S T S LAB

FCC SAR TEST REPORT

Report No: STS1503081H01

Issued for

Light Repute International Limited

Room 101, No. 91, Avenue 3288 Yanggao South Road, Pudong New Area, Shanghai， People's Rep. of China

Product Name:	GSM Mobile Phone
Brand Name:	D3
Model No.:	D520X
FCC ID:	2ADVCD-520X
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2003
Max. SAR (1g):	Head :1.195W/kg
	Body: 1.006W/kg

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Test Report Certification

Applicant's name ..... :	Light Repute International Limited
Address ..... :	Room 101, No. 91, Avenue 3288 Yanggao South Road, Pudong New Area, Shanghai，People's Rep. of China
Manufacture's Name..... :	Light Repute International Limited
Address ..... :	Room 101, No. 91, Avenue 3288 Yanggao South Road, Pudong New Area, Shanghai，People's Rep. of China
Product description	
Product name ..... :	GSM Mobile Phone
Trademark ..... :	D3
Model and/or type reference :	D520X
IMEI NO.1:	358672060023144
IMEI NO.2:	358672060023151
Standards ..... :	ANSI/IEEE Std. C95.1-1992 FCC 47 CFR Part 2 (2.1093) IEEE 1528: 2003

The device was tested by Shenzhen STS Test Services Co., Ltd. in accordance with the measurement methods and procedures specified in KDB 865664 The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of Test ..... :	
Date (s) of performance of tests..... :	Mar. 26, 2015to Mar. 27, 2015
Date of Issue..... :	Mar. 27, 2015
Test Result..... :	Pass

Testing Engineer : Allen Chen

(Allen Chen)

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Authorized Signatory : Bovey Yang

(Bovey Yang)

TABLE OF CONTENS

1. General Information 4
   1.1 EUT Description 4
   1.2 Test Environment 5
   1.3 Test Facility 5
2. Test Standards And Limits 6
3. SAR Measurement System 7
   3.1 Definition Of Specific Absorption Rate (SAR) 7
   3.2 SAR System 7
      3.2.1 Probe 8
      3.2.2 Phantom 9
      3.2.3 Device Holder 9
4. Tissue Simulating Liquids 10
   4.1 Simulating Liquids Parameter Check 10
5. SAR System Validation 13
   5.1 Validation System 13
   5.2 Validation Result 14
6. SAR Evaluation Procedures 15
7. EUT Antenna Location Sketch 17
   7.1 SAR TEST EXCLUSION CONSIDER TABLE 18
8. EUT Test Position 19
   8.1 Define Two Imaginary Lines On The Handset 19
9. Measurement Uncertainty 21
   9.1 Measurement Uncertainty 21
   9.2 System cheek Uncertainty 23
10. Conducted Power Measurement 25
11. EUT And Test Setup Photo 29
   11.1 EUT Photo 29
   11.2 Setup Photo 32
12. SAR Result Summary 39
   12.1 Head SAR 39
   12.2Body SAR and Hotspot 40
13. Equipment List 44
Appendix A. System Validation Plots 45
Appendix B. SAR Test Plots 53
Appendix C. Probe Calibration And Dipole Calibration Report 77

1. General Information

1.1 EUT Description

Equipment	GSM Mobile Phone	
Brand Name	D3	
Model No.	D520X	
FCC ID	2ADVCD-520X	
Adapter	Input: AC100-240V, 0.15A, 50/60 Hz Output: DC 5V, 500mA	
Battery	Rated Voltage: 3.7V Charge Limit: 4.2V Capacity:890mAh	
Hardware Version	F19B_MB_V1.1	
Software Version	f19B_s31da_1.0_qqvga_JD_D3_D520X_32m_spa_eng_fre_v1.03_c02_20141226.pac	
Frequency Range	GSM 850: 824.2 ~ 848.8 MHz PCS1900: 1850.2 ~ 1909.8 MHz Bluetooth：2402~2480MHz	
Transmit Power(MAX):	**SIM 1 Card** GSM 850: 31.86dBm GSM 1900: 28.33dBm **SIM 2 Card** GSM 850: 31.81dBm GSM 1900: 28.15dBm	Bluetooth: 1.26dBm
Max. Reported SAR(1g):	Head: GSM 850: 1.195 W/kg GSM 1900: 0.777 W/kg	Body: GSM 850: 1.006W/kg GSM 1900: 0.477 W/kg
Operating Mode:	GSM: GSM Voice/GPRS Class 12; Bluetooth: V2.1 + EDR (GFSK + π /4DQPSK+8DPSK)	
Antenna Specification:	GSM: PIFA Antenna BT: PIFA Antenna	
SIM Card	Support dual-SIM, dual standby, the multiple SIM card with two lines cannot transmitting at the same time	
DTM Mode:	Not Support	

Product	Type	
	☒ Production unit	☐ Identical Prototype

1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required	Actual
Temperature (℃)	18-25	22~23
Humidity (%RH)	30-70	55~65

1.3 Test Facility

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong, Baoan District, Shenzhen, China
FCC Registration No.: 842334;IC Registration No.: 12108A-1

2. Test Standards And Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v05r02	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r03	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 941225 D01 v03	SAR test for 3G devices

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

(A). Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 1 grams of tissue defined as a tissue volume in the shape of a cube.

Population/Uncontrolled Environments:
are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational/Controlled Environments:
are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

NOTE

GENERAL POPULATION/UNCONTROLLED EXPOSURE

PARTIAL BODY LIMIT

1.6 W/kg

3. SAR Measurement System

3.1 Definition Of Specific Absorption Rate (SAR)

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.

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

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

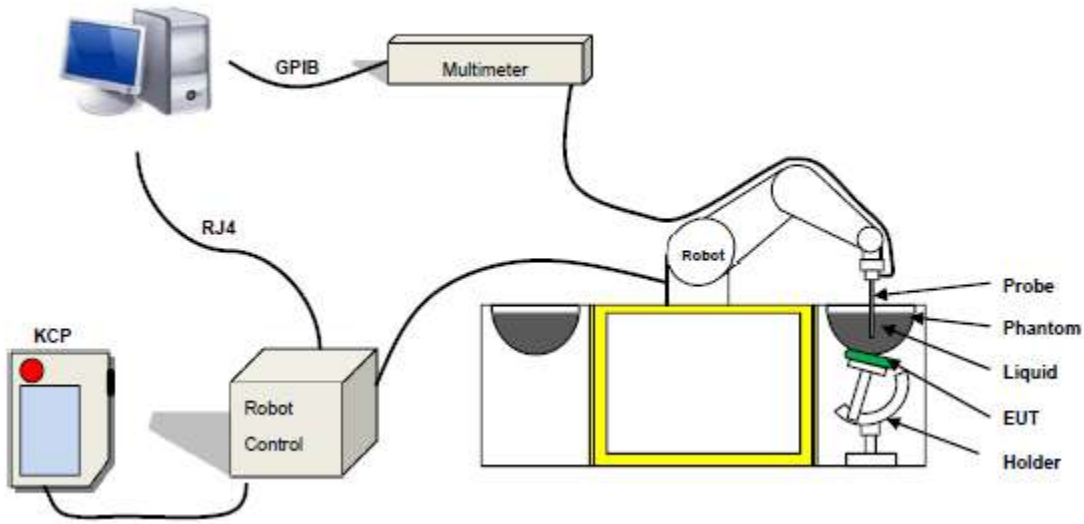
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

SATIMO SAR System Diagram:



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.

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 17/14 EP221 with following specifications is used

- Dynamic range: 0.01-100 W/kg
- Tip Diameter :5 mm
- Distance between probe tip and sensor center: 2.7mm
- Distance between sensor center and the inner phantom surface: 4 mm (repeatability better than +/- 1mm)
- Probe linearity: ＜0.25 dB
- Axial Isotropy: ＜0.25 dB
- Spherical Isotropy: ＜0.25 dB
- Calibration range: 450MHz to 2600MHz for head & body simulating liquid.

Angle between probe axis (evaluation axis) and suface normal line:less than 30°

Figure 1 – *Satimo COMOSAR Dosimetric E field Dipole*

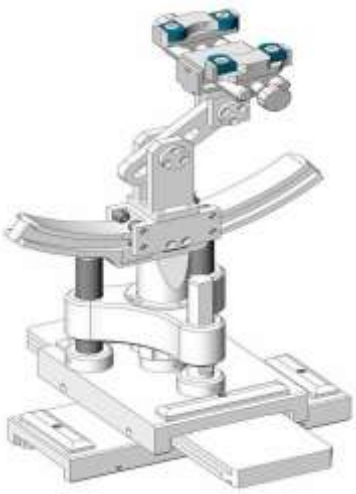
3.2.2 Phantom

For the measurements the SAM twin phantom 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.

The SAM twin phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

SN 32/14 SAM115

3.2.3 Device Holder

The COMOSAR device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR). Thus the device needs no repositioning when changing the angles. The COMOSAR device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity εr =3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.	

4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 4.2

Frequency (MHz)	Water	Suger	Cellulose	Salt	Preventol	Dgbe	Conductivity	Permitivity:
	%	%	%	%	%	%	σ	ε
Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1900	54.9	0	0	0.18	0	44.92	1.4	40.0
2450	46.7	0	0	0	0	53.3	1.80	0
Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1900	40.5	58.0	0	0.5	0.5	0	1.52	53.3
2450	73.2	0	0	0.04	0	26.7	1.95	52.7

LIQUID MEASUREMENT RESULTS

Date: Mar,26 2015 **Ambient condition:** Temperature 20.4°C **Relative humidity:** 51.8%

Head Simulating Liquid		Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]					
824.2 MHz	21	Permitivity:	41.5	42.56	2.55	± 5
		Conductivity:	0.90	0.87	-3.33	± 5
835 MHz		Permitivity:	41.5	41.75	0.60	± 5
		Conductivity:	0.90	0.90	0.00	± 5
836.6 MHz		Permitivity:	41.5	41.09	-0.99	± 5
		Conductivity:	0.90	0.91	1.11	± 5
848.8MHz		Permitivity:	41.5	40.64	-2.07	± 5
		Conductivity:	0.90	0.93	3.33	± 5
Body Simulating Liquid		**Parameters**	**Target**	**Measured**	**Deviation[%]**	**Limited[%]**
Frequency	Temp. [°C]					
824.2 MHz	21	Permitivity:	55.20	56.81	2.92	± 5
		Conductivity:	0.97	0.94	-3.09	± 5
835 MHz		Permitivity:	55.20	56.00	1.45	± 5
		Conductivity:	0.97	0.96	-1.03	± 5
836.6 MHz		Permitivity:	55.20	54.51	-1.25	± 5
		Conductivity:	0.97	0.97	0.00	± 5
848.8MHz		Permitivity:	55.20	54.15	-1.90	± 5
		Conductivity:	0.97	0.97	0.00	± 5

Date: Mar.27, 2015 **Ambient condition:** Temperature 21.0°C **Relative humidity:** 55.1%

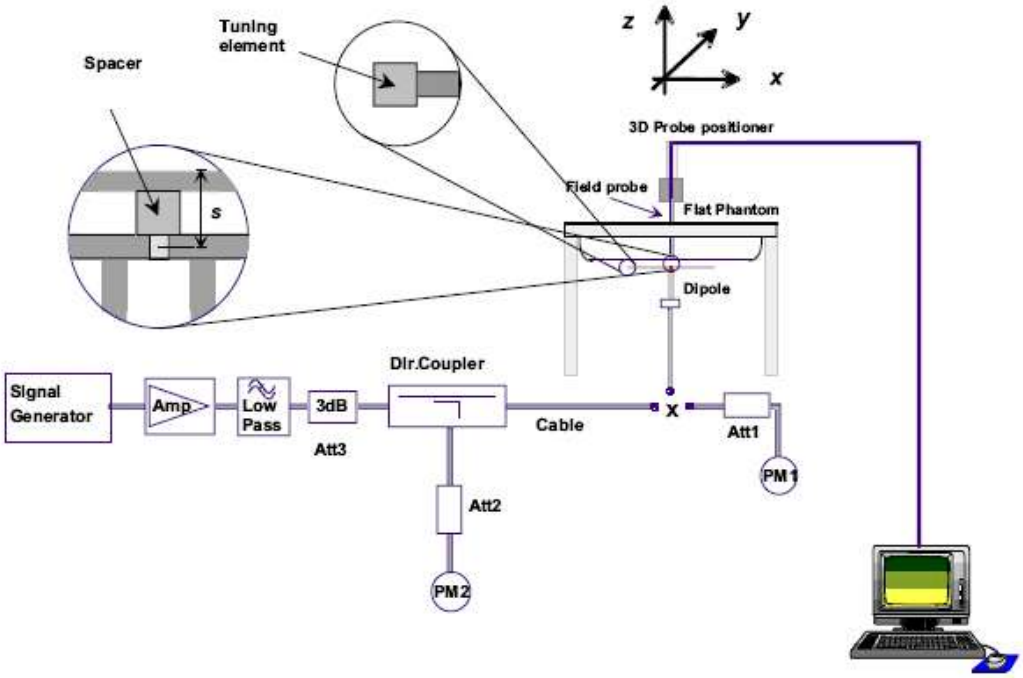
Head Simulating Liquid		Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]					
1850.2 MHz	21.3	Permitivity:	40.00	41.59	3.98	± 5
		Conductivity:	1.40	1.37	-2.14	± 5
1880 MHz		Permitivity:	40.00	41.12	2.80	± 5
		Conductivity:	1.40	1.41	0.71	± 5
1900 MHz		Permitivity:	40.00	40.87	2.17	± 5
		Conductivity:	1.40	1.43	2.14	± 5
1909.8 MHz		Permitivity:	40.00	40.23	0.57	± 5
		Conductivity:	1.40	1.45	3.57	± 5
Body Simulating Liquid		**Parameters**	**Target**	**Measured**	**Deviation[%]**	**Limited[%]**
Frequency	Temp. [°C]					
1850.2 MHz	21.3	Permitivity:	53.30	54.51	2.27	± 5
		Conductivity:	1.52	1.48	-2.63	± 5
1880 MHz		Permitivity:	53.30	53.16	-0.26	± 5
		Conductivity:	1.52	1.53	0.66	± 5
1900 MHz		Permitivity:	53.30	53.00	-0.56	± 5
		Conductivity:	1.52	1.55	1.97	± 5
1909.8 MHz		Permitivity:	53.30	52.46	-1.58	± 5
		Conductivity:	1.52	1.56	2.63	± 5

5. SAR System Validation

5.1 Validation System

Each SATIMO system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the SATIMO software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



5.2 Validation Result

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %.

Freq.(MHz)	Power (mW)	Tested Value (W/Kg)	Normalized SAR (W/kg)	Target (W/Kg)	Limited[%]	Ambient Temperature (°C)	Relative Humidity (%)	Date
835 Head	63.1	0.568	9.088	9.63	8.667-10.593	20.4	21.8	2015-03-26
835 Body	63.1	0.579	9.264	9.93	8.937-10.923	20.4	21.8	2015-03-26
1900 Head	63.1	2.660	42.56	39.84	35.856-43.824	21.0	55.1	2015-03-27
1900 Body	63.1	2.712	43.392	43.33	38.997-47.663	21.0	55.1	2015-03-27

Note: The tolerance limit of System validation ±10%.

6. SAR Evaluation Procedures

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the SAM twin phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at $1mm^2$) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at $1mm^3$).

When multiple peak SAR location were found during the same configuration or test mode, Zoom scan shall performed on each peak SAR location, only the peak point with maximum SAR value will be reported for the configuration or test mode.

Area Scan& Zoom Scan

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a $10mm^2$ step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments. In this report, Area Scan: dx=8mm dy=8mm

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003 and relevant KDB files, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. A density of 1000 kg/m^3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 8mmx8mmx5mm providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

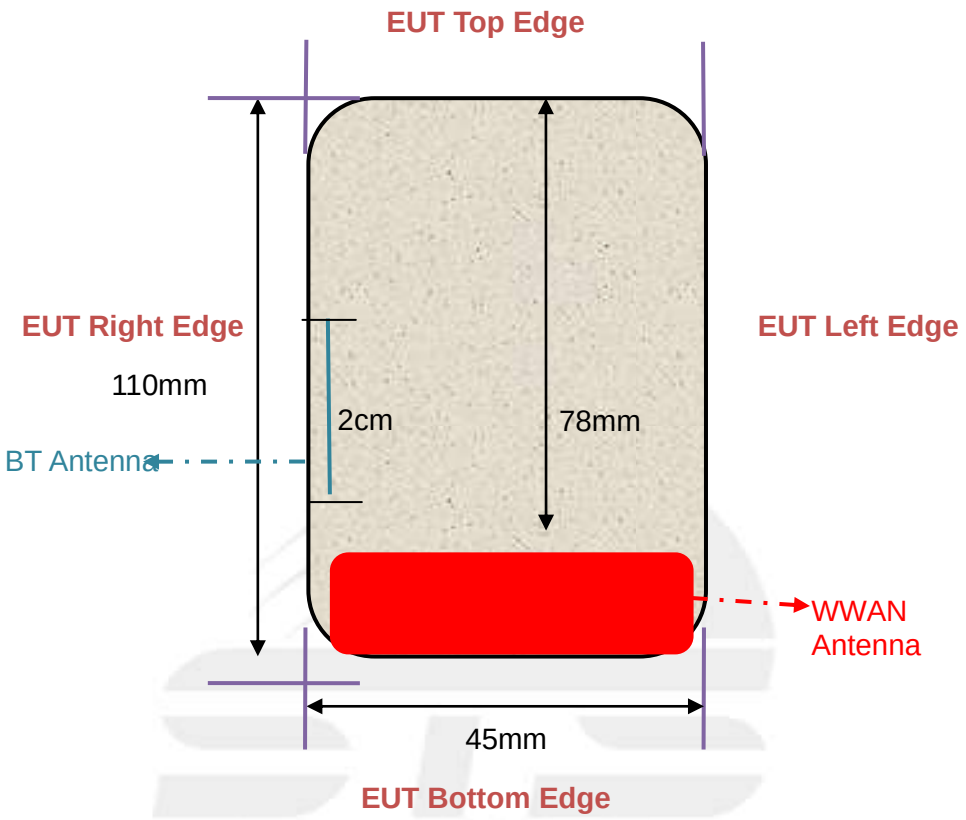
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7. EUT Antenna Location Sketch

It is a GSM Mobile Phone, support GSM mode.

