FCC SAR TEST REPORT

Report No.:	SET2015-03832
Product:	Industrial Handheld Terminal
Model No.:	AUTOID9, AUTOID9HC
FCC ID:	2AC68-AUTOID9
Applicant:	Jiangsu SEUIC Technology Co.,Ltd.
Address:	No 23, Wenzhu Road,Yuhuatai District, Nanjing, Jiangsu, China
Issued by:	CCIC-SET
Lab Location:	Electronic Testing Building, Shahe Road，Xili, Nanshan District, Shenzhen, 518055, P. R. China
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Test Report

Product. …….:	Industrial Handheld Terminal
Model No. ……..:	AUTOID9, AUTOID9HC
Brand Name……..:	AUTOID
FCC ID…….:	2AC68-AUTOID9
Applicant……..:	Jiangsu SEUIC Technology Co.,Ltd.
Applicant Address…….:	No 23, Wenzhu Road,Yuhuatai District,Nanjing,Jiangsu,China
Manufacturer……:	Jiangsu SEUIC Technology CO.,Ltd.
Manufacturer Address:	Nanjing High-tech Development Zone software center 406#
Test Standards…….:	**447CFR § 2.1093-** Radiofrequency Radiation Exposure Evaluation: Portable Devices; **ANSI C95.1–1992:** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991) **IEEE 1528–2003:** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques;
Test Result……:	Pass

Tested by ……..: Mei Chun 2015-02-12

Chun Mei, Test Engineer

Reviewed by……: Shuangwen Zhang 2015-02-12

Shuangwen Zhang,Senior Egineer

Approved by……: Wu Lian 2015-02-12

Wu Li'an , Manager

Contents

This Test Report consists of the following Annexes:

1. GENERAL CONDITIONS

1.1 This report only refers to the item that has undergone the test.

1.2 This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities.

1.3 This document is only valid if complete; no partial reproduction can be made without written approval of CCIC-SET

1.4 This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of CCIC-SET and the Accreditation Bodies, if it applies.

2. Administrative Date

2.1. Identification of the Responsible Testing Laboratory

Company Name:	CCIC-SET
Department:	EMC & RF Department
Address:	Electronic Testing Building, Shahe Road, Nanshan District, ShenZhen, P. R. China
Telephone:	+86-755-26629676
Fax:	+86-755-26627238
Responsible Test Lab Managers:	Mr. Wu Li'an

2.2. Identification of the Responsible Testing Location(s)

Company Name:	CCIC-SET
Address:	Electronic Testing Building, Shahe Road, Nanshan District, Shenzhen, P. R. China

2.3. Organization Item

CCIC-SET Report No.:	SET2015-03832
CCIC-SET Project Leader:	Mr. Li Sixiong
CCIC-SET Responsible for accreditation scope:	Mr. Wu Li'an
Start of Testing:	2015-01-19
End of Testing:	2015-01-27

2.4. Identification of Applicant

Company Name:	Jiangsu SEUIC Technology Co.,Ltd.
Address:	No 23, Wenzhu Road,Yuhuatai District, Nanjing, Jiangsu, China

2.5. Identification of Manufacture

Company Name:	Jiangsu SEUIC Technology CO.,Ltd.
Address:	Nanjing High-tech Development Zone software center 406#

Notes: This data is based on the information by the applicant.

3. Equipment Under Test (EUT)

3.1. Identification of the Equipment under Test

Sample Name:	Industrial Handheld Terminal	
Type Name:	AUTOID9, AUTOID9HC	
Brand Name:	AUTOID	
General description:	Support Band	GSM850MHz/1900MHz, WCDMA 850MHz Wi-Fi802.11b,802.11g,802.11n-20/802.11n-40, WIFI 802.11a, Bluetooth
	Test Band	GSM 850MHz/ GSM 1900MHz, GPRS 850MHz/ GPRS 1900MHz, WCDMA 850MHz Wi-Fi 802.11b, WIFI 802.11a
	Multislot Class	GPRS: Class 12,EDGE:Class 12
	Release Version	WCDMA:R99,HSDPA:R5 ,HSUPA:R6,HSPA+:R7
	GPRS Class	Class B
	Development Stage	Identical Prototype
	Accessories	Power Supply
	Battery type	3.8V 3920mAh
	Antenna type	PIFI Antenna
	Operation mode	GSM / GPRS/EDGE/WCDMA / Bluetooth / WIFI
	Modulation mode	GMSK, QPSK,DSSS,OFDM, GFSK/π /4-DQPSK /8-DPSK
	Max. RF Power	33.43dBm
	Max. SAR Value	Head:0.130w/kg; Body:0.750w/kg; Hotspot: 0.798w/kg

NOTE:

a. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

b. This device supports GPRS and EDGE operation up to class12(max.uplin:4, max.downlink:4, total timeslots:5)

c. The EUT does not support 16QAM uplink function in HSPA+ mode.

4 SAR SUMMARY

Highest Standalone SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Head	GSM850	0.130	0.130
	GSM1900	0.024	
	WCDMA Band Ⅴ	0.091	
	WIFI	0.031	
Body-worn Accessory (10mm Gap)	GSM850	0.698	0.750
	GSM1900	0.190	
	WCDMA Band Ⅴ	0.750	
	WIFI	0.048	

Highest Simultaneous SAR Summary

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Head	GSM850&WIFI	0.130+0.028	0.158
	GSM1900&WIFI	0.024+0.031	
	WCDMA Band Ⅴ&WIFI	0.091+0.031	
Body-worn Accessory (10mm Gap)	GSM850&WIFI	0.698+0.048	0.798
	GSM1900&WIFI	0.190+0.048	
	WCDMA Band Ⅴ&WIFI	0.750+0.048	

Exposure Position	Frequency Band	Scaled 1g-SAR(W/kg)	Highest Scaled 1g-SAR(W/kg)
Hotspot (10mm Gap)	GSM850&WIFI	0.648+0.048	0.798
	GSM1900&WIFI	0.152+0.048	
	WCDMA Band Ⅴ&WIFI	0.750+0.048	

5 Specific Absorption Rate (SAR)

5.1 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.

5.2 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 (). The equation description is as below:

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

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

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

$$\mathrm{SAR} = C\frac{\delta T}{\delta t}$$

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

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

where σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the rms electrical field strength.

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

5.3 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SATIMO. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

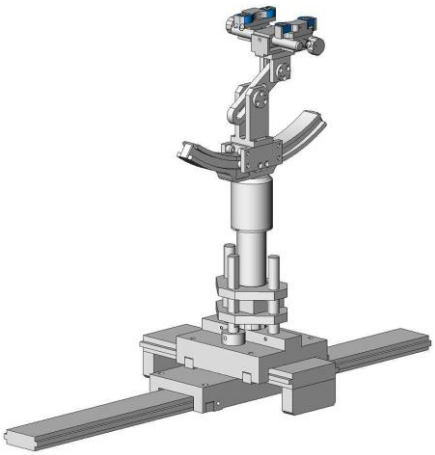
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

5.4 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SATIMO as an integral part of the COMOSAR test system.

The device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder

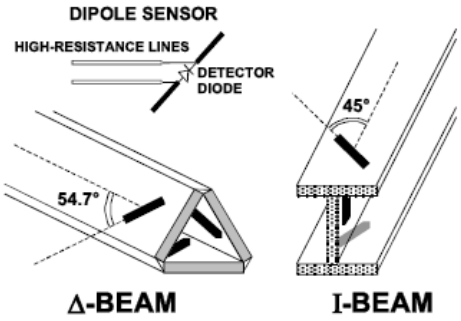
5.5 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	700 MHz to 3 GHz; Linearity: ± 0.5 dB (700 MHz to 3 GHz)
Directivity	± 0.25 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	1.5 µW/g to 100 mW/g; Linearity: ± 0.5 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 5 mm (Body: 8 mm) Distance from probe tip to dipole centers: <2.7 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones
Frequency	450 MHz to 6 GHz; Linearity: ± 0.5 dB (450 MHz to 6 GHz)
Dimensions	Overall length: 330 mm Tip diameter: 2.5 mm Distance from probe tip to dipole centers: 1 mm
Compatibility	COMOSAR

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



6 OPERATIONAL CONDITIONS DURING TEST

6.1 Schematic Test Configuration

During SAR test, EUT was operating in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.

The Absolute Radio Frequency Channel Number (ARFCN) was allocated to 128, 189 and 251 respectively in the case of GSM 850MHz, or to 512, 661 and 810 respectively in the case of PCS 1900MHz, or to 4132, 4182 and 4233 respectively in the case of WCDMA 850MHz, or to 9262, 9400 and 9538 respectively in the case of WCDMA 1900MHz, and WIFI 802.11b. The EUT was commanded to operate at maximum transmitting power.

The EUT should use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link was used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point should be lower than the output power level of the handset by at least 35 dB

6.2 SAR Measurement System

The SAR measurement system being used is the SATIMO system, the system is controlled remotely from a PC, which contains the software to control the robot and data acquisition equipment. The software also displays the data obtained from test scans.

In operation, the system first does an area (2D) scan at a fixed depth within the liquid from the inside wall of the phantom. When the maximum SAR point has been found, the system will then carry out a 3D scan centred at that point to determine volume averaged SAR level.

6.2.1 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 Power drifts 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.

Table 1: Recommended Dielectric Performance of Tissue

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.46	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (Nacl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (s/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Table 2 Recommended Tissue Dielectric Parameters

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

Frequency: 5800MHz	
Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

6.2.2 Simulant liquids

For measurements against the phantom head, the “cheek” and “tilt” position on both the left hand and the right hand sides of the phantom. For body-worn measurements, the EUT was tested against flat phantom representing the user body. The EUT was put on in the belt holder. Simulant liquids that are used for testing at frequencies of GSM 850MHz/1900MHz, WCDMA850MHzand Wi-Fi 2.4GHz, which are made mainly of sugar, salt and water solutions may be left in the phantoms.

Table 3: Dielectric Performance of Head Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835MHz	41.5	0.90
Validation value (Jan. 19th, 2015)	835MHz	41.37	0.88
Target value	1900MHz	40.0	1.40
Validation value (Jan. 21th, 2015)	1900MHz	39.86	1.37
Target value	2450MHz	39.2	1.80
Validation value (Jan. 24th, 2015)	2450MHz	38.87	1.78
Target value	5800MHz	35.3	5.27
Validation value (Jan. 27th, 2015)	5800MHz	35.6	5.08

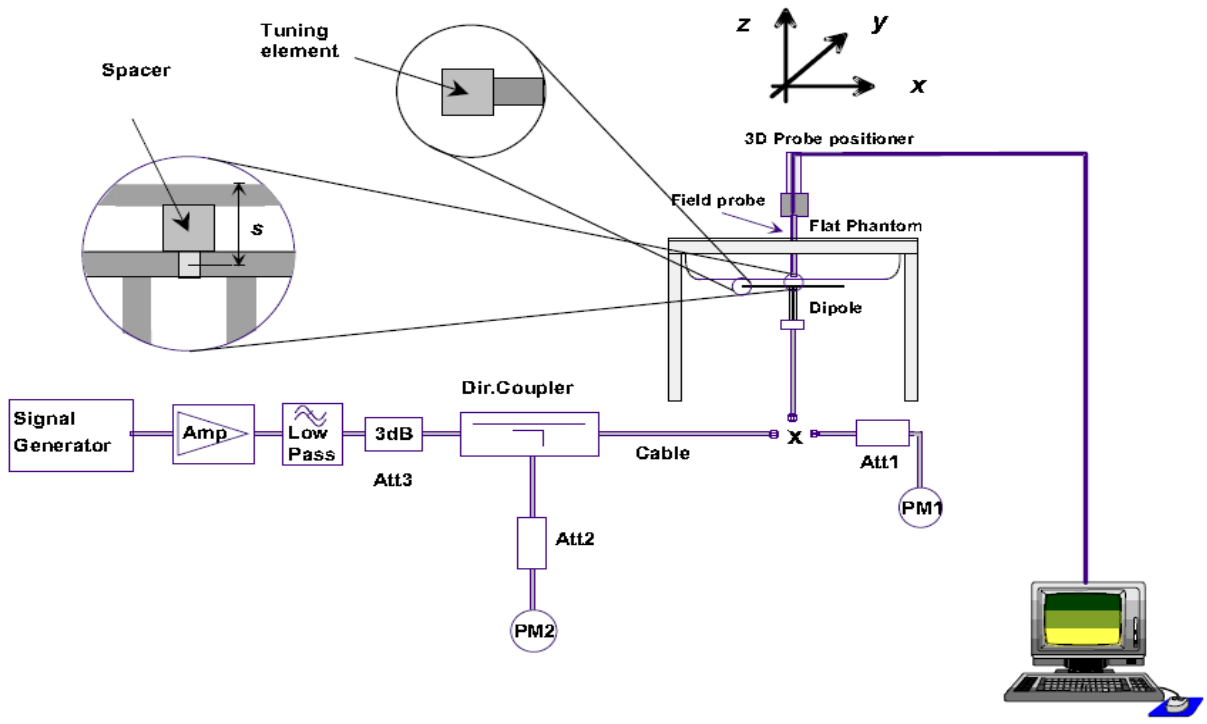
Table 4: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.2°C; Humidity: 64%;			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835MHz	55.2	0.97
Validation value (Jan. 19th, 2015)	835MHz	55.45	0.99
Target value	1900MHz	53.3	1.52
Validation value (Jan. 21th, 2015)	1900MHz	52.76	1.57
Target value	2450MHz	52.7	1.95
Validation value (Jan. 24th, 2015)	2450MHz	51.34	1.90
Target value	5800MHz	48.2	6.00
Validation value (Jan. 27th, 2015)	5800MHz	46.55	6.12

6.3 Equipments and results of validation testing

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The following procedure, recommended for performing validation tests using box phantoms is based on the procedures described in the IEEE standard P1528 2003. Setup according to the setup diagram below :



With the SG and Amp and with directional coupler in place, set up the source signal at the relevant frequency and use a power meter to measure the power at the end of the SMA cable that you intend to connect to the balanced dipole. Adjust the SG to make this, say, 0.25W (24 dBm). If this level is too high to read directly with the power meter sensor, insert a calibrated attenuator (e.g. 10 or 20 dB) and make a suitable correction to the power meter reading.

Note 1: In this method, the directional coupler is used for monitoring rather than setting the exact feed power level. If, however, the directional coupler is used for power measurement, you should check the frequency range and power rating of the coupler and measure the coupling factor (referred to output) at the test frequency using a VNA.

Note 2: Remember that the use of a 3dB attenuator (as shown in Figure 8.1 of P1528) means that you need an RF amplifier of 2 times greater power for the same feed power. The other issue is the cable length. You might get up to 1dB of loss per meter of cable, so the cable length after the coupler needs to be quite short.

Note 3: For the validation testing done using CW signals, most power meters are suitable. However, if you are measuring the output of a modulated signal from either a signal generator or a handset, you must ensure that the power meter correctly reads the modulated signals.

The measured 1-gram averaged SAR values of the device against the phantom are provided in Tables 7 and Table 8. The humidity and ambient temperature of test facility were 64% and 23.2°C respectively. The body phantom were full of the body tissue simulating liquid. The EUT was supplied with full-charged battery for each measurement.

The distance between the back of the EUT and the bottom of the flat phantom is 5 mm (taking into account of the IEEE 1528 and the place of the antenna).

Table 7: Head SAR system validation (1g)

Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			250 mW	1W
835MHz(Jan. 19th, 2015)	1:1	9.77	2.34	9.36
1900MHz(Jan. 21th, 2015)	1:1	40.37	9.42	37.68
2450MHz(Jan. 24th, 2015)	1:1	53.60	12.57	50.28

Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			10 mW	1W
5800MHz(Jan. 27th, 2015)	1:1	182.74	1.68	168

Table 8: Body SAR system validation (1g)

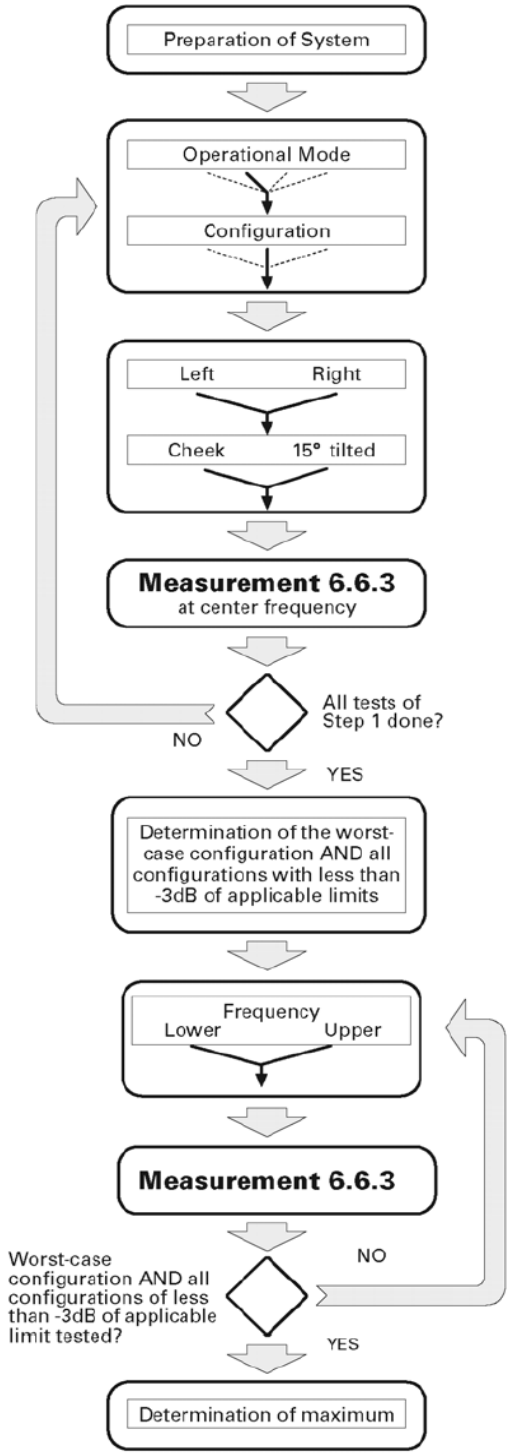
Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			250 mW	1W
835MHz(Jan. 19th, 2015)	1:1	10.31	2.46	9.84
1900MHz(Jan. 21th, 2015)	1:1	40.81	9.82	39.28
2450MHz(Jan. 24th, 2015)	1:1	52.66	12.78	51.12

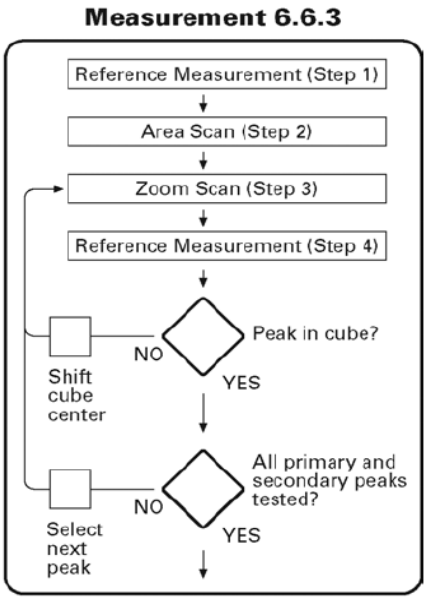
Frequency	Duty cycle	Target value （W/kg）	Test value (W/kg)	
			10 mW	1W
5800MHz(Jan. 27th, 2015)	1:1	176.93	1.63	163

* Note: Target value was referring to the measured value in the calibration certificate of reference dipole.
Note: All SAR values are normalized to 1W forward power.

6.4 SAR measurement procedure

The SAR test against the head phantom was carried out as follow:





Establish a call with the maximum output power with a base station simulator, the connection between the EUT and the base station simulator is established via air interface.

