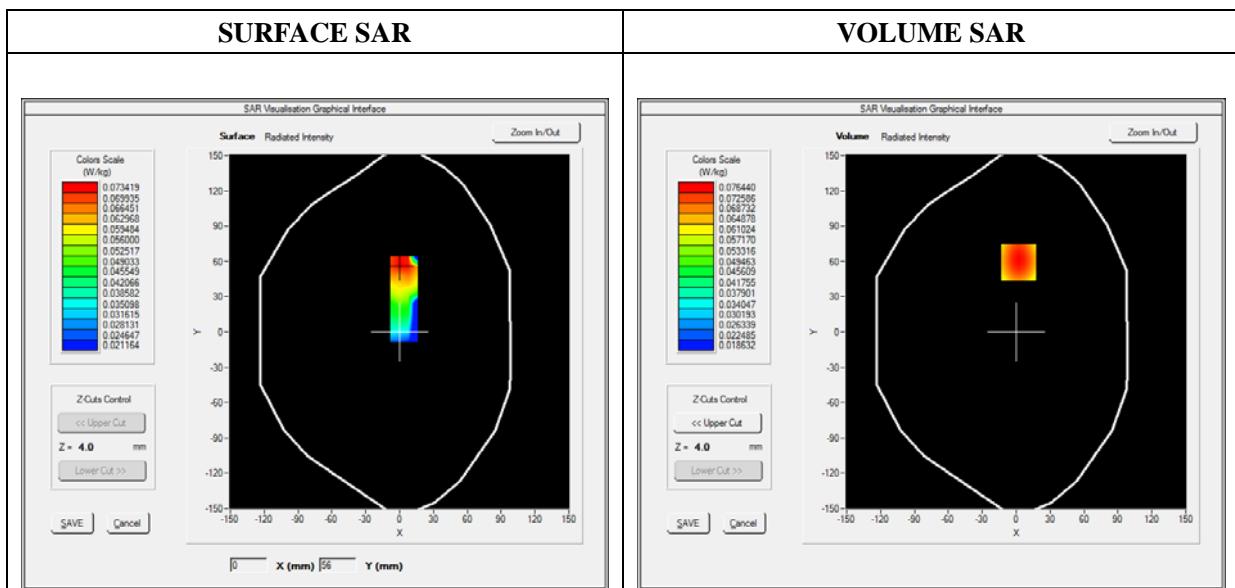
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat plane
<b>Device Position</b>	Front
<b>Band</b>	GPRS850_4TX
<b>Channels</b>	Middle
<b>Signal</b>	Duty Cycle: 1:2

## B. SAR Measurement Results

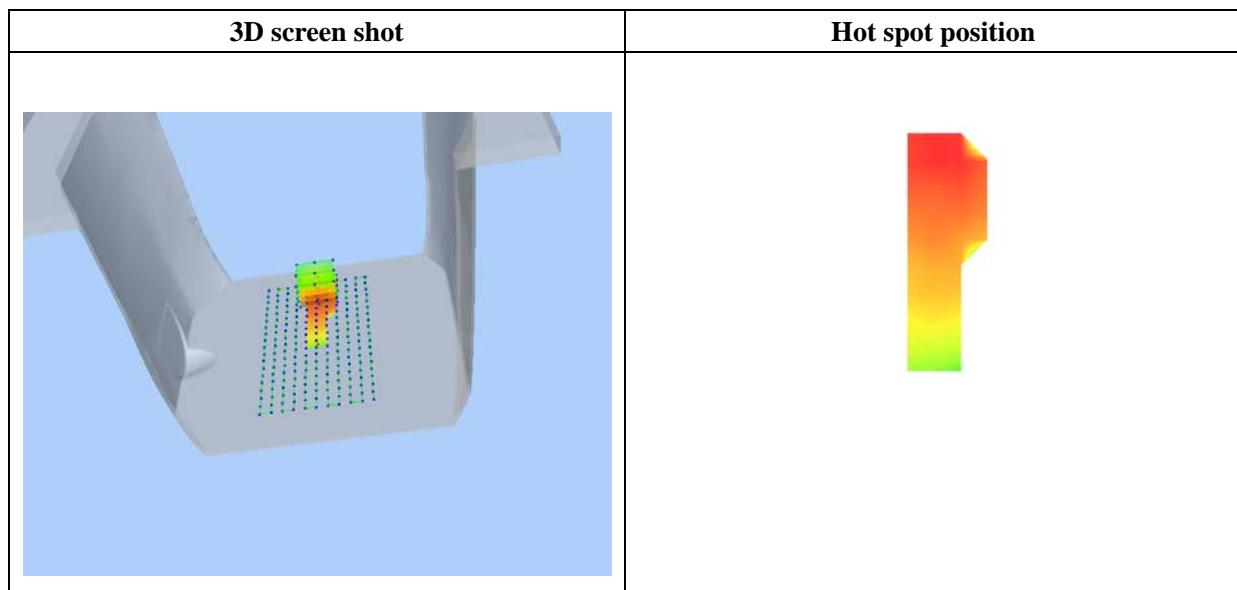
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	54.851214
<b>Conductivity (S/m)</b>	0.951454
<b>Power Variation (%)</b>	0.901472
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=2.00, Y=59.00

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.052512
SAR 1g (W/Kg)	0.073485



# MEASUREMENT 77

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

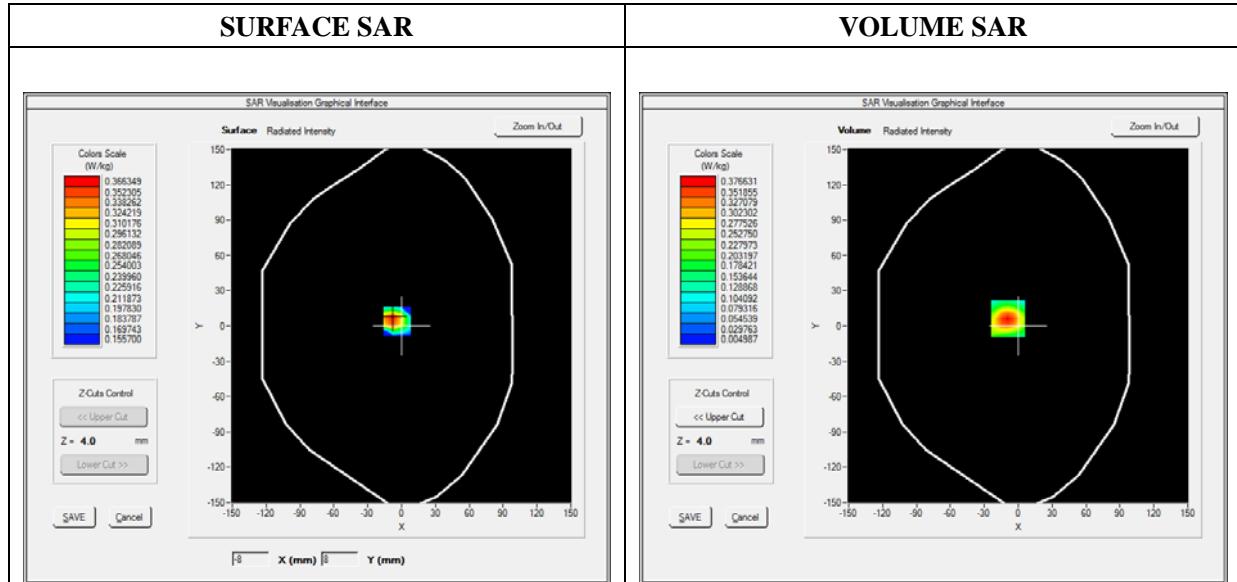
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

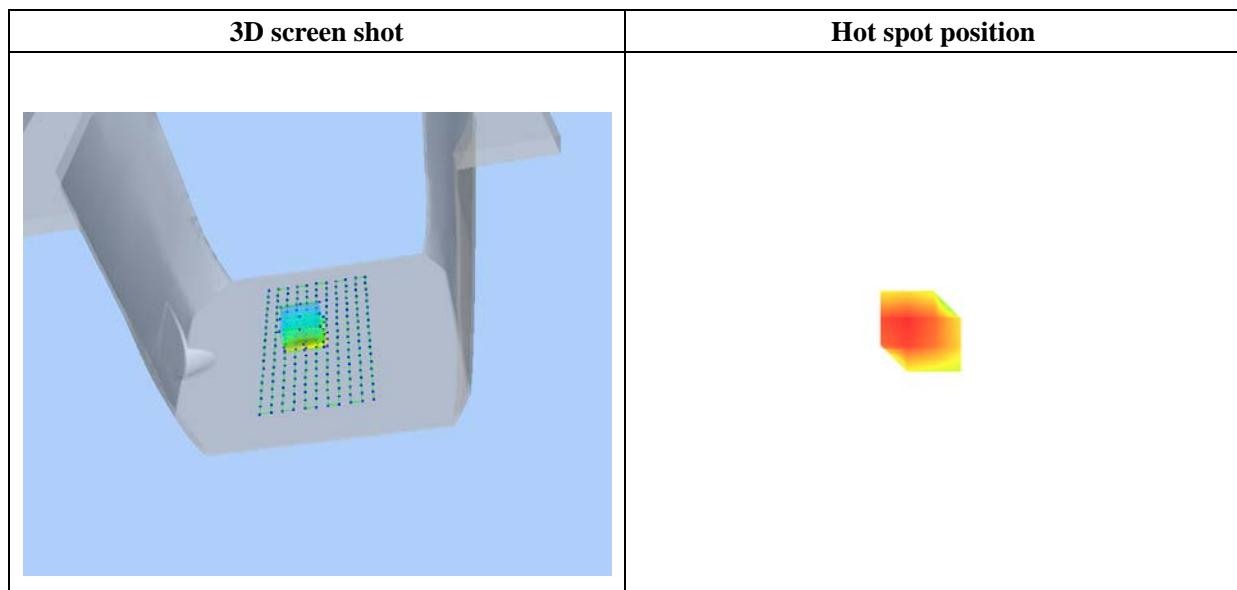
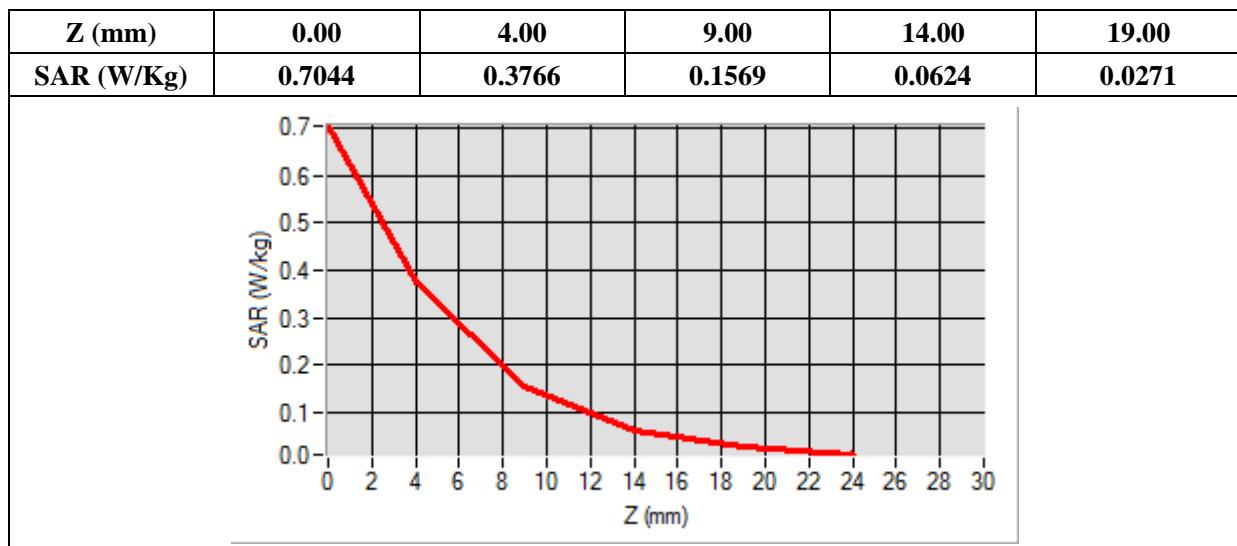
<b>Frequency (MHz)</b>	1909.800000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	2.483762
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-9.00, Y=6.00

SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.160401
SAR 1g (W/Kg)	0.345342



# MEASUREMENT 81

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

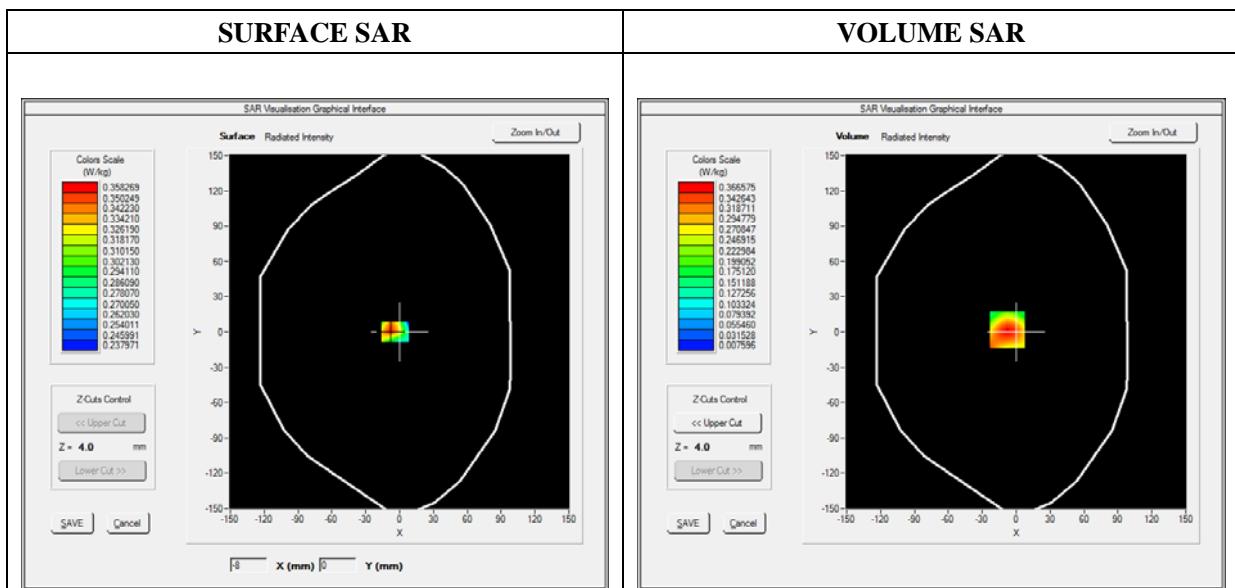
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