Antenna Location:



7.1 SAR TEST EXCLUSION CONSIDER TABLE

For WWAN mode:

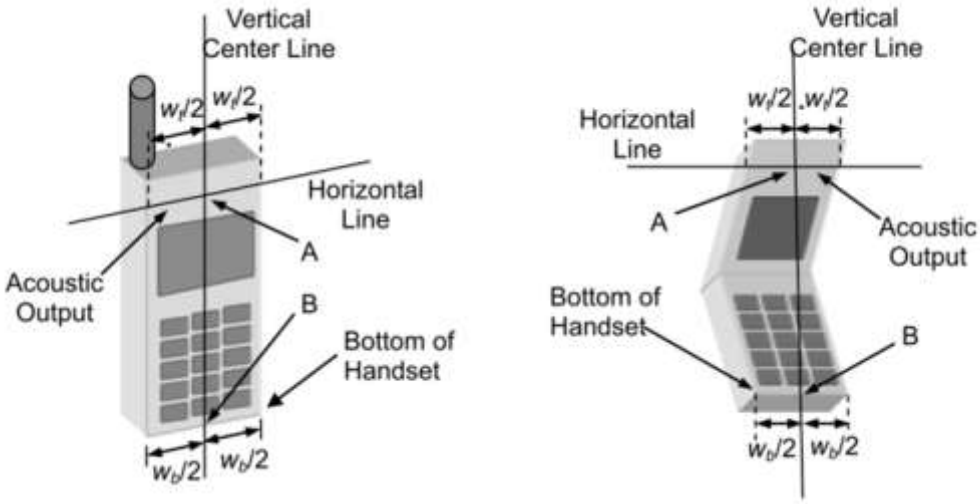
Test Configurations	Antenna to edges/surface	SAR required
Back	<25mm	Yes
Front	<25mm	Yes
Edge 1 (Top)	78mm	No
Edge 2 (Right)	3 mm	Yes
Edge 3 (Bottom)	3 mm	Yes
Edge 4 (Left)	3 mm	Yes

8. EUT Test Position

This EUT was tested in Right Cheek, Right Titled, Left Cheek, Left Titled Front Face and Rear Face and 4 edges.

8.1 Define Two Imaginary Lines On The Handset

(1)The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.
(2)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.
(3)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 to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



Cheek Position
1)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 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.
2)To move the device towards the phantom with the ear piece aligned with the the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with 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

Title Position

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

(2) While maintaining the device in 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 with the ear is lost.

Body-worn Position Conditions

(1) To position the EUT parallel to the phantom surface.

(2) To adjust the EUT parallel to the flat phantom.

(3) To adjust the distance between the EUT surface and the flat phantom to 5mm.

9. Measurement Uncertainty

9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2003.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

NO	Source	Tol(%)	Prob. Dist.	Div. k	ci (1g)	ci (10g)	1gUi	10gUi	Veff
Measurement System									
1	Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
2	Axial isotropy	3.5	R	√3	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.43	1.43	∞
3	Hemispherical isotropy	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
4	Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
5	Linearity	4.7	R	√3	1	1	2.71	2.71	∞
6	System Detection limits	1.0	R	√3	1	1	0.58	0.58	∞
7	Readout electronics	0.5	N	1	1	1	0.50	0.50	∞
8	Response time	0	R	√3	1	1	0	0	∞
9	Integration time	1.4	R	√3	1	1	0.81	0.81	∞
10	Ambient noise	3.0	R	√3	1	1	1.73	1.73	∞
11	Ambient reflections	3.0	R	√3	1	1	1.73	1.73	∞
12	Probe positioner mech. restrictions	1.4	R	√3	1	1	0.81	0.81	∞
13	Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
14	Max.SAR evaluation	1.0	R	√3	1	1	0.6	0.6	∞
Test sample related									

15	Device positioning	2.6	N	1	1	1	2.6	2.6	11
16	Device holder	3	N	1	1	1	3.0	3.0	7
17	Drift of output power	5.0	R	√3	1	1	2.89	2.89	∞
Phantom and set-up									
18	Phantom uncertainty	4.0	R	√3	1	1	2.31	2.31	∞
19	Liquid conductivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	5
20	Liquid conductivity (meas)	4	N	1	0.23	0.26	0.92	1.04	5
21	Liquid Permittivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	∞
22	Liquid Permittivity (meas)	5.0	N	1	0.23	0.26	1.15	1.30	∞
Combined standard			RSS	$U_C = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			10.63%	10.54%	
Expanded uncertainty (P=95%)		$U = k\ U_C$,k=2					21.26%	21.08%	

9.2 System cheek Uncertainty

NO	Source	Tol(%)	Prob. Dist.	Div. k	ci (1g)	ci (10g)	1gUi	10gUi	Veff
Measurement System									
1	Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
2	Axial isotropy	3.5	R	√3	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.43	1.43	∞
3	Hemispherical isotropy	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
4	Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
5	Linearity	4.7	R	√3	1	1	2.71	2.71	∞
6	System Detection limits	1.0	R	√3	1	1	0.58	0.58	∞
7	Modulation response	0	N	1	1	1	0	0	∞
8	Readout electronics	0.5	N	1	1	1	0.50	0.50	∞
9	Response time	0	R	√3	1	1	0	0	∞
10	Integration time	1.4	R	√3	1	1	0.81	0.81	∞
11	Ambient noise	3.0	R	√3	1	1	1.73	1.73	∞
12	Ambient reflections	3.0	R	√3	1	1	1.73	1.73	∞
13	Probe positioner mech. restrictions	1.4	R	√3	1	1	0.81	0.81	∞
14	Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
15	Max.SAR evaluation	1.0	R	√3	1	1	0.6	0.6	∞
Dipole									

16	Deviation of experimental source from numerical source	4	N	1	1	1	4.00	4.00	∞
17	Input power and SAR drit measurement	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
18	Dipole Axis to liquid Distance	2	R	$\sqrt{3}$	1	1			∞
Phantom and set-up									
19	Phantom uncertainty	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
20	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	2.0	N	1	1	0.84	2	1.68	∞
21	Liquid conductivity (target)	2	N	1	1	0.84	2.00	1.68	∞
22	Liquid conductivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
23	Liquid conductivity (meas)	4	N	1	0.23	0.26	0.92	1.04	5
24	Liquid Permittivity (target)	2.5	N	1	0.78	0.71	1.95	1.78	∞
25	Liquid Permittivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
26	Liquid Permittivity (meas)	5.0	N	1	0.23	0.26	1.15	1.30	∞
Combined standard			RSS	$U_C = \sqrt{\sum_{i=1}^{n} C_i^2 U_i^2}$			10.15%	10.05%	
Expanded uncertainty (P=95%)		$U = k\ U_C$,k=2					21.29%	21.10%	

10. Conducted Power Measurement

SIM 1 Card
GSM BAND

Mode	Frequency (MHz)	Peak Power	Avg. Burst Power(dBm)	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850	824.2	**32.44**	**31.86**	-9	22.86
	836.6	32.37	31.81	-9	22.81
	848.8	32.33	31.77	-9	22.77
GPRS850 (1 Slot)	824.2	31.78	31.29	-9	22.29
	836.6	31.72	31.26	-9	22.26
	848.8	31.71	31.25	-9	22.25
GPRS850 (2 Slot)	824.2	30.64	30.17	-6	24.17
	836.6	30.59	30.12	-6	24.12
	848.8	30.56	30.08	-6	24.08
GPRS850 (3 Slot)	824.2	28.87	28.38	-4.26	24.12
	836.6	28.85	28.36	-4.26	24.1
	848.8	28.82	28.33	-4.26	24.07
GPRS850 (4 Slot)	824.2	27.76	27.24	-3	**24.24**
	836.6	27.75	27.22	-3	24.22
	848.8	27.69	27.18	-3	24.18
GSM1900	1850.2	**28.76**	**28.33**	-9	19.33
	1880	28.72	28.31	-9	19.31
	1909.8	28.71	28.28	-9	19.28
GPRS1900 (1 Slot)	1850.2	28.64	28.23	-9	19.23
	1880	28.61	28.21	-9	19.21
	1909.8	28.59	28.06	-9	19.06
GPRS1900 (2 Slot)	1850.2	27.83	27.41	-6	21.41
	1880	27.81	27.38	-6	21.38
	1909.8	27.72	27.36	-6	21.36
GPRS1900 (3 Slot)	1850.2	25.86	25.45	-4.26	21.19
	1880	25.82	25.44	-4.26	21.18
	1909.8	25.75	25.37	-4.26	21.11
GPRS1900 (4 Slot)	1850.2	24.83	24.42	-3	**21.42**
	1880	24.81	24.37	-3	21.37
	1909.8	24.75	24.34	-3	21.34

Note 1:
The Frame Power (Source-based time-averaged Power) is scaled the maximum burst average power based on time slots. The calculated methods are show as following:
Frame Power = Max burst power (1 Up Slot) – 9 dB
Frame Power = Max burst power (2 Up Slot) – 6 dB
Frame Power = Max burst power (3 Up Slot) – 4.26 dB
Frame Power = Max burst power (4 Up Slot) – 3 dB

GSM Card 2 Slot:

GSM 850:

Mode	Frequency (MHz)	Peak Power	AVG Power
GSM850	824.2	**32.33**	**31.81**
	836.6	32.29	31.76
	848.8	32.25	31.72
GPRS850 (1 Slot)	824.2	31.61	31.21
	836.6	31.57	31.16
	848.8	31.54	31.15
GPRS850 (2 Slot)	824.2	30.69	30.23
	836.6	30.65	30.18
	848.8	30.64	30.16
GPRS850 (3 Slot)	824.2	28.87	28.38
	836.6	28.83	28.35
	848.8	28.81	28.31
GPRS850 (4 Slot)	824.2	27.78	27.27
	836.6	27.76	27.24
	848.8	27.72	27.22

PCS 1900:

Mode	Frequency (MHz)	Peak Power	AVG Power
GSM1900	1850.2	**28.66**	**28.15**
	1880	28.61	28.12
	1909.8	28.59	28.08
GPRS1900 (1 Slot)	1850.2	28.23	27.77
	1880	28.18	27.73
	1909.8	28.15	27.68
GPRS1900 (2 Slot)	1850.2	27.72	27.24
	1880	27.71	27.22
	1909.8	27.68	27.18
GPRS1900 (3 Slot)	1850.2	25.76	25.25
	1880	25.74	25.23
	1909.8	25.67	25.19
GPRS1900 (4 Slot)	1850.2	24.86	24.41
	1880	24.84	24.38
	1909.8	24.81	24.33

Bluetooth

Mode	Channel Number	Frequency (MHz)	Peak Power (dBm)
GFSK(1M)	0	2402	0.53
	39	2441	1.08
	78	2480	**1.26**
π/4-DQPSK(2Mbps)	0	2402	0.09
	39	2441	0.64
	78	2480	0.72
8-DPSK(3Mbps)	0	2402	0.07
	39	2441	0.50
	78	2480	0.73