After an area scan has been done at a fixed distance of 2mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a

second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEEp1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behaviour are tested.

For body-worn measurement, the EUT was tested under two position: face upward and back upward.

6.5 Transmitting antenna information

There are GSM &WCDMA antenna, WIFI&BT antenna inside the EUT

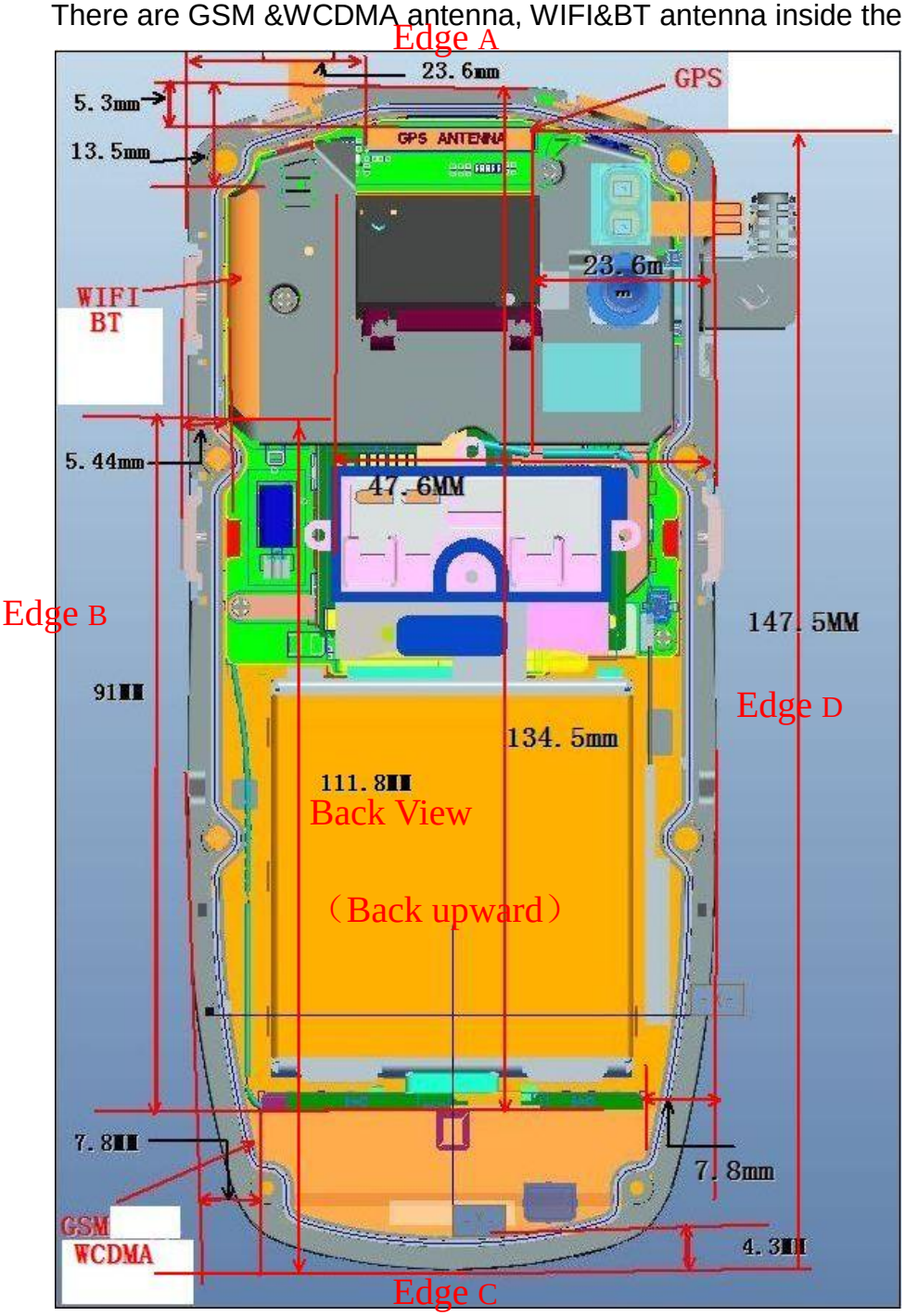


Fig. 3 Position of the antennas

7 Applicable Measurement Standards

47CFR § 2.1093- Radiofrequency Radiation Exposure Evaluation: Portable Devices;

ANSI C95.1–1992: Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)

IEEE 1528–2003: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques;

IEEE Std 1528a-2005: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

FCC KDB 865664 D01 v01r03 SAR Measurement 100MHz to 6GHz

FCC KDB 865664 D02 v01r01 RF Exposure Reporting

FCC KDB 447498 D01 v05r02 General RF Exposure Guidance

FCC KDB 648474 D04 v01r02 Handset SAR

FCC KDB 941225 D01 v03 3G SAR Procedures

FCC KDB 941225 D06 v02 Hotspot SAR

FCC KDB 248227 D01 v01r02 802.11 Wi-Fi SAR

8 LABORATORY ENVIRONMENT

8.1 The Ambient Conditions during SAR Test

Temperature	Min. = 18 ° C, Max. = 25 ° C
Atmospheric pressure	Min.=86 kPa, Max.=106 kPa
Relative humidity	Min. = 45%, Max. = 75%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards.Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

9.Conducted RF Output Power

9.1 GSM Conducted Power

Band		Burst Average Power (dBm)			Frame-Average Power (dBm)		
GSM850	TX Channel	128	190	251	128	190	251
	Frequency(MHz)	824.2	836.4	848.8	824.2	836.4	848.8
	GSM	33.38	**33.43**	33.41	24.35	24.4	24.38
	GPRS (Slot 1)	33.13	33.14	33.15	24.10	24.11	24.12
	GPRS (Slot 2)	30.14	30.18	30.17	**24.12**	**24.16**	**24.15**
	GPRS (Slot 3)	28.24	28.25	28.26	23.98	23.99	24.00
	GPRS (Slot 4)	26.64	26.65	26.63	23.63	23.64	23.62
	EDGE (Slot 1)	30.32	30.34	30.31	21.29	21.31	21.28
	EDGE (Slot 2)	27.18	27.22	27.21	21.16	21.2	21.19
	EDGE (Slot 3)	25.23	25.24	25.27	20.97	20.98	21.01
	EDGE (Slot 4)	23.87	23.79	23.84	20.86	20.78	20.83
GSM1900	TX Channel	512	661	810	512	661	810
	Frequency(MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
	GSM	30.44	**30.46**	30.37	21.41	21.43	21.34
	GPRS (Slot 1)	30.12	30.17	30.13	21.09	21.14	21.10
	GPRS (Slot 2)	27.34	27.36	27.35	**21.32**	**21.34**	**21.33**
	GPRS (Slot 3)	25.55	25.57	25.55	21.29	21.31	21.29
	GPRS (Slot 4)	23.86	23.9	23.88	20.85	20.89	20.87

GSM1900	EDGE (Slot 1)	30.24	30.31	30.26	21.21	21.28	21.23
	EDGE (Slot 2)	27.14	27.19	27.21	21.12	21.17	21.19
	EDGE (Slot 3)	25.24	25.22	25.19	20.98	20.96	20.93
	EDGE (Slot 4)	23.47	23.45	23.51	20.46	20.44	20.50

Note: Per KDB 447498 D01 v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.

For Head SAR testing, GSM should be evaluated, therefore the EUT was set in GSM Voice for GSM850 and GSM1900 due to its highest frame-average power.

For Body worn SAR testing, GSM should be evaluated, therefore the EUT was set in GSM Voice for GSM850 and GSM 1900 due to its highest frame-average power.

For hotspot mode SAR testing, GPRS and EDGE should be evaluated, therefore the EUT was set in GPRS （2Tx slots）due to its highest frame-average power.

Timeslot consignations:

No. Of Slots	Slot 1	Slot 2	Slot 3	Slot 4
Slot Consignation	1Up4Down	2Up3Down	3Up2Down	4Up1Down
Duty Cycle	1:8	1:4	1:267	1:2
Crest Factor	-9.03dB	-6.02dB	-4.26dB	-3.01dB

9.2 WCDMA Conducted peak output Power

Item	band	WCDMA 850		
	ARFCN	4132	4183	4233
	subtest	dBm		
RMC 12.2kbps	non	23.34	**23.37**	23.35
AMR	non	23.03	23.14	23.16
HSDPA	1	22.73	22.81	22.84
	2	22.69	22.71	22.59
	3	21.68	21.82	21.75
	4	21.59	21.64	21.61
HSUPA	1	22.24	22.37	22.42
	2	22.27	22.34	22.28

	3	21.27	22.04	22.07
	4	22.05	22.07	22.13
	5	22.13	22.16	22.12
HSPA+	1	22.23	22.28	22.25
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.			

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Note:

1. Per KDB941225 D01v03, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
2. It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2dB more than specified by 3GPP,but also as low as 0dB according to the chipset implementation in this model.

9.3 WLAN 2.4GHz Band Conducted Power

For the 802.11b/g SAR tests, a communication link is set up with the test mode software for WiFi mode test. The Absolute Radio Frequency Channel Number(ARFCN) is allocated to 1 ,6 and 11 respectively in the case of 2450 MHz.During the test,at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate.

802.11b/g operating modes are tested independently according to the service requirements in each frquency band. 802.11b/g modes are tested on channel 1, 6, 11; however,if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1#	√	△
		2.437	6	√	△
		2.462	11#	√	△

Notes:
√ = "default test channels"
△= possible 802.11g channels with maximum average output ¼ dB the "default test channels"
= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

802.11 Test Channels per FCC KDB 248227

Channel	Frequency (MHz)	2.4G 802.11b Output Power(dBm)			
		1Mbps	2Mbps	5.5Mbps	11Mbps
CH 01	2412	16.17	15.98	15.57	15.38
CH 06	2437	16.06	16.00	15.65	15.42
CH 11	2462	15.99	15.92	15.61	15.36

Channel	Freq. (MHz)	2.4G 802.11g Output Power(dBm)							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	15.55	15.42	15.38	15.36	15.16	15.03	15.12	14.97
CH 06	2437	15.36	15.37	15.35	15.30	15.12	15.05	15.06	15.02
CH 11	2462	15.39	15.38	15.30	15.29	15.04	14.98	15.03	14.86

Channel	Freq. (MHz)	2.4G 802.11n-20 Output Power(dBm)								
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps	72 Mbps
CH 01	2412	14.49	14.48	14.35	14.27	14.25	14.32	14.29	14.05	14.07
CH 06	2437	14.59	14.50	14.41	14.32	14.31	14.29	14.28	14.13	14.09
CH 11	2462	14.49	14.52	14.28	14.26	14.28	14.23	14.30	14.08	14.03

Channel	Freq. (MHz)	2.4G 802.11n-40 Output Power(dBm)								
		13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps	150 Mbps
CH 03	2422	13.42	13.38	13.36	13.24	13.30	13.26	13.18	13.19	13.08
CH 06	2437	13.33	13.29	13.32	13.28	13.26	13.28	13.20	13.12	13.09
CH 09	2452	13.28	13.30	13.27	13.19	13.20	13.15	13.16	13.14	13.11

For the 802.11a SAR tests, a communication link is set up with the test mode software for WIFI mode test. 802.11a operating modes are tested independently according to the service requirements in each 5G WIFI frequency band. During the test at each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate

Channel	Freq. (MHz)	5G 802.11a Output Power(dBm)							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH149	5745	15.26	15.22	15.28	15.26	15.17	15.13	15.02	14.93
CH157	5785	15.38	15.35	15.31	15.20	15.22	15.15	15.06	15.01
CH165	5825	15.15	15.18	15.20	15.19	15.14	15.18	15.09	14.96

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at lowest data rate
3. Per KDB 248227 D01 v01r02, 802.11g /11n-HT20/11n-HT40 is not required, for the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b mode. Thus the SAR can be excluded.

Bluetooth Conducted Power

Channel	Frequency (MHz)	BT3.0 Output Power(dBm)		
		GFSK	π /4-DQPSK	8-DPSK
CH 0	2402	3.40	2.71	2.59
CH 39	2441	3.54	2.99	2.92
CH 78	2480	3.47	2.63	2.64

Channel	Frequency(MHz)	BT 4.0
CH 0	2402	-4.41
CH 20	2442	-3.95
CH 39	2480	-4.57

Note:

1. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thrssholds for 100MHz to 6GHz at test separation distances ≤ 50mm are determined by:[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [$\sqrt{f}$ (GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR
   (1) f(GHz) is the RF channel transmit frequency in GHz
   (2) Power and distance are round to the nearest mW and mm before calculation
   (3) The result is rounded to one decimal place for comparison
   (4) If the test separation diatance(antenna-user) is < 5mm, 5mm is used for excluded SAR calculation

Bluetooth Max Power (dBm)	mW	Test Distance (mm)	Frequency(Ghz)	Exclusion Thresholds
4	2.512	5	2.4	0.778

Per KDB 447498 D01v05r02 exclusion thresholds is 0.778<3, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5=0.778/7.5=0.104W/Kg

Bluetooth Max Power (dBm)	mW	Test Distance (mm)	Frequency(Ghz)	Exclusion Thresholds
4	2.512	10	2.4	0.389

Per KDB 447498 D01v05r02 exclusion thresholds is 0.389<3, RF exposure evaluation is not required.

BT estimated SAR value=Exclusion Thresholds/7.5=0.389/7.5=0.052W/Kg

The estimated SAR value is used for simultaneous transmission analysis.

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
2. Per KDB447498 D01v05r02, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
3. Per KDB941225 D06v02, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. As the manufacture required, the separation distance use 5mm for Hotspot mode.
4. Per KDB 865664 D01v01r03,for each frequency band,repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%,and the measured SAR <1.45W/Kg,only one repeated measurement is required.
5. Per KDB865664 D02v01r01, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to appendix D for details).
6. Per KDB941225 D01v03, when multiple slots can be used, the GPRS/EDGE slot configuration with the highest frame–averaged output power was selected for SAR testing.
7. Per KDB941225 D01v03, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.
8. Per KDB 248227 D01 v01r02, 802.11g /11n-HT20/11n-HT40 is not required, for the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b mode. Thus the SAR can be excluded.

Simultaneous SAR

No.	Transmitter Combinations	Scenario Supported or not	Supported for Mobile Hotspot or not
1	GSM(Voice)+GSM(Data)	No	No
2	WCDMA(Voice)+WCDMA(Data)	Yes	No
3	GSM(Voice)+ WCDMA(Data)	No	No
4	WCDMA(Voice)+GSM(Data)	No	No
5	GSM(Voice)+ WCDMA(Voice)	No	No
6	GSM(Voice)+Wifi	Yes	Yes
7	WCDMA(Voice) +Wifi	Yes	Yes
8	GSM(Voice)+ BT	Yes	No
9	WCDMA(Voice) + BT	Yes	No
10	WCDMA(Voice)+WCDMA(Data)+ Wifi	Yes	Yes
11	WCDMA(Voice)+WCDMA(Data)+ BT	Yes	No
12	GSM(Data)+wifi	Yes	Yes
13	WCDMA(Data) +wifi	Yes	Yes

. Scaling Factor calculation

Operation Mode	Channel	Output Power(dBm)	Tune up Power in tolerance(dBm)	Scaling Factor
GSM 850	128	33.38	33.00 ±0.5	1.028
	190	33.43	33.00 ±0.5	1.016
	251	33.41	33.00 ±0.5	1.021
GPRS 850(2Tx)	128	30.44	30.00 ±0.5	1.014
	190	30.46	30.00 ±0.5	1.009
	251	30.37	30.00 ±0.5	1.030
GSM1900	512	30.14	30.00 ±0.5	1.086
	661	30.18	30.00 ±0.5	1.076
	810	30.17	30.00 ±0.5	1.079
GPRS1900(2Tx)	512	27.34	27.00 ±0.5	1.038
	661	27.36	27.00 ±0.5	1.033
	810	27.35	27.00 ±0.5	1.035
WCDMA850	4132	23.34	23.00 ±0.5	1.038
	4183	23.37	23.00 ±0.5	1.030
	4233	23.35	23.00 ±0.5	1.035
2.4G 802.11b	2412	16.17	16.00 ±0.5	1.079
	2437	16.06	16.00 ±0.5	1.107
	2462	15.99	16.00 ±0.5	1.125
5G 802.11a	5745	15.26	15.00 ±0.5	1.057
	5785	15.38	15.00 ±0.5	1.028
	5825	15.15	15.00 ±0.5	1.084
BT 3.0 GFSK	2402	3.40	3.00 ±1	1.148
	2441	3.54	3.00 ±1	1.112
	2480	3.47	3.00 ±1	1.130

10 TEST RESULTS

10.1 Summary of Power Measurement Results

According the description above, the measurements against the head phantom were executed on the operation mode: GSM850 /1900MHz, WCDMA850MHz and WIFI 802.11b, while the tests against the body-worn were carried out on the operation mode : GSM850/1900MHz, GPRS 850 /1900MHz, WCDMA850,WIFI 802.11b, WIFI 802.11a.

Table 1: SAR Values of GSM 850MHz Band

	Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions			Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
				SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek		190/836.6	0.121	0.123
	Tilt 15 degrees		190/836.6	0.103	0.105
Left Side of Head	Cheek		190/836.6	**0.128**	0.130
	Tilt 15 degrees		190/836.6	0.123	0.125
Body (10mm Separation)	GSM	Face Upward	190/836.6	0.088	0.089
		Back Upward	190/836.6	**0.687**	0.698
		Edge A	190/836.6	0.053	0.054
		Edge B	190/836.6	0.105	0.107
		Edge C	190/836.6	0.324	0.329
		Edge D	190/836.6	0.217	0.220
	GPRS (2Tx)	Face Upward	190/836.6	0.062	0.063
		Back Upward	190/836.6	**0.642**	0.648
		Edge A	190/836.6	0.051	0.051
		Edge B	190/836.6	0.102	0.103
		Edge C	190/836.6	0.317	0.320
		Edge D	190/836.6	0.206	0.208

Table 2: SAR Values of GSM1900 MHz Band

Temperature: 22.0~23.5°C, humidity: 62~64%.					
Test Positions			Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
				SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek		661/1880.0	**0.022**	0.024
	Tilt 15 degrees		661/1880.0	0.011	0.012
Left Side of Head	Cheek		661/1880.0	0.020	0.022
	Tilt 15 degrees		661/1880.0	0.011	0.012
Body (10mm Separation)	GSM	Face Upward	661/1880.0	0.045	0.048
		Back Upward	661/1880.0	**0.177**	0.190
		Edge A	661/1880.0	0.034	0.037
		Edge B	661/1880.0	0.075	0.081
		Edge C	661/1880.0	0.092	0.099
		Edge D	661/1880.0	0.104	0.112
	GPRS (2Tx)	Face Upward	661/1880.0	0.040	0.041
		Back Upward	661/1880.0	**0.147**	0.152
		Edge A	661/1880.0	0.032	0.033
		Edge B	661/1880.0	0.071	0.073
		Edge C	661/1880.0	0.095	0.098
		Edge D	661/1880.0	0.107	0.111

Table 3: SAR Values of WCDMA850

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	4183/836.6	**0.088**	0.091
	Tilt 15 degrees	4183/836.6	0.056	0.058
Left Side of Head	Cheek	4183/836.6	0.081	0.083
	Tilt 15 degrees	4183/836.6	0.063	0.065
Body (10mm Separation)	Face Upward	4183/836.6	0.051	0.053
	Back Upward	4183/836.6	**0.628**	0.750
	Edge A	4183/836.6	0.051	0.053
	Edge B	4183/836.6	0.121	0.125
	Edge C	4183/836.6	0.395	0.407
	Edge D	4183/836.6	0.212	0.218

Table 4:SAR Values of Wi-Fi 802.11b

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	6/2437	**0.028**	0.031
	Tilt 15 degrees	6/2437	0.017	0.019
Left Side of Head	Cheek	6/2437	0.025	0.028
	Tilt 15 degrees	6/2437	0.013	0.014
802.11b(10mm Separation)	Edge A	6/2437	0.023	0.025
	Edge B	6/2437	0.036	0.048
	Edge C	6/2437	0.011	0.012
	Edge D	6/2437	0.017	0.019
	Face Upward	6/2437	0.024	0.027
	Back Upward	6/2437	**0.043**	0.048

Table 5:SAR Values of Wi-Fi 802.11a

Temperature: 22.0~23.5°C, humidity: 62~64%.				
Test Positions		Channel /Frequency (MHz)	SAR(W/Kg), 1.6 (1g average)	
			SAR(W/Kg1g Peak)	Scaled SAR(W/Kg),1g
Right Side of Head	Cheek	157/5785	0.025	0.026
	Tilt 15 degrees	157/5785	0.014	0.014
Left Side of Head	Cheek	157/5785	**0.027**	0.028
	Tilt 15 degrees	157/5785	0.014	0.014
802.11a(10mm Separation)	Edge A	157/5785	0.018	0.019
	Edge B	157/5785	0.026	0.027
	Edge C	157/5785	0.005	0.005
	Edge D	157/5785	0.011	0.011
	Face Upward	157/5785	0.020	0.021
	Back Upward	157/5785	**0.034**	0.035

Note:

When the 1-g SAR for the mid-band channel or the channel with the Highest output power satisfy the following conditions, testing of the other channels in the band is not required.(Per KDB 447498 D01 General RF Exposure Guidance v05r02)

• ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz
• ≤ 0.6 W/kg, when the transmission band is between 100 MHz and 200 MHz
• ≤ 0.4 W/kg, when the transmission band is ≥ 200 MHz

SIMULTANEOUS TRANSMISSION ANALYSIS

Test Position		Right Cheek	Right Title	Left Cheek	Left Tilt
Head MAX 1-g SAR(W/Kg)	GSM850	0.123	0.105	0.130	0.125
	GSM1900	0.024	0.012	0.022	0.012
	WCDMA 850	0.091	0.058	0.083	0.065
	WiFi	0.031	0.019	0.028	0.014
	BT	*0.104	*0.104	*0.104	*0.104
BT Simultaneous ∑1-g SAR(W/Kg)		0.227	0.209	**0.234**	0.229
WiFi Simultaneous ∑1-g SAR(W/Kg)		0.154	0.124	**0.158**	0.139

Simultaneous Tx Combination of GSM/WCDMA and BT/WIFI (Head).