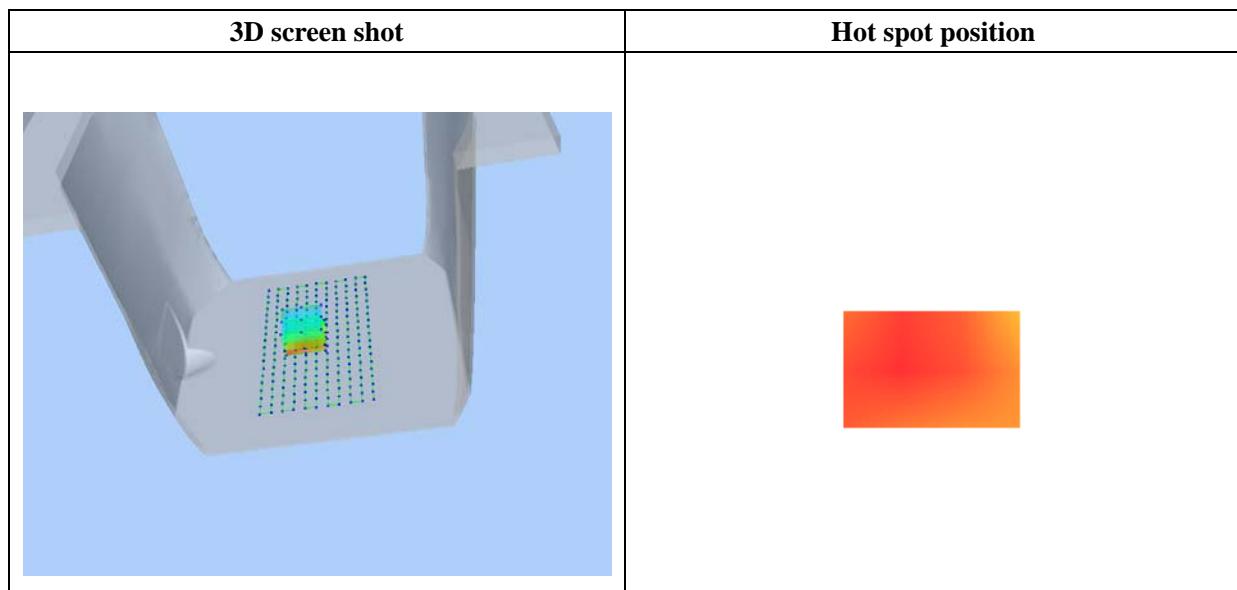
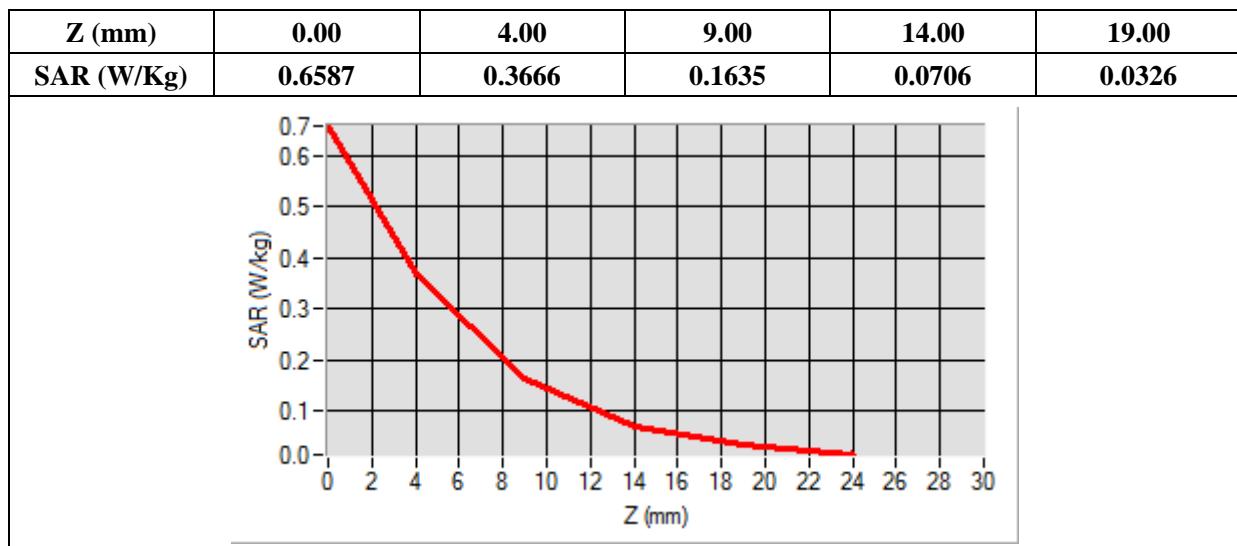
<b>Frequency (MHz)</b>	1852.400000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.163283
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



**Maximum location: X=-8.00, Y=2.00**

**SAR Peak: 0.66 W/kg**

<b>SAR 10g (W/Kg)</b>	<b>0.174424</b>
<b>SAR 1g (W/Kg)</b>	<b>0.345172</b>



# MEASUREMENT 83

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

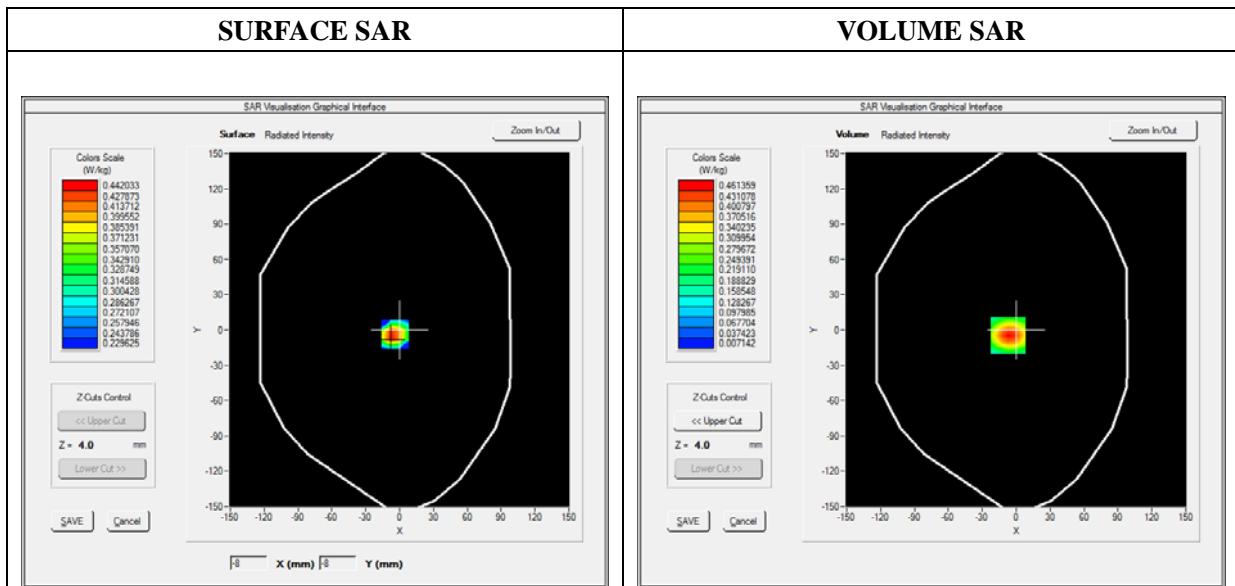
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat Plane
<b>Device Position</b>	Bottom
<b>Band</b>	WCDMA1900_RMC
<b>Channels</b>	Low
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

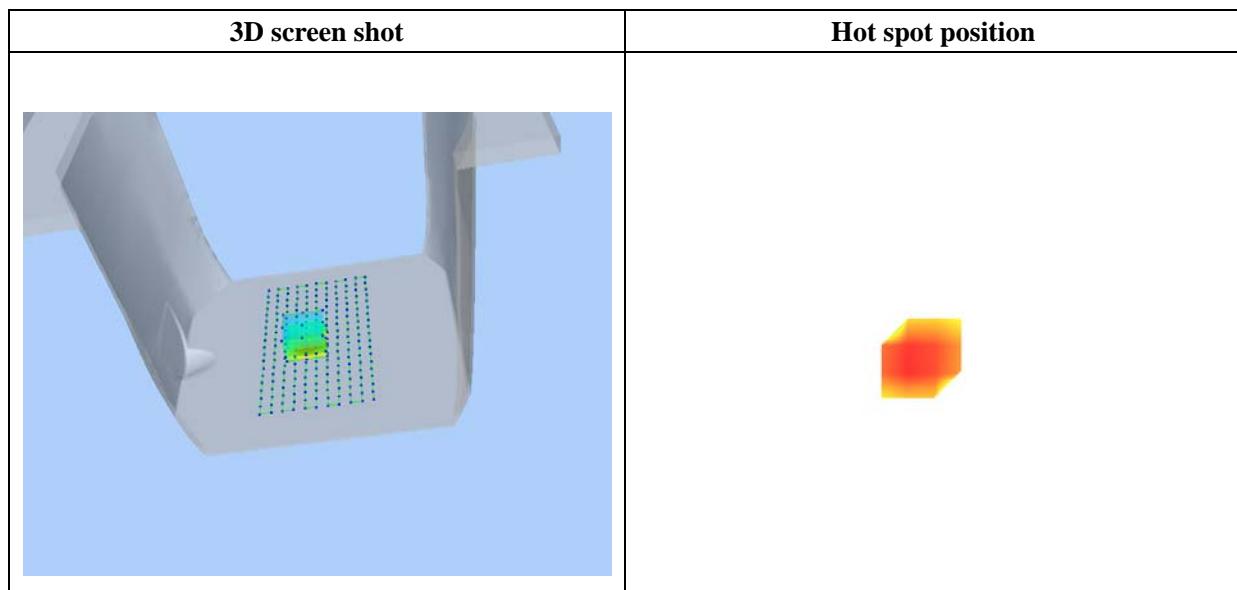
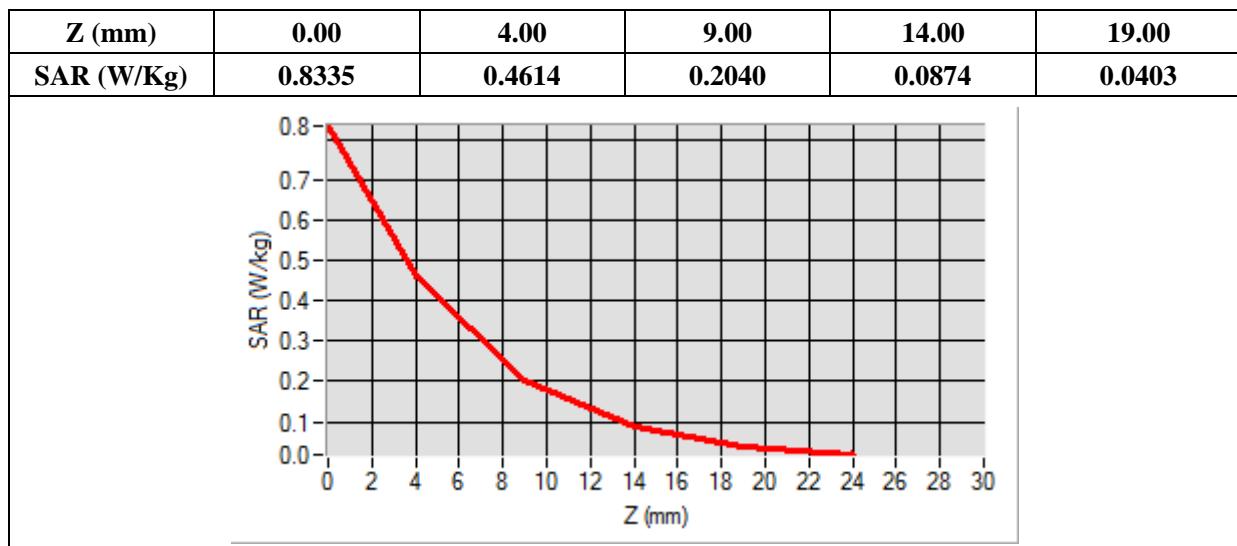
<b>Frequency (MHz)</b>	1852.400000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.847552
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-7.00, Y=-5.00

SAR Peak: 0.83 W/kg

SAR 10g (W/Kg)	0.204445
SAR 1g (W/Kg)	0.427468



# MEASUREMENT 85

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

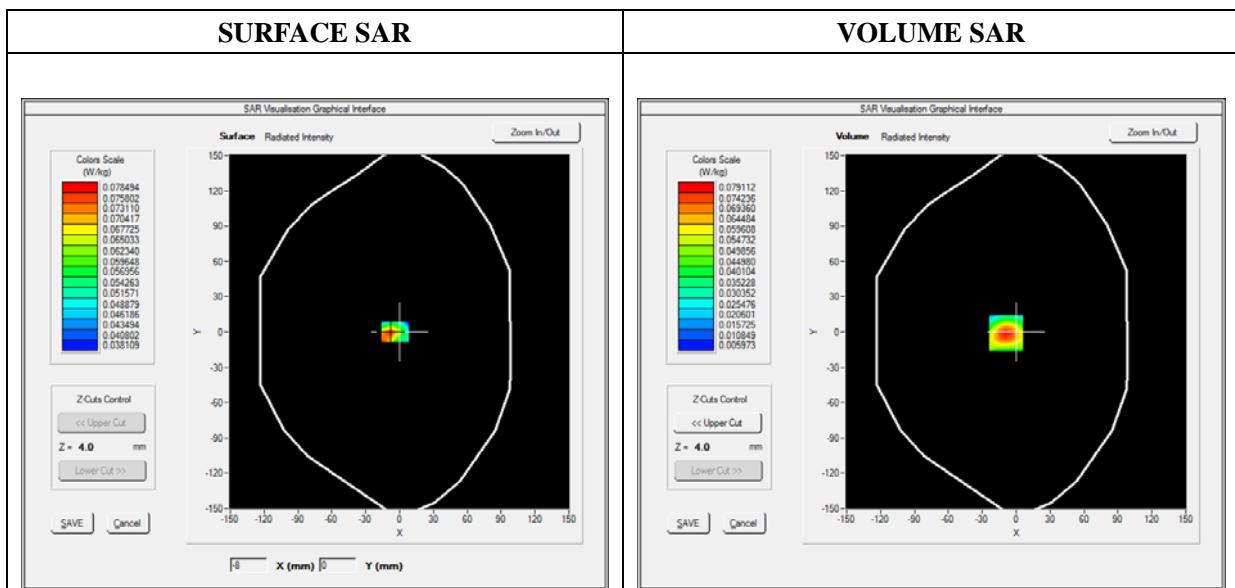
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.13; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