11. EUT And Test Setup Photo

11.1 EUT Photo

Front side

Back side

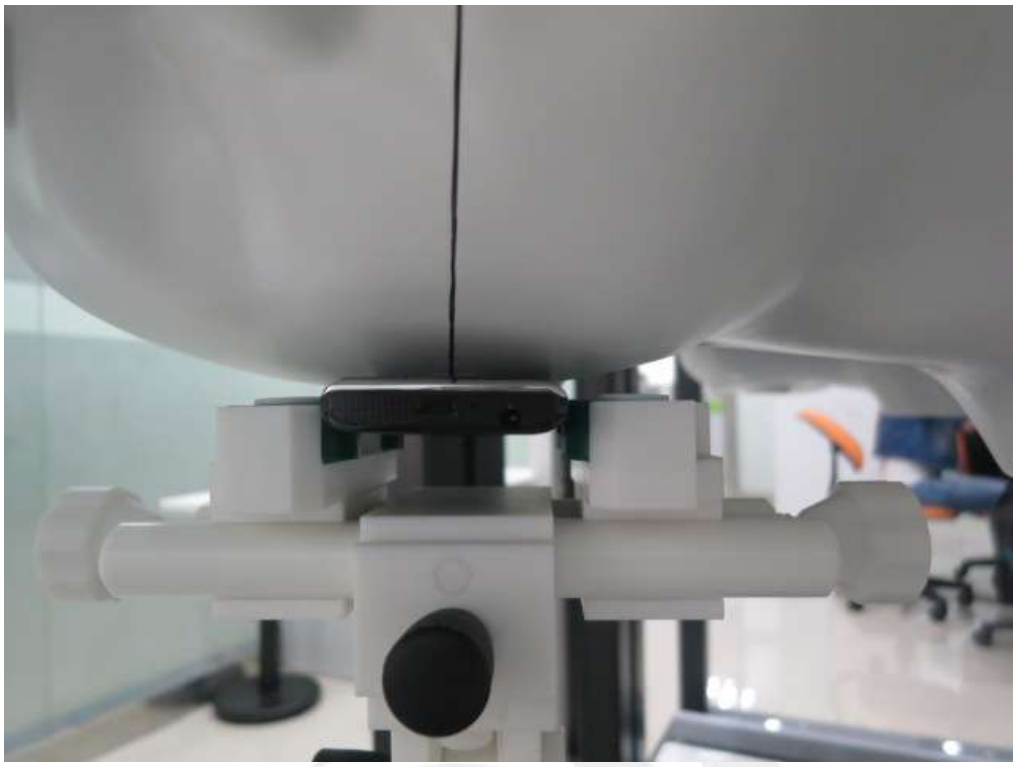
Top side

Bottom side

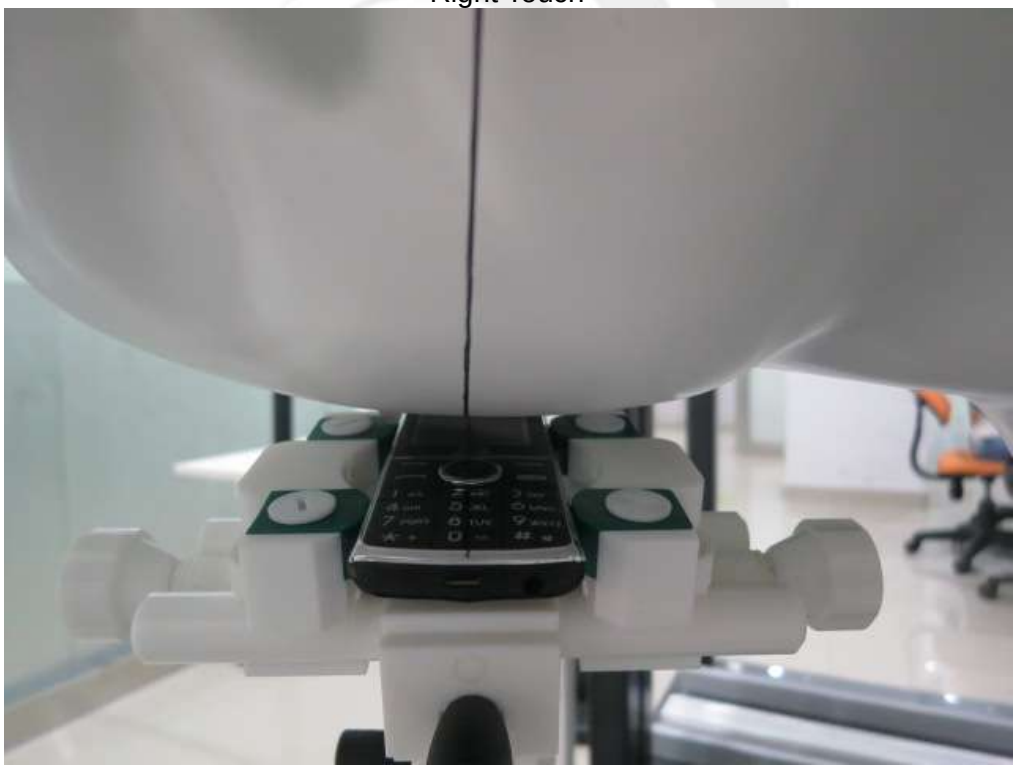
Left side

Right side

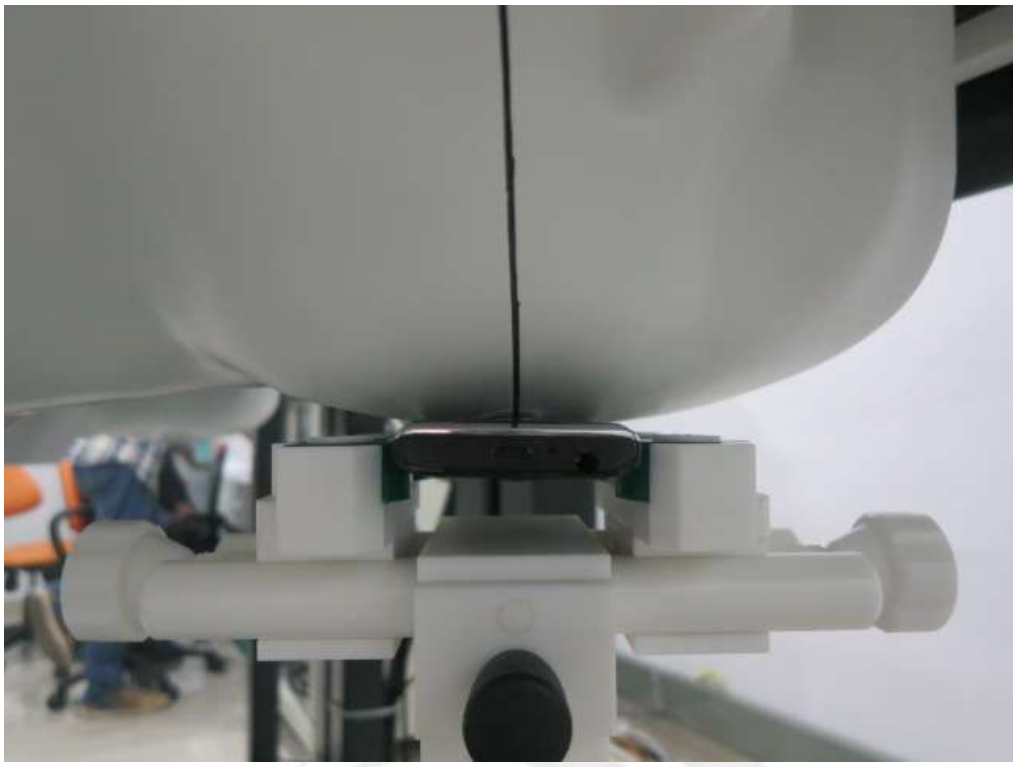
11.2 Setup Photo



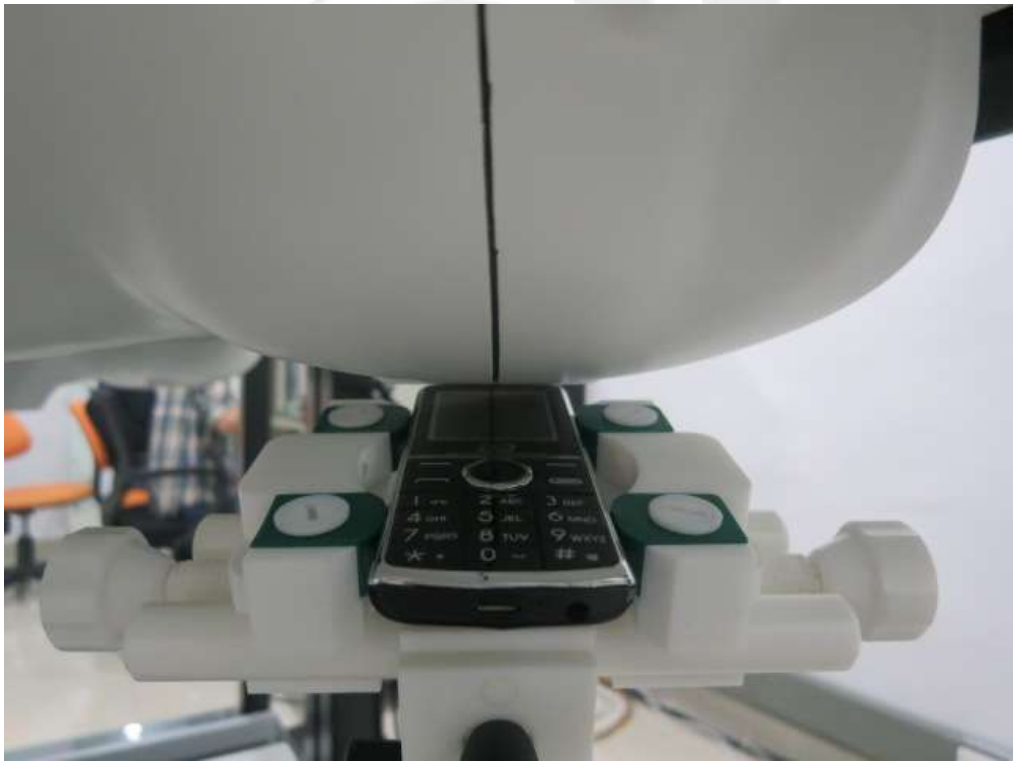
Right Touch



Right Tilt



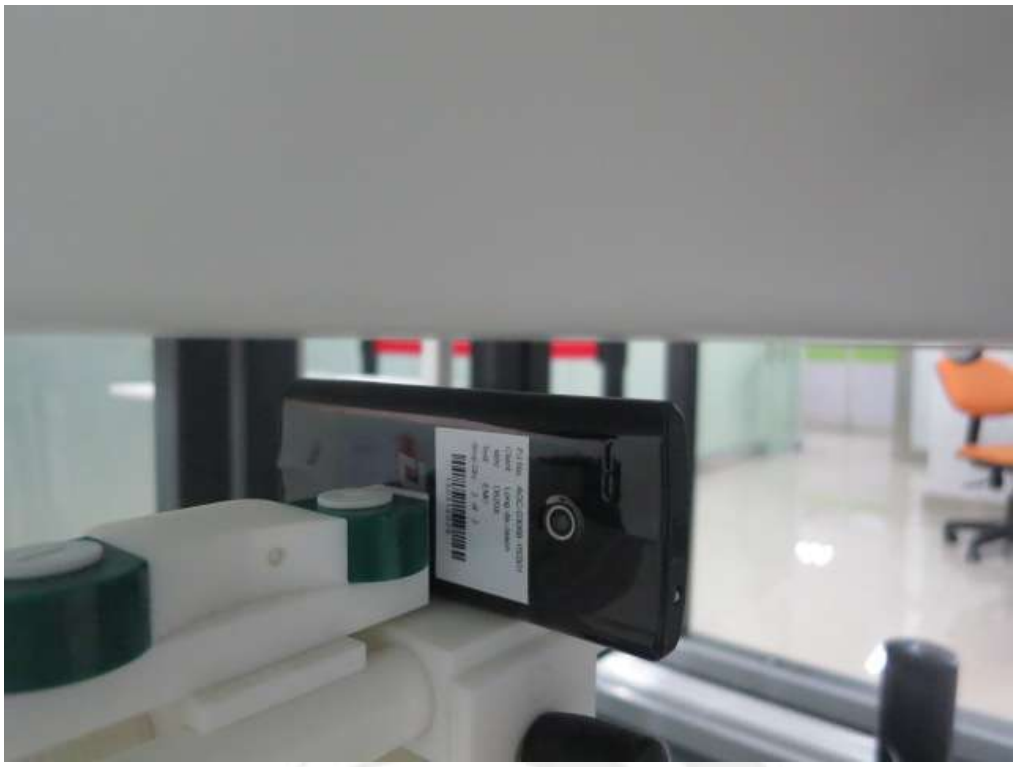
Left Touch



Left Tilt

Body Front side 10mm

Body Back side 10mm



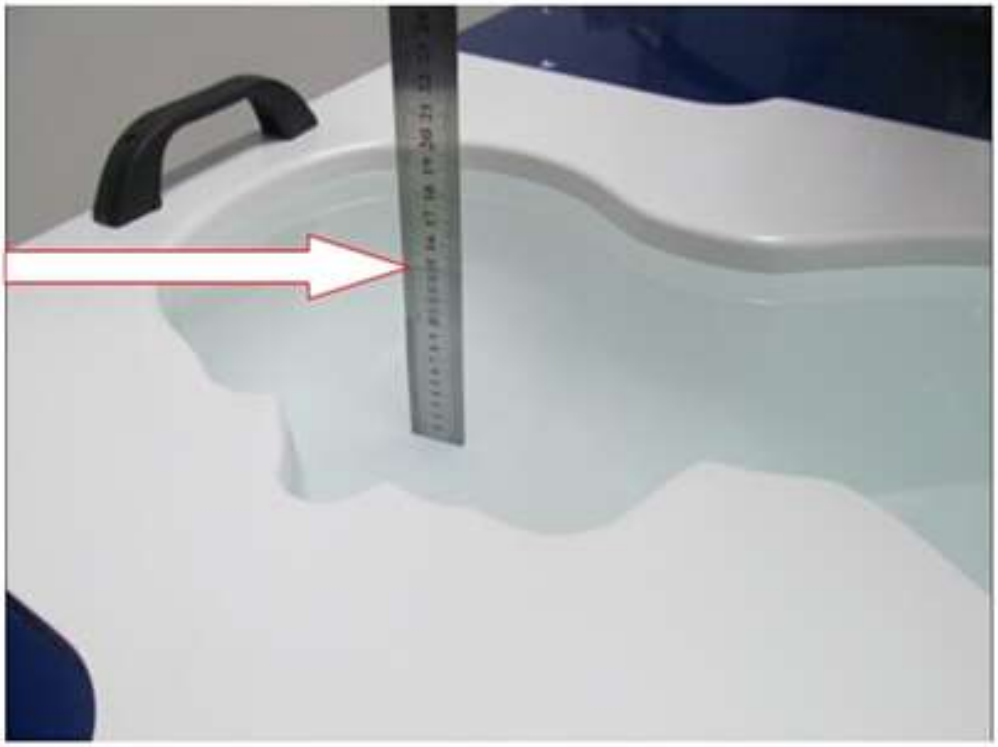
Body left side

Body Right side

Body top side

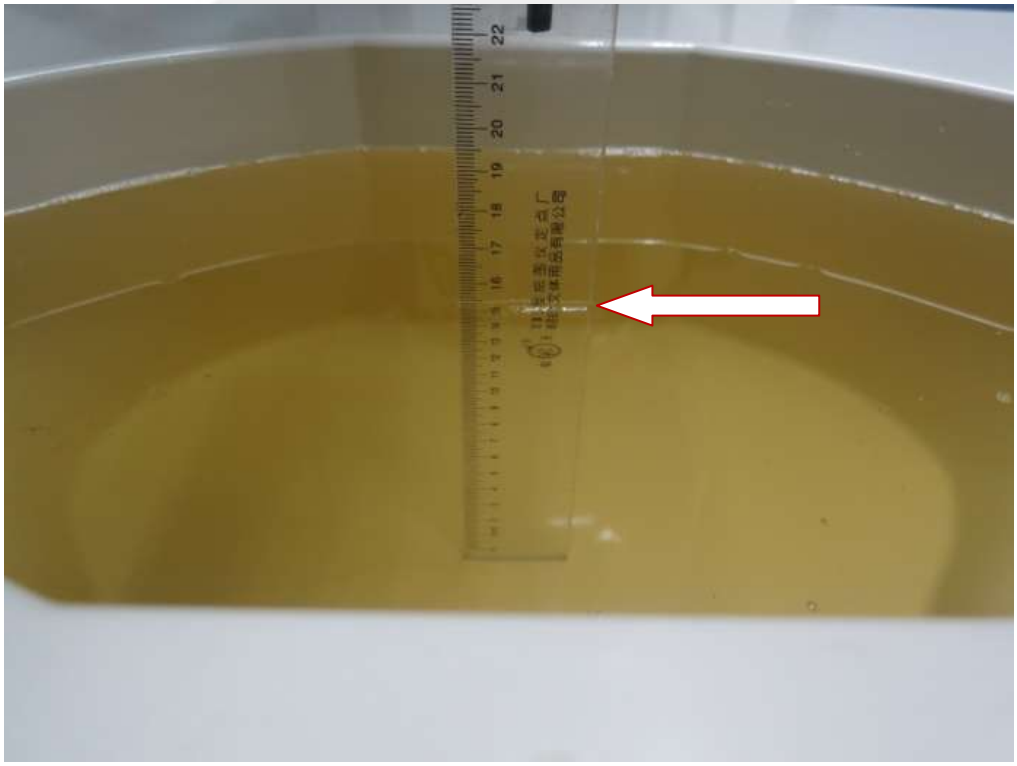
Body bottom side

Head Liquid depth at 850 MHz (15.2cm)



Head Liquid depth at 1900 MHz (15.1cm)

Body Liquid depth at 850 MHz (15.3 cm)



Body Liquid depth at 1900 MHz (15.2 cm)

12. SAR Result Summary

12.1 Head SAR

Band	Mode	Test Position	Channel	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	Voice	Right Cheek	CH 190	**0.647**	-0.28	33.0	31.81	**0.851**	1
		Right Tilt	CH 190	0.258	0.85	33.0	31.81	0.339	2
		Left Cheek	CH 190	0.616	-0.63	33.0	31.81	0.810	3
		Left Tilt	CH 190	0.334	0.21	33.0	31.81	0.439	4
	GPRS Data-4 Slot	Right Cheek	CH 128	0.609	-0.26	28.0	27.24	0.725	5
		Right Cheek	CH 190	0.753	-1.32	28.0	27.22	0.901	6
		Right Cheek	CH 251	0.970	0.69	28.0	27.18	1.172	7
		Right Tilt	CH 190	0.417	0.25	28.0	27.22	0.499	8
		Left Cheek	CH 128	0.756	-0.96	28.0	27.24	0.901	9
		Left Cheek	CH 190	0.821	-0.15	28.0	27.22	0.983	10
		Left Cheek	CH 251	**0.989**	1.02	28.0	27.18	**1.195**	11
		Left Tilt	CH 190	0.425	0.58	28.0	27.22	0.509	12
GSM1900	Voice	Right Cheek	CH 661	**0.557**	0.63	30.0	28.31	**0.822**	13
		Right Tilt	CH 661	0.047	0.15	30.0	28.31	0.069	14
		Left Cheek	CH 661	0.447	-0.93	30.0	28.31	0.660	15
		Left Tilt	CH 661	0.049	-0.45	30.0	28.31	0.072	16
	GPRS Data-4 Slot	Right Cheek	CH 661	**0.672**	1.23	25.0	24.37	**0.777**	17
		Right Tilt	CH 661	0.059	-1.95	25.0	24.37	0.068	18
		Left Cheek	CH 661	0.564	-1.58	25.0	24.37	0.652	19
		Left Tilt	CH 661	0.053	0.74	25.0	24.37	0.061	20

12.2Body SAR and Hotspot

Band	Mode	Test Position	Channel	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	Voice	Front side	CH 190	0.431	-0.25	33.0	31.81	0.567	21
		Back side	CH 128	0.730	0.64	33.0	31.86	0.949	22
		Back side	CH 190	**0.765**	-0.92	33.0	31.81	**1.006**	23
		Back side	CH 251	0.756	0.25	33.0	31.77	1.004	24
	GPRS Data-4 Slot	Front side	CH 190	0.343	0.65	28.0	27.22	0.410	25
		Back side	CH 128	0.761	0.16	28.0	27.24	0.907	26
		Back side	CH 190	**0.807**	-0.46	28.0	27.22	**0.966**	27
		Back side	CH 251	0.781	-1.15	28.0	27.18	0.943	28
		Left side	CH 190	0.023	-0.49	28.0	27.22	0.028	29
		Right side	CH 190	0.462	1.15	28.0	27.22	0.553	30
		Top side	CH 190	0.323	0.10	28.0	27.22	0.387	31
		Bottom side	CH 190	0.259	1.23	28.0	27.22	0.310	32
GSM1900	Voice （body-worn）	Front side	CH 661	0.113	0.18	30.0	28.31	0.167	33
		Back side	CH 661	**0.323**	0.23	30.0	28.31	**0.477**	34
	GPRS Data-4 Slot	Front side	CH 661	0.166	0.84	25.0	24.37	0.192	35
		Back side	CH 661	**0.496**	-0.31	25.0	24.37	**0.573**	36
		Left side	CH 661	0.031	1.96	25.0	24.37	0.036	37
		Right side	CH 661	0.247	-0.02	25.0	24.37	0.286	38
		Top side	CH 661	0.099	0.56	25.0	24.37	0.114	39
		Bottom side	CH 661	0.258	0.41	25.0	24.37	0.298	40

Summary of Measurement Results (SIM 2 Card)

Band	Mode	Test Position	Channel	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Left Cheek	CH 251	0.970	-0.41	28.0	27.18	1.172	41
GSM1900	GPRS Data-4 Slot	Right Cheek	CH 661	0.638	1.36	25.0	24.37	0.738	42

Summary of Measurement Results (Repeated SAR)

Band	Mode	Test Position	Channel	Once SAR (1g) (W/kg)	Twice SAR (1g) (W/kg)	Third SAR (1g) (W/kg)	Limit W/kg	Meas. No.
GSM 850	GPRS Data-4 Slot	Left Cheek	CH 251	0.968	-	-	1.6	43
GSM 850	GPRS Data-4 Slot	Back side	CH 190	0.784	-	-	1.6	44

Simultaneous Multi-band Transmission Evaluation:

Application Simultaneous Transmission information:

NO	Simultaneous state	Portable Handset			Note
		Head	Body-worn	Hotspot	
1	GSM(voice)+Bluetooth(data)	Yes	Yes	-	-
2	GPRS (Data)+Bluetooth(data)	Yes	Yes	-	-

NOTE:

1. Simultaneous with every transmitter must be the same test position.
2. KDB 447498 D01, BT SAR is excluded as below table.
3. KDB 447498 D01, for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user; which is 0mm for head SAR and 10mm for body-worn SAR.
4. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
5. According to KDB447497 D01 4.3.2, simultaneous transmission SAR test exclusion is as follow:
   (1) Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.
   (2) Any transmitters and antennas should be considered when calculating simultaneous mode.
   (3) For mobile phone and PC, it's the sum of all transmitters and antennas at the same mode with same position in each applicable exposure condition
   (4) When the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the 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.
6. When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion. The ratio is determined by (SAR1 + SAR2)1.5/Ri, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

Estimated SAR		Maximum Peak Power		Antenna to user(mm)	Frequency(GHz)	Stand alone SAR(1g) [W/kg]
		dBm	mW			
BT	Head	2	1.585	5	2.480	0.067
	Body			10	2.480	0.033

Maximum test results (WWAN) with BT SAR:

BT: Head (0 cm gap): 0.067 W/kg and Body (0cm gap): 0.033 W/kg

Sum of the SAR for GSM 850 & BT:

RF Exposure Conditions	Test Position	Simultaneous Transmission Scenario		Σ1-g SAR (W/Kg)
		GSM 850 Band	Bluetooth	
Head (voice)	Right Cheek	0.851	0.067	0.918
	Right Tilt	0.339	0.067	0.406
	Left Cheek	0.810	0.067	0.877
	Left Tilt	0.439	0.067	0.506
Head (Data)	Right Cheek	1.172	0.067	1.239
	Right Tilt	0.499	0.067	0.566
	Left Cheek	1.195	0.067	1.262
	Left Tilt	0.509	0.067	0.576
Body-worn	Front	0.567	0.033	0.600
	Rear	1.006	0.033	1.039
GPRS	Front	0.410	0.033	0.443
	Rear	0.966	0.033	0.999
	Left side	0.028	0.033	0.061
	Right side	0.553	0.033	0.586
	Top side	0.387	0.033	0.420
	Bottom side	0.310	0.033	0.343

Sum of the SAR for GSM 1900 & BT:

RF Exposure Conditions	Test Position	Simultaneous Transmission Scenario		Σ1-g SAR (W/Kg)
		GSM 1900 Band	Bluetooth	
Head (voice)	Right Cheek	0.822	0.067	0.889
	Right Tilt	0.069	0.067	0.136
	Left Cheek	0.660	0.067	0.727
	Left Tilt	0.072	0.067	0.139
Head (Data)	Right Cheek	0.777	0.067	0.844
	Right Tilt	0.068	0.067	0.135
	Left Cheek	0.652	0.067	0.719
	Left Tilt	0.061	0.067	0.128
Body-worn	Front	0.167	0.033	0.200
	Rear	0.477	0.033	0.510
GPRS	Front	0.192	0.033	0.225
	Rear	0.573	0.033	0.606
	Left side	0.036	0.033	0.069
	Right side	0.286	0.033	0.319
	Top side	0.114	0.033	0.147
	Bottom side	0.298	0.033	0.331

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR-1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR-1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

13. Equipment List

NO.	Instrument	Manufacturer	Model	S/N	Cal. Date	Cal. Due Date
1	835MHz Dipole	SATIMO	SID835	SN 30/14 DIP0G835-332	2014.09.01	2015.08.31
2	1900MHz Dipole	SATIMO	SID1900	SN 30/14 DIP1G900-333	2014.09.01	2015.08.31
3	E-Field Probe	SATIMO	SSE5	SN 17/14 EP221	2014.09.01	2015.08.31
4	Antenna	SATIMO	ANTA3	SN 07/13 ZNTA52	2014.09.01	2015.08.31
5	Waveguide	SATIMO	SWG5500	SN 13/14 WGA32	2014.09.01	2015.08.31
6	Phantom	SATIMO	SAM	SN_4511_SAM90	2014.09.01	2015.08.31
7	SAR TEST BENCH	SATIMO	Tablet POSITIONNING SYSTEM	SN 32/14 MSH97	2014.09.01	--
8	SAR TEST BENCH	SATIMO	LAPTOP POSITIONNING SYSTEM	SN 32/14 LSH29	2014.09.01	2015.08.31
9	Dielectric Probe Kit	SATIMO	SCLMP	SN 32/14 OCPG52	2014.09.01	2015.08.31
10	Multi Meter	Keithley	Multi Meter 2000	4050073	2014.11.20	2015.11.19
11	Signal Generator	R&S	SMF100A	104260	2014.10.27	2015.10.26
12	Power Meter	R&S	NRP	100510	2014.10.25	2015.10.24
13	Power Sensor	R&S	NRP-Z11	101919	2014.10.25	2015.10.24
14	Network Analyzer	R&S	5071C	EMY46103472	2014.12.12	2015.12.11
15	Power Amplifier	SATIMO	ZHL-42W	9638	2014.11.20	2015.11.19
16	Power Meter	R&S	NRP-Z23	US38261498	2014.10.25	2015.10.24
17	Power Sensor	R&S	NRP-Z21	1137.6000.02	2014.10.22	2015.10.21
18	Directional Couple	Werlatone	C5571-10	N/A	2014.10.25	2015.10.24
19	Directional Couple	Werlatone	C6026-10	N/A	2014.10.25	2015.10.24

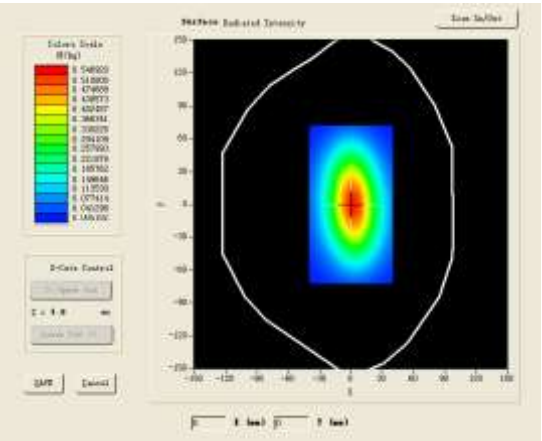
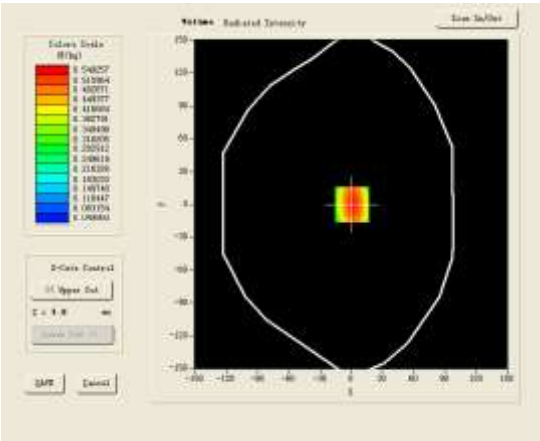
Appendix A. System Validation Plots

System Performance Check Data (835MHz Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2015.03.26
Measurement duration: 13 minutes 25 seconds

Experimental conditions

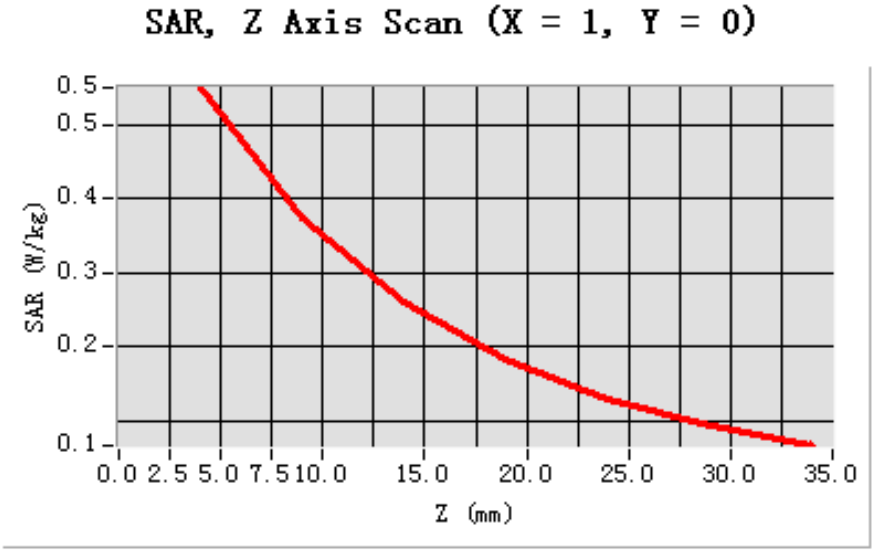
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity (real part)	41.75
Relative permittivity	18.72
Conductivity (S/m)	0.90
Power drift (%)	0.60
Ambient Temperature:	20.4°C
Liquid Temperature:	21.0°C
ConvF:	4.83
Crest factor:	1:1

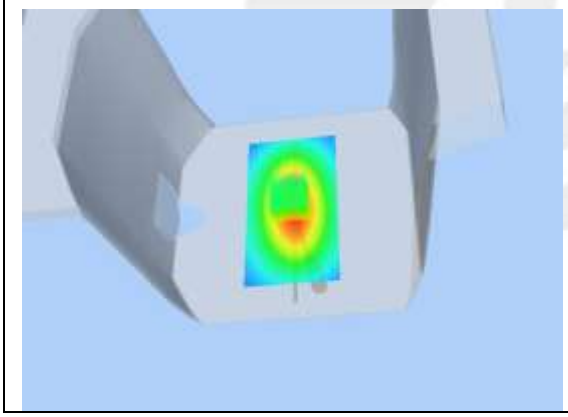
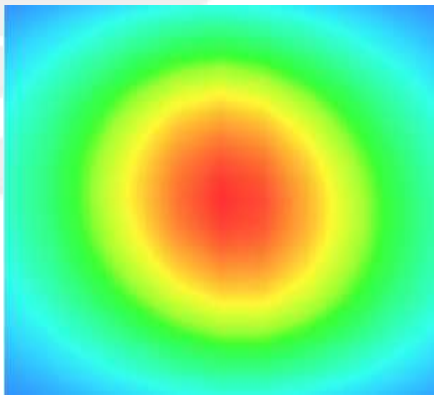
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	0.370682
SAR 1g (W/Kg)	0.568149

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5493	0.3736	0.2606	0.1828	0.1301	0.0928



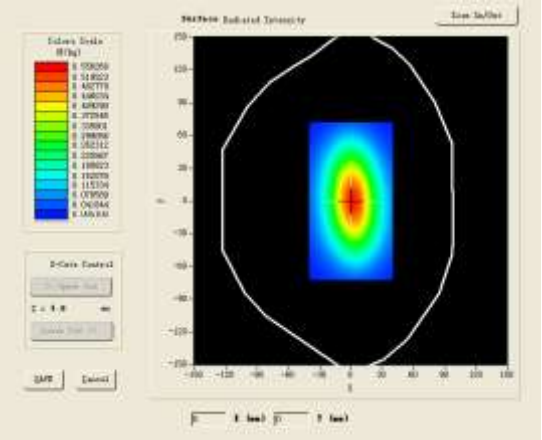
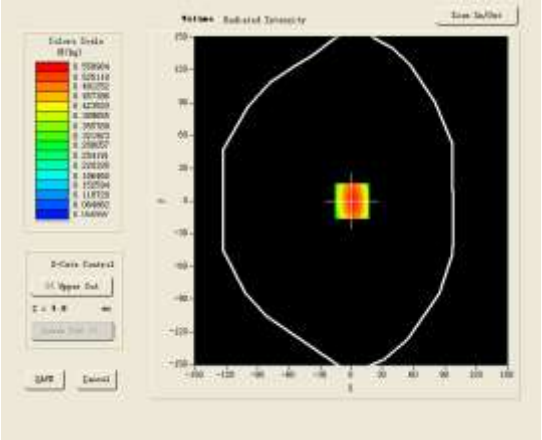
3D screen shot	Hot spot position
	

System Performance Check Data (835MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2015.03.26
Measurement duration: 14 minutes 13 seconds

Experimental conditions.

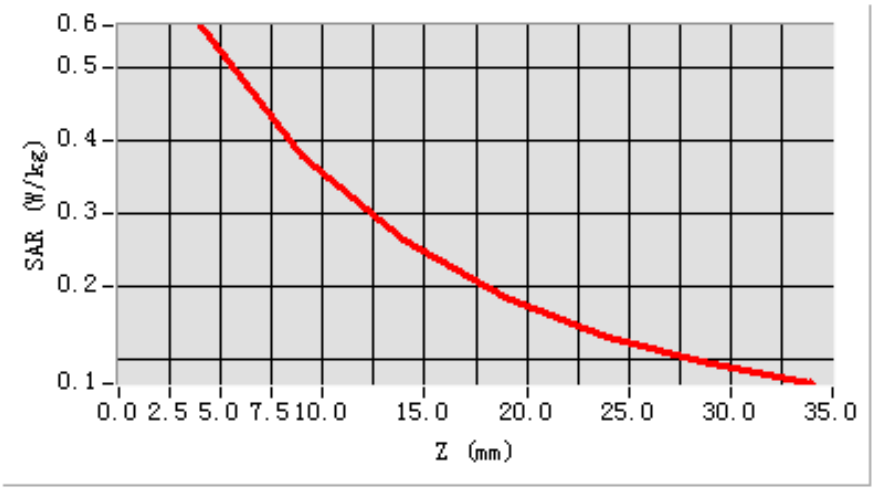
Probe	SN 17/14 EP221
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity (real part)	56.00
Relative permittivity	20.672109
Conductivity (S/m)	0.96
Power drift (%)	-1.03
Ambient Temperature:	20.4˚C
Liquid Temperature:	21.0˚C
ConvF:	5.02
Crest factor:	1:1

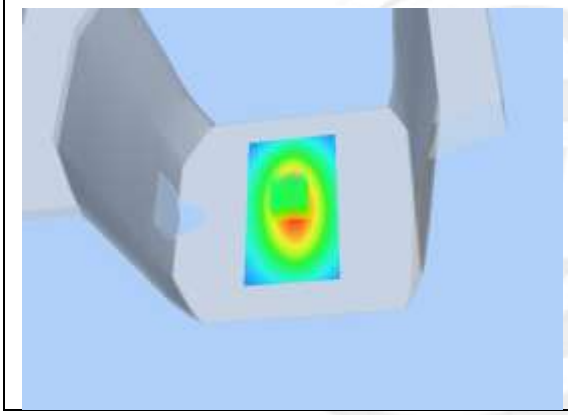
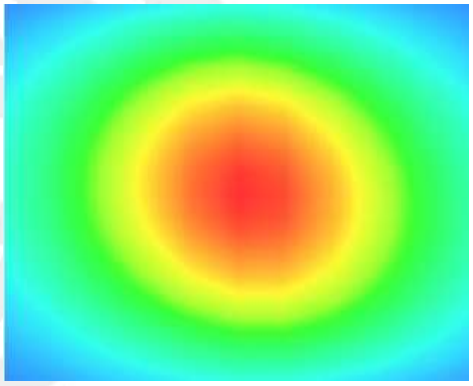
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	0.377963
SAR 1g (W/Kg)	0.578627

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.5590	0.3805	0.2656	0.1862	0.1326	0.0944



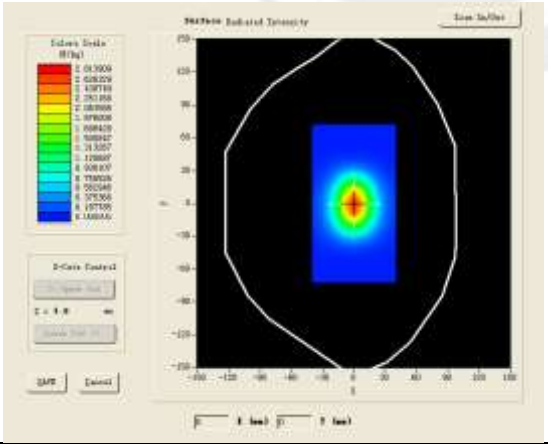
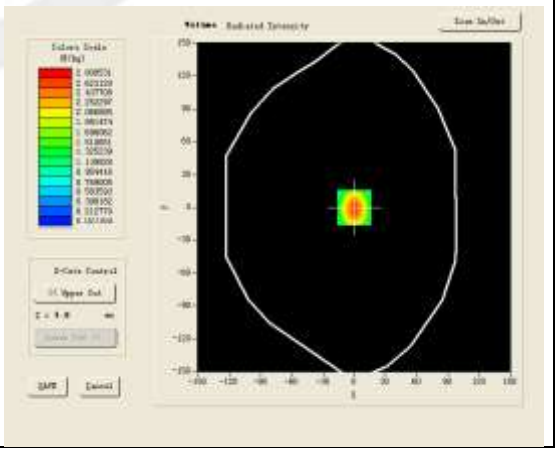
3D screen shot	Hot spot position
	

System Performance Check Data (1900MHz Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2015.03.27
Measurement duration: 14 minutes 12 seconds

Experimental conditions.