Test Position		Face	Back	Edge A	Edge B	Edge C	Edge D
Body-worn 10mm separation MAX 1-g SAR(W/Kg)	GSMS850	0.089	0.698	0.054	0.107	0.329	0.220
	GSM1900	0.048	0.190	0.037	0.081	0.099	0.112
	WCDMA 850	0.053	0.750	0.053	0.125	0.407	0.218
	WiFi	0.027	0.048	0.025	0.048	0.012	0.019
	BT	*0.052	*0.052	*0.052	*0.052	*0.052	*0.052
BT Simultaneous ∑1-g SAR(W/Kg)		0.141	**0.802**	0.106	0.177	0.381	0.272
WiFi Simultaneous ∑1-g SAR(W/Kg)		0.116	**0.798**	0.079	0.173	0.341	0.239

Simultaneous Tx Combination of GSM/WCDMA and BT/WIFI (Body).

Test Position		Face	Back	Edge A	Edge B	Edge C	Edge D
Hotspot 10mm separation MAX 1-g SAR(W/Kg)	GPRS850	0.063	0.648	0.051	0.103	0.320	0.208
	GPRS1900	0.041	0.152	0.033	0.073	0.098	0.111
	WCDMA 850	0.053	0.750	0.053	0.125	0.407	0.218
	WiFi	0.027	0.048	0.025	0.048	0.012	0.019
Simultaneous ∑1-g SAR(W/Kg)		0.090	**0.798**	0.076	0.173	0.419	0.237

Simultaneous Tx Combination of GSM/WCDMA and WIFI (Body).

The estimated SAR value with * Signal

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required

11 Measurement Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	– Probe Calibration	B	5.8	N	1	1	5.8	∞
2	– Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	–Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	– Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	– Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	– System Detection Limits	B	1.0	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	3	N	1	1	3.00	
8	– Readout Electronics	B	0.5	N	1	1	0.50	∞
9	– Response Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
10	– Integration Time	B	3.0	R	$\sqrt{3}$	1	1.73	∞
11	– RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	– Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	– Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	– Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							
15	– Position of the DUT	A	2.6	N	$\sqrt{3}$	1	2.6	5
16	– Holder of the DUT	A	3	N	$\sqrt{3}$	1	3.0	5

17	– Output Power Variation –SAR drift measurement	B	5.0	R	$\sqrt{3}$	1	2.89	∞
Phantom and Tissue Parameters								
18	– Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	– Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	– Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	– Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	– Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.63	
Expanded uncertainty (Confidence interval of 95 %)				K=2			21.26	

System Check Uncertainty

No.	Uncertainty Component	Type	Uncertainty Value (%)	Probability Distribution	k	ci	Standard Uncertainty (%) ui(%)	Degree of freedom Veff or vi
	Measurement System							
1	– Probe Calibration	B	5.8	N	1	1	5.8	∞
2	– Axial isotropy	B	3.5	R	$\sqrt{3}$	0.5	1.43	∞
3	–Hemispherical Isotropy	B	5.9	R	$\sqrt{3}$	0.5	2.41	∞
4	– Boundary Effect	B	1	R	$\sqrt{3}$	1	0.58	∞
5	– Linearity	B	4.7	R	$\sqrt{3}$	1	2.71	∞
6	– System Detection Limits	B	1	R	$\sqrt{3}$	1	0.58	∞
7	Modulation response	B	0	N	1	1	0.00	

8	– Readout Electronics	B	0.5	N	1	1	0.50	∞
9	– Response Time	B	0.00	R	$\sqrt{3}$	1	0.00	∞
10	– Integration Time	B	1.4	R	$\sqrt{3}$	1	0.81	∞
11	– RF Ambient Conditions	B	3.0	R	$\sqrt{3}$	1	1.73	∞
12	– Probe Position Mechanical tolerance	B	1.4	R	$\sqrt{3}$	1	0.81	∞
13	– Probe Position with respect to Phantom Shell	B	1.4	R	$\sqrt{3}$	1	0.81	∞
14	– Extrapolation, Interpolation and Integration Algorithms for Max. SAR evaluation	B	2.3	R	$\sqrt{3}$	1	1.33	∞
	Uncertainties of the DUT							
15	Deviation of experimental source from numberical source	A	4	N	1	1	4.00	5
16	Input Power and SAR drift measurement	A	5	R	$\sqrt{3}$	1	2.89	5
17	Dipole Axis to Liquid Distance	B	2	R	$\sqrt{3}$	1	1.2	∞
Phantom and Tissue Parameters								
18	– Phantom Uncertainty(shape and thickness tolerances)	B	4	R	$\sqrt{3}$	1	2.31	∞
19	Uncertainty in SAR correction for deviation(in permittivity and conductivity)	B	2	N	1	1	2.00	
20	– Liquid Conductivity Target –tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
21	– Liquid Conductivity –measurement Uncertainty)	B	4	N	$\sqrt{3}$	1	0.92	9
22	– Liquid Permittivity Target tolerance	B	2.5	R	$\sqrt{3}$	0.6	1.95	∞
23	– Liquid Permittivity –measurement uncertainty	B	5	N	$\sqrt{3}$	1	1.15	∞
Combined Standard Uncertainty				RSS			10.15	
Expanded uncertainty (Confidence interval of 95 %)				K=2			20.29	

12 MAIN TEST INSTRUMENTS

EQUIPMENT	TYPE	Series No.	Last Calibration	Due Date
System Simulator	E5515C	GB 47200710	2014/02/23	1 Year
SAR Probe	SATIMO	SN 09/13 EP169	2014/04/05	1 Year
SAR Probe	SATIMO	SN 27/14 EPG210	2014/07/01	1 Year
Dipole	SID750	SN25/13 DIP0G750-253	2014/08/17	1 Year
Dipole	SID835	SN09/13 DIP0G835-217	2014/08/28	1 Year
Dipole	SID1900	SN09/13 DIP1G900-218	2014/08/28	1 Year
Dipole	SID2450	SN09/13 DIP2G450-220	2014/08/28	1 Year
Dipole	SWG5500	SN 24/11 WGA16	2014/06/18	1 Year
Network Analyzer	ZVB8	A0802530	2014/06/13	1 Year
Signal Generator	SMR27	A0304219	2014/06/10	1 Year
Amplifier	Nucletudes	143060	2014/04/05	1 Year
Directional Coupler	DC6180A	305827	2014/06/10	1 Year
Power Meter	NRVS	1020.1809.02	2014/06/13	1 Year
Power Sensor	NRV-Z4	100069	2014/06/10	1 Year
Power Meter	NRP2	A140401673	2014/04/04	1 Year
Power Sensor	NPR-Z11	1138.3004.02-114072-nq	2014/04/04	1 Year
Multimeter	Keithley2000	4014020	2014/04/16	1 Year
Device Holder	SATIMO	SN 09/13 MSH80	2014/04/05	1 Year
SAM Phantom	SAM97	SN 09/13 SAM97	2014/04/05	1 Year

ANNEX A

of

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-03832

Jiangsu SEUIC Technology CO.,Ltd.

Industrial Handheld Terminal

Type Name: AUTOID9, AUTOID9HC

Hardware Version： D500_Main

Software Version： 3.4.0

Accreditation Certificate

This Annex consists of 2 pages

Date of Report: 2015-02-12

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L1659)

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Building 28/29, Shigudong, Xili Industrial Area, Xili Street,

Nanshan District, Shenzhen, Guangdong, China

is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) *for the competence of testing and calibration.*

The scope of accreditation is detailed in the attached appendices bearing the same registration number as above. The appendices form an integral part of this certificate.

Date of Issue: 2012-09-29

Date of Expiry: 2015-09-28

Date of Initial Accreditation: 1999-08-03

Date of Update: 2012-09-29

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

No.CNAS AL 2 0005210

ANNEX B

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-03832

Jiangsu SEUIC Technology CO.,Ltd.

Industrial Handheld Terminal

Type Name: AUTOID9, AUTOID9HC

Hardware Version： D500_Main

Software Version： 3.4.0

TEST LAYOUT

This Annex consists of 11 pages

Date of Report: 2015-02-12

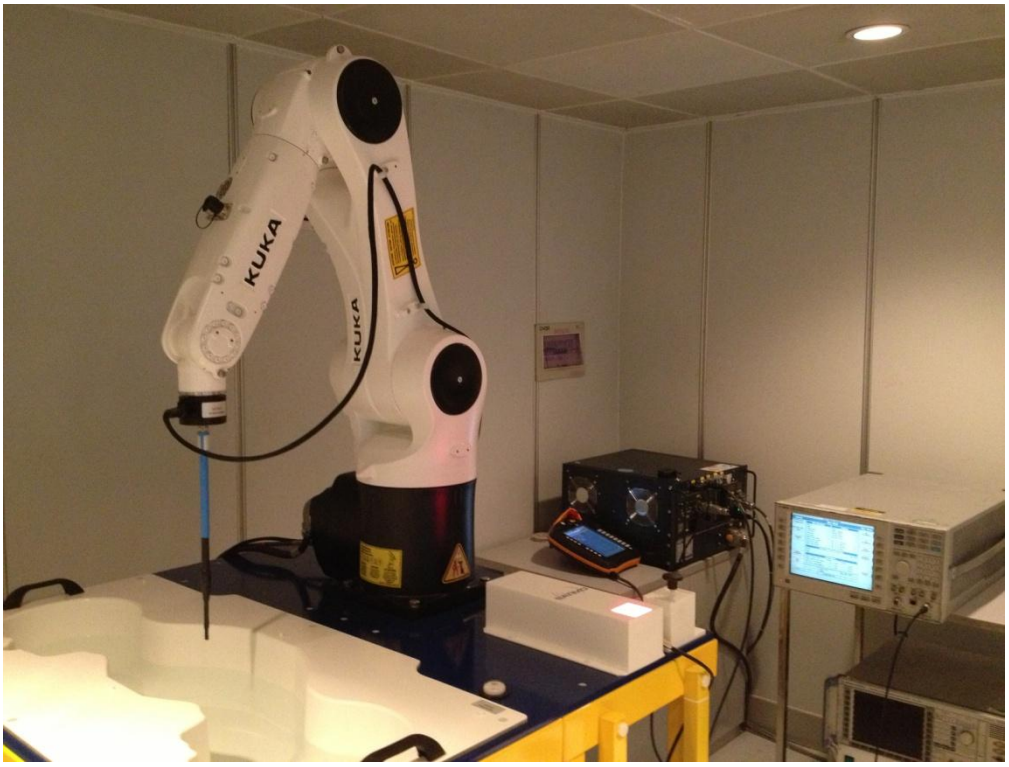


Fig.1 COMO SAR Test System

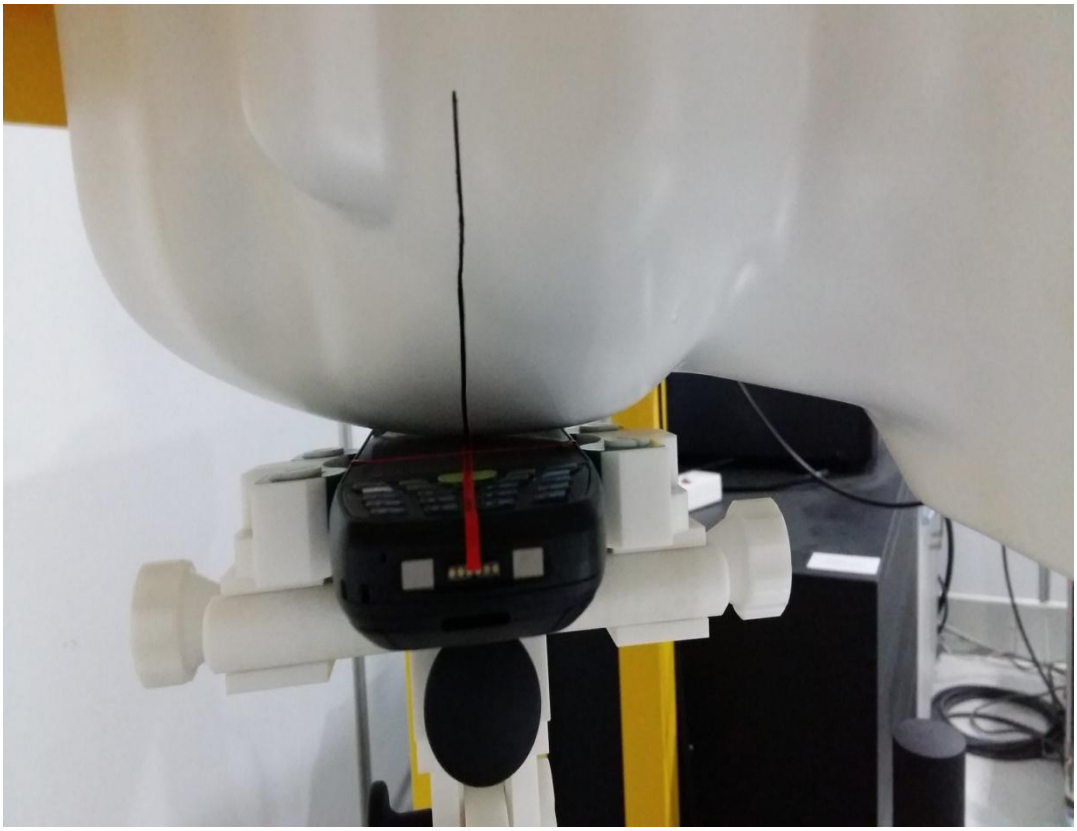


Fig.2 Right_Cheek

Fig.3 Right_Tilt

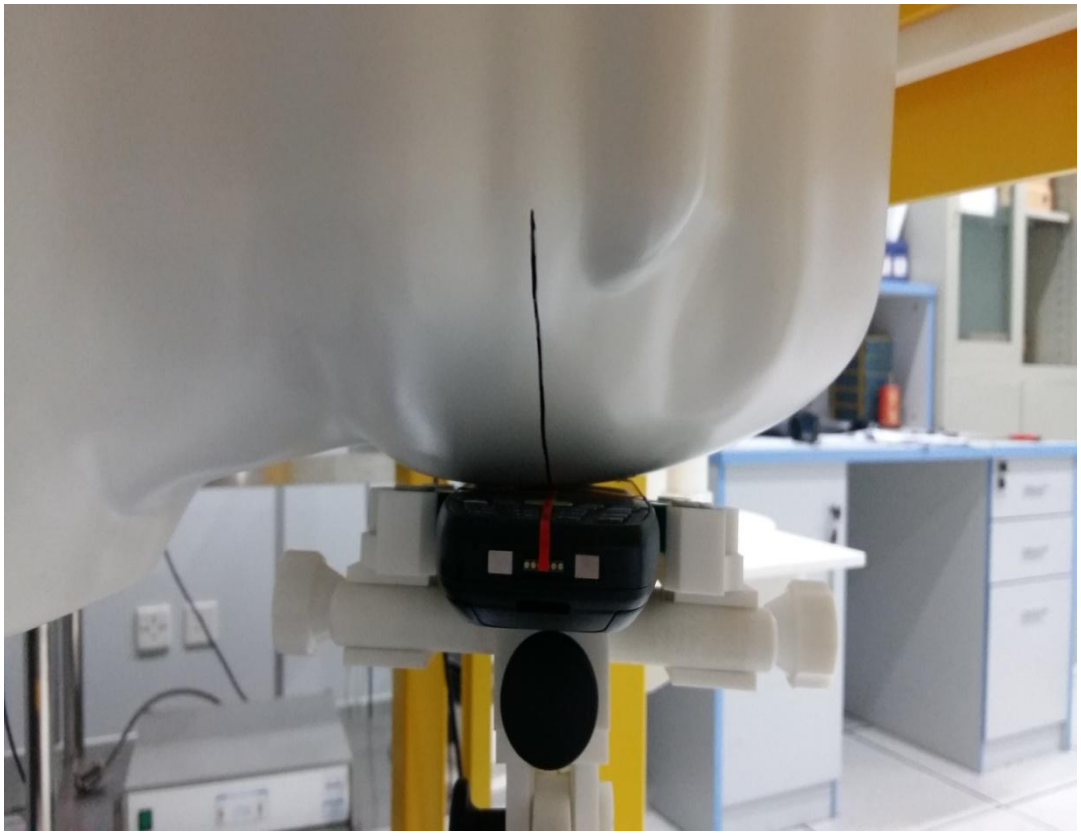


Fig.4 Left Cheek

Fig.5 Left_Tilt

Fig.6 Body(Back upside,10mm seperation)

Fig.7 Body(Face upside,10mm seperation)

Fig.8 Body Edge A(UP,10mm seperation)