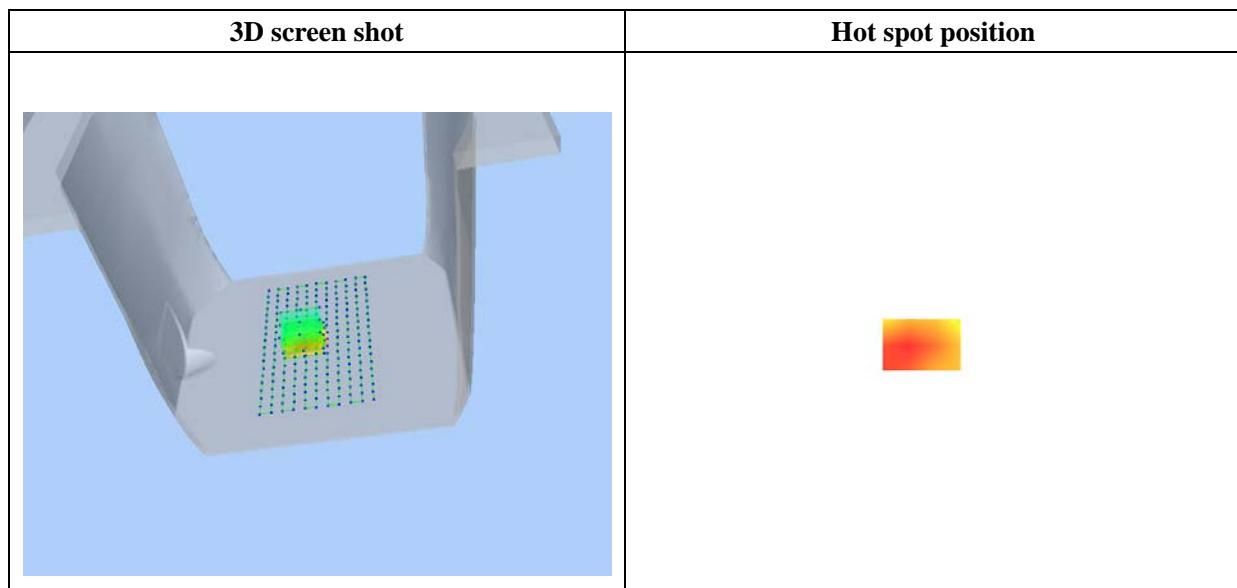
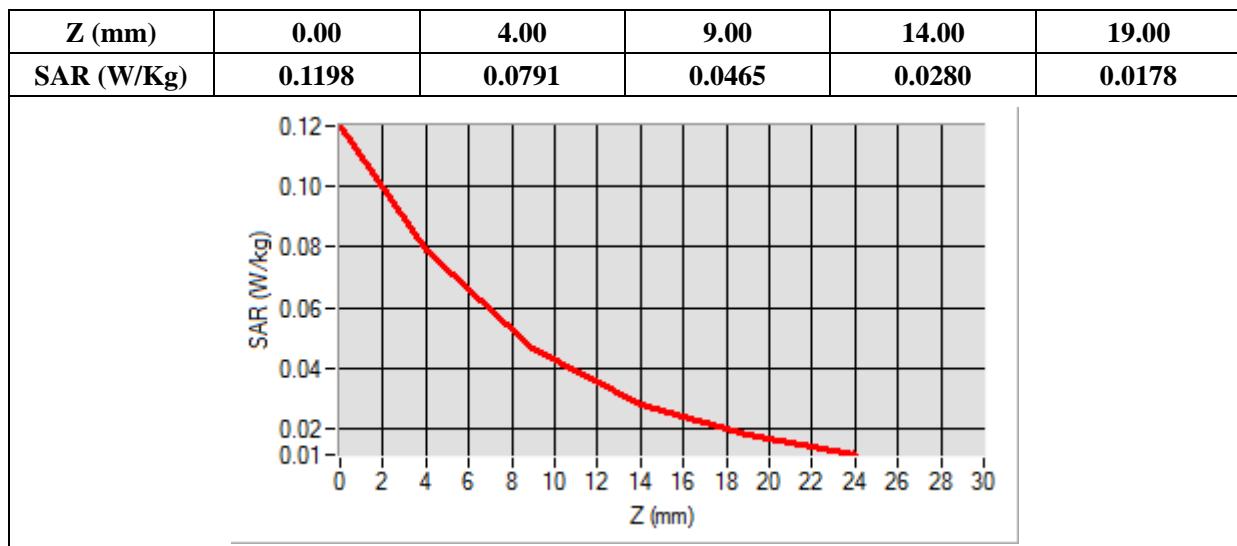
<b>Frequency (MHz)</b>	836.600000
<b>Relative Permittivity (real part)</b>	54.851214
<b>Conductivity (S/m)</b>	0.951454
<b>Power Variation (%)</b>	2.341234
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-9.00, Y=-1.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.040639
SAR 1g (W/Kg)	0.073481



# MEASUREMENT 89

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

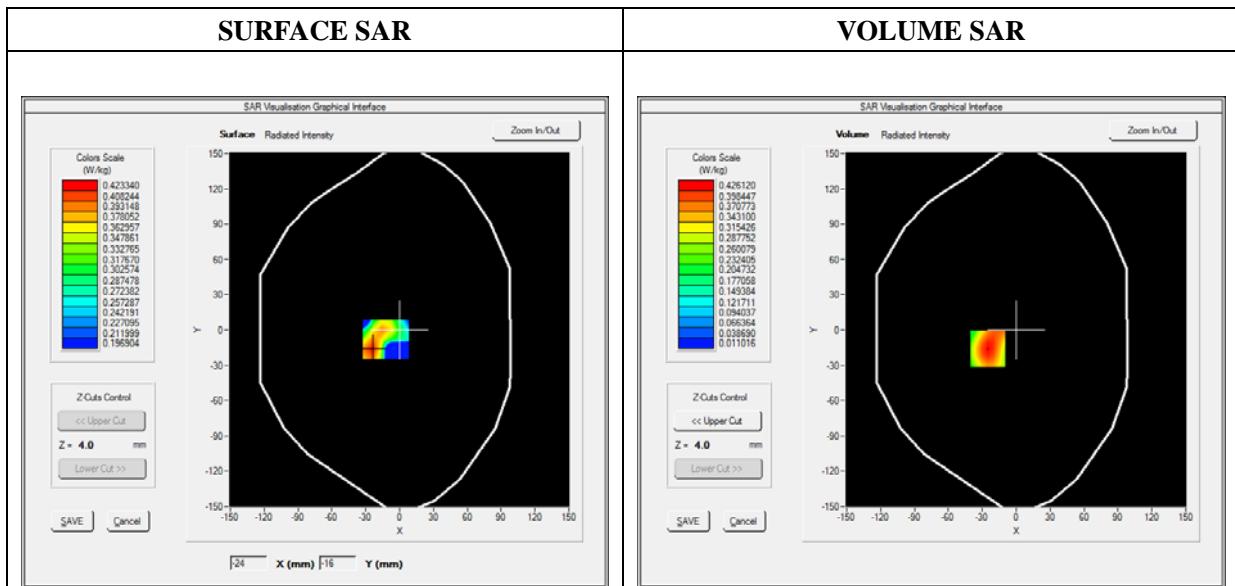
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat Plane
<b>Device Position</b>	Back
<b>Band</b>	LTE Band 2_RMC
<b>Channels</b>	QPSK, 20MHz, 1RB, Low
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

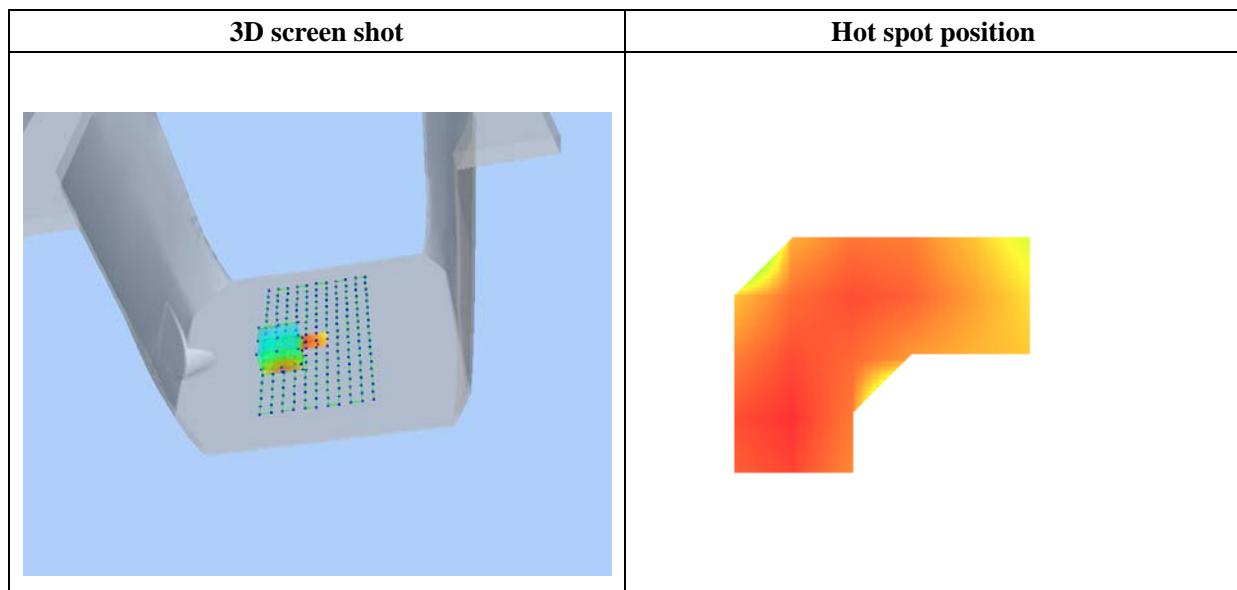
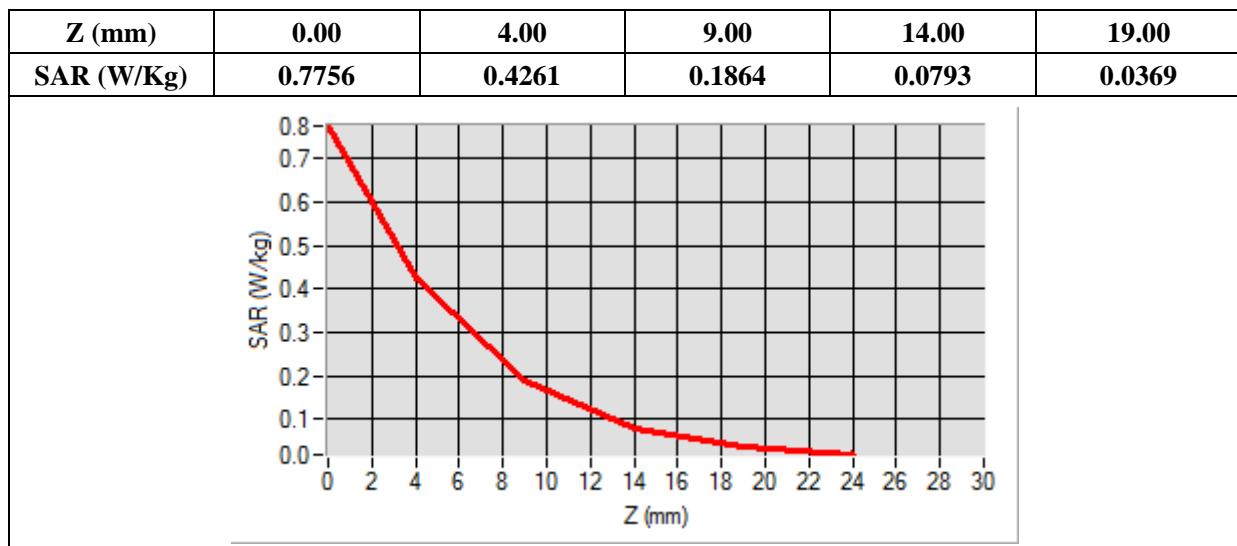
<b>Frequency (MHz)</b>	1860.000000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.327810
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-25.00, Y=-16.00