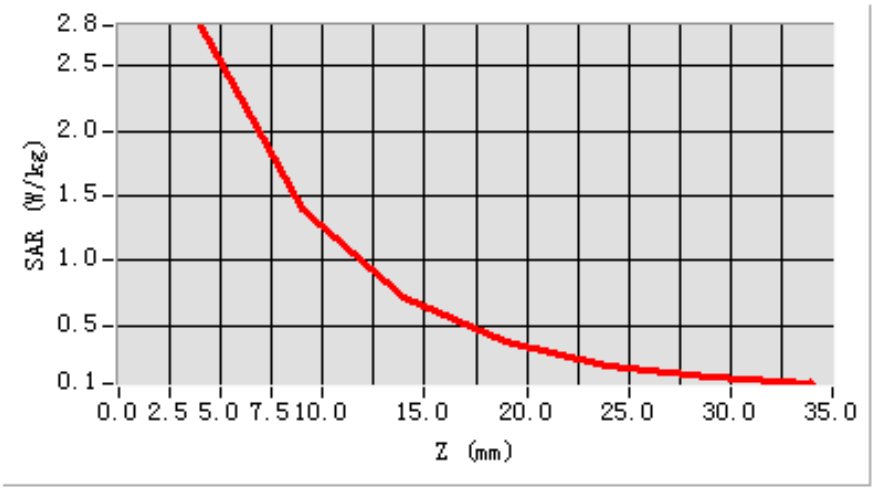
Phantom	Validation plane
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900MHz
Relative permittivity (real part)	40.87
Relative permittivity	13.26
Conductivity (S/m)	1.43
Power drift (%)	0.47
Ambient Temperature:	21.0˚C
Liquid Temperature:	21.3˚C
Probe	SN 17/14 EP221
ConvF:	4.71
Crest factor:	1:1

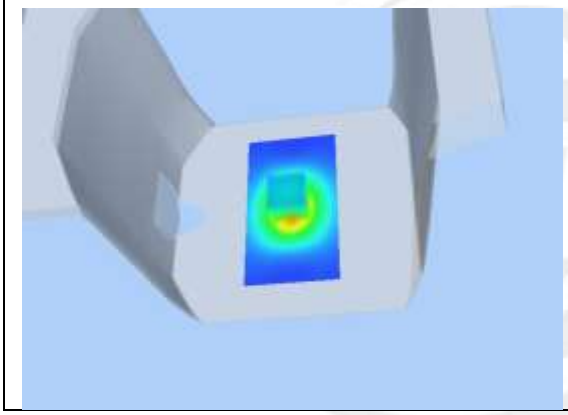
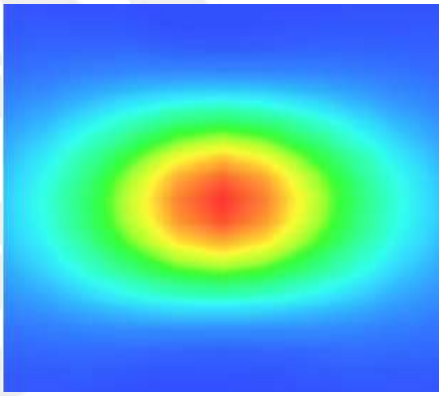
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.327986
SAR 1g (W/Kg)	2.660145

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.8094	1.4035	0.7213	0.3799	0.2016	0.1072



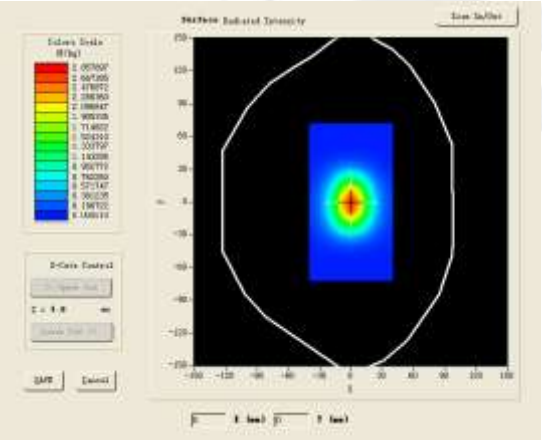
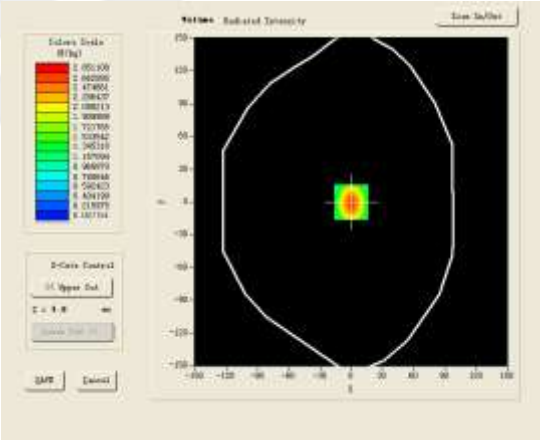
3D screen shot	Hot spot position
	

System Performance Check Data (1900MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2015.03.27
Measurement duration: 14 minutes 46 seconds

Experimental conditions.

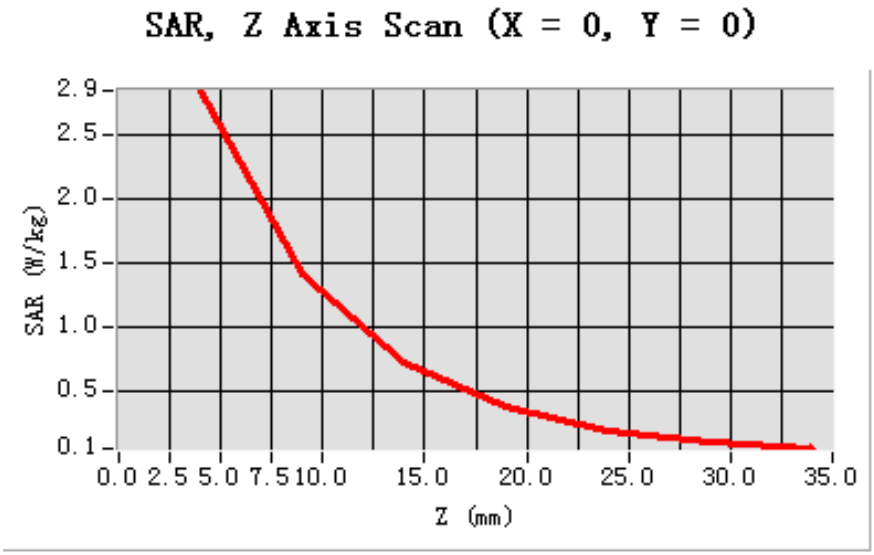
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity (real part)	53.00
Relative permittivity	14.47
Conductivity (S/m)	1.55
Power drift (%)	-0.56
Ambient Temperature:	21.0°C
Liquid Temperature:	21.3°C
Probe	SN 17/14 EP221
ConvF:	4.85
Crest factor:	1:1

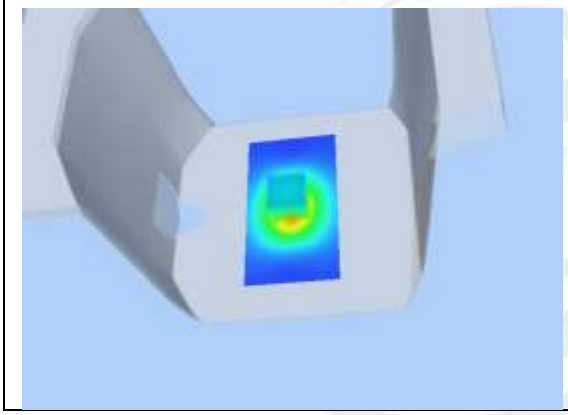
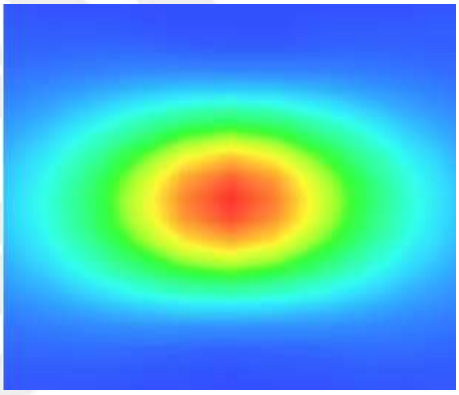
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=0.00

SAR 10g (W/Kg)	1.339157
SAR 1g (W/Kg)	2.711523

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	2.8492	1.4231	0.7396	0.3864	0.2010	0.1089

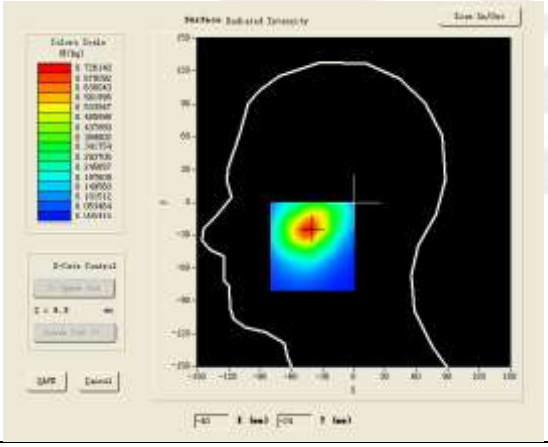
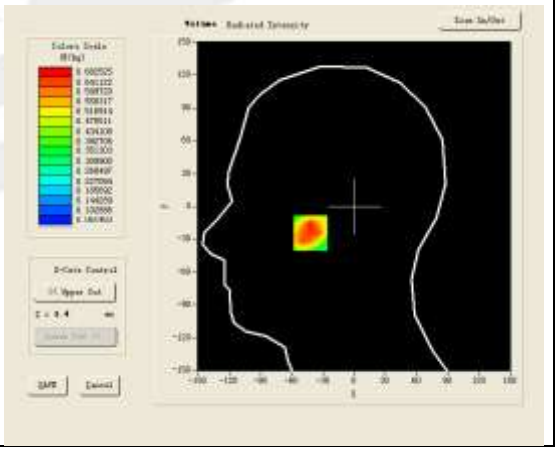


3D screen shot	Hot spot position
	

Appendix B. SAR Test Plots

Plot 1: DUT: Revel Pro; EUT Model: D520X

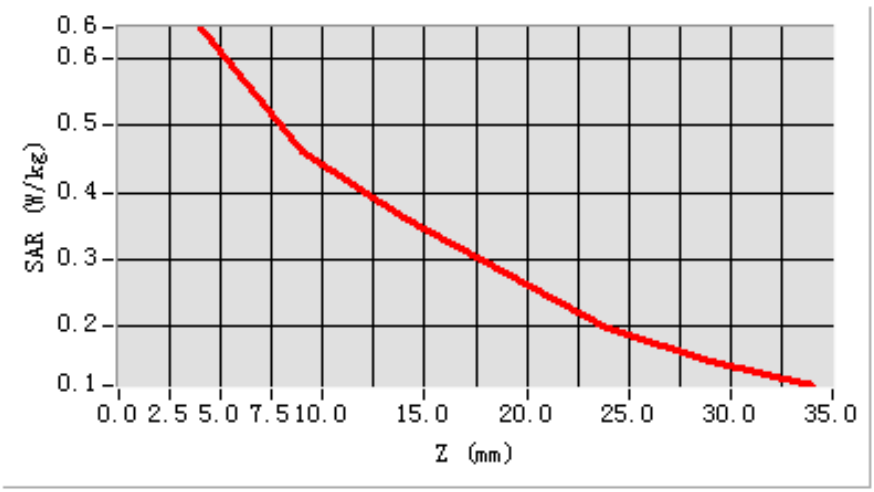
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	4.83
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	40.64
Conductivity (S/m)	0.93
Variation (%)	-0.28

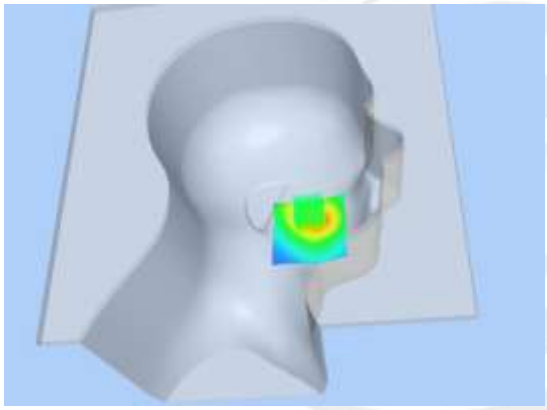
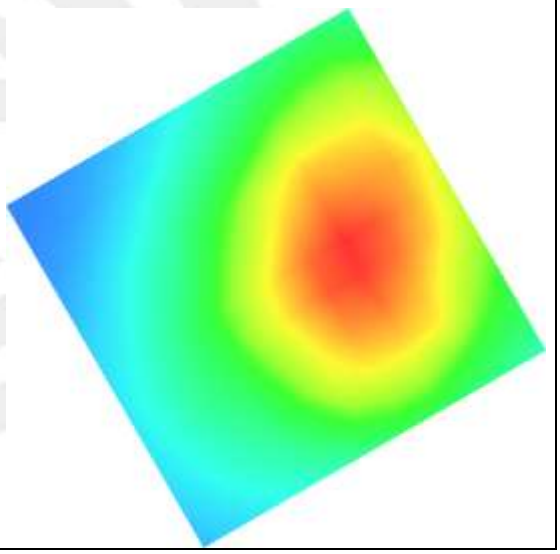
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-42.00, Y=-24.00

SAR 10g (W/Kg)	0.424832
SAR 1g (W/Kg)	0.647306

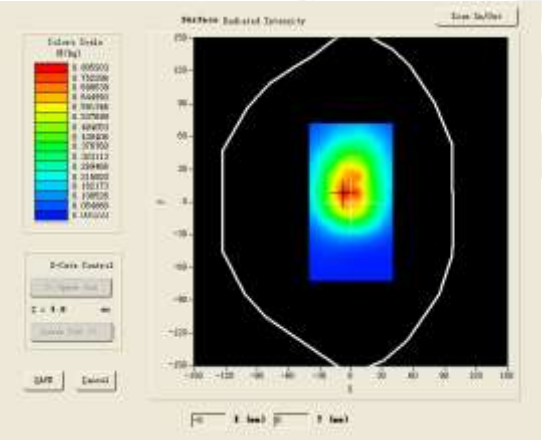
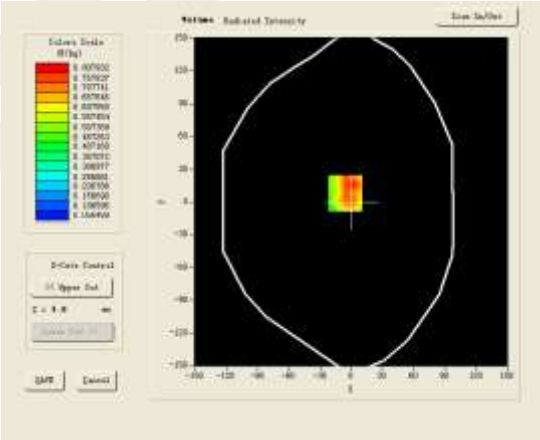
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6454	0.4618	0.3618	0.2816	0.1970	0.1488



3D screen shot	Hot spot position
	

Plot 23: DUT: GSM Mobile Phone; EUT Model: D520X

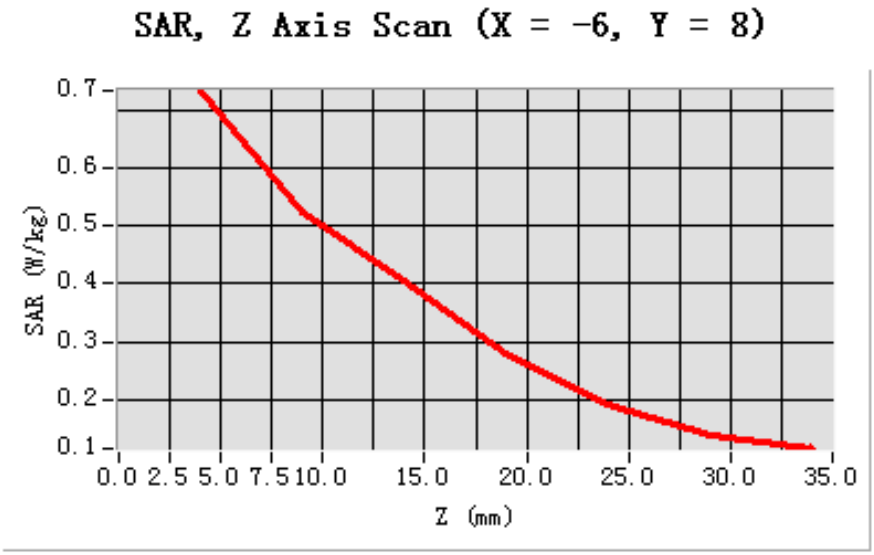
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	5.02
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Back side
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	55.34
Conductivity (S/m)	0.96
Variation (%)	-0.92

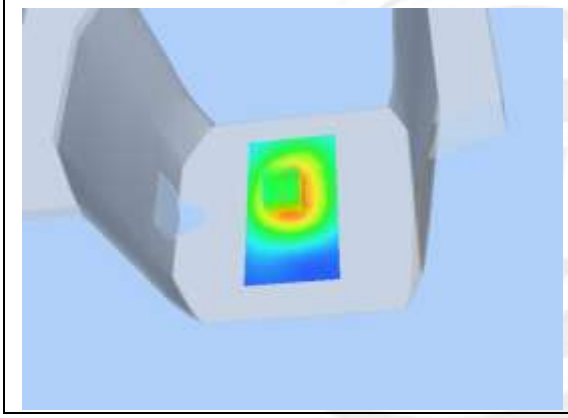
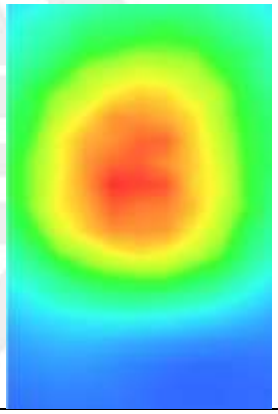
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-6.00, Y=8.00