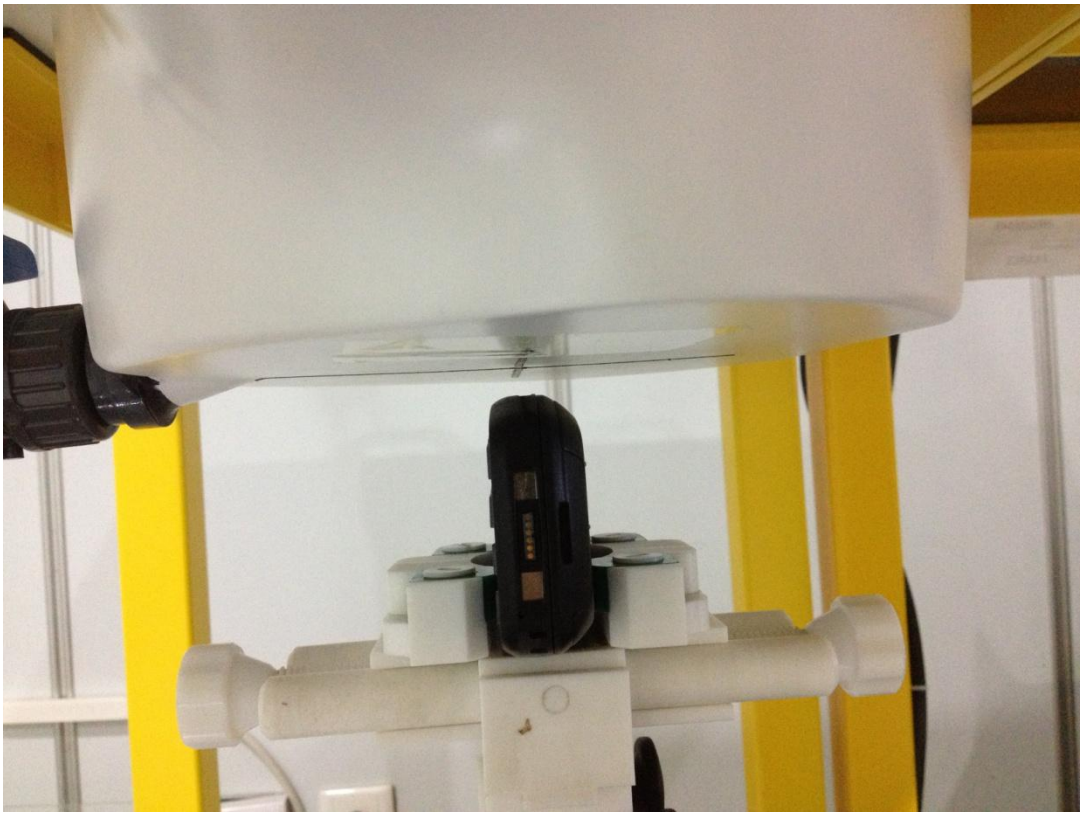


Fig.9 Body Edge B(Right upside,10mm separation)

Fig.10 Body Edge C(Down,10mm seperation)

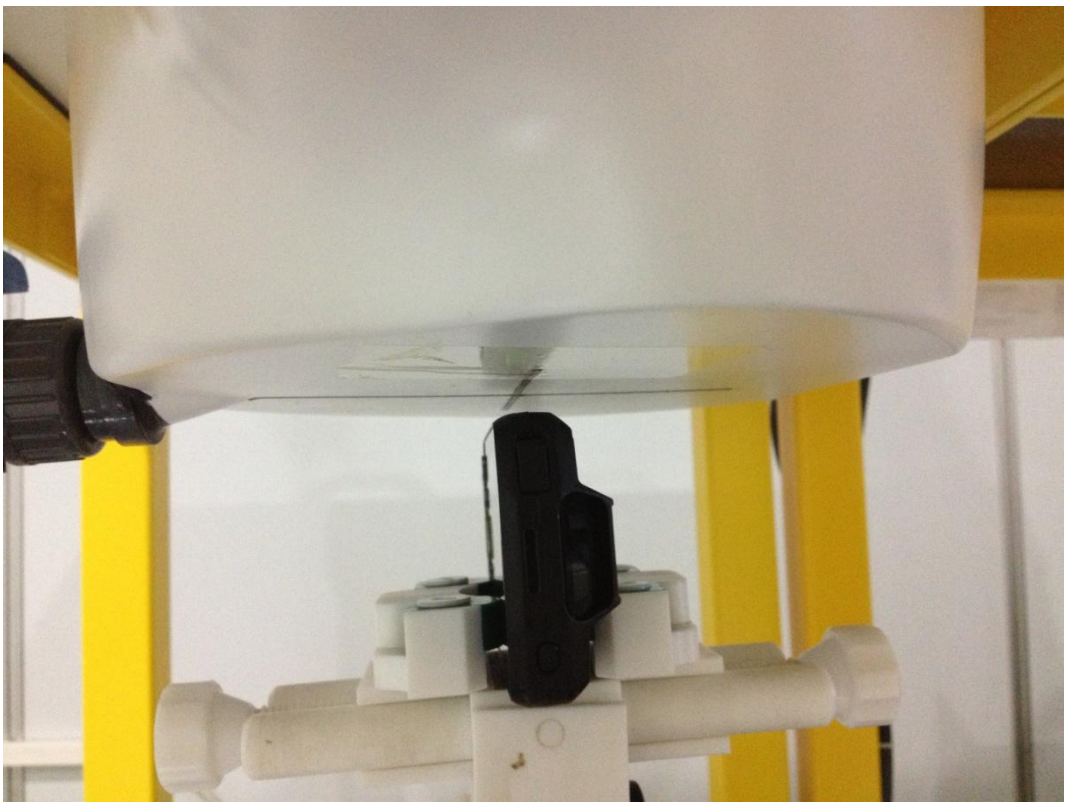


Fig.11 Body Edge D(Left upside,10mm separation)

Fig.12 Head Liquid of 835MHz(15cm)

Fig.13 Body Liquid of 835MHz(15cm)

Fig.14 Head Liquid of 1900MHz(15cm)

Fig.15 Body Liquid of 1900MHz(15cm)

Fig.16 Head Liquid of 2450MHz(15cm)

Fig.17 Body Liquid of 2450MHz(15cm)

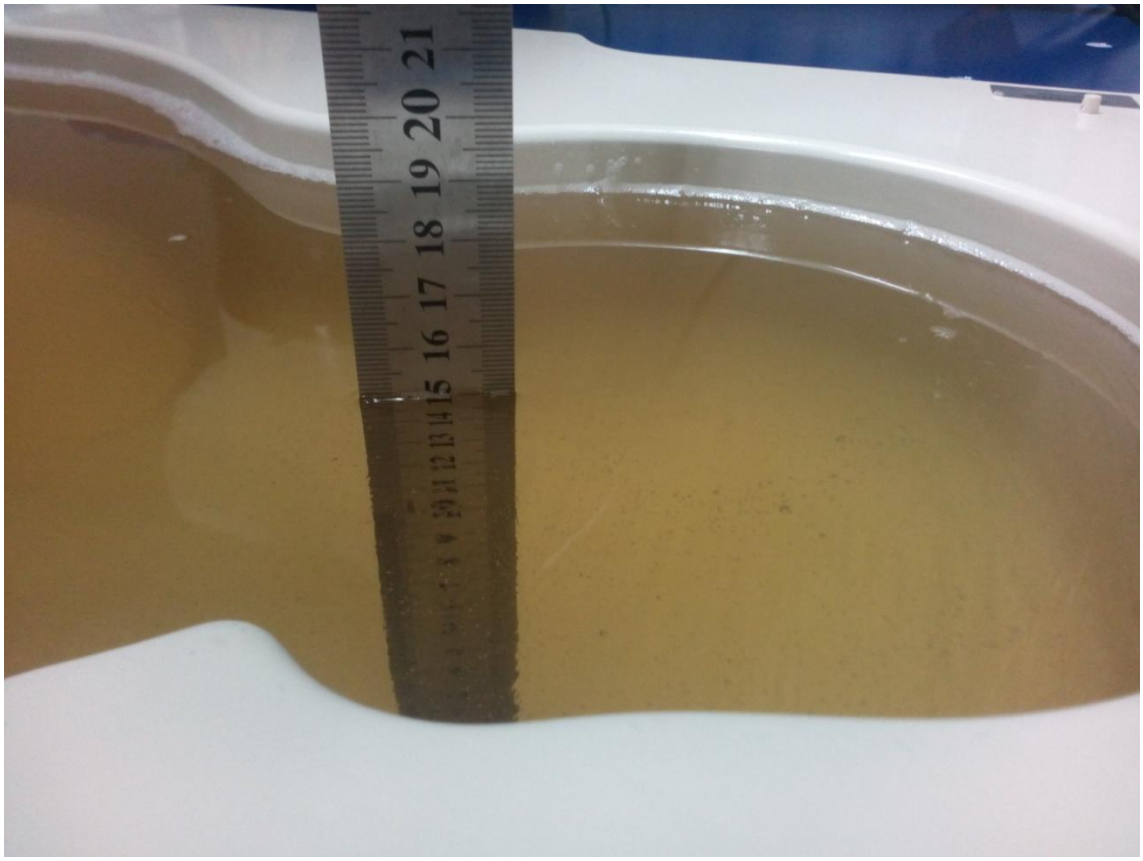


Fig.18 Head Liquid of 5800MHz(15cm)

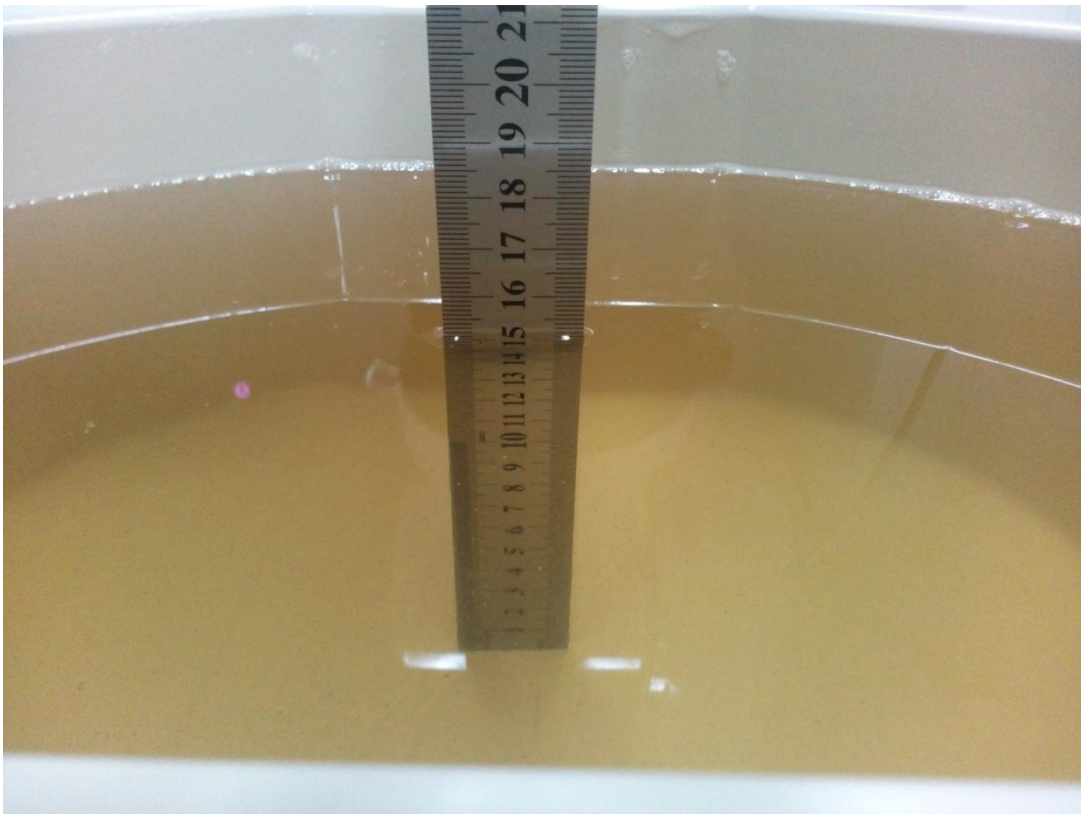


Fig.19 Body Liquid of 5800MHz(15cm)

ANNEX C

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-03832

Industrial Handheld Terminal

Type Name: AUTOID9, AUTOID9HC

Hardware Version: D500_Main

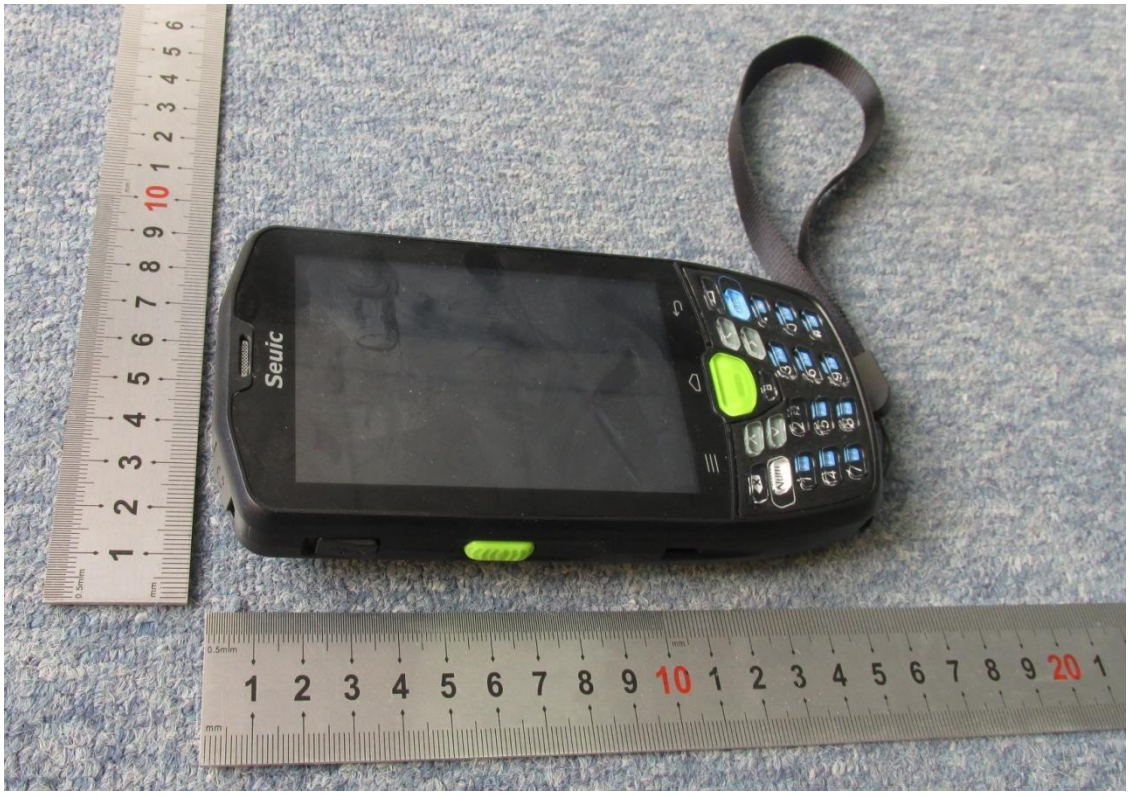
Software Version: 3.4.0

Sample Photographs

This Annex consists of 3 pages

Date of Report: 2015-02-12

1. Appearance



Appearance and size (obverse)

Appearance and size (reverse)

AUTOID9, AUTOID9HC

AUTOID9, AUTOID9HC

ANNEX D

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-03832

Industrial Handheld Terminal

Type Name: AUTOID9, AUTOID9HC

Hardware Version: D500_Main

Software Version: 3.4.0

System Performance Check Data and Highest SAR Plots

This Annex consists of 34 pages

Date of Report: 2015-02-12

GRAPH TEST RESULTS

BAND	PAPAMETERS
GSM 850	Left Head with Cheek device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode Flat Plane with Edge D Body device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GPRS mode
GSM 1900	Right Head with Cheek device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode Flat Plane with Back Body device position on Middle Channel in GSM mode (repeated measurement1) Flat Plane with Back Body device position on Middle Channel in GPRS mode
WCDMA 850	Left Head with Cheek device position on Middle Channel in WCDMA mode Flat Plane with Edge D Body device position on Middle Channel in WCDMA mode
WIFI 802.11b	Right Head with Cheek device position on Low Channel in DSSS mode Flat Plane with Back Body device position on Low Channel in DSSS mode
WIFI 802.11a	Left Head with Cheek device position on Low Channel in OFDM mode Flat Plane with Back Body device position on Low Channel in OFDM mode

System Performance Check (Head, 835MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement:19/01/2015

Measurement duration: 12 minutes 57 seconds

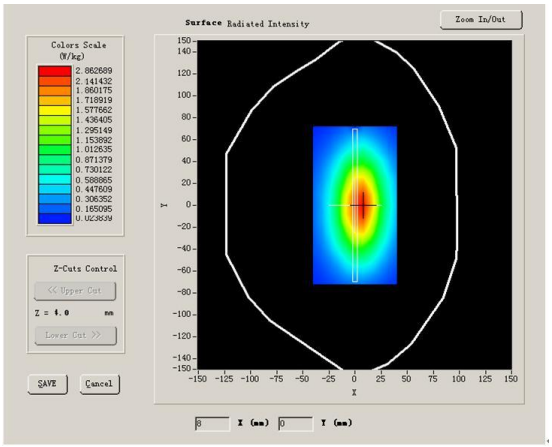
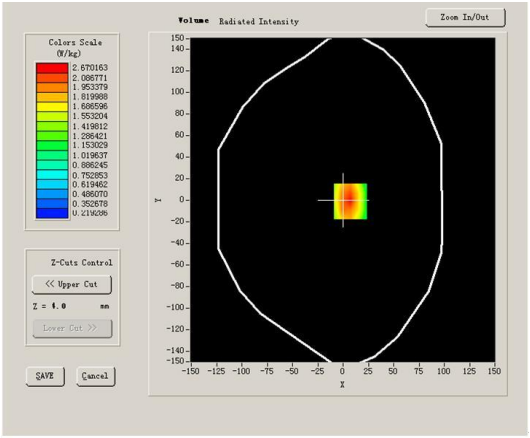
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.37
Relative permittivity	18.97
Conductivity (S/m)	0.88
Power drift (%)	-0.30
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.5 ℃
ConvF:	5.51
Duty factor:	1:1

SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	1.523041
SAR 1g (W/Kg)	2.340425

System Performance Check (Head, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 21/01/2015

Measurement duration: 12 minutes 57 seconds

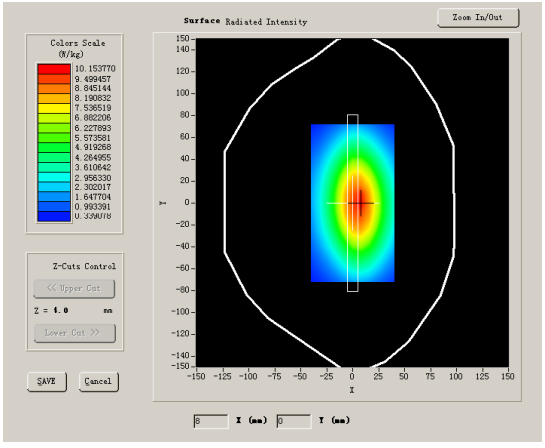
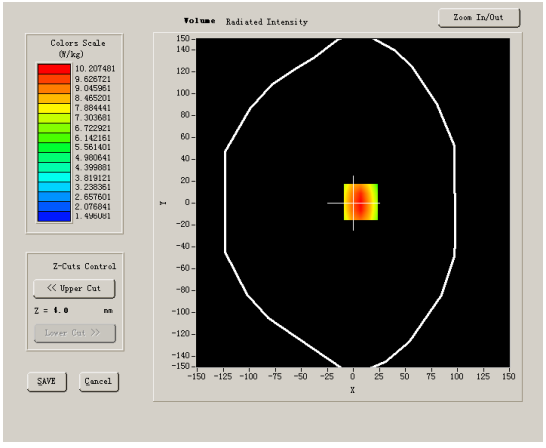
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.86
Relative permittivity	12.98
Conductivity (S/m)	1.37
Power drift (%)	1.230000
Ambient Temperature:	22.3 ℃
Liquid Temperature:	22.6 ℃
ConvF:	5.49
Duty factor:	1:1

SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=0.00

SAR 10g (W/Kg)	5.027548
SAR 1g (W/Kg)	9. 423760

System Performance Check (Head, 2450MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm

Date of measurement:24/01/2015

Measurement duration: 15 minutes 24 seconds

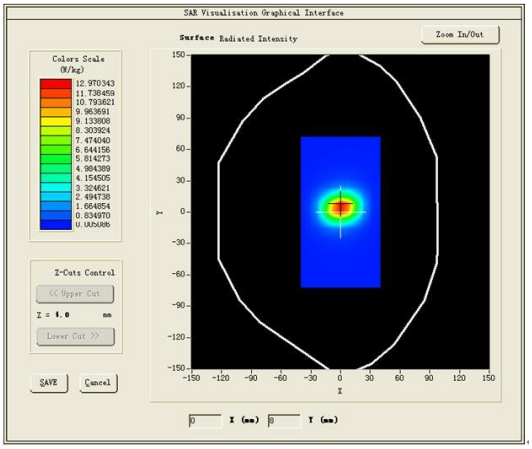
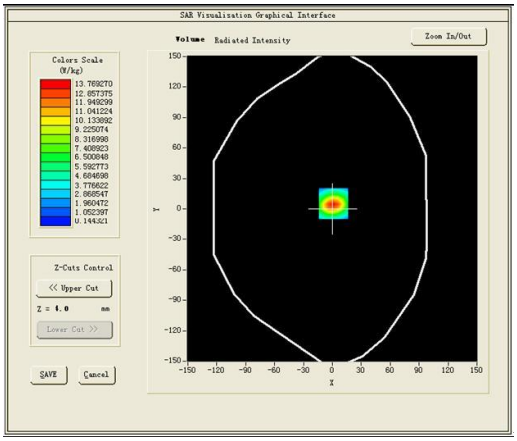
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	2450MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	2450
Relative permittivity (real part)	38.87
Relative permittivity	13.08
Conductivity (S/m)	1.78
Power Drift (%)	0.070000
ConvF:	4.81
Duty factor:	1:1

SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=0.00, Y=7.00

SAR 10g (W/Kg)	5.356472
SAR 1g (W/Kg)	12.574830

System Validation (Head, 5800MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm

Date of measurement: 27/01/2015

Measurement duration: 15 minutes 24 seconds

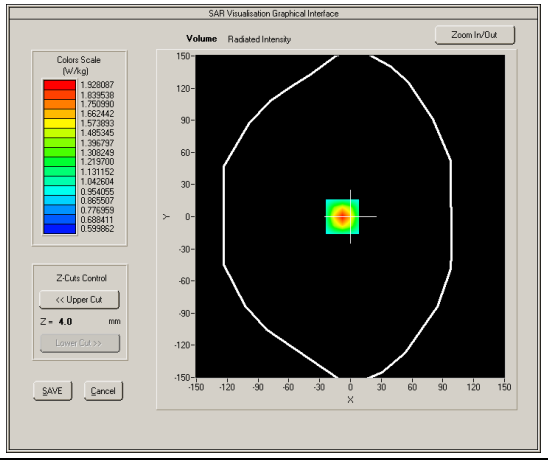
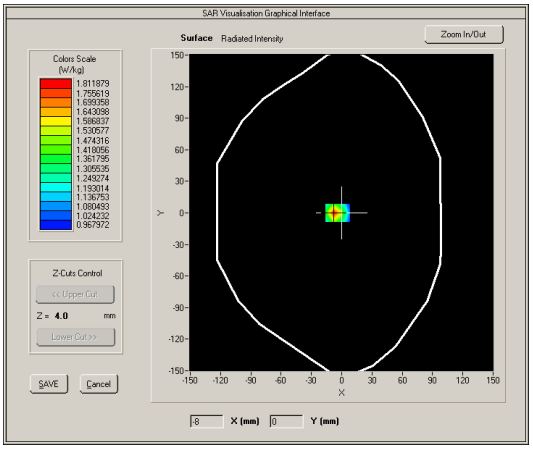
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	5800MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	5800
Relative permittivity (real part)	35.6
Relative permittivity	15.77
Conductivity (S/m)	5.08
Power Drift (%)	-4.38
ConvF:	3.22
Crest factor:	1:1

SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-8.00, Y=0.00

SAR 10g (W/Kg)	0.665304
SAR 1g (W/Kg)	1.683752

System Performance Check (Body, 835MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 19/01/2015

Measurement duration: 13 minutes 12 seconds

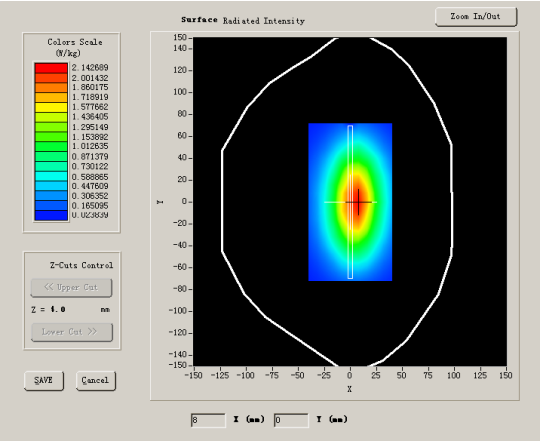
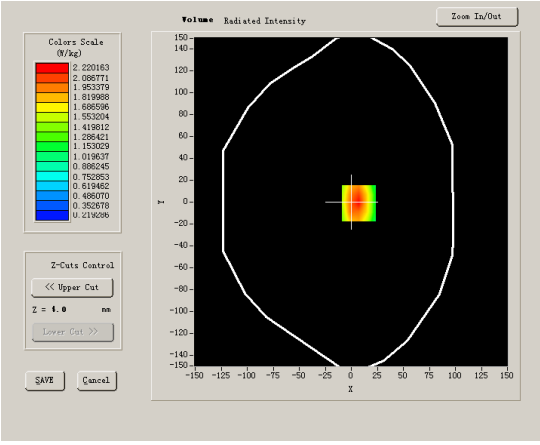
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Flat Plane
Device Position	
Band	835MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	835.000000
Relative permittivity (real part)	55.45
Relative permittivity	21.34
Conductivity (S/m)	0.99
Power drift (%)	-0.870000
Ambient Temperature:	23.2 ℃
Liquid Temperature:	23.5 ℃
ConvF:	5.68
Duty factor:	1:1

SURFACE SAR	VOLUME SAR
	

Maximum location: X=7.00, Y=-1.00

SAR 10g (W/Kg)	1.735354
SAR 1g (W/Kg)	2.463532

System Performance Check (Body, 1900MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 21/01/2015

Measurement duration: 13 minutes 12 seconds

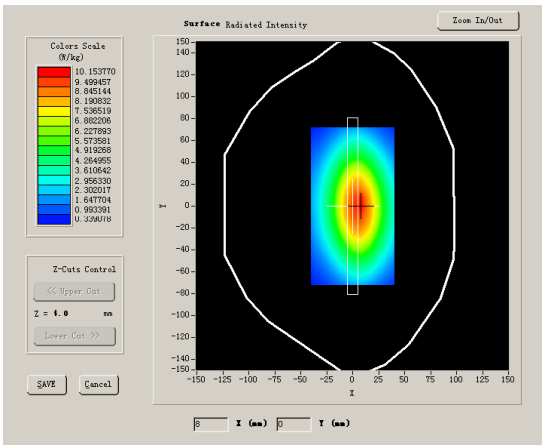
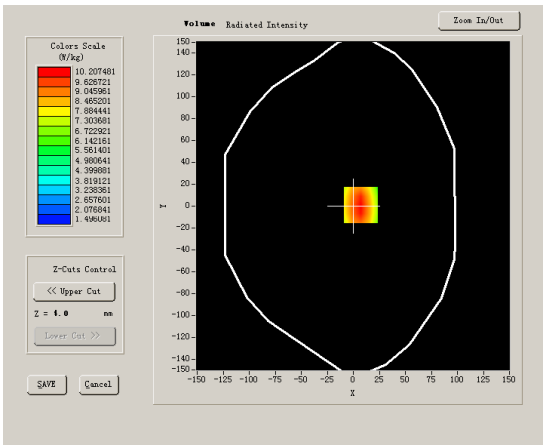
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	
Band	1900MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	1900.000000
Relative permittivity (real part)	52.76
Relative permittivity	14.87
Conductivity (S/m)	1.57
Power Drift (%)	0.120000
Ambient Temperature:	22.0 ℃
Liquid Temperature:	21.8 ℃
ConvF:	5.65
Duty factor:	1:1

SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=6.00

SAR 10g (W/Kg)	5.113542
SAR 1g (W/Kg)	9.825223

System Performance Check (Body, 2450MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm

Date of measurement: 24/01/2015

Measurement duration: 13 minutes 21 seconds

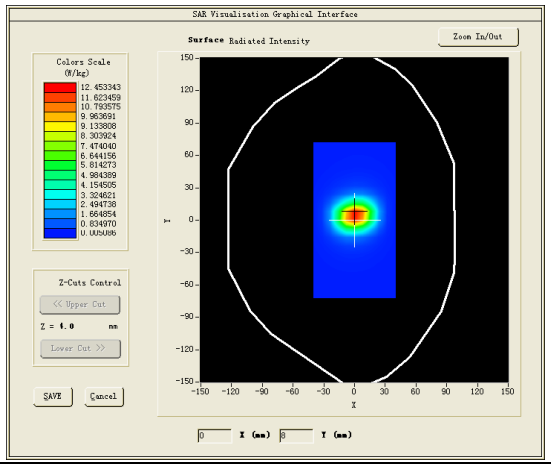
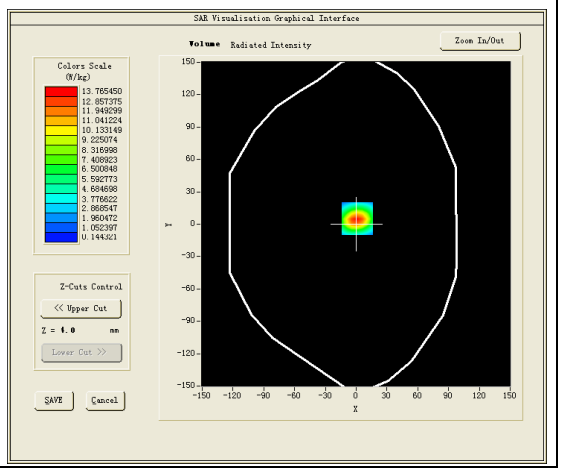
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	2450MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	2450.000000
Relative permittivity (real part)	51.34
Relative permittivity	13.96
Conductivity (S/m)	1.90
Power Drift (%)	-0.310000
Duty factor:	1:1
ConvF:	4.91

SURFACE SAR	VOLUME SAR
	

Maximum location: X=0.00, Y=8.00

SAR 10g (W/Kg)	5.036324
SAR 1g (W/Kg)	12.782432

System Validation (Body, 5800MHz)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm,dy=8mm

Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm

Date of measurement: 27/01/2015

Measurement duration: 13 minutes 21 seconds

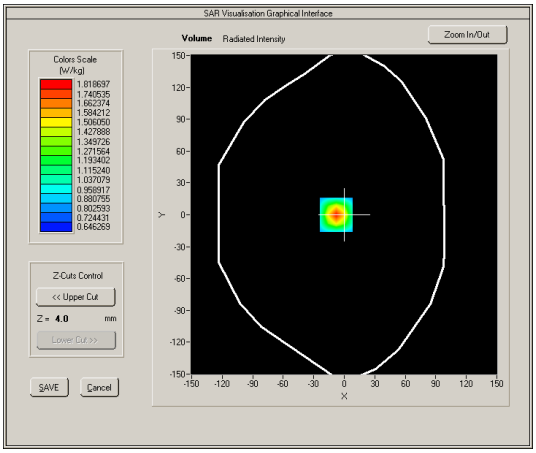
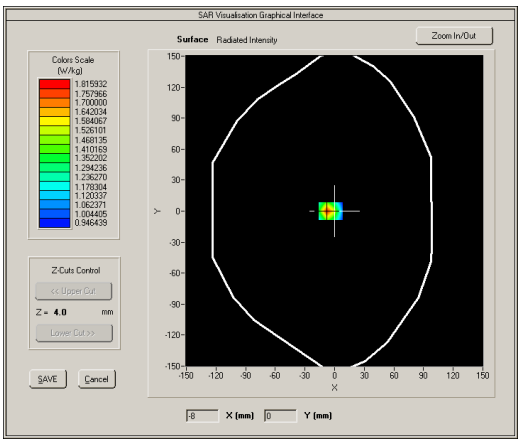
A. Experimental conditions.

Phantom File	surf_sam_plan.txt
Phantom	Validation plane
Device Position	Dipole
Band	5800MHz
Channels	
Signal	CW

B. SAR Measurement Results

Band SAR

Frequency (MHz)	5800
Relative permittivity (real part)	46.55
Relative permittivity	18.99
Conductivity (S/m)	6.12
Power Drift (%)	-2.050000
Duty factor:	1:1
ConvF:	3.38

SURFACE SAR	VOLUME SAR
	

Maximum location: X=-8.00, Y=0.00

SAR 10g (W/Kg)	0.578541
SAR 1g (W/Kg)	1.632054

GSM850, Left Cheek, Middle

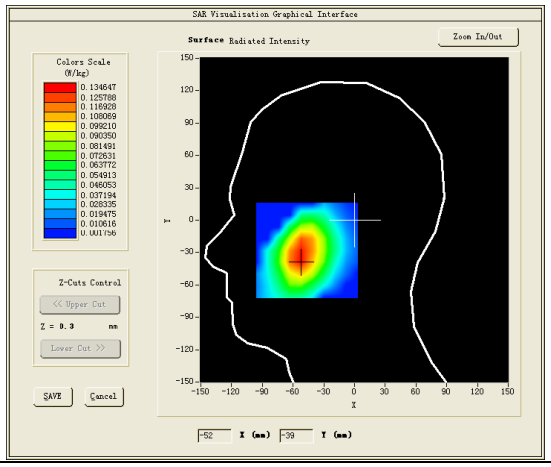
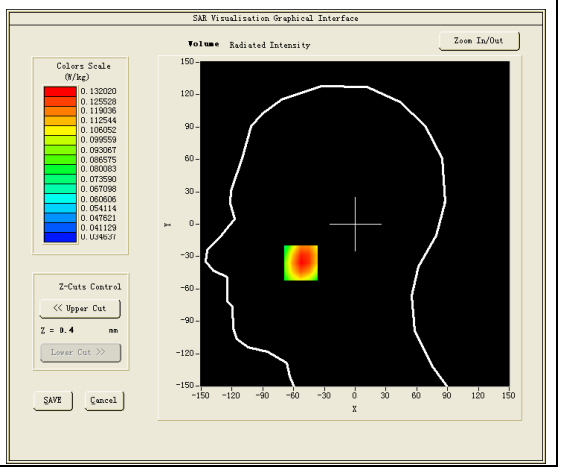
Type: Phone measurement (11 points in the volume)
Date of measurement: 19/01/2015
Measurement duration: 6 minutes 35 seconds
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	sam_direct_droit2_surf8mm.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	GSM850
Channels	190
Signal	GSM (Duty cycle: 1:8)

B. SAR Measurement Results

Frequency (MHz)	836.6
Relative permittivity (real part)	41.37
Relative permittivity (imaginary part)	18.97
Conductivity (S/m)	0.88
Variation (%)	1.810000
ConvF:	5.51

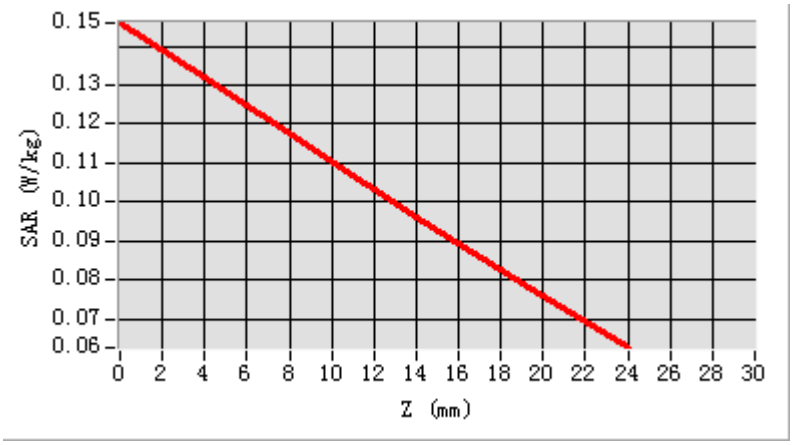
SURFACE SAR	VOLUME SAR
	

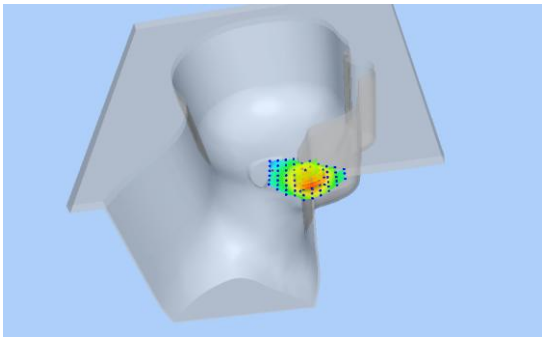
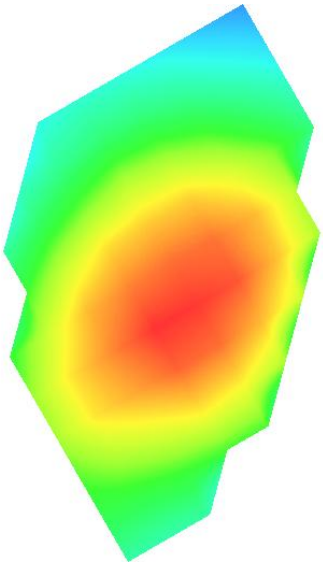
Maximum location: X=-53.00, Y=-36.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.100639
SAR 1g (W/Kg)	0.128458

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1460	0.1320	0.1142	0.0963	0.0788



3D screen shot	Hot spot position
	

GSM850, Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/01/2015

Measurement duration: 7 minutes 32 seconds

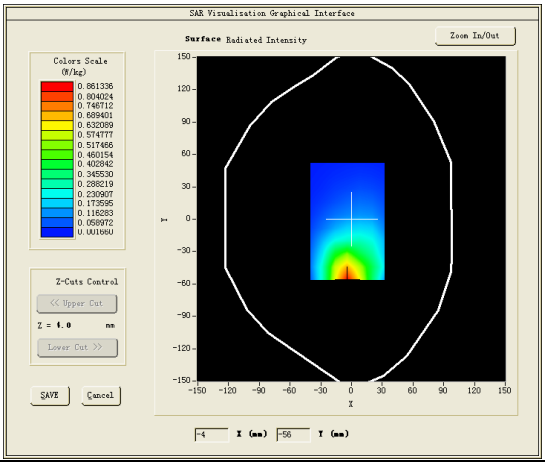
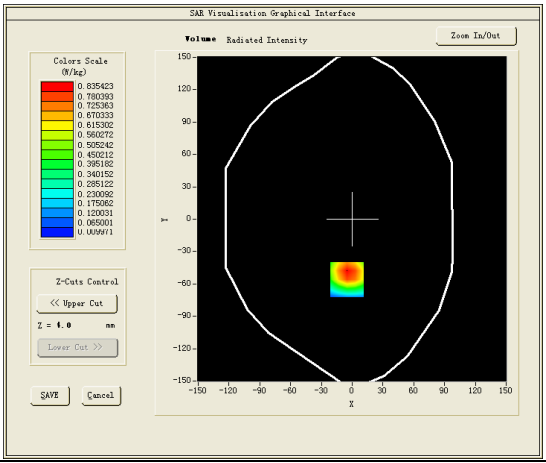
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	GSM850
Channels	190
Signal	GSM(Duty cycle: 1:8)