SAR Peak: 0.77 W/kg

SAR 10g (W/Kg)	0.205324
SAR 1g (W/Kg)	0.403360



# MEASUREMENT 90

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

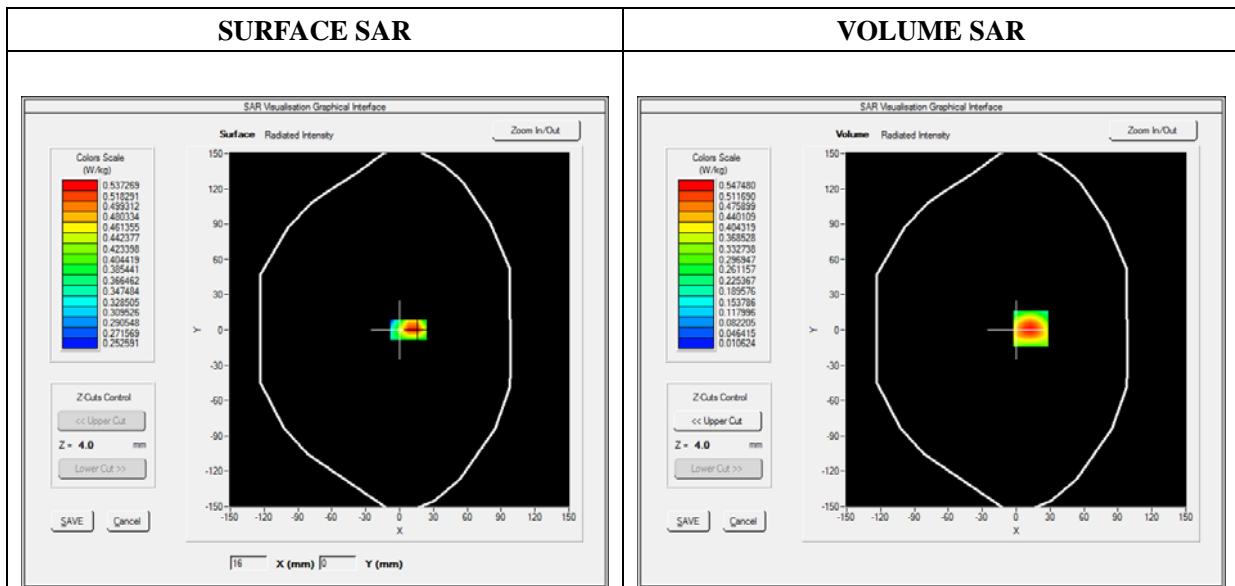
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat Plane
<b>Device Position</b>	Back
<b>Band</b>	LTE Band 2_RMC
<b>Channels</b>	QPSK, 20MHz, 1RB, Low
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

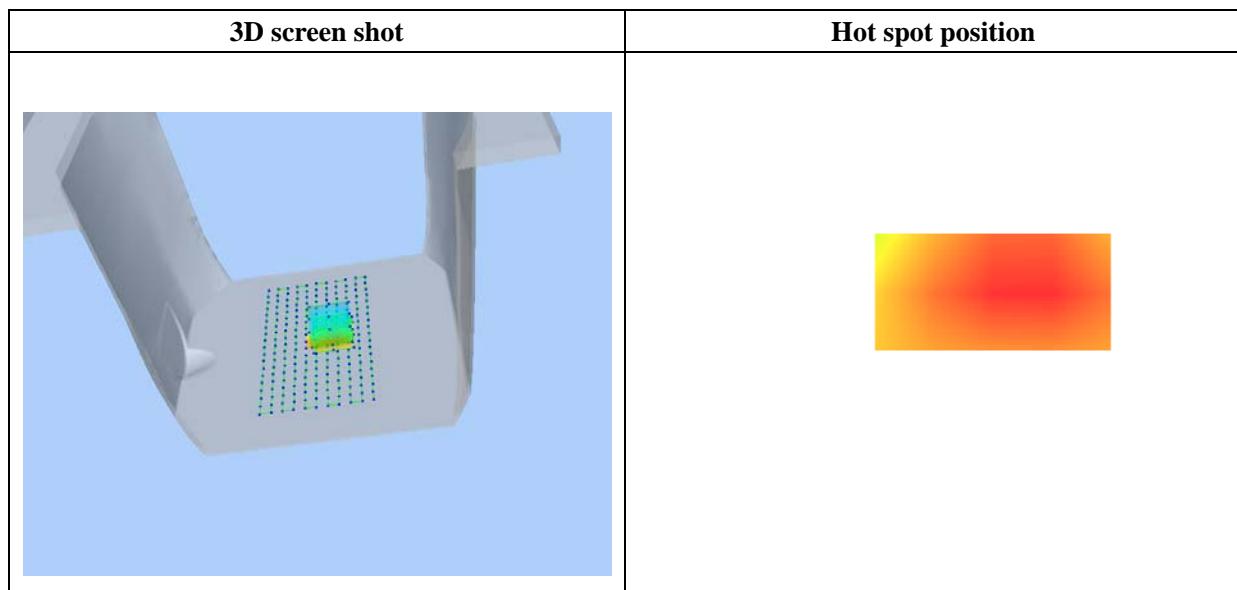
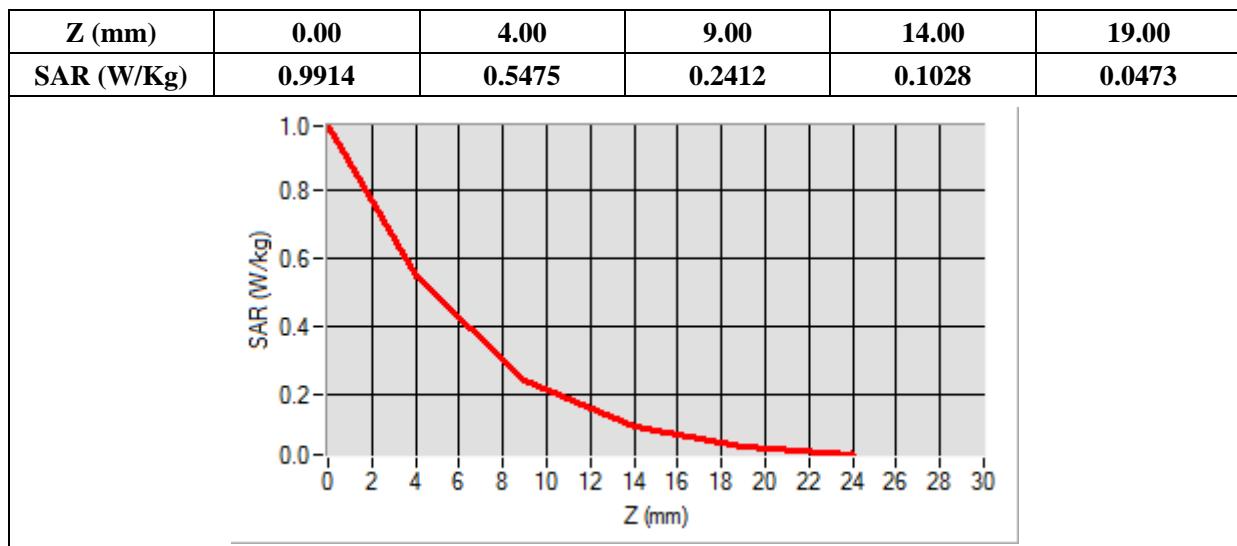
<b>Frequency (MHz)</b>	1860.000000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.570000
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=-13.00, Y=-1.00

SAR Peak: 0.99 W/kg

SAR 10g (W/Kg)	0.249344
SAR 1g (W/Kg)	0.509212



# MEASUREMENT 91

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

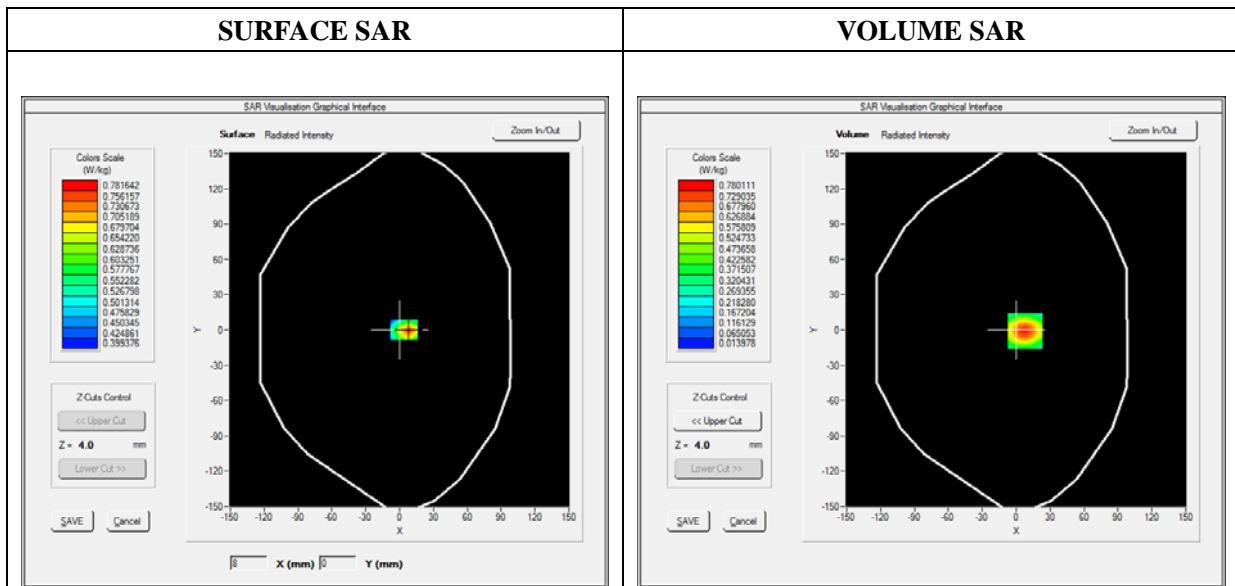
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.55; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

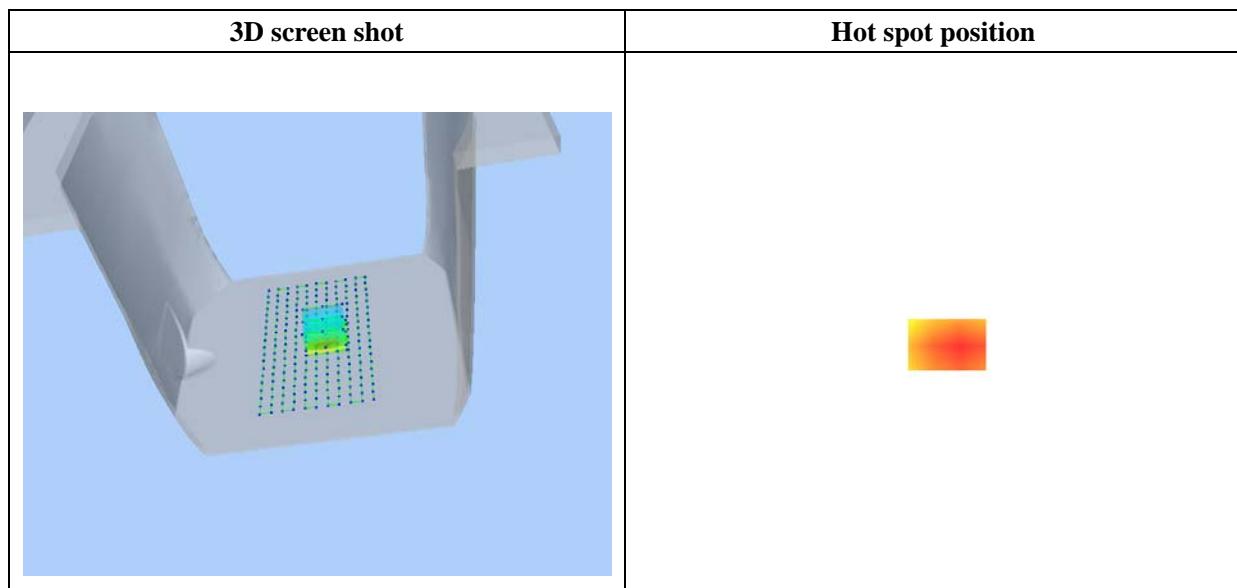
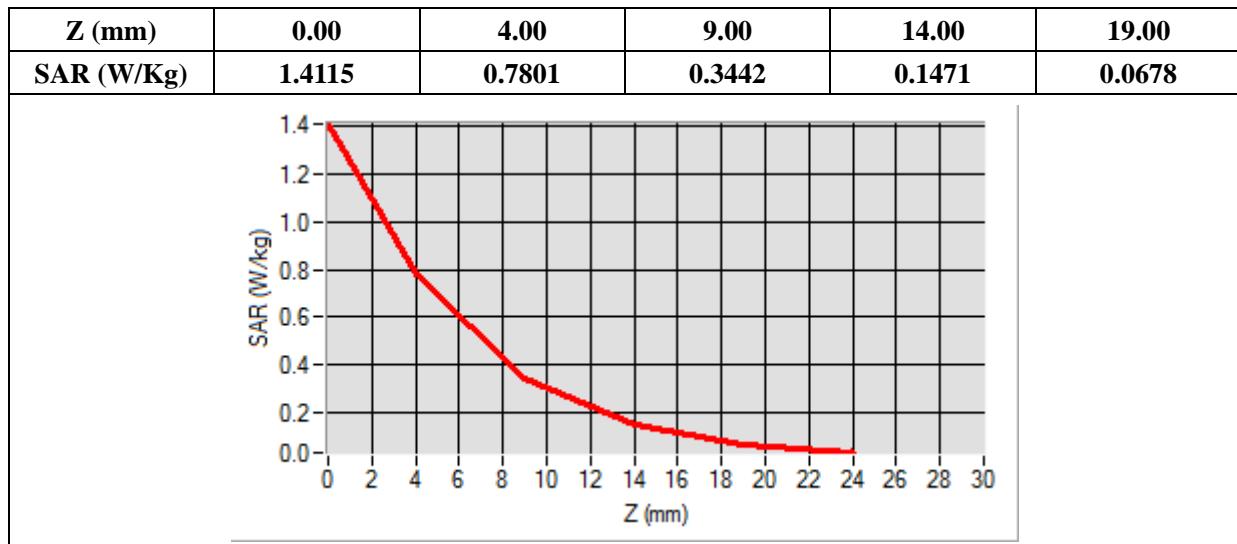
<b>Frequency (MHz)</b>	1860.000000
<b>Relative Permittivity (real part)</b>	52.420415
<b>Conductivity (S/m)</b>	1.501966
<b>Power Variation (%)</b>	1.523573
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.3



Maximum location: X=8.00, Y=-1.00

SAR Peak: 1.41 W/kg

SAR 10g (W/Kg)	0.342680
SAR 1g (W/Kg)	0.717753



# MEASUREMENT 97

Type: Phone measurement (Complete)