SAR 10g (W/Kg)	0.506284
SAR 1g (W/Kg)	0.764719

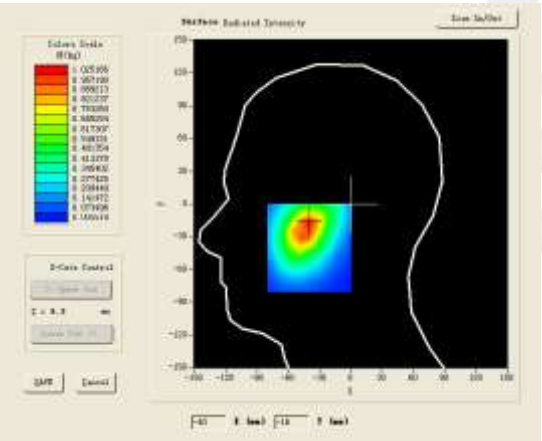
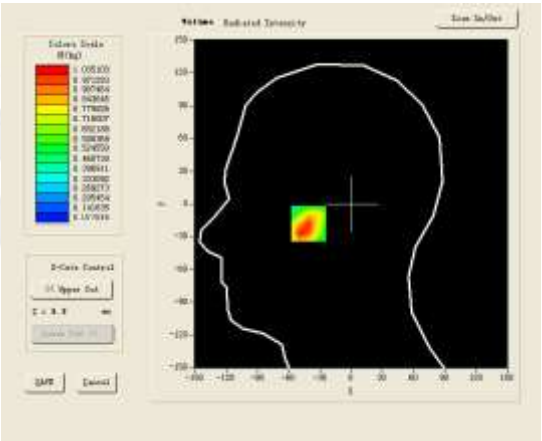
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7354	0.5242	0.4066	0.2776	0.1921	0.1378



3D screen shot	Hot spot position
	

Plot 11: DUT: Revel Pro; EUT Model: D520X

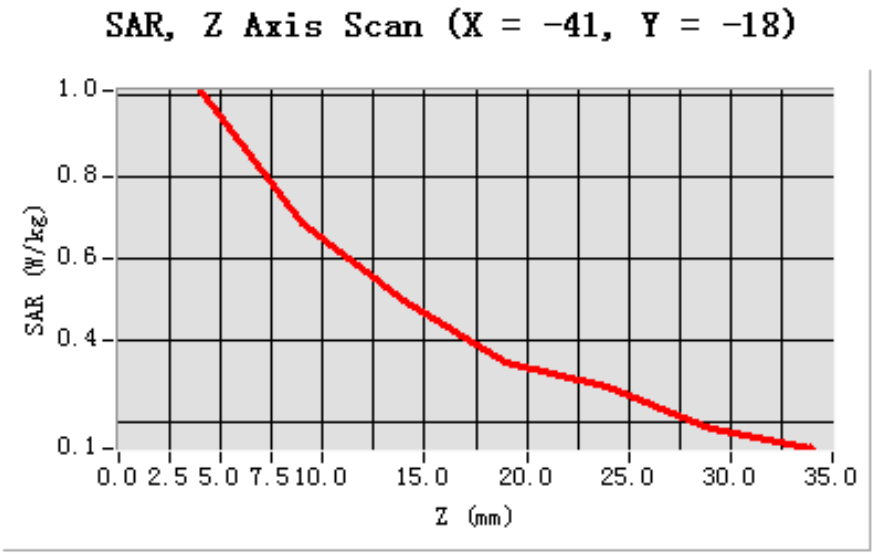
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	4.83
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Left head
Device Position	Cheek
Band	GPRS850-4 Slot
Channels	High
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	41.99
Conductivity (S/m)	0.90
Variation (%)	1.02

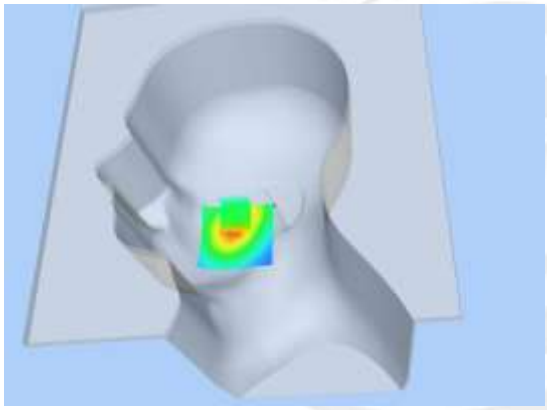
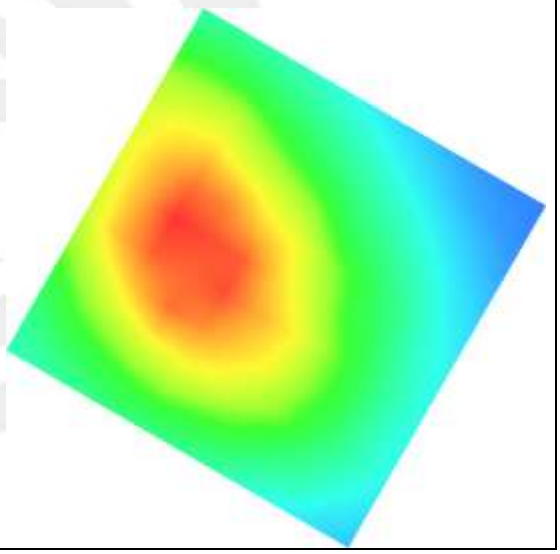
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-41.00, Y=-18.00

SAR 10g (W/Kg)	0.616953
SAR 1g (W/Kg)	0.988861

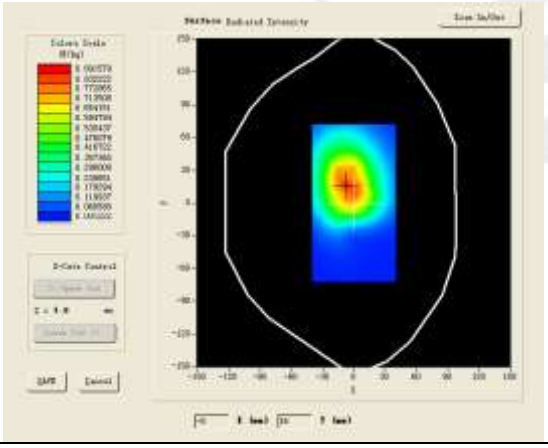
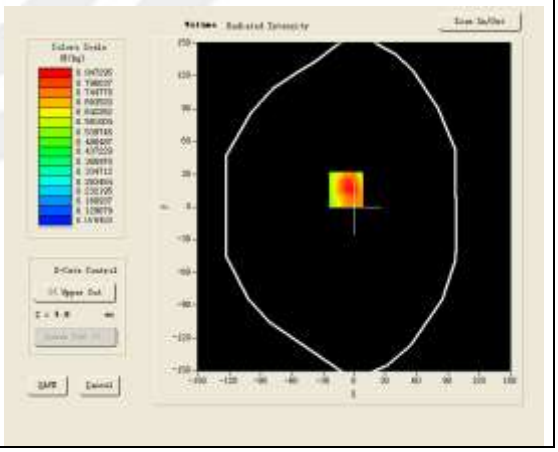
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	1.0090	0.6877	0.4959	0.3460	0.2839	0.1818



3D screen shot	Hot spot position
	

Plot 27: DUT: GSM Mobile Phone; EUT Model: D520X

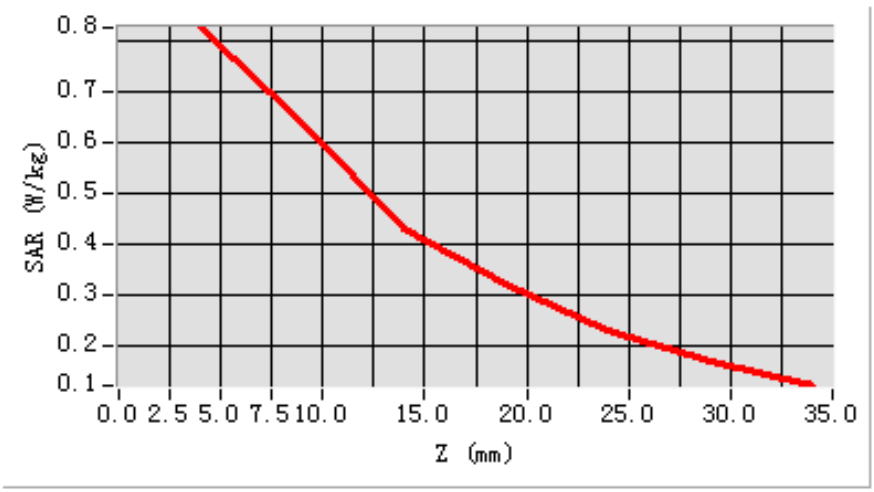
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	5.02
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Back side
Band	GPRS850-4 Slot
Channels	Middle
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	55.34
Conductivity (S/m)	0.96
Variation (%)	-0.46

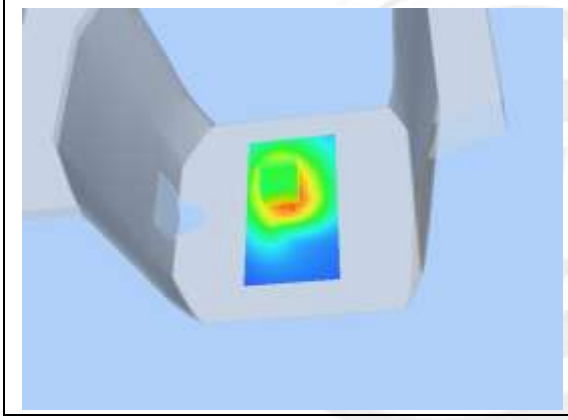
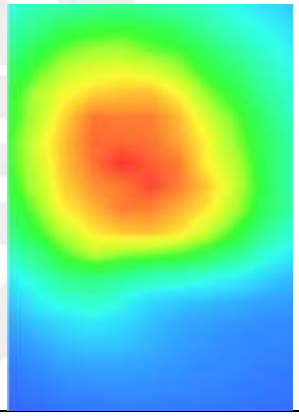
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-8.00, Y=16.00

SAR 10g (W/Kg)	0.552944
SAR 1g (W/Kg)	0.807267

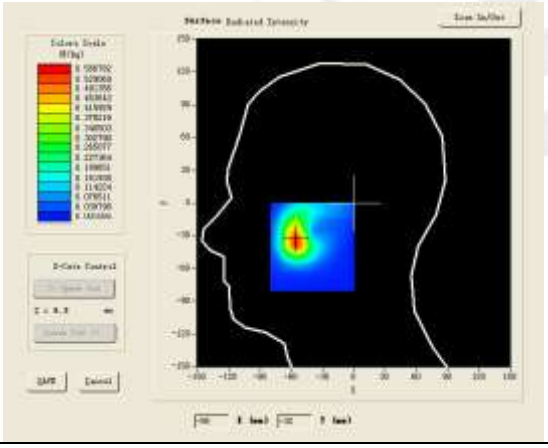
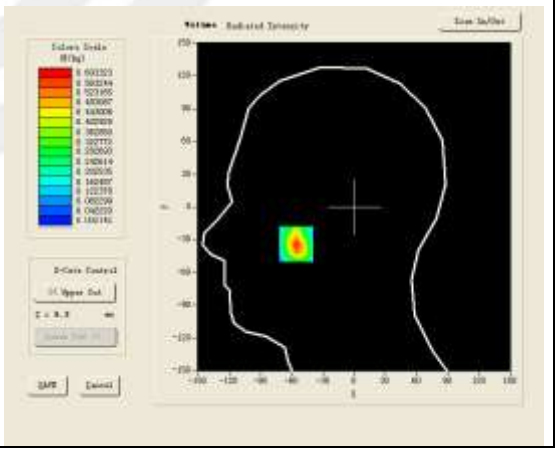
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8243	0.6385	0.4304	0.3221	0.2307	0.1676



3D screen shot	Hot spot position
	

Plot 13: DUT: Revel Pro; EUT Model: D520X

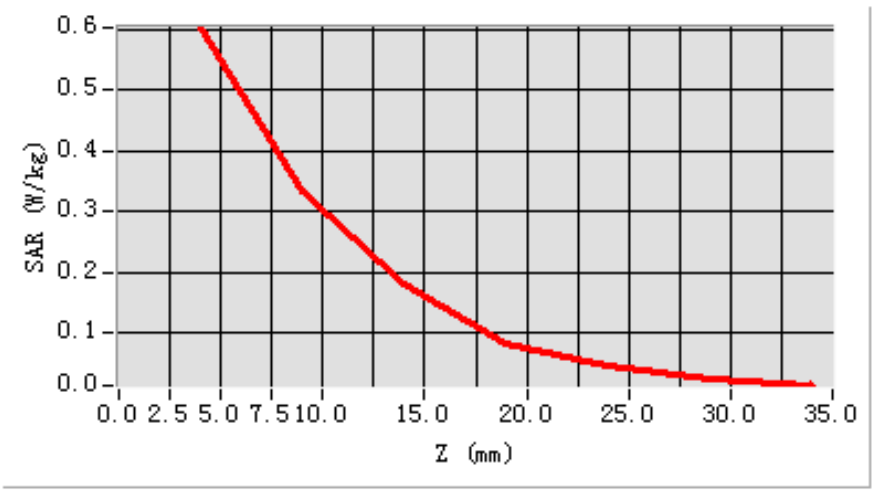
Test Data	2015.03.27
Ambient Temperature(°C)	21.0°C
Liquid Temperature(°C)	21.3°C
Probe	SN 17/14 EP221
ConvF	4.71
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	Mid
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	1880
Relative permittivity (real part)	41.02
Conductivity (S/m)	1.40
Variation (%)	0.63

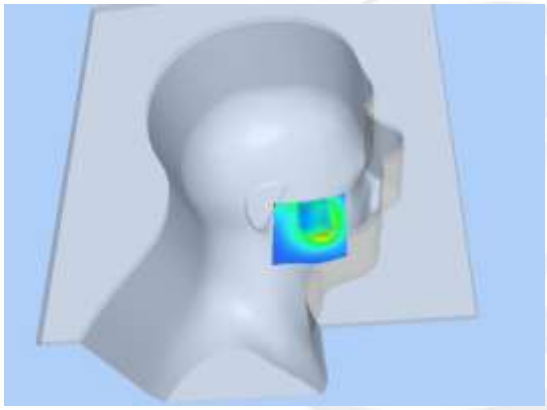
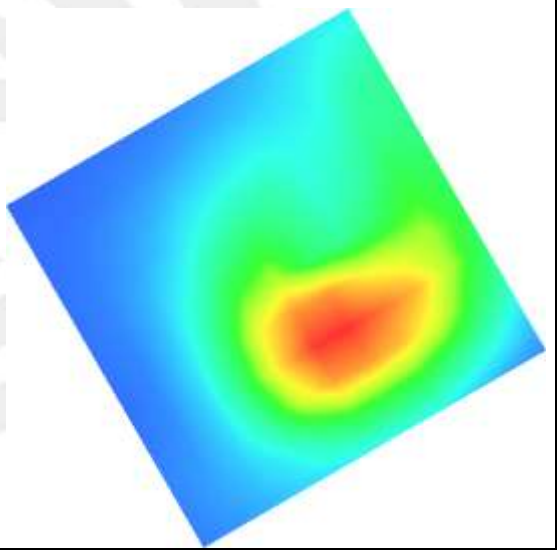
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-56.00, Y=-34.00

SAR 10g (W/Kg)	0.266521
SAR 1g (W/Kg)	0.557289

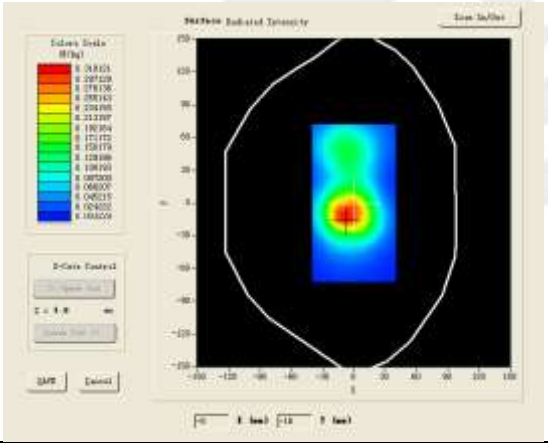
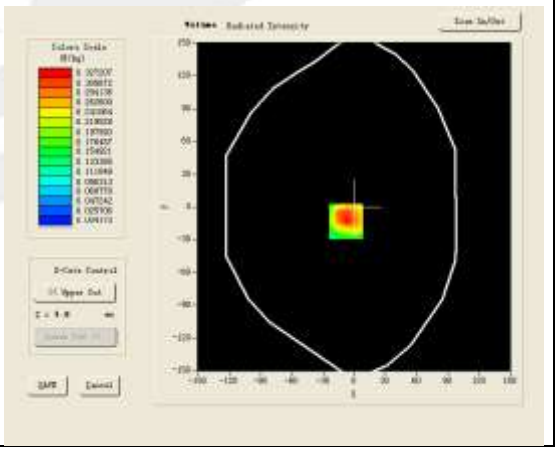
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6033	0.3330	0.1797	0.0815	0.0437	0.0217



