SAR TEST REPORT

For

FENIX TRADING COMPANY S.A.

SMART PHONE

Model No.:COOL

Prepared for	:	FENIX TRADING COMPANY S.A.
Address	:	1410 Spain Av., La Torre Building 2nd Floor. Asuncion, Paraguay.

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	April 02, 2015
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	April 07, 2015 - April 11, 2015
Date of Report	:	April 11, 2015

SAR TEST REPORT

Report Reference No.................:	**LCS1504020153E**
Date Of Issue...............................:	April 11, 2015
Testing Laboratory Name ....:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address..:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure ....:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name......................:	**FENIX TRADING COMPANY S.A.**
Address..:	1410 Spain Av., La Torre Building 2nd Floor. Asuncion, Paraguay.
Test Specification:	
SAR Max. Values is....................:	0.446W/Kg (1g) for Body,0.581 W/Kg (1g) for Head.
TestStandard................................:	ANSI/IEEE C95.1:2005/ANSI/IEEE C95.3 :2002 IEEE1528 :2003/47CFR § 2.1093
Test Report Form No. ....:	LCSEMC-1.0
TRF Originator............................:	Shenzhen LCS Compliance Testing Laboratory Ltd.

Test Item Description................:	**SMART PHONE**
Trade Mark..................................:	COOL
Model/Type Reference................:	FTC
Ratings ....:	DC 3.7V by battery(1100mAh) Adapter parameters: Input: AC 100~240V, 50/60Hz 0.15A Output: DC 5V/0.5A
Result ....:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Dick Su	Andy Hu	Gavin Liang
Dick Su/ File administrators	Andy Hu/ Technique principal	Gavin Liang/ Manager

SAR -- TEST REPORT

Test Report No. : LCS1504020153E	April 11, 2015 Date of issue

Type / Model.........................	:	COOL
EUT.......................................	:	SMART PHONE
Applicant..............................	**:**	**FENIX TRADING COMPANY S.A.**
Address.................................	:	1410 Spain Av., La Torre Building 2nd Floor. Asuncion, Paraguay.
Telephone.............................	:	/
Fax..	:	/
Manufacturer.......................	**:**	**Shenzhen MOBOT Tech.Co.,Ltd.**
Address.................................	:	402#,Building 211,Terra Trade&Industry Park ,Futian District Shenzhen,China
Telephone.............................	:	/
Fax..	:	/
Factory.................................	**:**	**Shenzhen MOBOT Tech.Co.,Ltd.**
Address.................................	:	402#,Building 211,Terra Trade&Industry Park ,Futian District Shenzhen,China
Telephone.............................	:	/
Fax..	:	/

Test Result	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1.TEST STANDARDS AND TEST DESCRIPTION

1.1. Test Standards

The tests were performed according to following standards:

ANSI/IEEE C95.1: 2005:IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fileds,3 kHz to 300 GHz.
ANSI/IEEE C95.3: 2002:IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to SuchFields,100 kHz—300 GHz.
IEEE1528:2003:Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate.
KDB447498 D01v05r02:General RF Exposure Guidance.
KDB248227 D01v01r02:SAR measure for 802.11 a/b/g.
KDB865664 D01v01r03:SAR measurement 100MHz to 6GHz.
KDB865664 D02v01r01:SAR Report.
KDB690783 D01v01r03:SAR lisitings on Grants.
KDB616217 D04v01r01: SAR for laptop and tablets v01r01
KDB648474 D04:SAR Handsets Multi Xmiter and Ant v01
KDB941225 D01v02:SAR Test for 3G devices.
KDB941225 D01v02r02:HSPA and 1xAdvanced.
KDB941225 D06:Hot Spot SAR v01
FCC Part 2:2012: frequency alloca-tions and radio treaty mat-ters; general rules and reg-ulations

1.2. Test Description

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power .
And Test device is identical prototype.

1.3. Product Description

Product Name:	SMART PHONE
Trade Mark:	FTC
Model/Type reference:	COOL
Listed Model(s):	/
Hardware Version	H1 94V-0
Software Version:	Android 4.4.2
Power supply:	DC 3.7V by battery(1100mAh) Adapter parameters: Input: AC 100~240V, 50/60Hz 0.15A Output: DC 5V/0.5A
2G	
Operation Band:	GSM850, PCS1900
Supported type:	GSM/GPRS
Power Class:	GSM850:Power Class 5 DCS1900:Power Class 0
Modulation Type:	GMSK for GSM/GPRS
GSM Release Version	R99
GPRS Multislot Class	12
EGPRS Multislot Class	N/A
WCDMA	
Operation Band:	FDD Band II & FDD Band V
Power Class:	Power Class 3
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
WCDMA Release Version:	R7
HSDPA Release Version:	Release 8
HSUPA Release Version:	Release 6
DC-HSUPA Release Version:	Not Supported
WIFI	
Supported type:	802.11b/802.11g/802.11n
Modulation:	802.11b: DSSS 802.11g/802.11n:OFDM
Operation frequency:	802.11b/802.11g/802.11n(HT20):2412MHz~2462MHz; 802.11n(HT40):2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(HT20):11; 802.11n(HT40):7
Channel separation:	5MHz
Bluetooth	
Version:	Supported BT4.0/3.0
Modulation:	GFSK(1Mbps) , π /4-DQPSK(2Mbps) , 8-DPSK(3Mbps)
Operation frequency:	2402MHz~2480MHz
Channel number:	40/79
Channel separation:	2MHz/1MHz