B. SAR Measurement Results

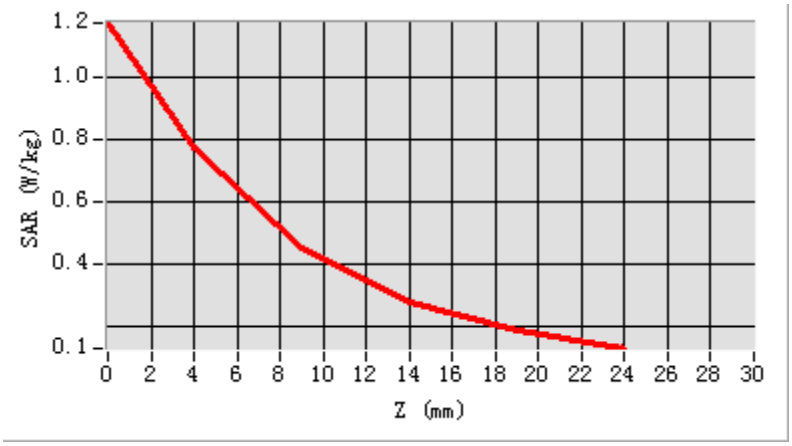
Frequency (MHz)	836.6
Relative permittivity (real part)	55.45
Relative permittivity (imaginary part)	21.34
Conductivity (S/m)	0.99
Variation (%)	-3.200000
ConvF:	5.68

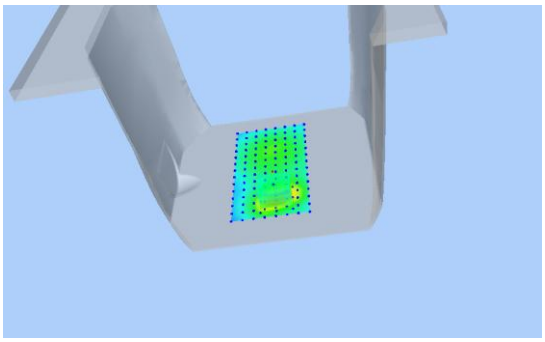
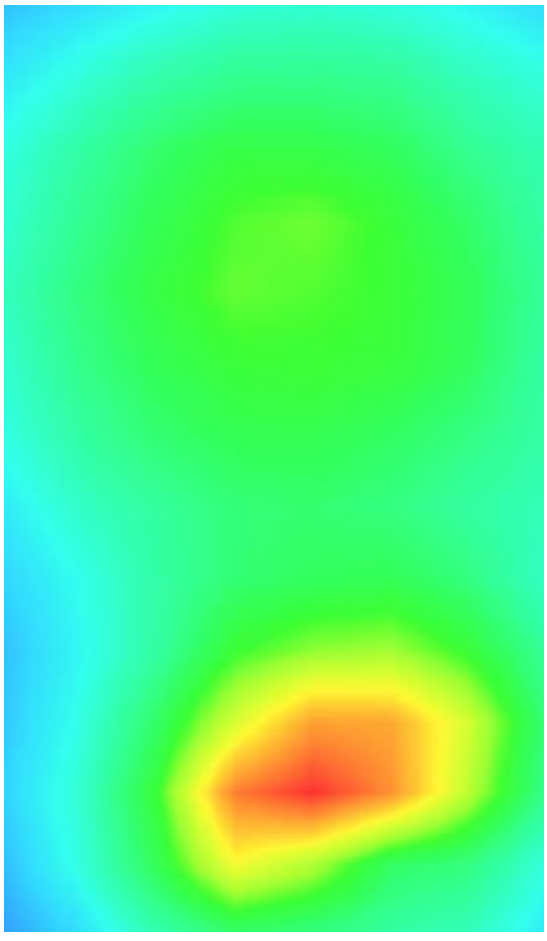
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-5.00, Y=-52.00

SAR 10g (W/Kg)	0.325410
SAR 1g (W/Kg)	0.687324

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.1624	0.7247	0.4125	0.2301	0.1243



3D screen shot	Hot spot position
	

GPRS 850, Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/01/2015

Measurement duration: 7 minutes 33 seconds

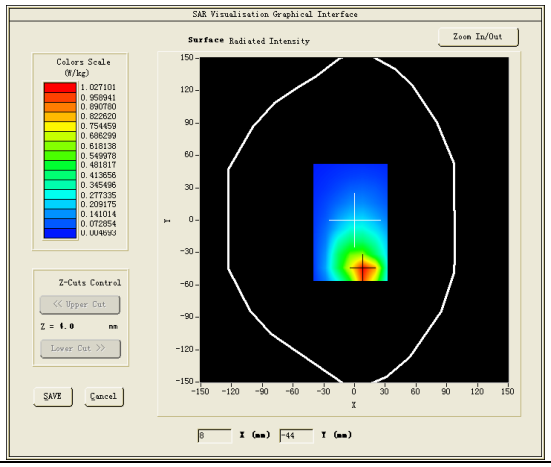
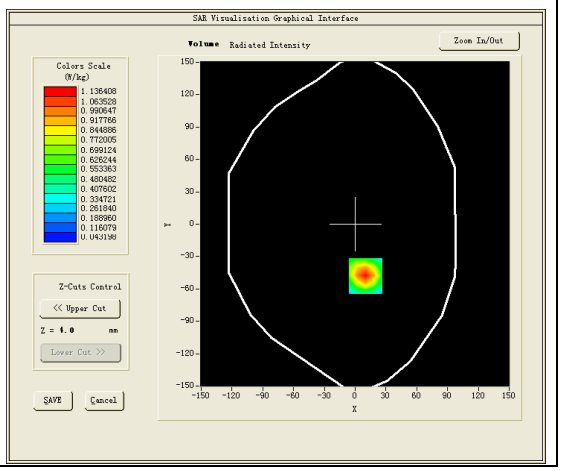
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	CUSTOM (GPRS850_2Tx)
Channels	190
Signal	GPRS(Duty cycle: 1:4)

B.SAR Measurement Results

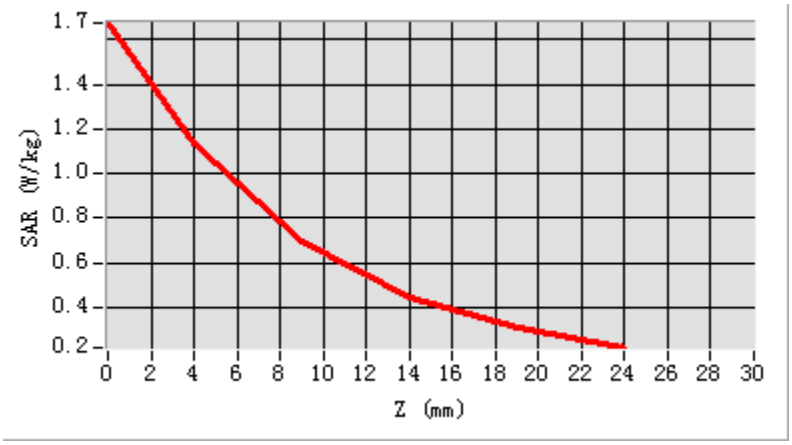
Frequency (MHz)	836.6
Relative permittivity (real part)	55.45
Relative permittivity (imaginary part)	21.34
Conductivity (S/m)	0.99
Variation (%)	-3.180000
ConvF:	5.68

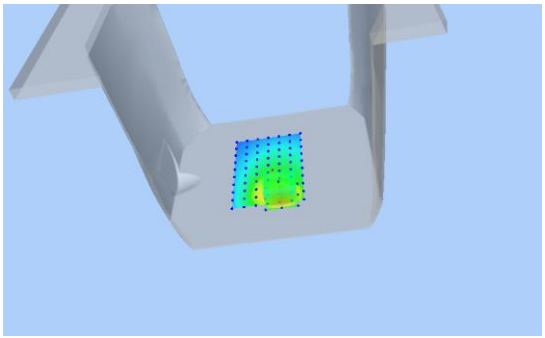
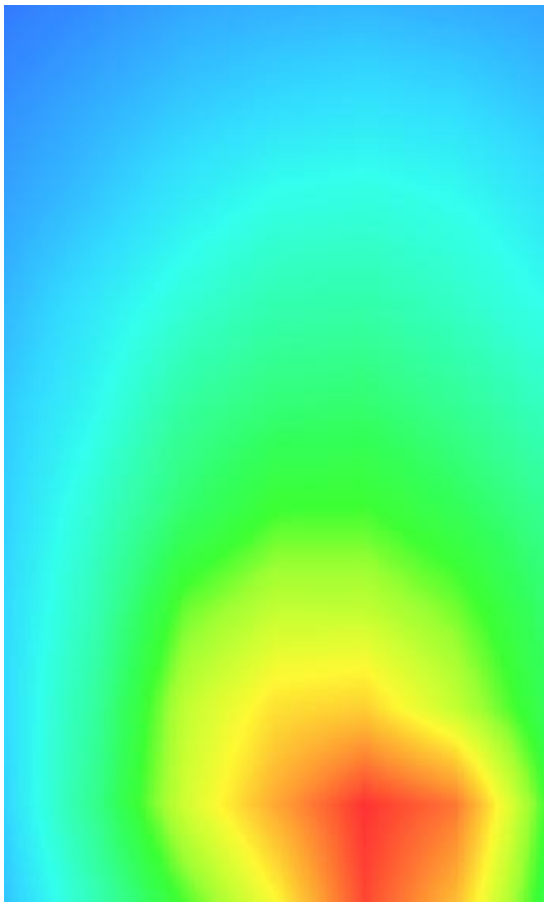
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=10.00, Y=-48.00

SAR 10g (W/Kg)	0.350172
SAR 1g (W/Kg)	0.642154

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.6021	1.1124	0.6245	0.4201	0.3001



3D screen shot	Hot spot position
	

GSM1900, Right Cheek, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 21/01/2015

Measurement duration: 5 minutes 37 seconds

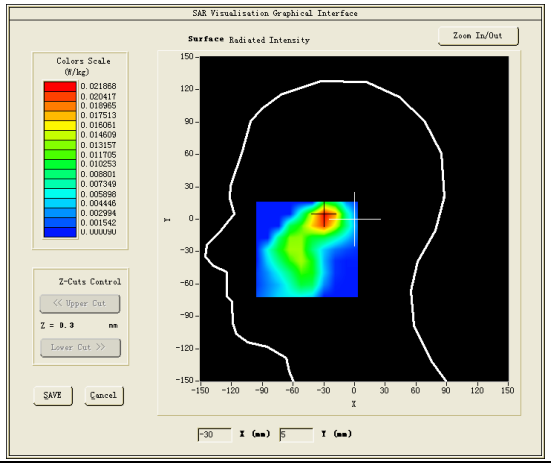
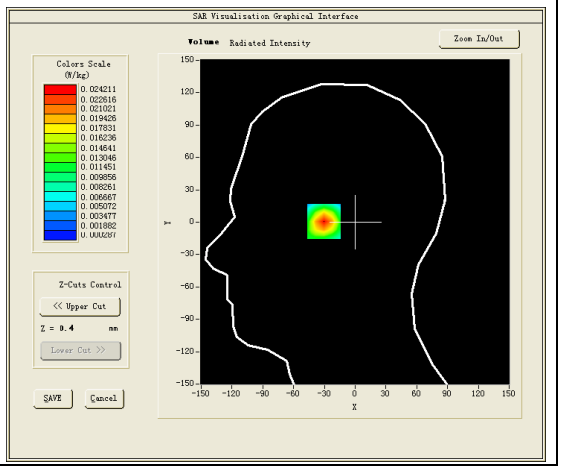
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	sam_direct_droit2_surf8mm.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	661
Signal	GSM (Duty cycle: 1:8)

B.SAR Measurement Results

Frequency (MHz)	1880
Relative permittivity (real part)	39.86
Relative permittivity (imaginary part)	12.98
Conductivity (S/m)	1.37
Variation (%)	-0.570000
ConvF:	5.49

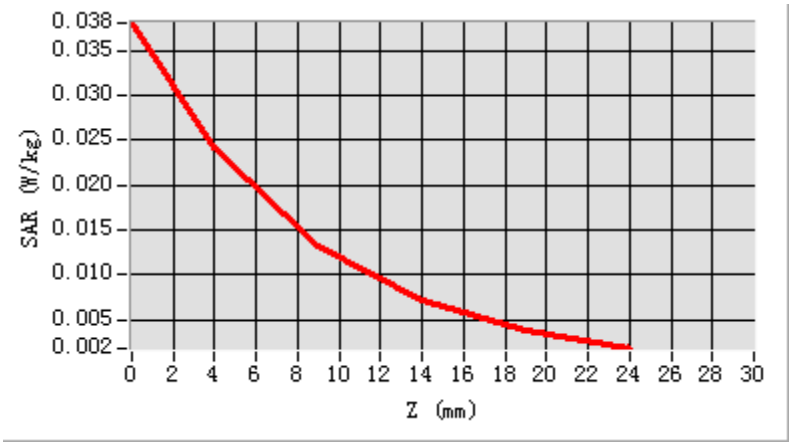
SURFACE SAR	VOLUME SAR
	

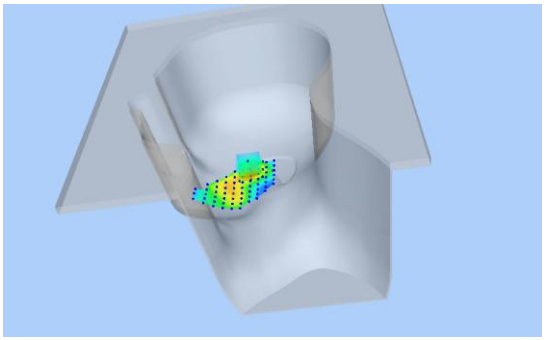
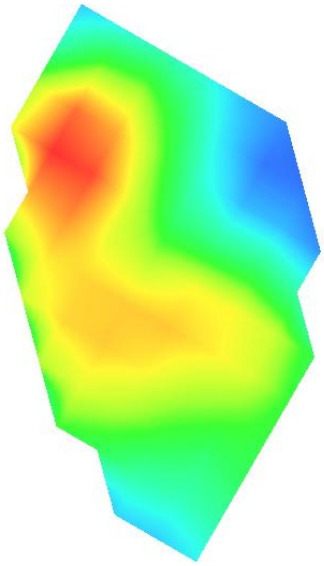
Maximum location: X=-29.00, Y=2.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.011215
SAR 1g (W/Kg)	0.022334

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0381	0.0242	0.0132	0.0070	0.0037



3D screen shot	Hot spot position
	

GSM1900, Back, Middle

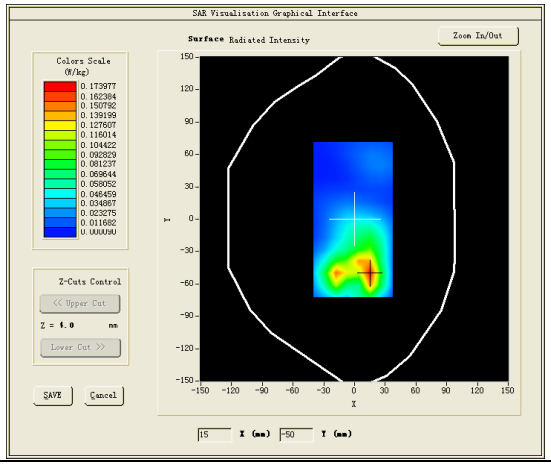
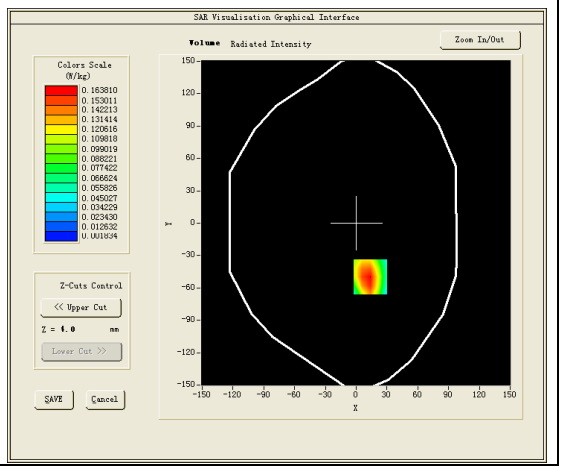
Type: Phone measurement (11 points in the volume)
Date of measurement: 21/01/2015
Measurement duration: 6 minutes 52 seconds
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	GSM1900
Channels	661
Signal	GSM (Duty cycle: 1:8)

B. SAR Measurement Results

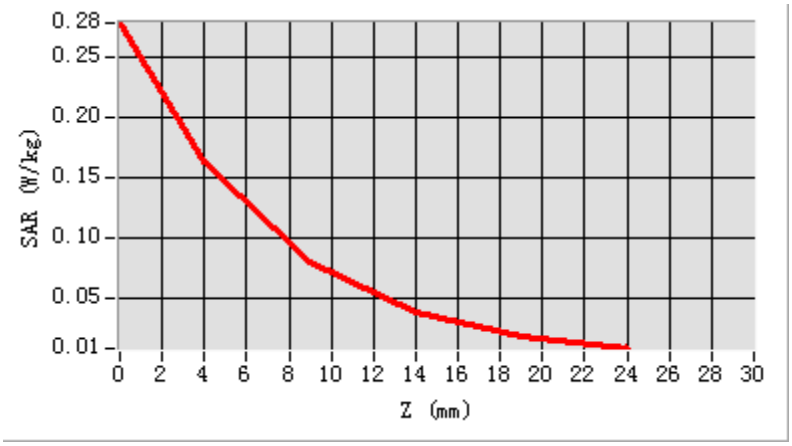
Frequency (MHz)	1880.0
Relative permittivity (real part)	52.76
Relative permittivity (imaginary part)	14.87
Conductivity (S/m)	1.57
Variation (%)	0.090000
ConvF:	5.65

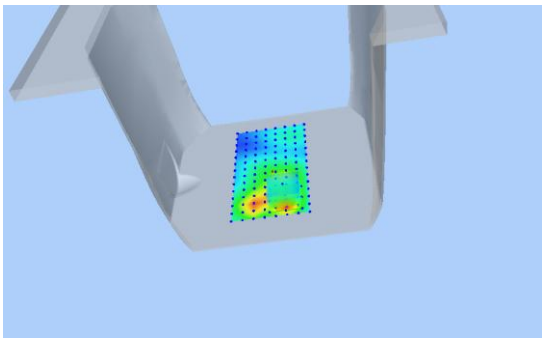
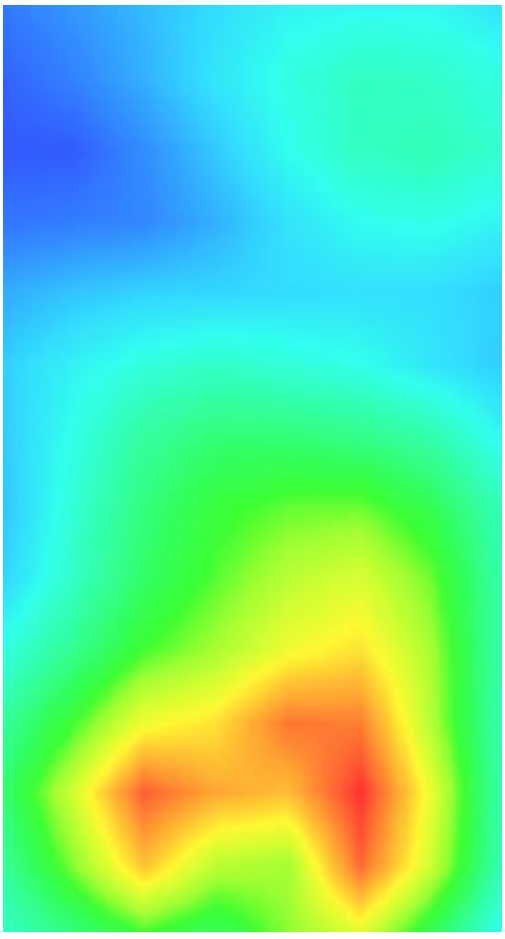
SURFACE SAR	VOLUME SAR
	