Date of measurement: 01/03/2018

Measurement duration: 12 minutes 3 seconds

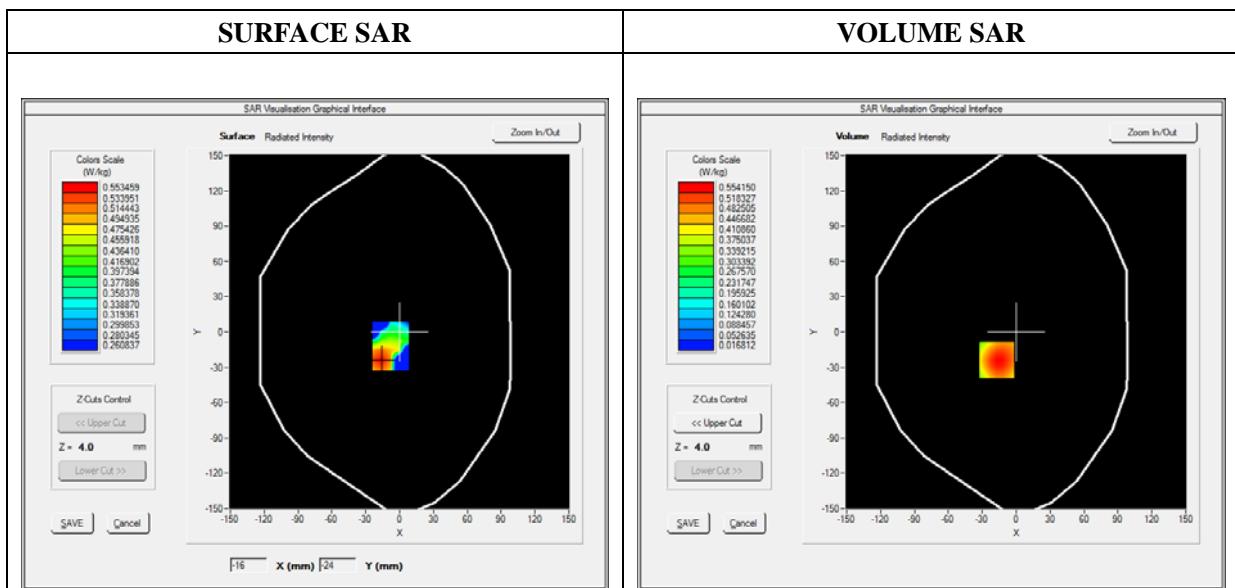
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 6.06; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

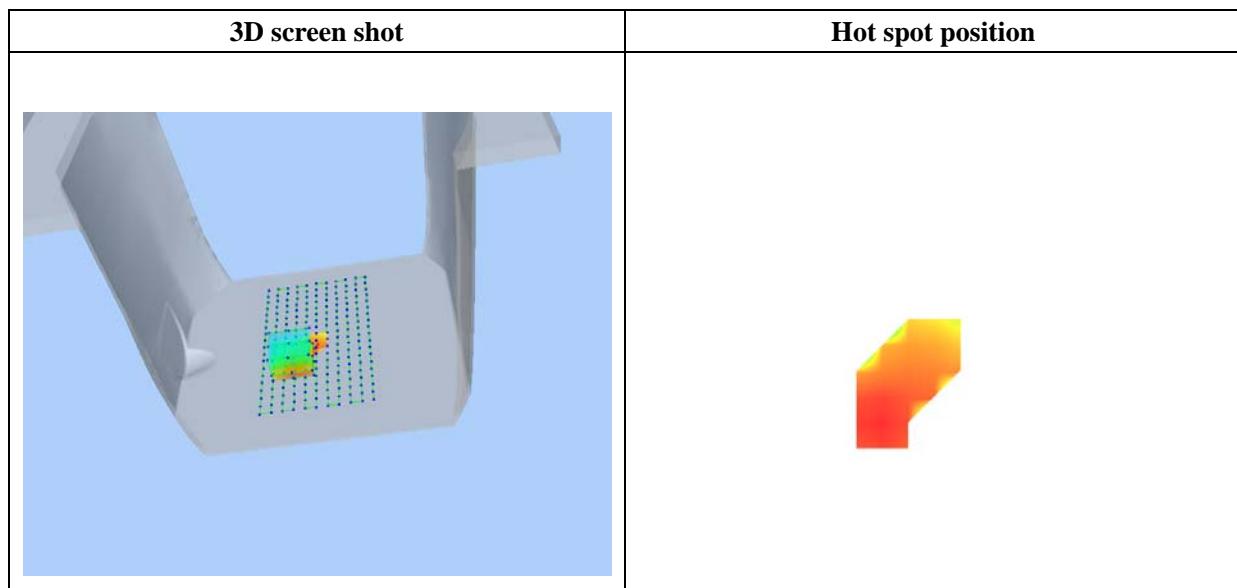
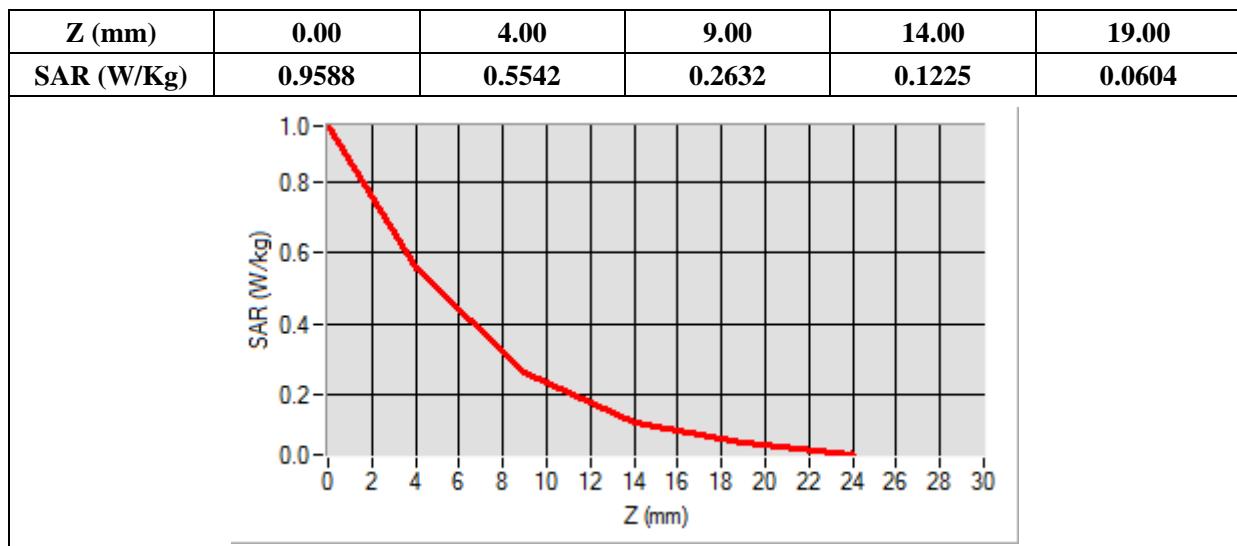
<b>Frequency (MHz)</b>	1720.000000
<b>Relative Permittivity (real part)</b>	51.224510
<b>Conductivity (S/m)</b>	1.461261
<b>Power Variation (%)</b>	0.858383
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-17.00, Y=-24.00

SAR Peak: 0.96 W/kg

SAR 10g (W/Kg)	0.285084
SAR 1g (W/Kg)	0.529530



# MEASUREMENT 106

Type: Phone measurement (Complete)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 3 seconds

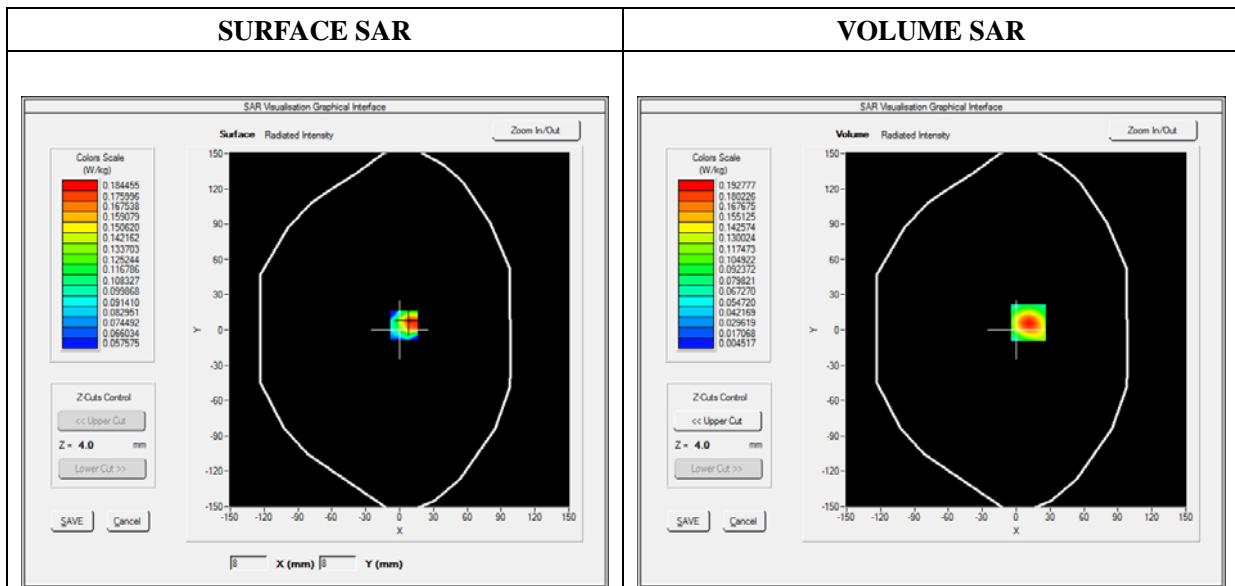
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.58; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

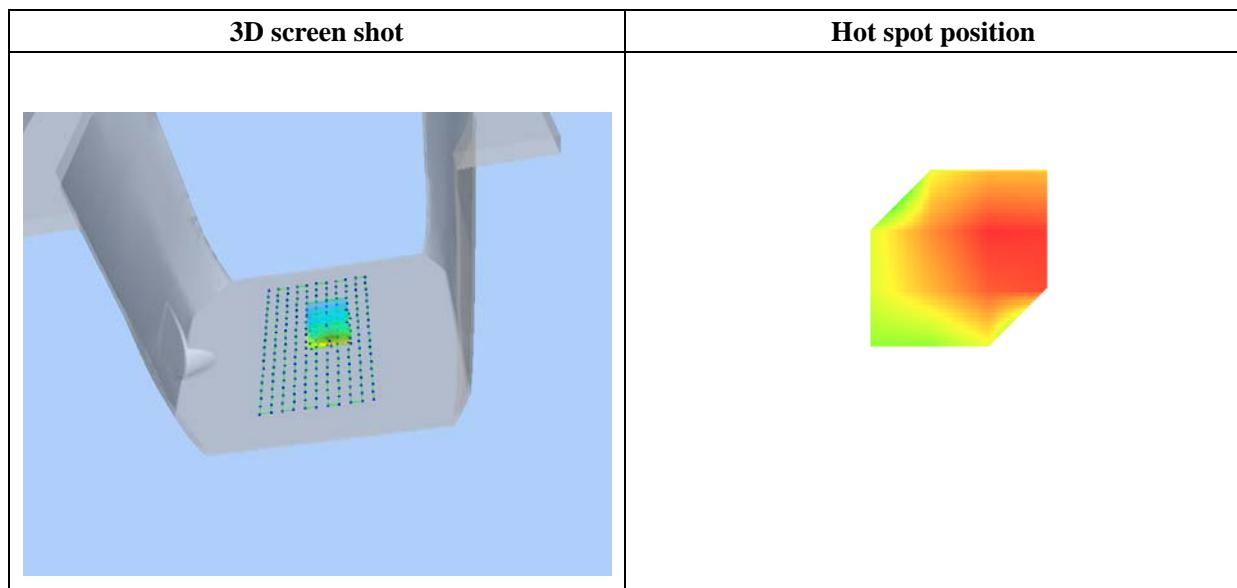
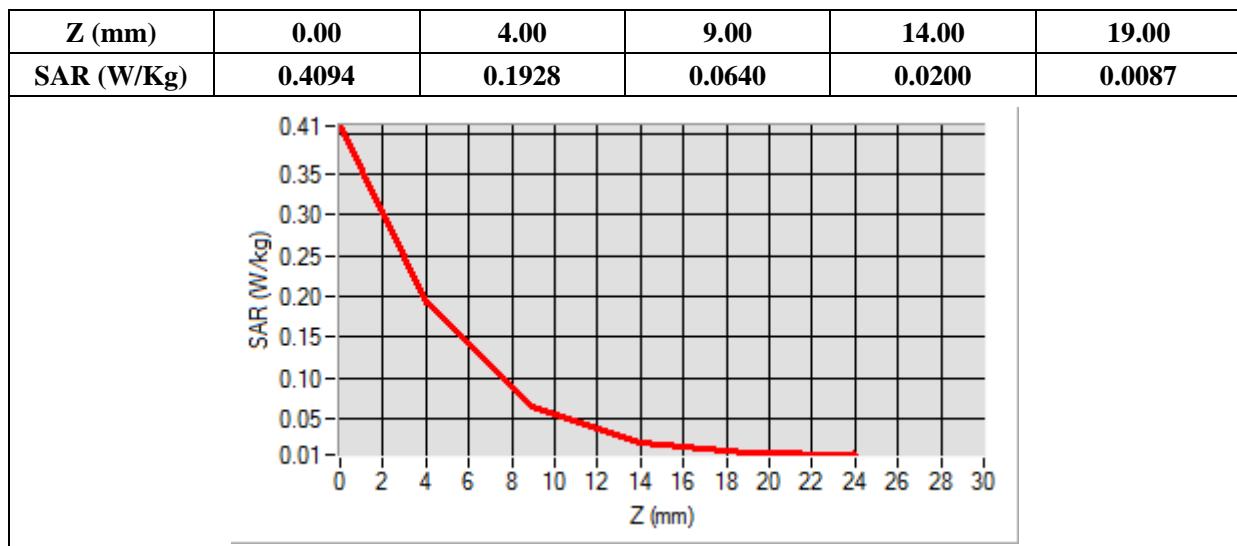
<b>Frequency (MHz)</b>	2510.000000
<b>Relative Permittivity (real part)</b>	52.241202
<b>Conductivity (S/m)</b>	2.120943
<b>Power Variation (%)</b>	3.018829
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=11.00, Y=6.00

SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.080466
SAR 1g (W/Kg)	0.181425