1.4. Summary SAR Results

Table 1:Max. SAR Measured(1g)

Exposure Configuration	Technolohy Band	Highest Measured SAR 1g(W/Kg)
Body-worn (Separation Distance 15mm)	GSM850	**0.037**
	PCS1900	**0.431**
	WCDMA Band II	**0.398**
	WCDMA Band V	**0.273**
	WLAN2450	**0.048**
Head	GSM850	**0.331**
	PCS1900	**0.547**
	WCDMA Band II	**0.539**
	WCDMA Band V	**0.570**
	WLAN2450	**0.209**

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6W/Kg as averaged over any 1g tissue accordintg to the ANSI C95.1-1999.
For body worn operation,this devices has been tested and meets FCC RF exposure guidelines when used with any accessory that conrtains no metal and which provides a minimum separation distance of 0mm between this devices and the body of the user.User of other accessories may not ensure compliance with FCC RF exposure guidelines.
This EUT owns two SIM cards,after we perform the pretest for these two SIM card;we found the SIM 1 is the worst case ,so its result is recorded in this report.
The EUT battery must be fully charged and checked periodically during the test to ascertain iniform power output

1.5. EUT operation mode

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

1.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.TEST ENVIRONMENT

2.1. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Site Description

EMC Lab. : CNAS Registration Number. is L4595.
FCC Registration Number. is 899208.
Industry Canada Registration Number. is 9642A-1.
VCCI Registration Number. is C-4260 and R-3804.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	18-25 ° C
Humidity:	40-65 %
Atmospheric pressure:	950-1050mbar

2.3. SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average(averaged over the whole body)	0.08	0.4
Spatial Peak(averaged over any 1 g of tissue)	1.6	8.0
Spatial Peak(hands/wrists/ feet/anklesaveraged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual 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).

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Calibration Date	Calibration Due
PC	Lenovo	G5005	MY42081102	N/A	N/A
Signal Generator	Angilent	E4438C	MY42081396	09/25/2014	09/24/2015
Multimeter	Keithley	MiltiMeter 2000	4059164	10/01/2014	09/30/2015
S-parameter Network Analyzer	Agilent	8753ES	US38432944	09/25/2014	09/24/2015
Wireless Communication Test Set	R & S	CMU200	105988	06/18/2014	06/17/2015
Power Meter	R&S	NRVS	100444	06/18/2014	06/17/2015
Power Meter	R&S	NRVS	100469	06/18/2014	06/17/2015
Power Sensor	R&S	NRV-Z51	100458	06/18/2014	06/17/2015
Power Sensor	R&S	NRV-Z32	100657	06/18/2014	06/17/2015
E-Field PROBE	SATIMO	SSE5	SN 17/14 EP220	10/01/2014	09/30/2015
E-Field PROBE	SATIMO	SSE5	SN 17/14 EP221	09/01/2014	08/31/2015
DIPOLE 835	SATIMO	SID 835	SN 07/14 DIP 0G835-303	10/01/2014	09/30/2015
DIPOLE 900	SATIMO	SID 900	SN 07/14 DIP 0G900-300	10/01/2014	09/30/2015
DIPOLE 1900	SATIMO	SID 1900	SN 30/14 DIP 1G900-333	09/01/2014	08/31/2015
DIPOLE 2450	SATIMO	SID 2450	SN 07/14 DIP 2G450-306	10/01/2014	09/30/2015
COMOSAR OPEN Coaxial Probe	SATIMO	OCPG 68	SN 40/14 OCPG68	10/01/2014	09/30/2015
Communication Antenna	SATIMO	ANTA57	SN 39/14 ANTA57	10/01/2014	09/30/2015
Mobile Phone POSITIONING DEVICE	SATIMO	MSH98	SN 40/14 MSH98	N/A	N/A
DUMMY PROBE	SATIMO	DP60	SN 03/14 DP60	N/A	N/A
SAM PHANTOM	SATIMO	SAM117	SN 40/14 SAM117	N/A	N/A
Simulated Tissue 900 MHzBody and Head	SATIMO	SAM-9-H	SN 21/14 HLD438	Each Time	N/A
Simulated Tissue 1900 MHz For Head	SATIMO	SAM-18-H	SN 21/14 HLF439	Each Time	N/A
Simulated Tissue 2450 MHz Body and Head	SATIMO	SAM-24-H	SN 21/14 HLJ445	Each Time	N/A
PHANTOM TABLE	SATIMO	TABP98	SN 40/14 TABP98	N/A	N/A
6 AXIS ROBOT	KUKA	KR6-R900	501217	N/A	N/A
High Power Solid State Amplifier (80MHz~1000MHz)	Instruments for Industry	CMC150	M631-0627	09/25/2014	09/24/2015
Medium Power Solid State Amplifier (0.8~4.2GHz)	Instruments for Industry	S41-25	M629-0539	09/25/2014	09/24/2015
Wave Tube Amplifier 48 GHz at 20Watt	Hughes Aircraft Company	1277H02F000	102	09/25/2014	09/24/2015

3.SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1. SARMeasurement Set-up

The OPENSAR system for performing compliance tests consist of the following items:

A standard high precision 6-axis robot (KUKA) with controller and software.