3D screen shot	Hot spot position
	

Plot 34: DUT: GSM Mobile Phone; EUT Model: D520X

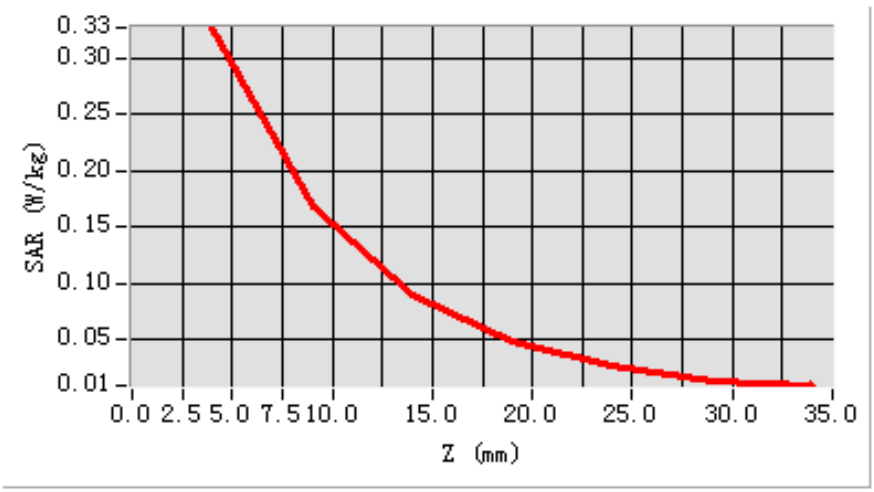
Test Data	2015.03.27
Ambient Temperature(°C)	21.0°C
Liquid Temperature(°C)	21.3°C
Probe	SN 17/14 EP221
ConvF	4.85
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Back
Band	GSM1900
Channels	Middle
Signal	TDMA (Crest factor: 8.0)
Frequency (MHz)	1880
Relative permittivity (real part)	53.77
Conductivity (S/m)	1.50
Variation (%)	0.23

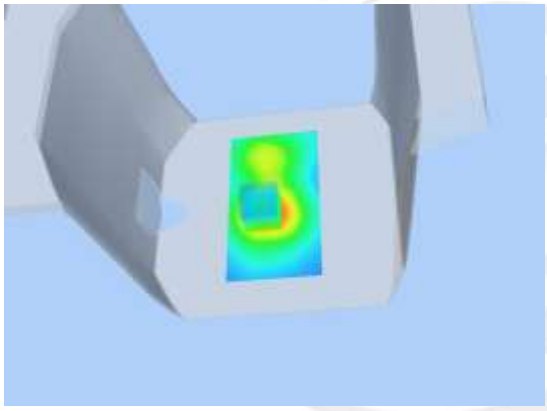
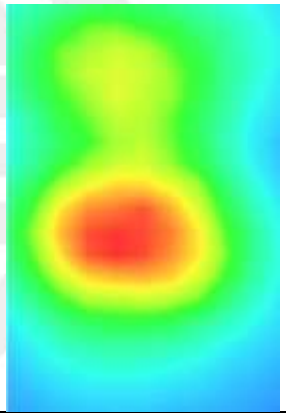
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-8.00, Y=-13.00

SAR 10g (W/Kg)	0.167654
SAR 1g (W/Kg)	0.322945

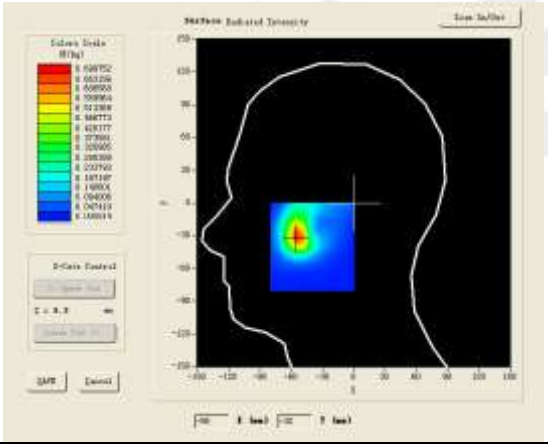
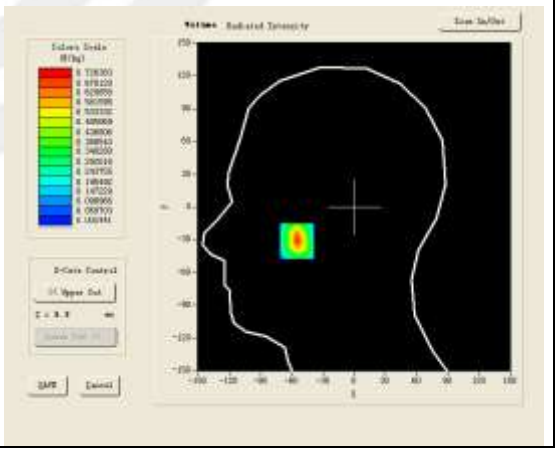
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.3272	0.1685	0.0893	0.0477	0.0261	0.0135



3D screen shot	Hot spot position
	

Plot 17: DUT: Revel Pro; EUT Model: D520X

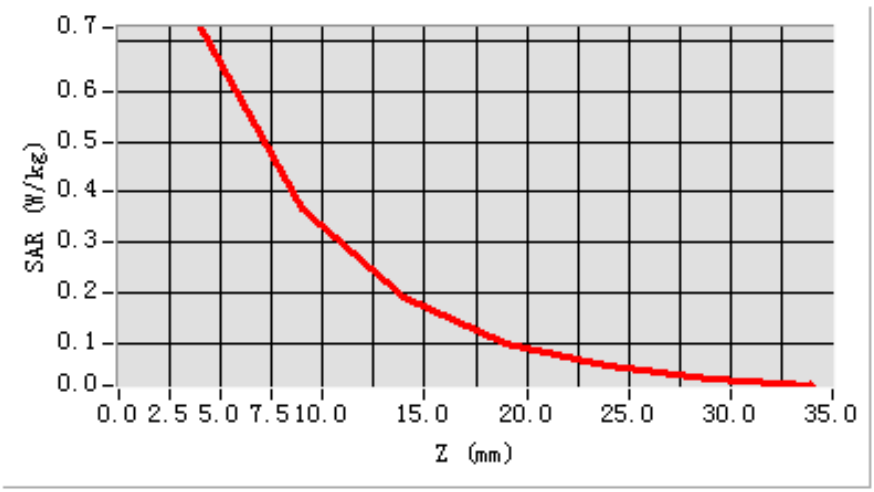
Test Data	2015.03.27
Ambient Temperature(°C)	21.0°C
Liquid Temperature(°C)	21.3°C
Probe	SN 17/14 EP221
ConvF	4.71
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GPRS 1900-4 Slot
Channels	Mid
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	1880
Relative permittivity (real part)	41.02
Conductivity (S/m)	1.40
Variation (%)	1.23

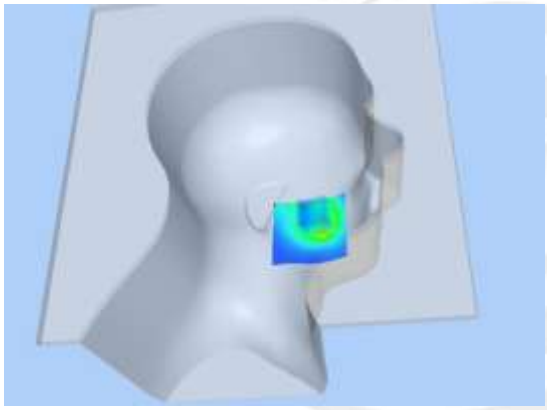
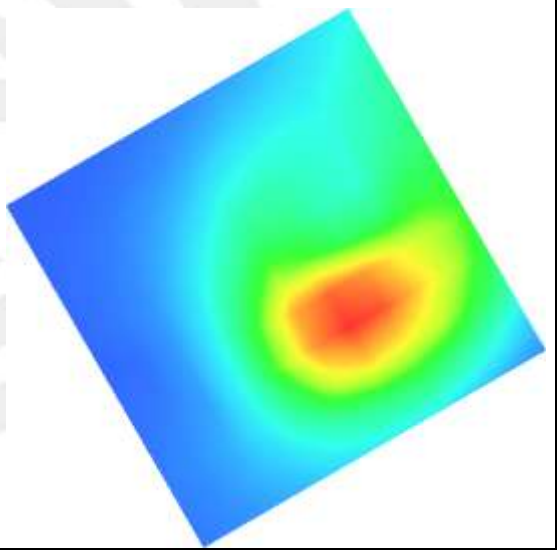
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-55.00, Y=-31.00

SAR 10g (W/Kg)	0.316921
SAR 1g (W/Kg)	0.672394

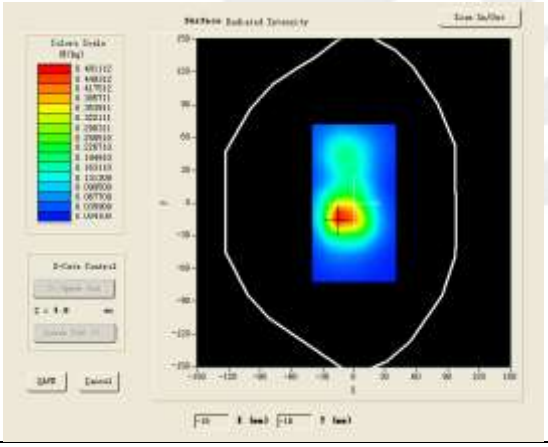
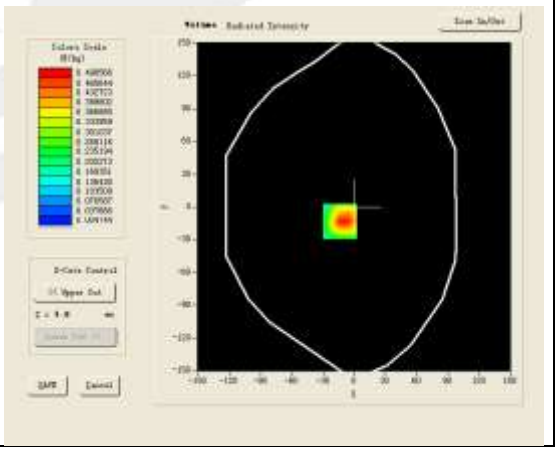
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.7264	0.3656	0.1922	0.0961	0.0533	0.0266



3D screen shot	Hot spot position
	

Plot 36: DUT: GSM Mobile Phone; EUT Model: D520X

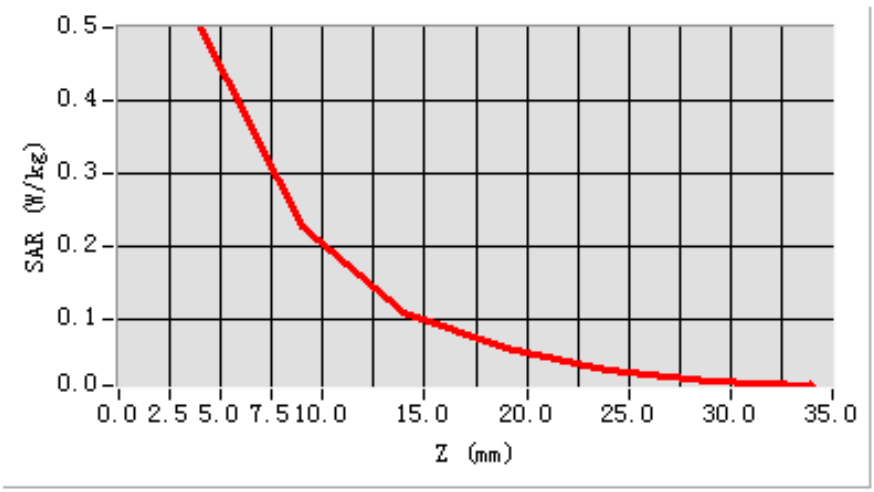
Test Data	2015.03.27
Ambient Temperature(°C)	21.0°C
Liquid Temperature(°C)	21.3°C
Probe	SN 17/14 EP221
ConvF	4.85
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Back
Band	GPRS 1900-4 Slot
Channels	Middle
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	1880
Relative permittivity (real part)	53.77
Conductivity (S/m)	1.50
Variation (%)	-0.31

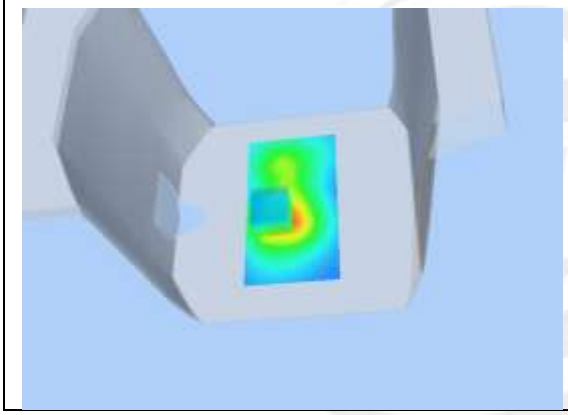
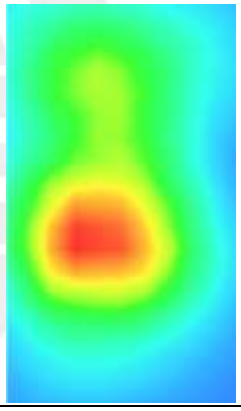
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-14.00, Y=-13.00

SAR 10g (W/Kg)	0.246312
SAR 1g (W/Kg)	0.496441

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.4986	0.2268	0.1105	0.0614	0.0306	0.0168

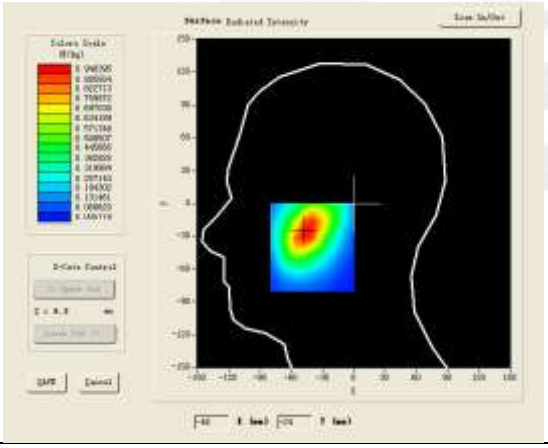
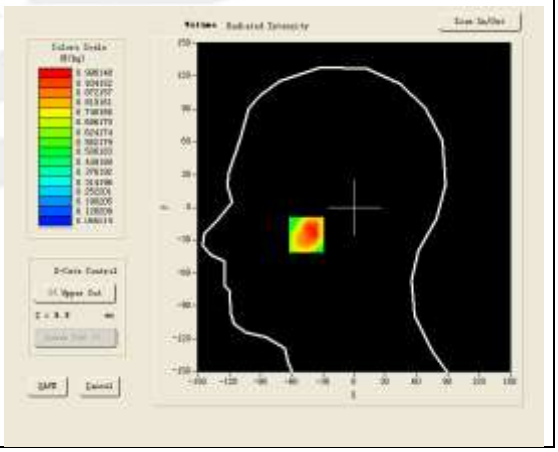


3D screen shot	Hot spot position
	

SIM 2 Card

Plot 41: DUT: Revel Pro; EUT Model: D520X

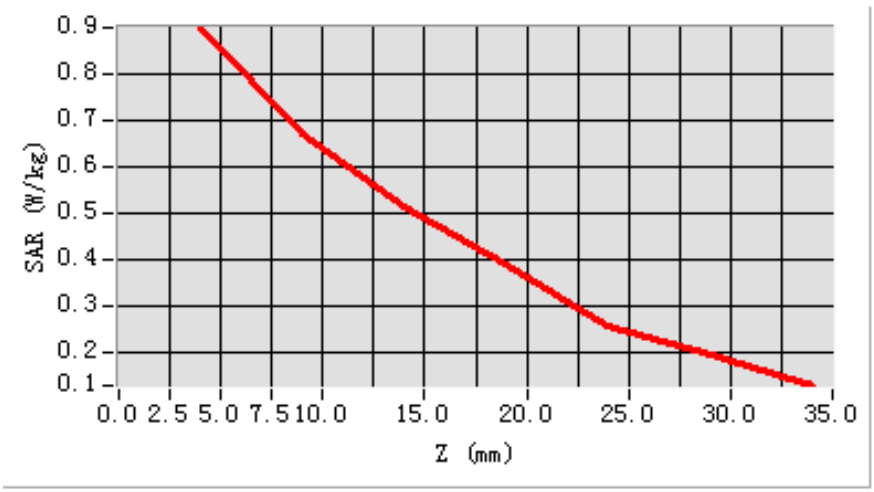
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	4.83
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Left head
Device Position	Cheek
Band	GPRS850-4 Slot
Channels	High
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	40.64
Conductivity (S/m)	0.93
Variation (%)	-0.41