# MEASUREMENT 107

Type: Phone measurement (Complete)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 3 seconds

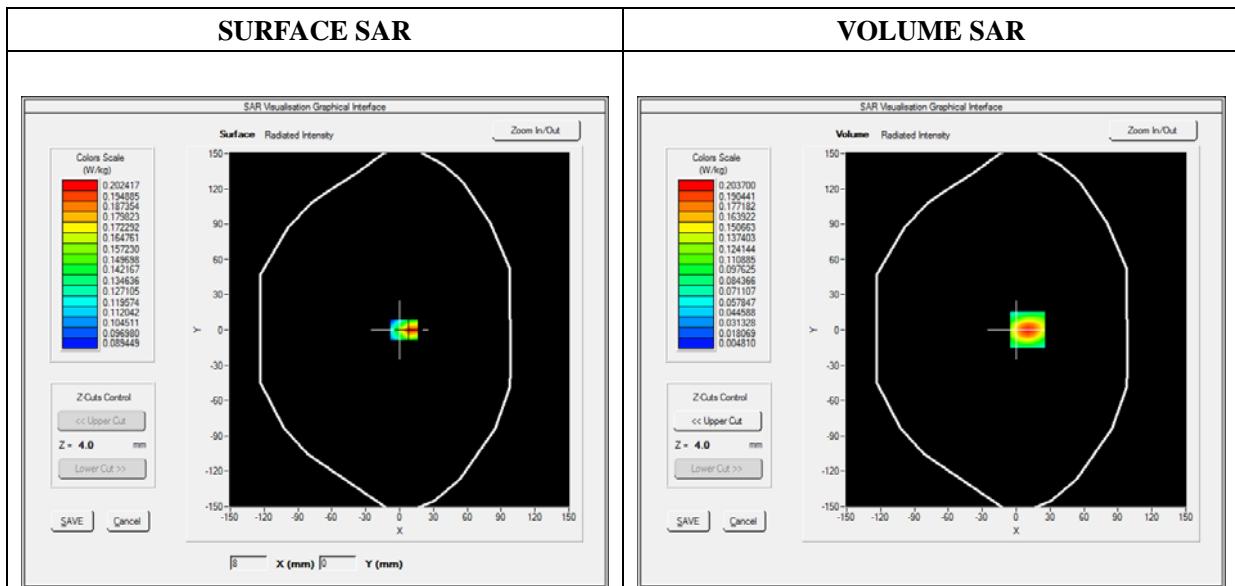
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.58; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

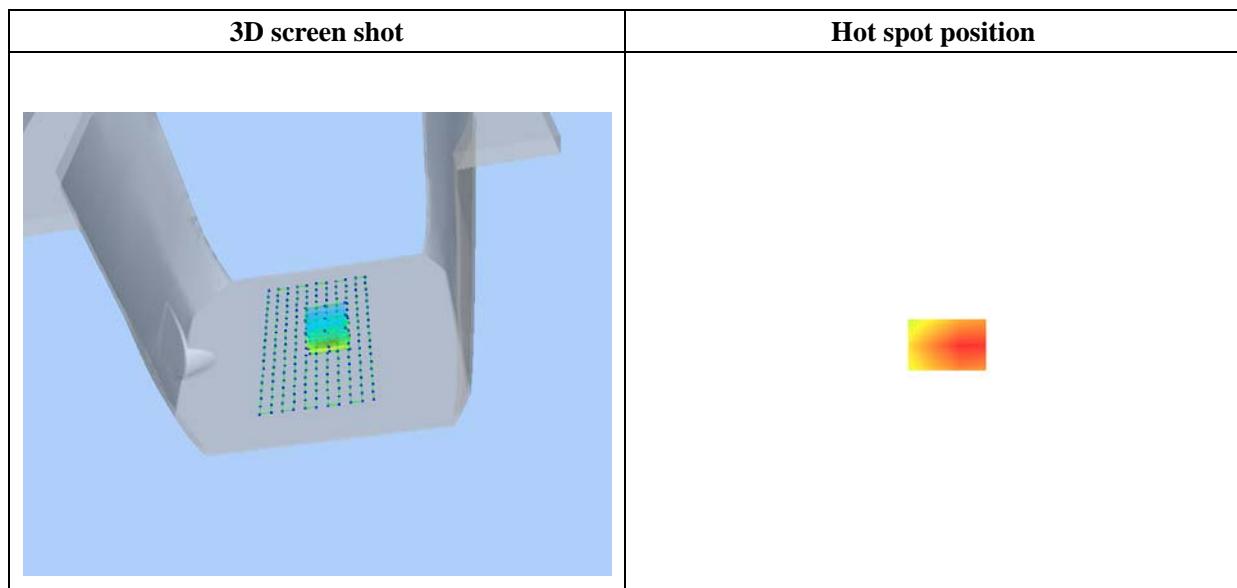
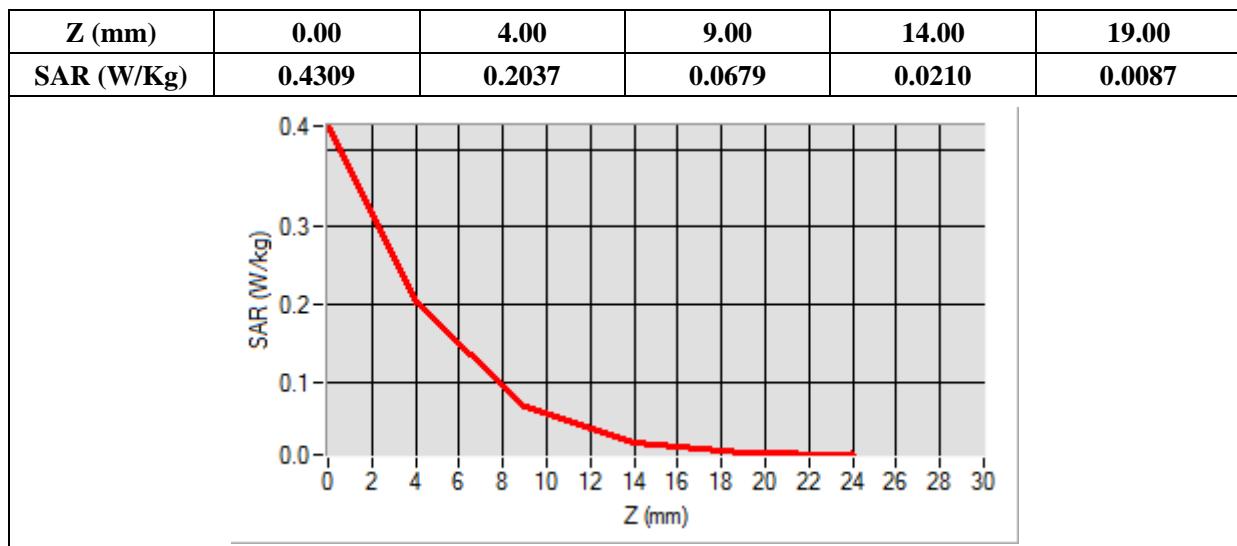
<b>Frequency (MHz)</b>	2510.000000
<b>Relative Permittivity (real part)</b>	52.241202
<b>Conductivity (S/m)</b>	2.120943
<b>Power Variation (%)</b>	3.672346
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=10.00, Y=0.00

SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)	0.082757
SAR 1g (W/Kg)	0.190425



# MEASUREMENT 113

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

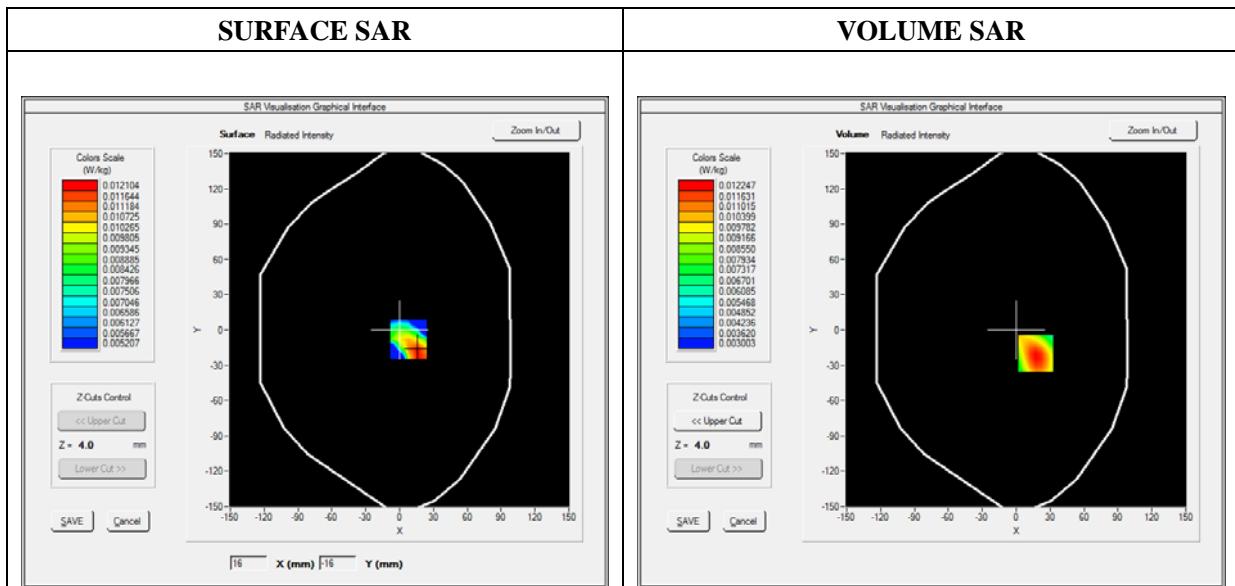
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2017

## A. Experimental conditions

<b>Area Scan</b>	sam_direct_droit2_surf8mm.txt
<b>Phantom</b>	Flat Plane
<b>Device Position</b>	Back
<b>Band</b>	LTE Band 13_RMC
<b>Channels</b>	QPSK, 10MHz, 1RB, Middle
<b>Signal</b>	Duty Cycle 1:1

## B. SAR Measurement Results

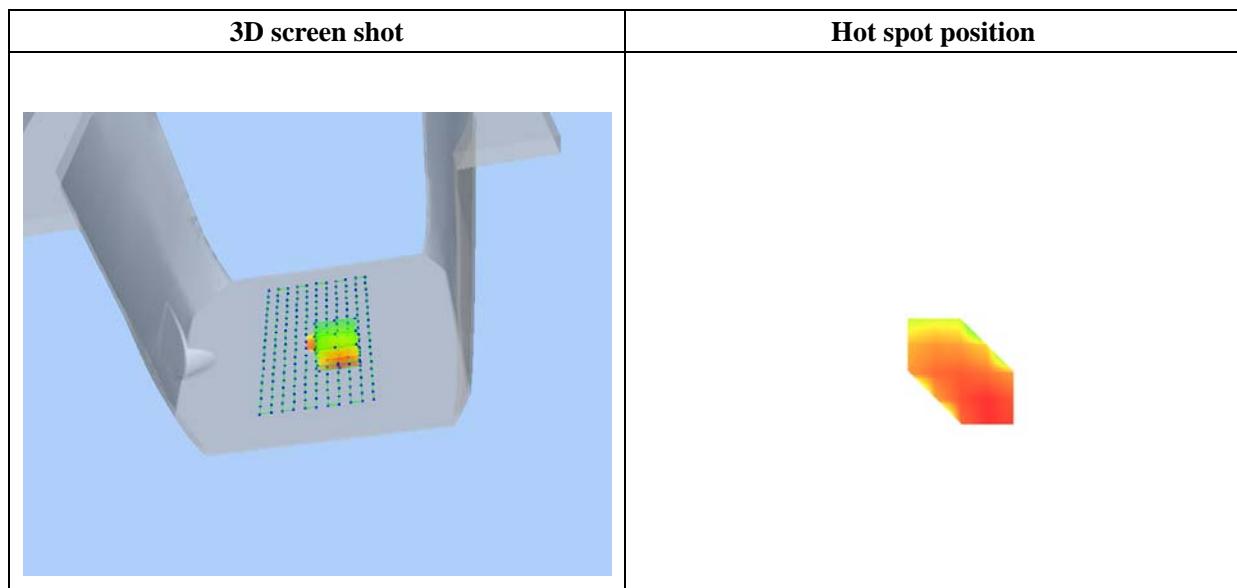
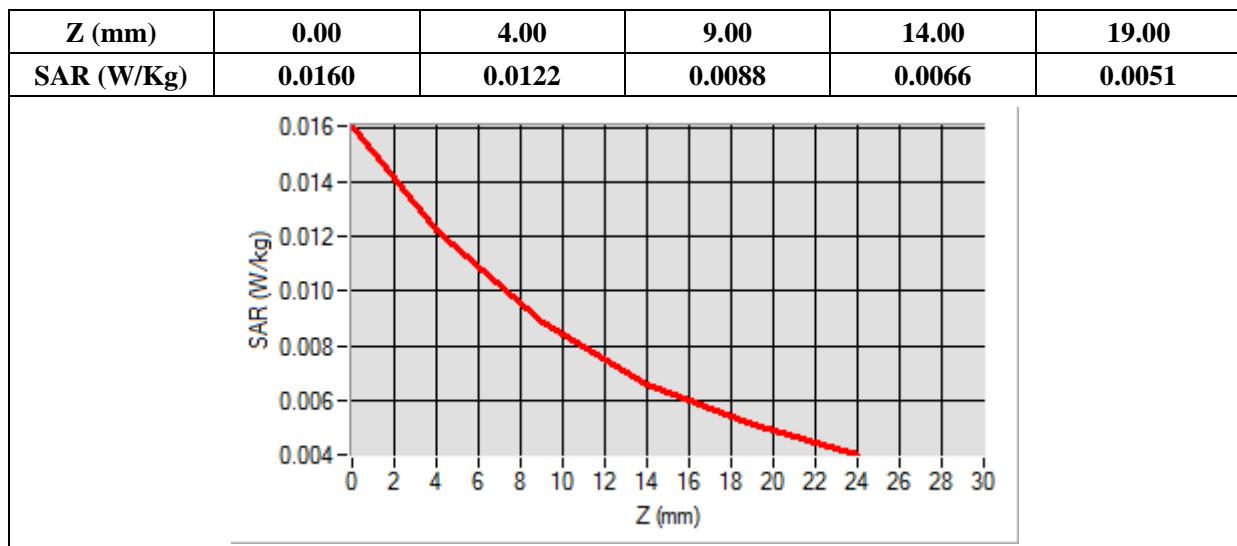
<b>Frequency (MHz)</b>	782.000000
<b>Relative Permittivity (real part)</b>	54.964739
<b>Conductivity (S/m)</b>	0.931048
<b>Power Variation (%)</b>	3.672346
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=17.00, Y=-20.00