Maximum location: X=14.00, Y=-50.00

SAR 10g (W/Kg)	0.088555
SAR 1g (W/Kg)	0.176623

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2789	0.1638	0.0795	0.0375	0.0181



3D screen shot	Hot spot position
	

GPRS1900, BACK, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 21/01/2015

Measurement duration: 7 minutes 31 seconds

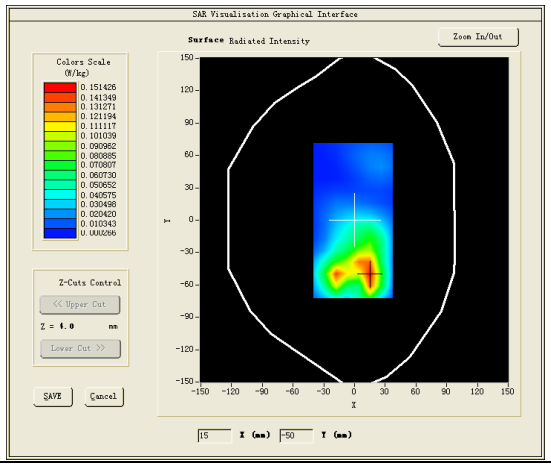
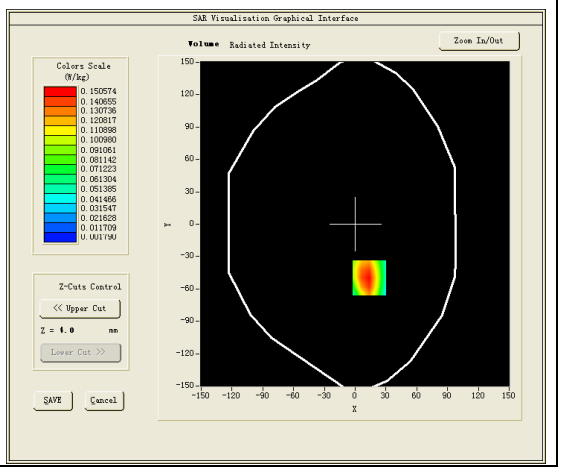
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	CUSTOM (GPRS1900_2Tx)
Channels	661
Signal	GPRS (Duty cycle: 1:4)

B. SAR Measurement Results

Frequency (MHz)	1880.0
Relative permittivity (real part)	52.76
Relative permittivity (imaginary part)	14.87
Conductivity (S/m)	1.57
Variation (%)	-0.850000
ConvF:	5.65

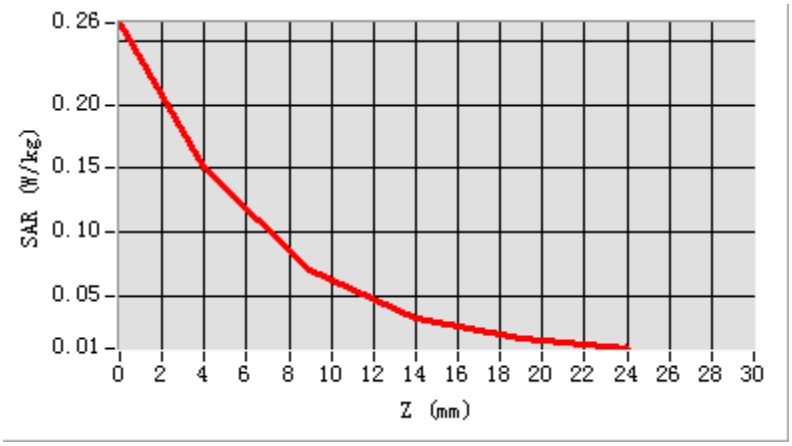
SURFACE SAR	VOLUME SAR
	

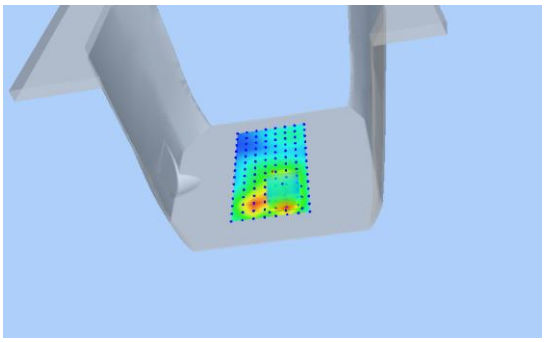
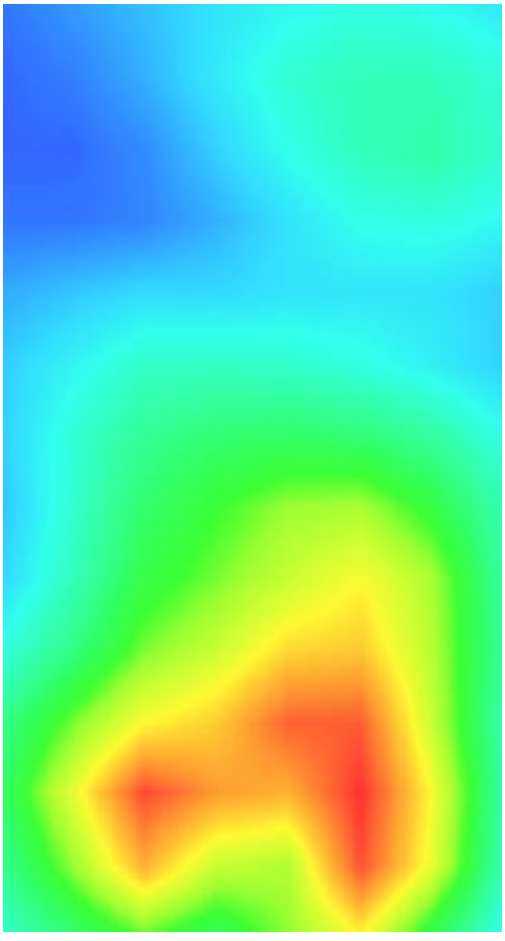
Maximum location: X=14.00, Y=-50.00

SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)	0.073082
SAR 1g (W/Kg)	0.147279

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.2645	0.1506	0.0700	0.0321	0.0160



3D screen shot	Hot spot position
	

WCDMA850, Right Cheek, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/01/2015

Measurement duration: 5 minutes 19 seconds

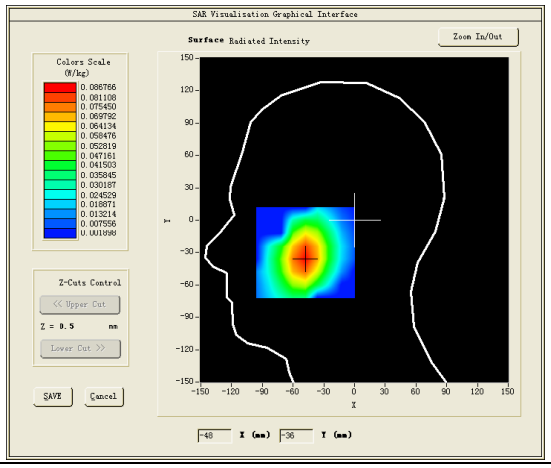
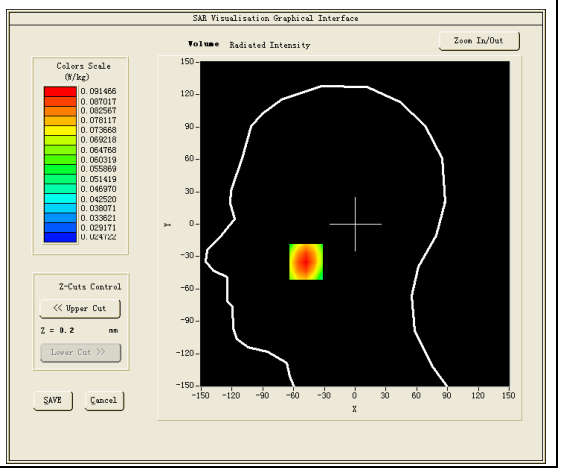
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	sam_direct_droit2_surf8mm.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Right head
Device Position	Cheek
Band	Band5_WCDMA850
Channels	4183
Signal	WCDMA (Duty cycle: 1:1)

B. SAR Measurement Results

Frequency (MHz)	836.6
Relative permittivity (real part)	41.37
Relative permittivity (imaginary part)	18.97
Conductivity (S/m)	0.88
Variation (%)	2.180000
ConvF:	5.51

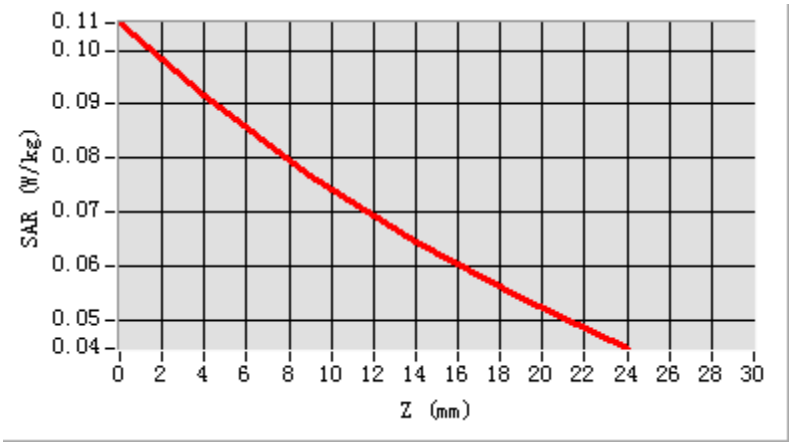
SURFACE SAR	VOLUME SAR
	

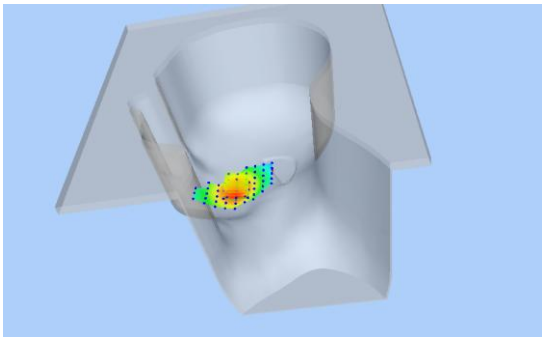
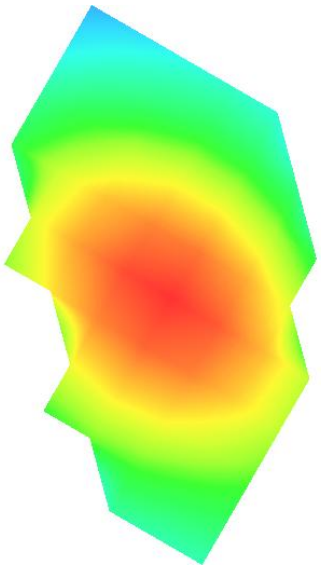
Maximum location: X=-48.00, Y=-35.00

SAR Peak: 0.11 W/kg

SAR 10g (W/Kg)	0.068706
SAR 1g (W/Kg)	0.088360

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.1051	0.0915	0.0768	0.0644	0.0539



3D screen shot	Hot spot position
	

WCDMA850, BACK, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 19/01/2015

Measurement duration: 7 minutes 26 seconds

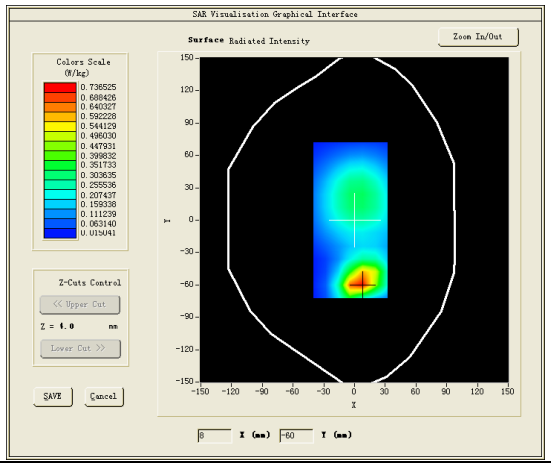
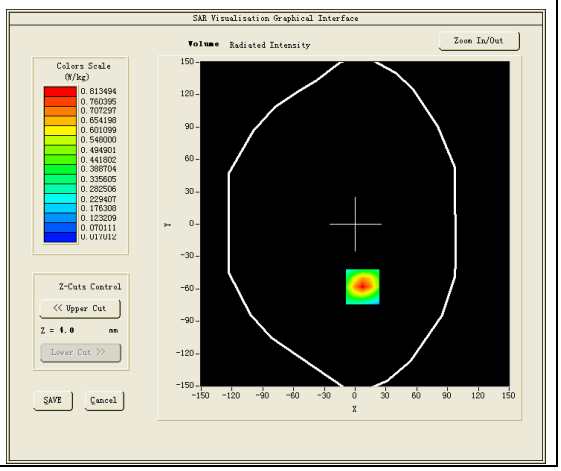
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	surf_sam_plan.txt
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	BACK
Band	Band5_WCDMA850
Channels	4183
Signal	WCDMA (Crest factor: 1:1)

B. SAR Measurement Results

Frequency (MHz)	836.6
Relative permittivity (real part)	55.45
Relative permittivity (imaginary part)	21.34
Conductivity (S/m)	0.99
Variation (%)	0.040000
ConvF:	5.68

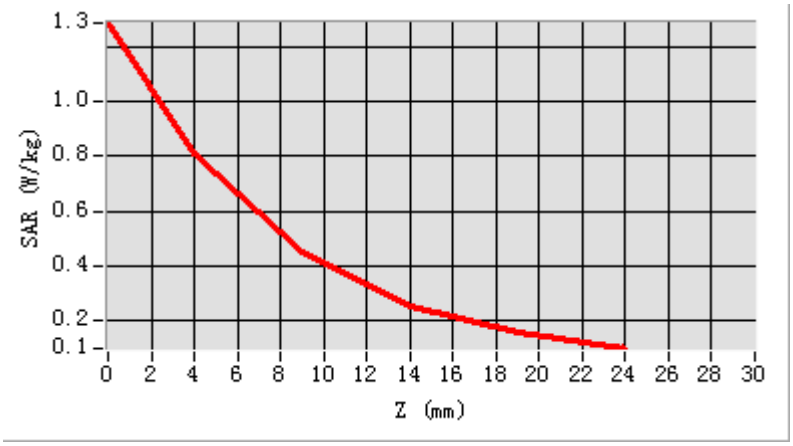
SURFACE SAR	VOLUME SAR
	

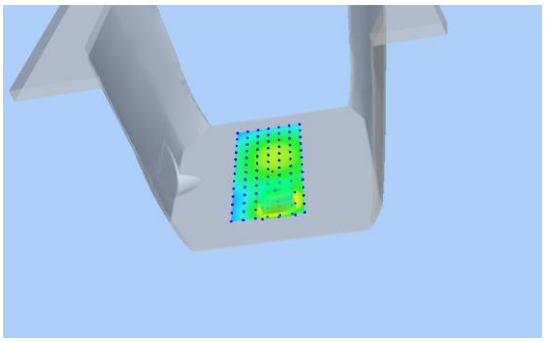
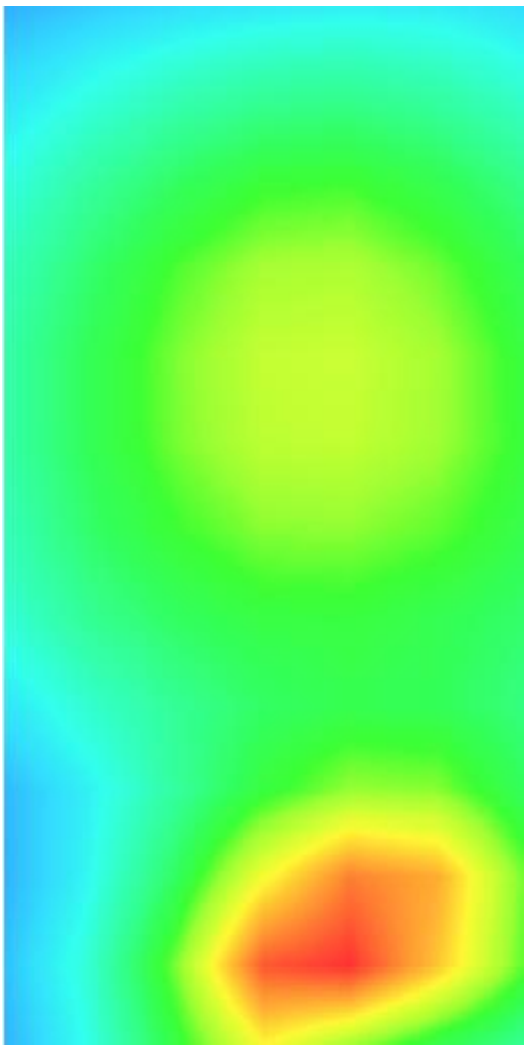
Maximum location: X=7.00, Y=-58.00

SAR Peak: 1.34 W/kg

SAR 10g (W/Kg)	0344911
SAR 1g (W/Kg)	0.627840

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.2866	0.8135	0.4500	0.2560	0.1583



3D screen shot	Hot spot position
	

Wi-Fi 802.11b ,Right Cheek, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 24/01/2015

Measurement duration: 7 minutes 21 seconds

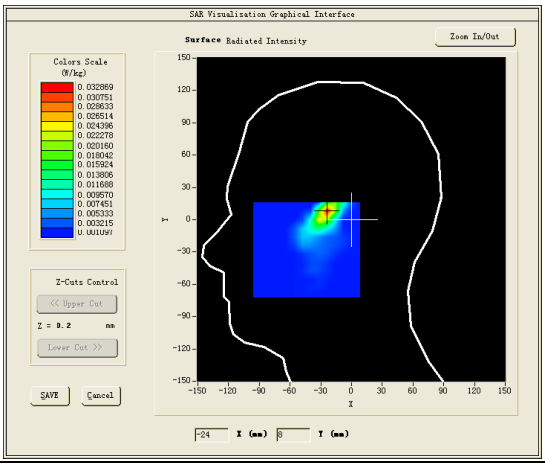
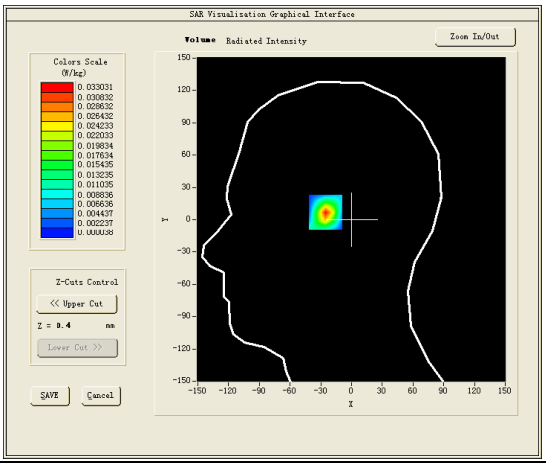
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=5mm dy=5mm dz=5mm
Phantom	Right head
Device Position	Cheek
Band	IEEE 802.11b ISM
Channels	6
Signal	DSSS (Crest factor: 1:1)