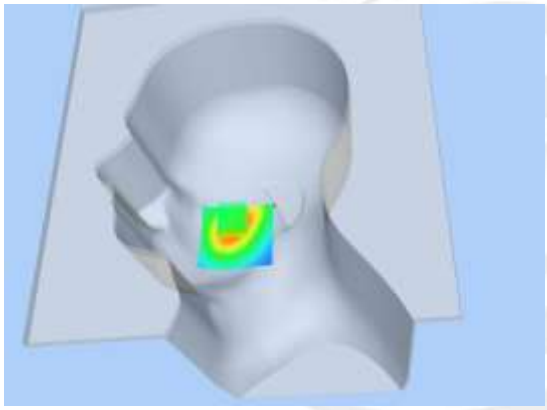
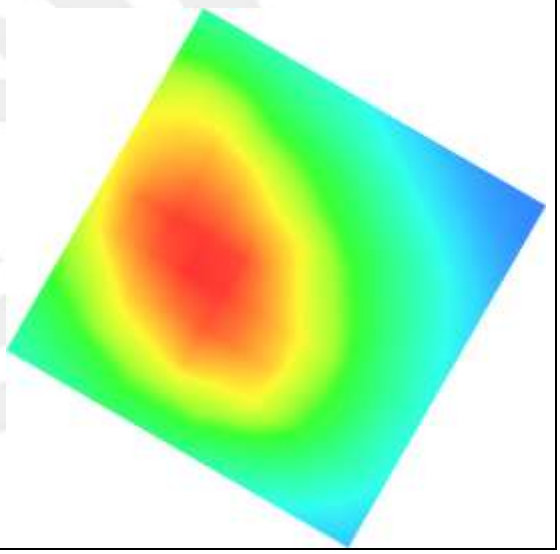
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-46.00, Y=-25.00

SAR 10g (W/Kg)	0.612939
SAR 1g (W/Kg)	0.969807

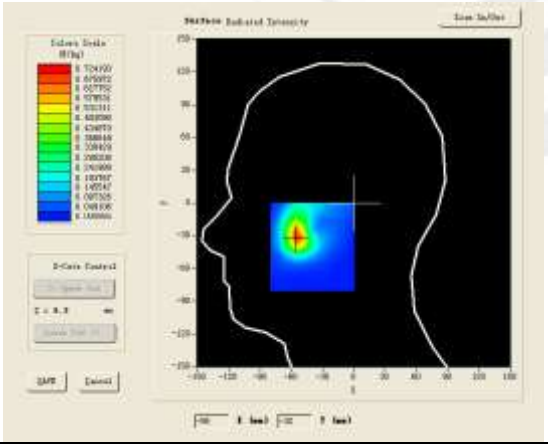
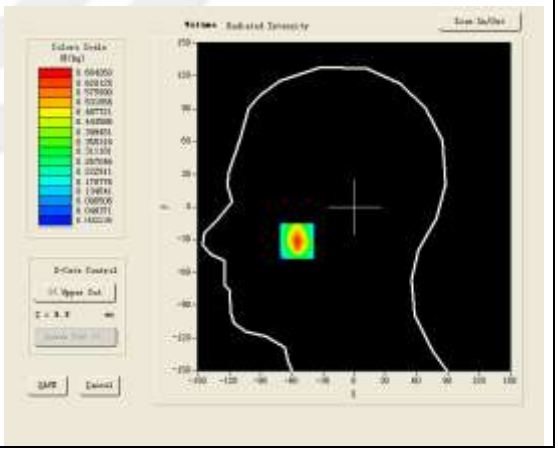
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.9015	0.6728	0.5149	0.3888	0.2542	0.1926



3D screen shot	Hot spot position
	

Plot 42: DUT: Revel Pro; EUT Model: D520X

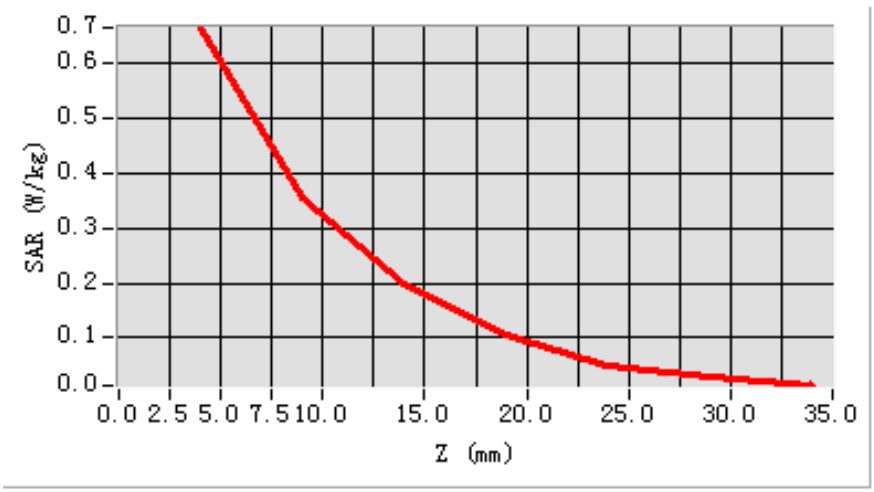
Test Data	2015.03.27
Ambient Temperature(°C)	21.0°C
Liquid Temperature(°C)	21.3°C
Probe	SN 17/14 EP221
ConvF	4.71
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GPRS1900-4 Slot
Channels	Mid
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	1880
Relative permittivity (real part)	41.02
Conductivity (S/m)	1.40
Variation (%)	1.36

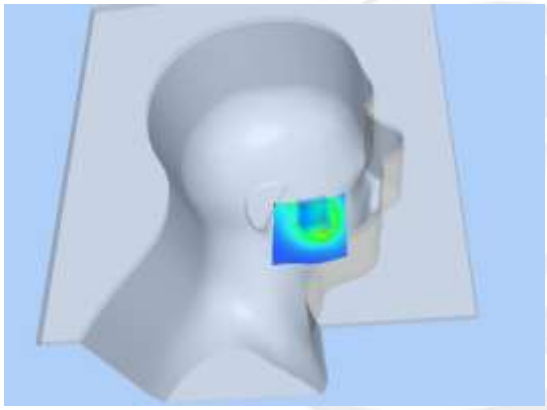
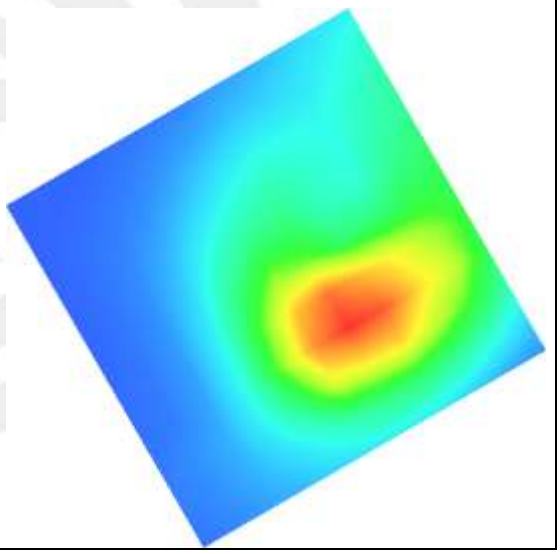
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-55.00, Y=-31.00

SAR 10g (W/Kg)	0.297128
SAR 1g (W/Kg)	0.637674

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.6643	0.3558	0.1993	0.1041	0.0515	0.0290

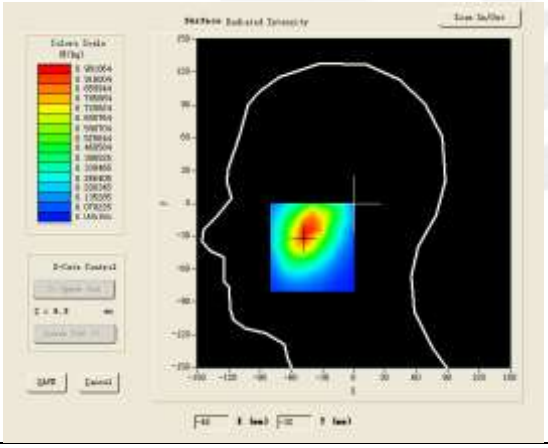
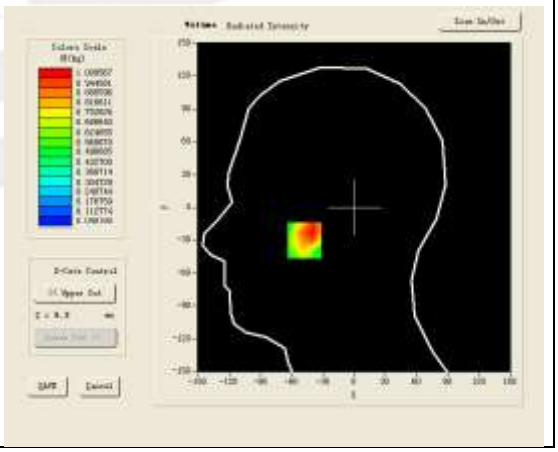


3D screen shot	Hot spot position
	

Repeated SAR

Plot 43: DUT: Revel Pro; EUT Model: D520X

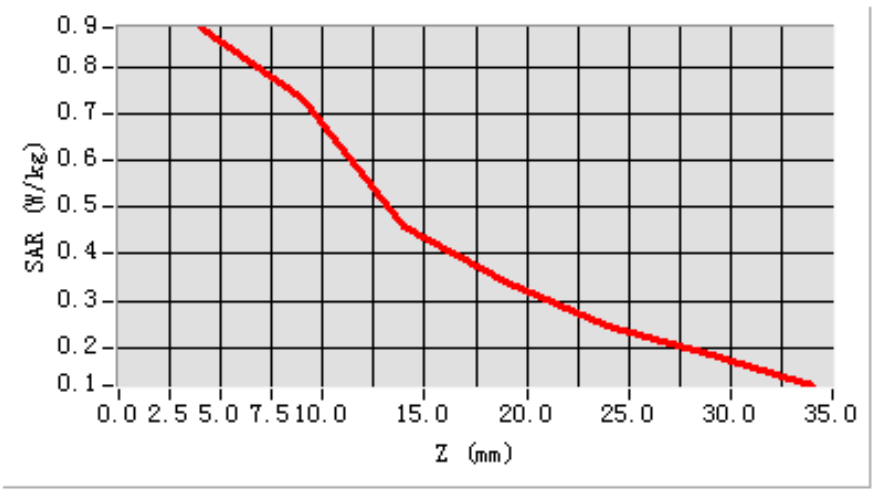
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	4.83
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GPRS850-4 Slot
Channels	High
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	40.64
Conductivity (S/m)	0.93
Variation (%)	0.62

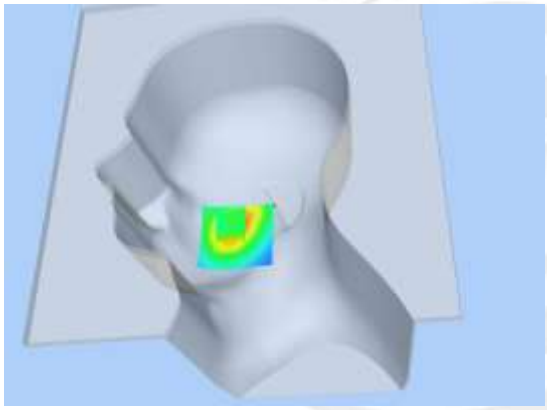
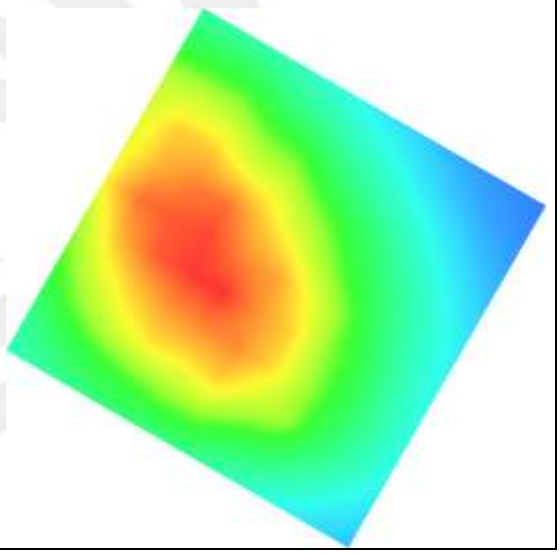
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-48.00, Y=-30.00

SAR 10g (W/Kg)	0.618986
SAR 1g (W/Kg)	0.967628

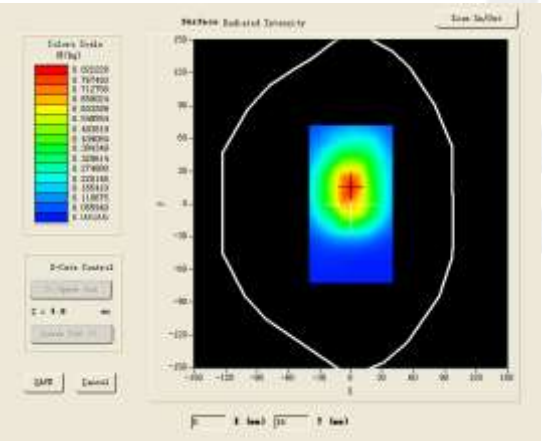
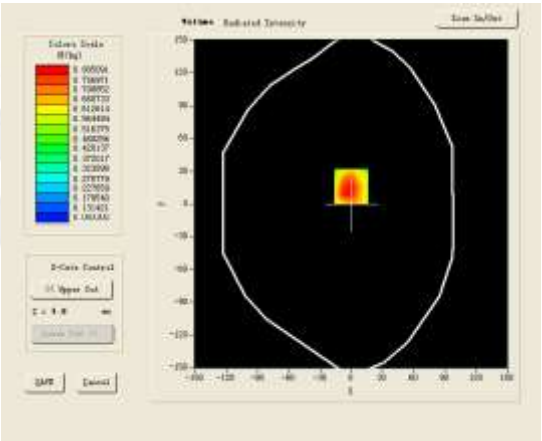
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8839	0.7320	0.4580	0.3425	0.2479	0.1857



3D screen shot	Hot spot position
	

Plot 44: DUT: Revel Pro; EUT Model: D520X

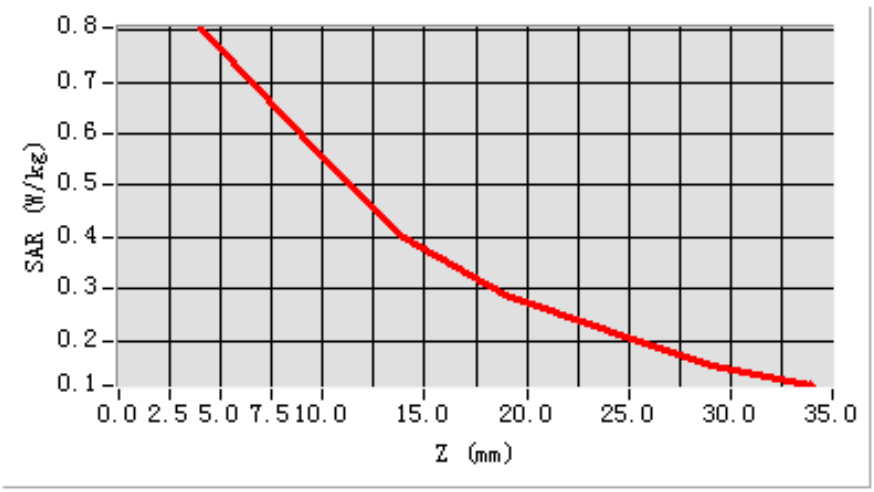
Test Data	2015.03.26
Ambient Temperature(°C)	20.4°C
Liquid Temperature(°C)	21.0°C
Probe	SN 17/14 EP221
ConvF	4.83
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GPRS850-4 Slot
Channels	Middle
Signal	TDMA (Crest factor: 2.0)
Frequency (MHz)	836.6
Relative permittivity (real part)	41.99
Conductivity (S/m)	0.90
Variation (%)	-0.28

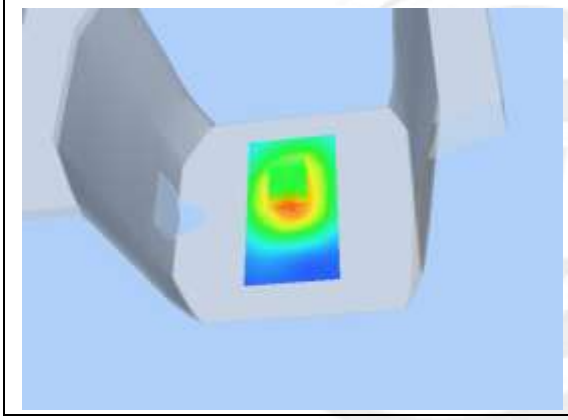
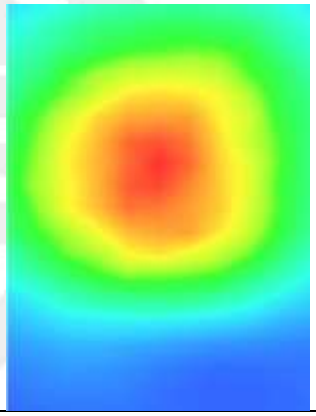
SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=16.00

SAR 10g (W/Kg)	0.514643
SAR 1g (W/Kg)	0.784156

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.0000	0.8051	0.5943	0.3990	0.2872	0.2220	0.1534



3D screen shot	Hot spot position
	

Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.