SAR Peak: 0.02 W/kg

SAR 10g (W/Kg)	0.008541
SAR 1g (W/Kg)	0.012345



# MEASUREMENT 121

Type: Phone measurement (Complete)

Date of measurement: 01/02/2018

Measurement duration: 12 minutes 3 seconds

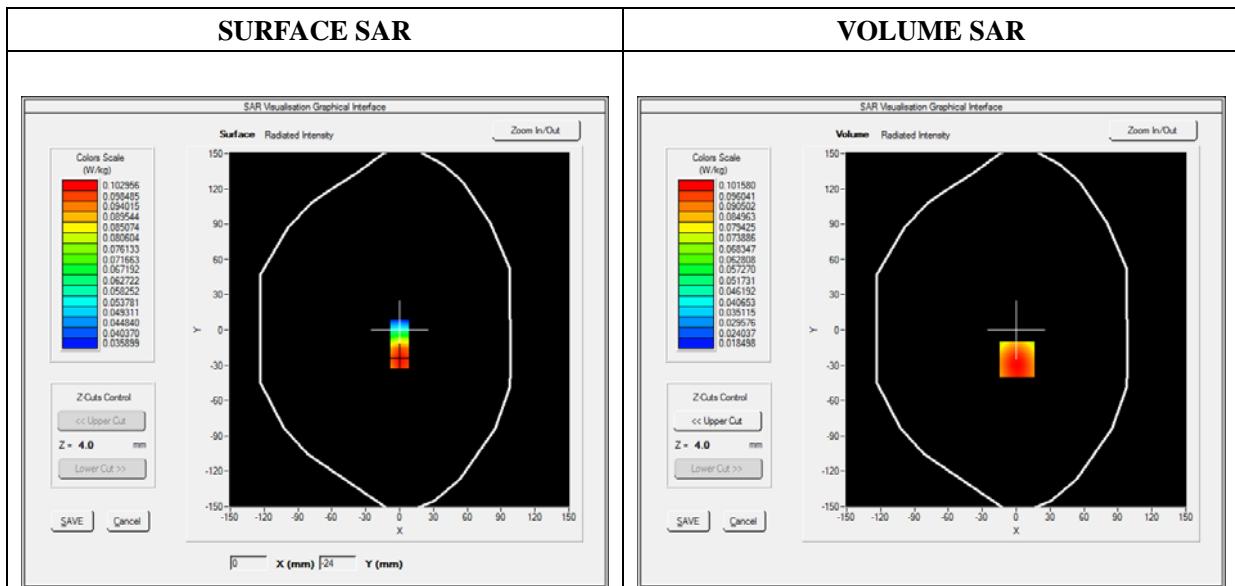
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 7.28; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

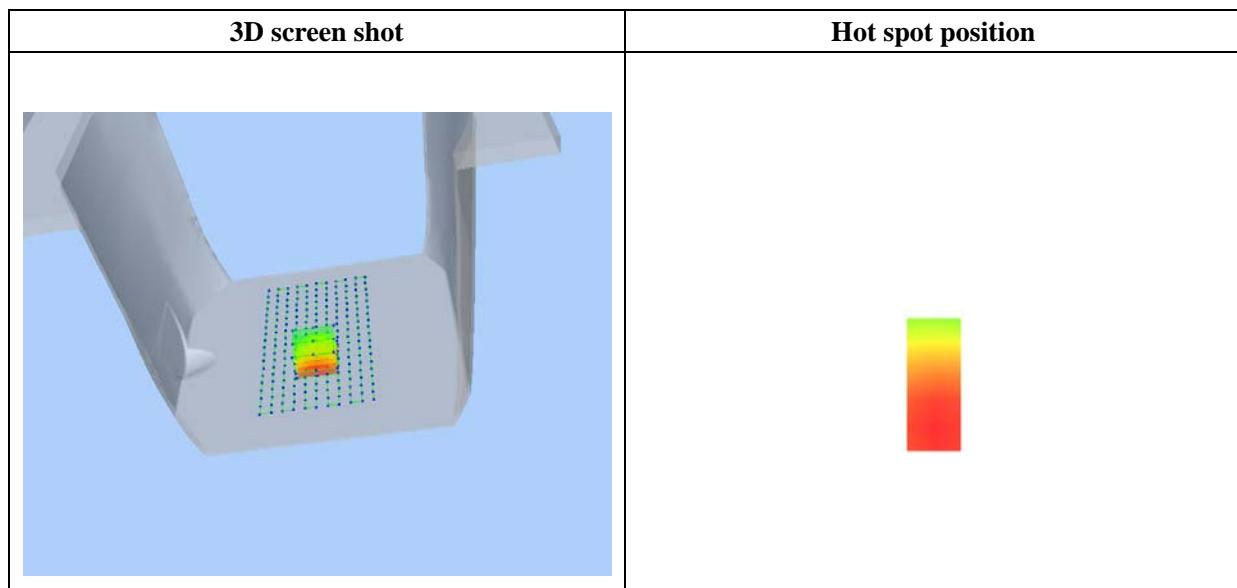
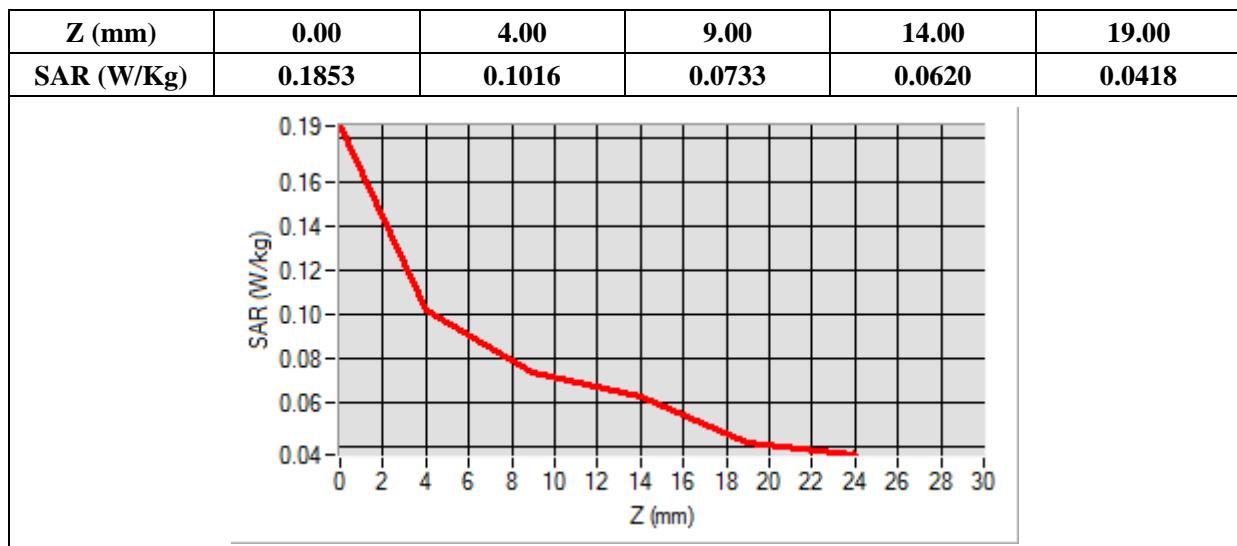
<b>Frequency (MHz)</b>	709.000000
<b>Relative Permittivity (real part)</b>	54.964739
<b>Conductivity (S/m)</b>	0.931048
<b>Power Variation (%)</b>	3.672346
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=1.00, Y=-25.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.076502
SAR 1g (W/Kg)	0.103497



# MEASUREMENT 129

Type: Phone measurement (Complete)

Date of measurement: 01/04/2018

Measurement duration: 12 minutes 3 seconds

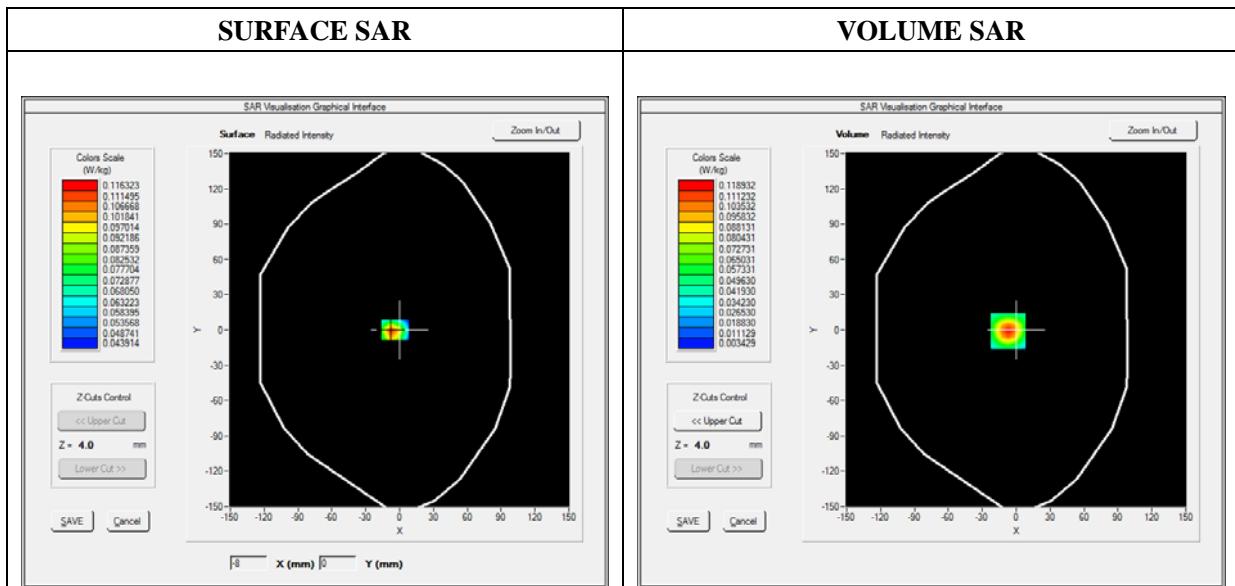
E-field Probe: SSE5 - SN 09/13 EP168; ConvF: 5.80; Calibrated: 06/01/2017

## A. Experimental conditions

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

## B. SAR Measurement Results

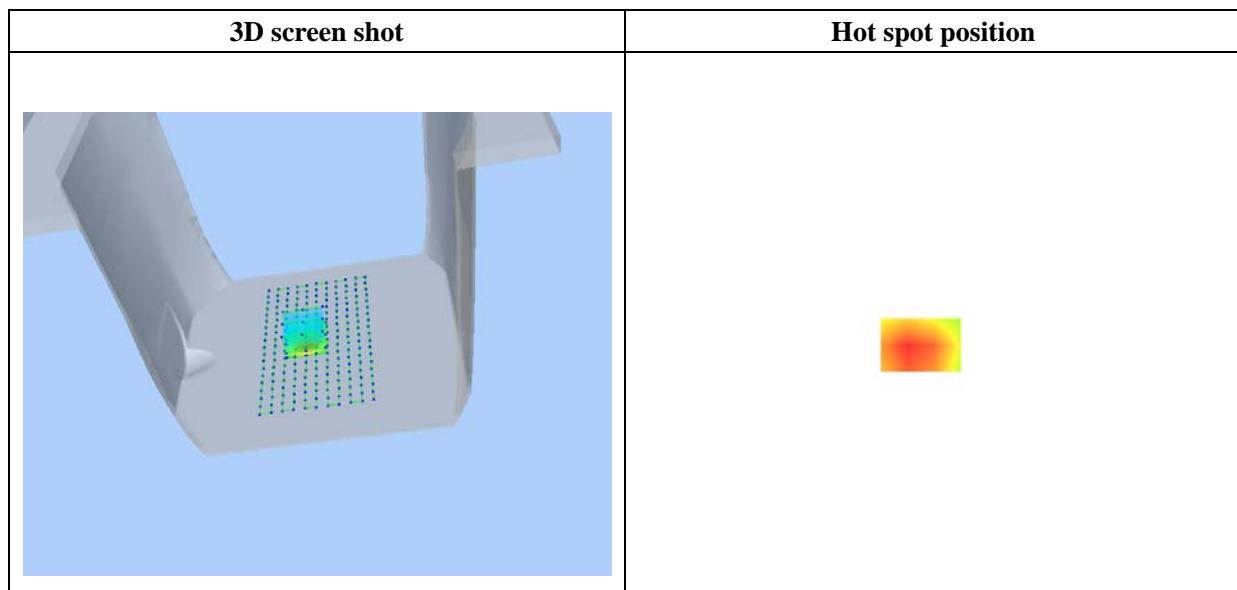
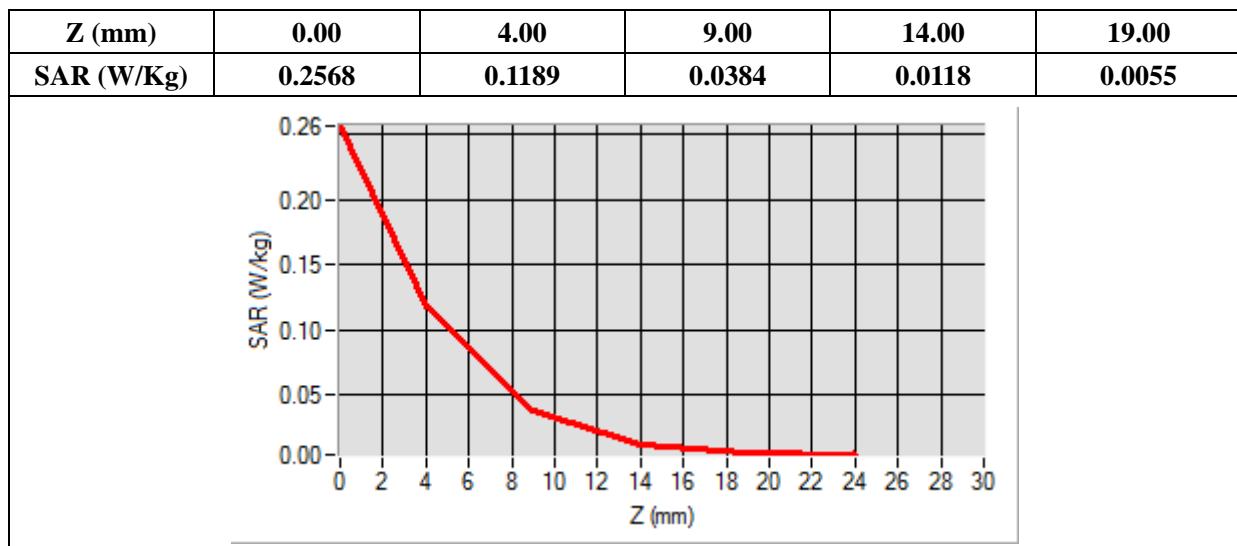
<b>Frequency (MHz)</b>	2412.000000
<b>Relative Permittivity (real part)</b>	52.010212
<b>Conductivity (S/m)</b>	1.910255
<b>Power Variation (%)</b>	2.492743
<b>Ambient Temperature</b>	21.1
<b>Liquid Temperature</b>	21.2