B. SAR Measurement Results

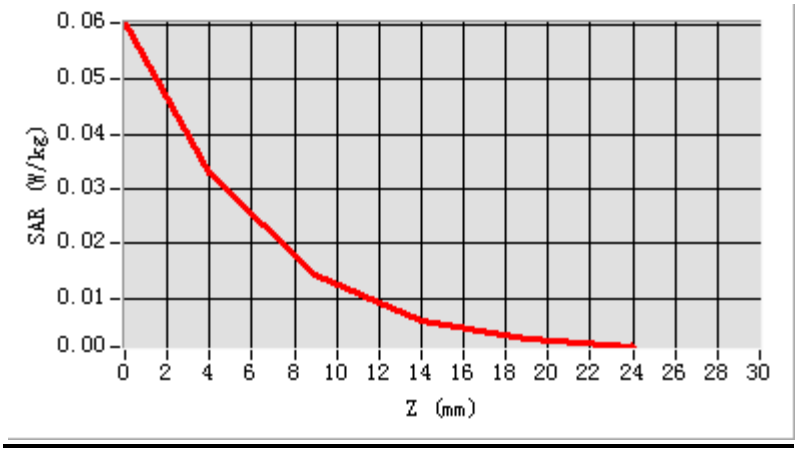
Frequency (MHz)	2437
Relative permittivity (real part)	38.87
Relative permittivity (imaginary part)	13.08
Conductivity (S/m)	1.78
Variation (%)	3.110000
ConvF:	4.81

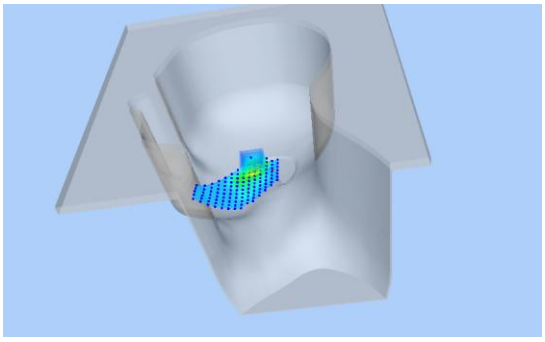
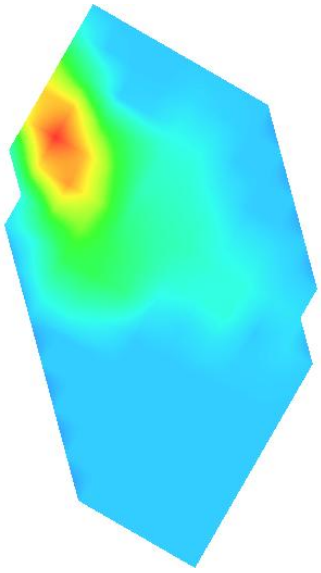
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-24.00, Y=8.00

SAR 10g (W/Kg)	0.011305
SAR 1g (W/Kg)	0.028421

Z axis scan



3D screen shot	Hot spot position
	

Wi-Fi 802.11b , Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 24/01/2015

Measurement duration: 7 minutes 11 seconds

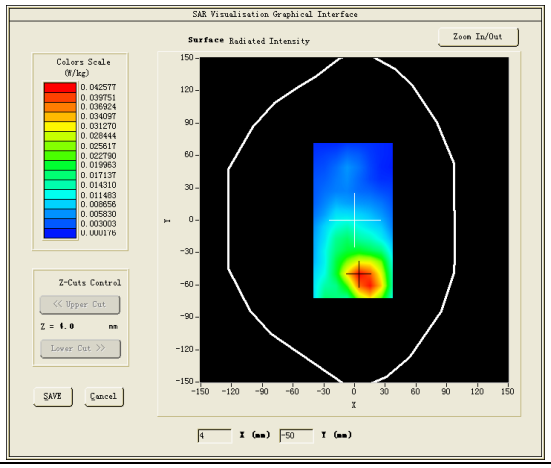
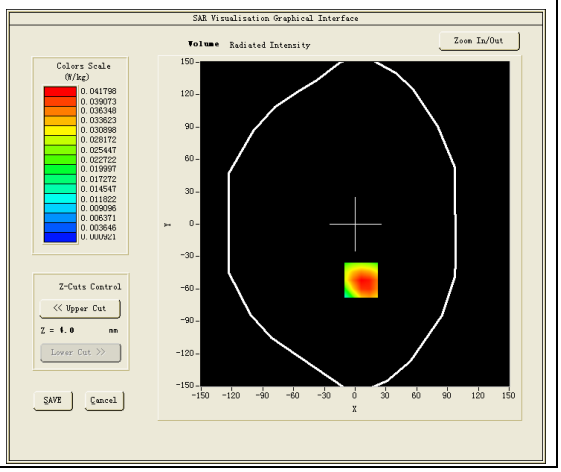
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	IEEE 802.11b ISM
Channels	6
Signal	DSSS (Crest factor: 1:1)

B. SAR Measurement Results

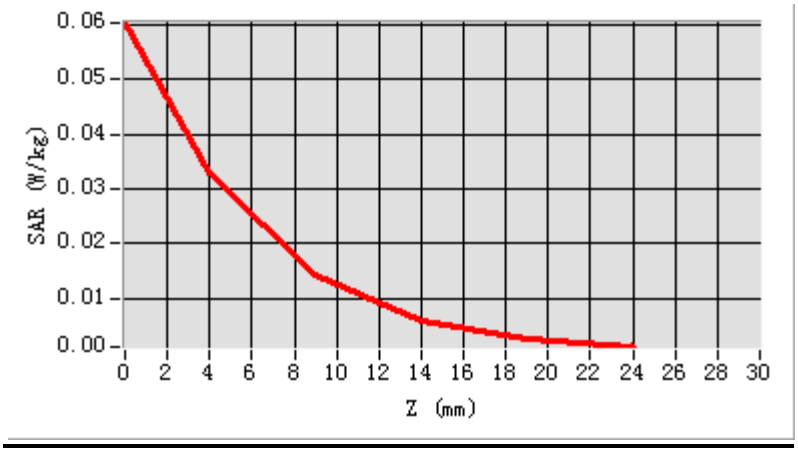
Frequency (MHz)	2437
Relative permittivity (real part)	51.34
Relative permittivity (imaginary part)	13.96
Conductivity (S/m)	1.90
Variation (%)	0.120000
ConvF:	4.91

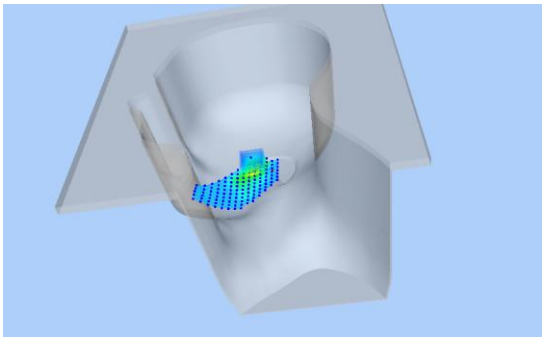
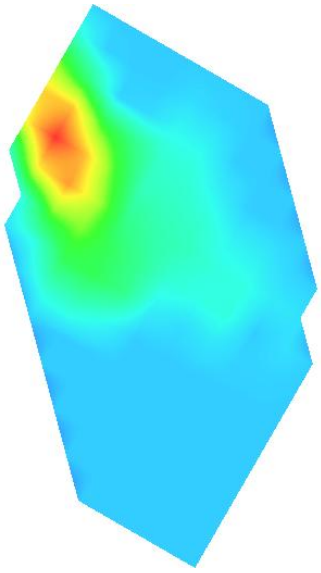
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=6.00, Y=-52.00

SAR 10g (W/Kg)	0.024898
SAR 1g (W/Kg)	0.043242

Z axis scan



3D screen shot	Hot spot position
	

Wi-Fi 802.11a ,Left Cheek, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 27/01/2015

Measurement duration: 7 minutes 21 seconds

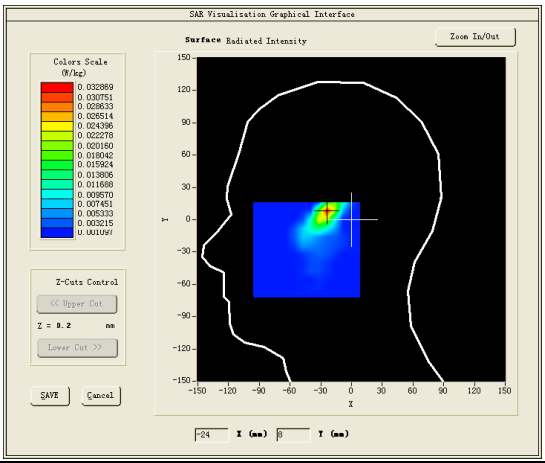
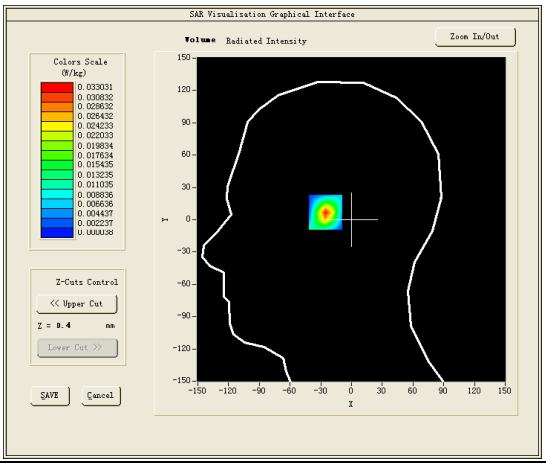
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=5mm dy=5mm dz=5mm
Phantom	Left head
Device Position	Cheek
Band	IEEE 802.11a ISM
Channels	157
Signal	DSSS (Crest factor: 1:1)

B. SAR Measurement Results

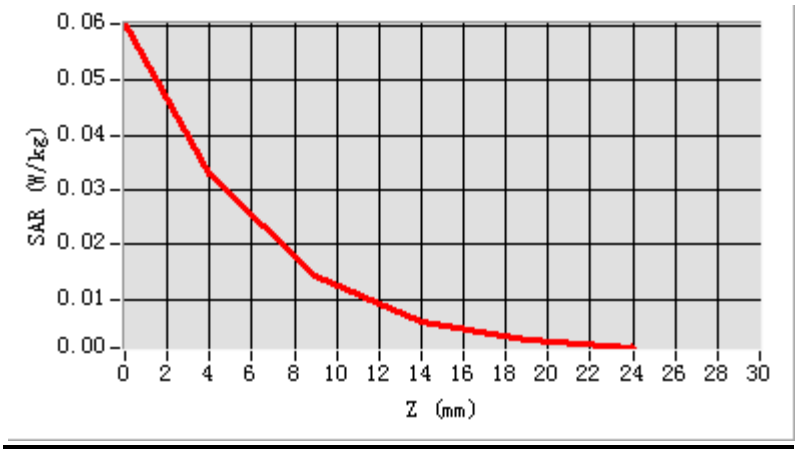
Frequency (MHz)	5785
Relative permittivity (real part)	35.6
Relative permittivity (imaginary part)	15.77
Conductivity (S/m)	5.08
Variation (%)	2.080000
ConvF:	3.22

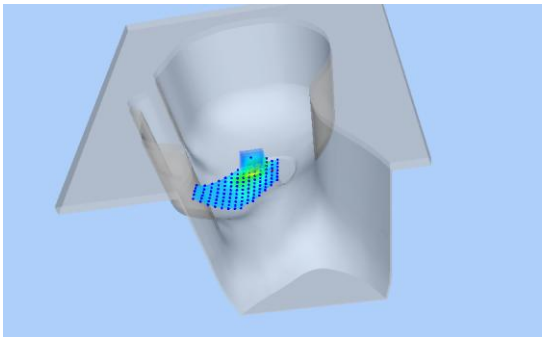
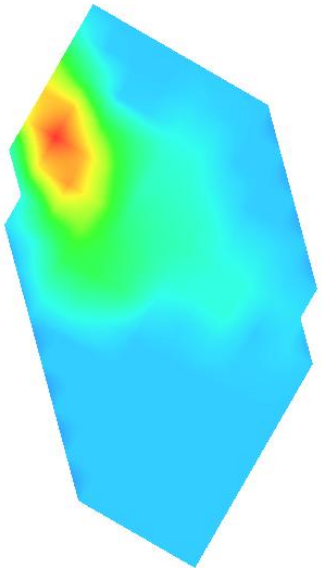
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-24.00, Y=8.00

SAR 10g (W/Kg)	0.011124
SAR 1g (W/Kg)	0.027035

Z axis scan



3D screen shot	Hot spot position
	

Wi-Fi 802.11a , Back, Middle

Type: Phone measurement (11 points in the volume)

Date of measurement: 27/01/2015

Measurement duration: 7 minutes 11 seconds

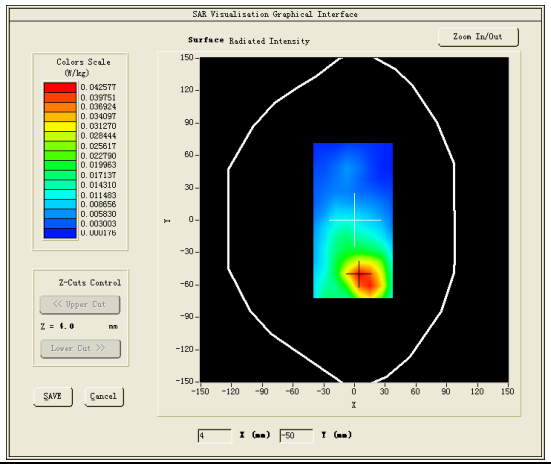
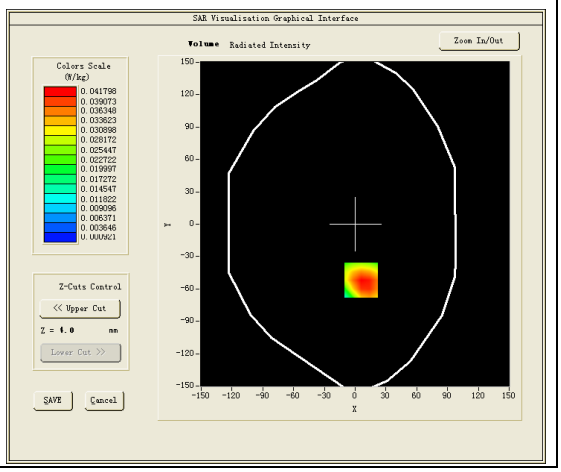
Mobile Phone IMEI number: --

A. Experimental conditions.

Area Scan	dx=8mm dy=8mm
ZoomScan	5x5x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Back
Band	IEEE 802.11a ISM
Channels	157
Signal	DSSS (Crest factor: 1:1)

B. SAR Measurement Results

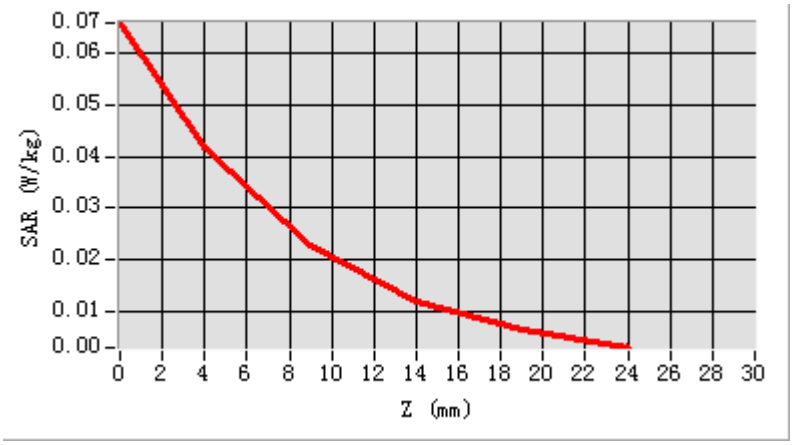
Frequency (MHz)	5785
Relative permittivity (real part)	46.55
Relative permittivity (imaginary part)	18.99
Conductivity (S/m)	6.12
Variation (%)	-1.050000
ConvF:	3.38

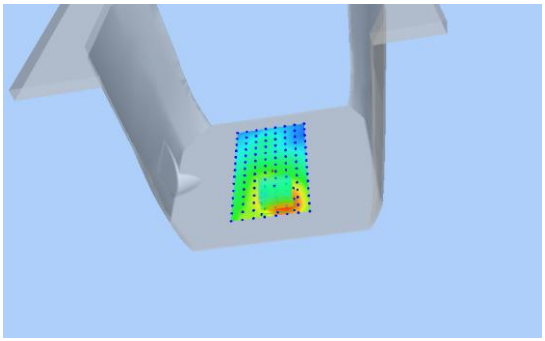
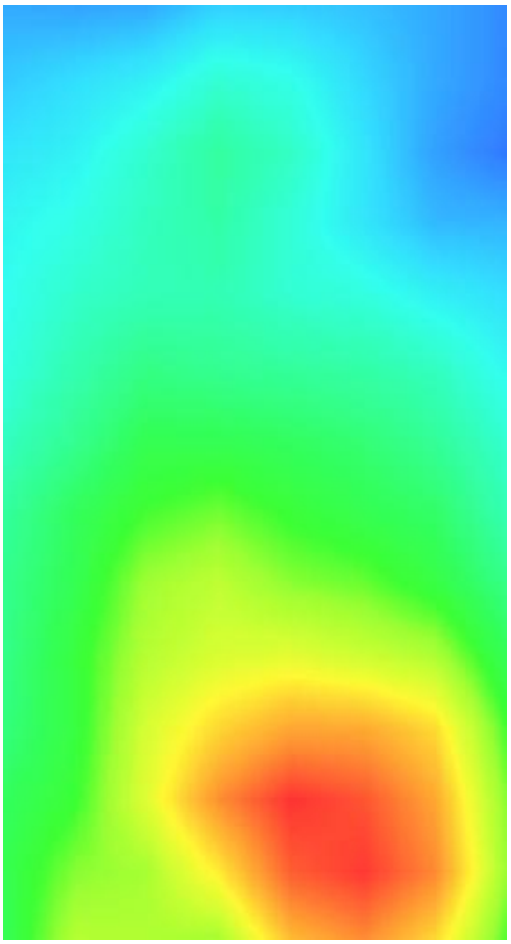
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=-52.00

SAR 10g (W/Kg)	0.018524
SAR 1g (W/Kg)	0.034465

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0632	0.0401	0.0205	0.0103	0.0054



3D screen shot	Hot spot position
	

ANNEX E

of

CCIC-SET

CONFORMANCE TEST REPORT FOR

HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

SET2015-03832

Industrial Handheld Terminal

Type Name: AUTOID9, AUTOID9HC

Hardware Version： D500_Main

Software Version： 3.4.0

Calibration Certificate of Probe and Dipoles

This Annex consists of 65 pages

Date of Report：2015-02-12

Probe Calibration Ceriticate

COMOSAR E-Field Probe Calibration Report

Ref : ACR.96.2.14.SATU.A

CCIC SOUTHERN ELECTRONIC PRODUCT TESTING (SHENZHEN) Co., Ltd

ELECTRONIC TESTING BUILDING, SHAHE ROAD, XILI TOWN, SHENZHEN, P.R. CHINA (POST CODE:518055)

SATIMO COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 09/13 EP169

Calibrated at SATIMO US

2105 Barrett Park Dr. - Kennesaw, GA 30144

ACCREDITED

04/05/14

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed in SATIMO USA using the CALISAR / CALIBAIR test bench, for use with a SATIMO COMOSAR system only. All calibration results are traceable to national metrology institutions.

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Product Manager	04/05/2014	
Checked by :	Jérôme LUC	Product Manager	04/05/2014	
Approved by :	Kim RUTKOWSKI	Quality Manager	04/08/2014	

	Customer Name
Distribution :	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd

Issue	Date	Modifications
A	04/08/2014	Initial release

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