Maximum location: X=-7.00, Y=-1.00

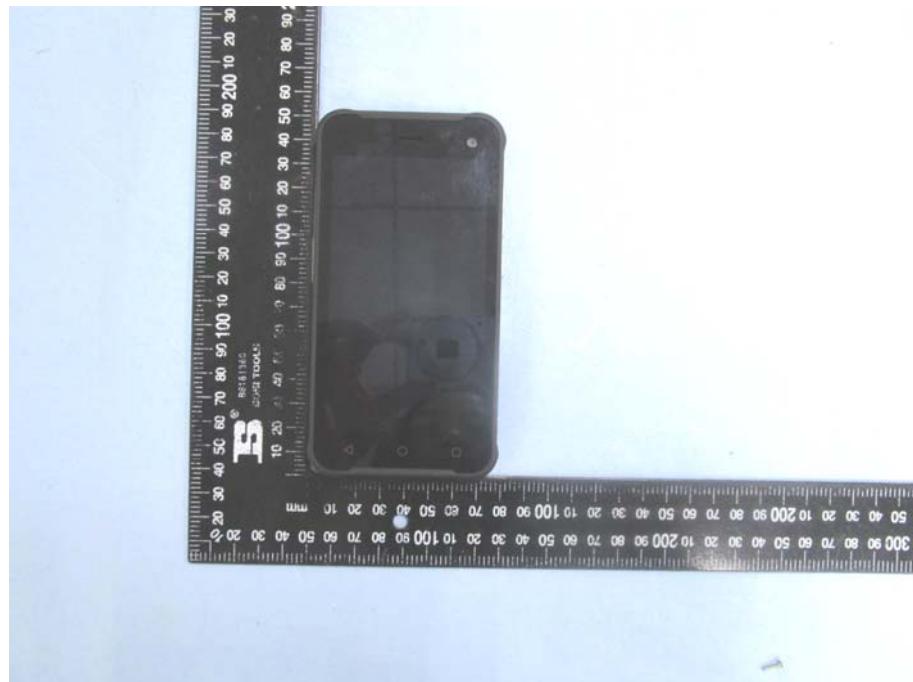
SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.046829
SAR 1g (W/Kg)	0.110655



## Annex C. EUT Photos

### EUT View Front



### EUT View Back



**Antenna View**

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## Annex D. Test Setup Photos

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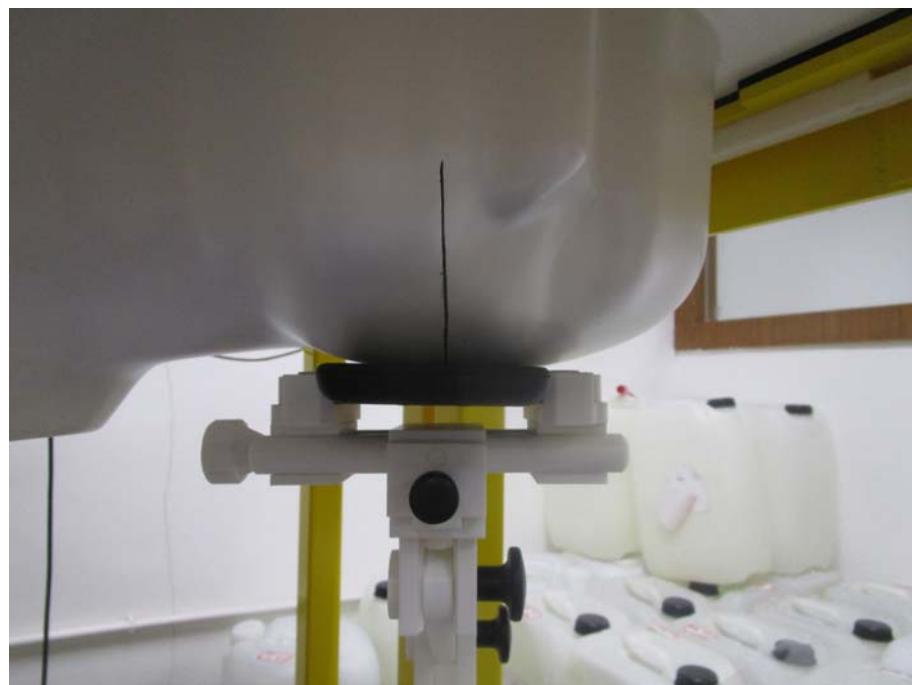
### Head Exposure Conditions

**Cheek**



**Tilt**

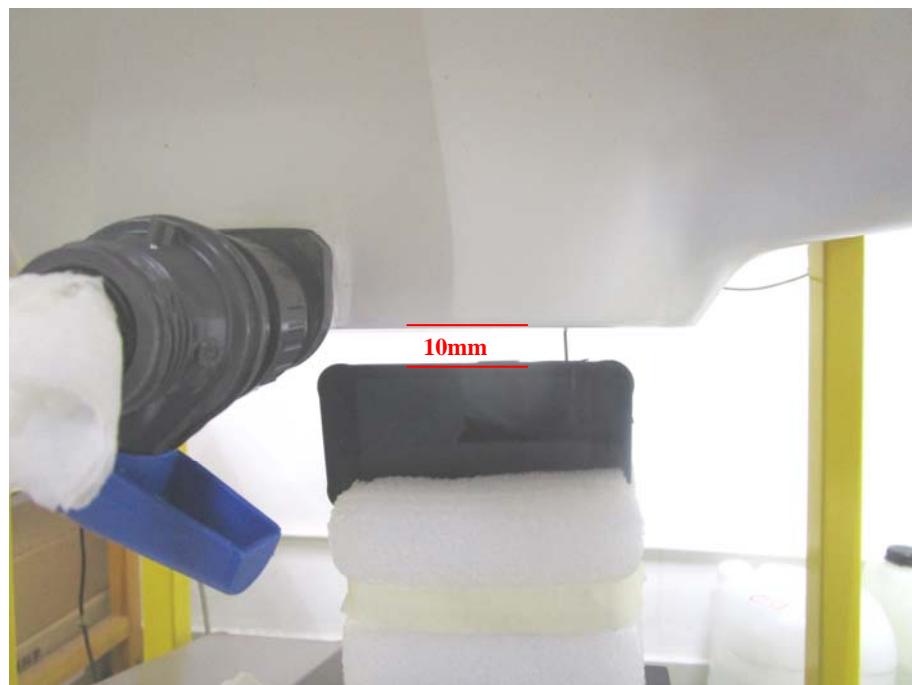


**Cheek****Tilt**

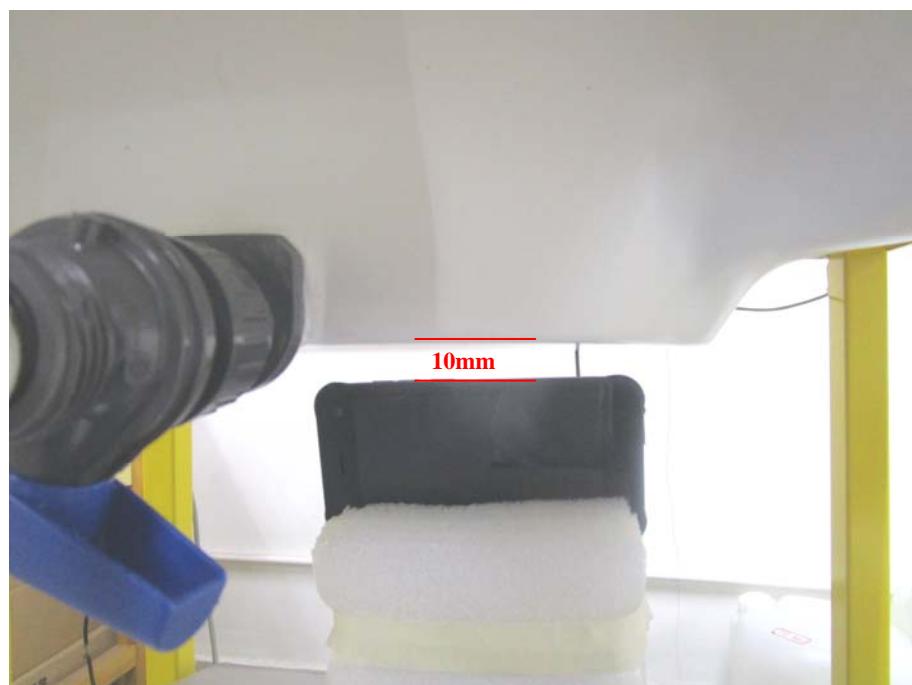
**Body-worn & Hotspot mode Exposure Conditions****Body Front****Body Back**

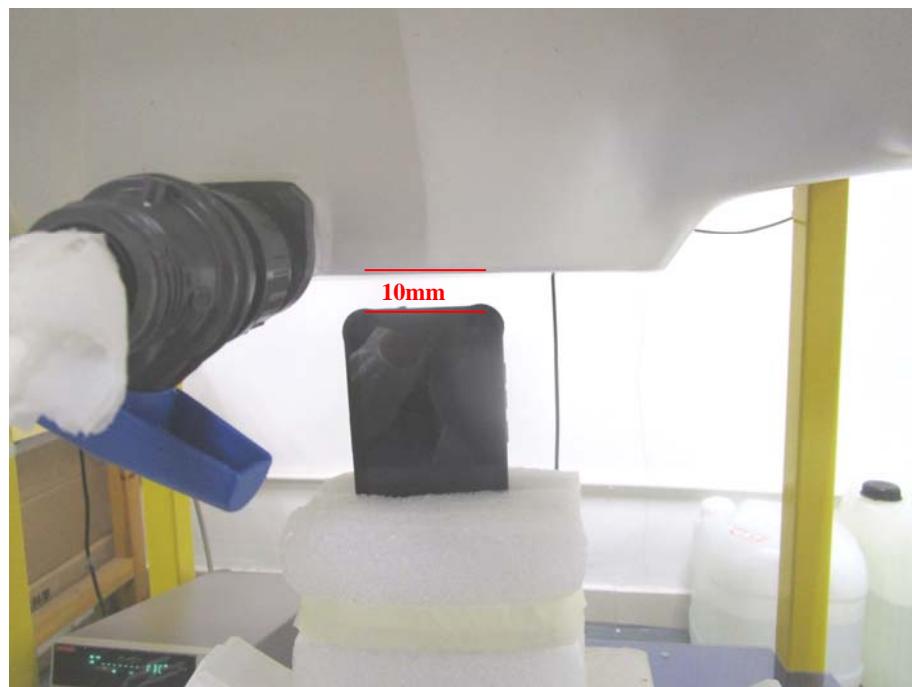
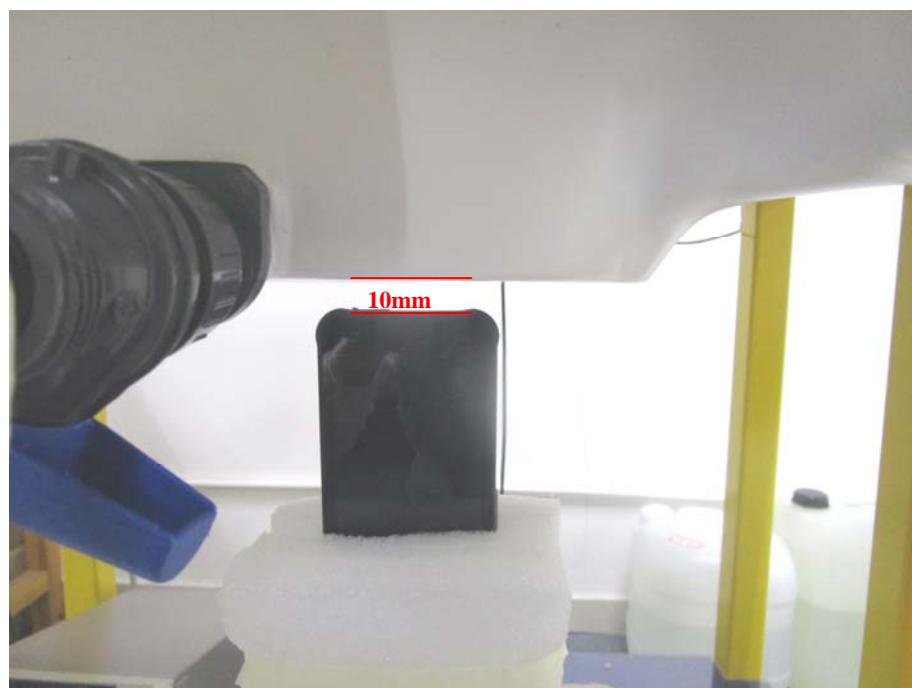
## Hotspot Exposure Conditions

**Body Left**



**Body Right**



**Body Top****Body Bottom**

## Annex E. Calibration Certificate

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*Please refer to the exhibit for the calibration certificate*

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