KUKA Control Panel (KCP)

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with a Video Positioning System(VPS).

The stress sensor is composed with mechanical and electronic when the electronic part detects a change on the electro-mechanical switch,It sends an “Emergency signal” to the robot controller that to stop robot’s moves

A computer operating Windows XP.

OPENSAR software

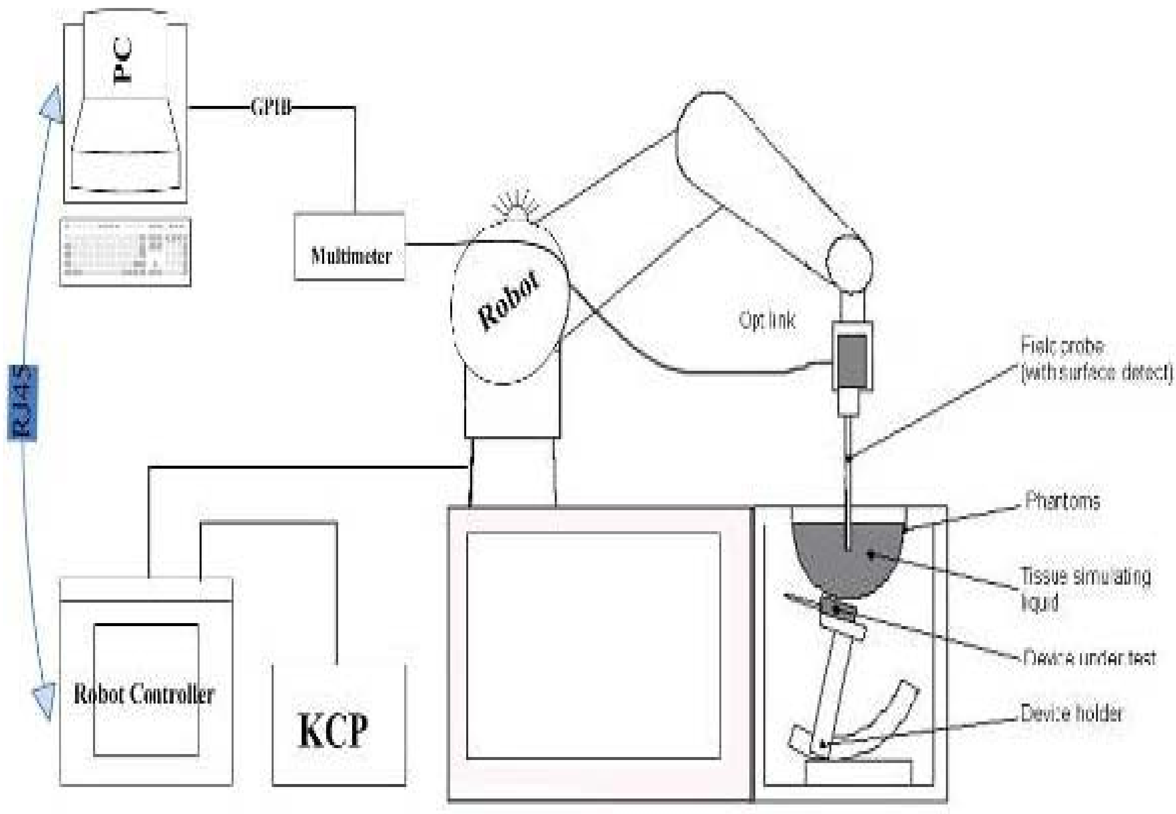
Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

The SAM phantom enabling testing left-hand right-hand and body usage.

The Position device for handheld EUT

Tissue simulating liquid mixed according to the given recipes .

System validation dipoles to validate the proper functioning of the system.



3.2. OPENSAR E-field Probe System

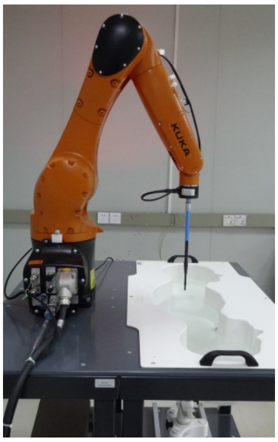
The SAR measurements were conducted with the dosimetric probe EP220 (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

Probe Specification

ConstructionSymmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

CalibrationISO/IEC 17025 calibration service available.

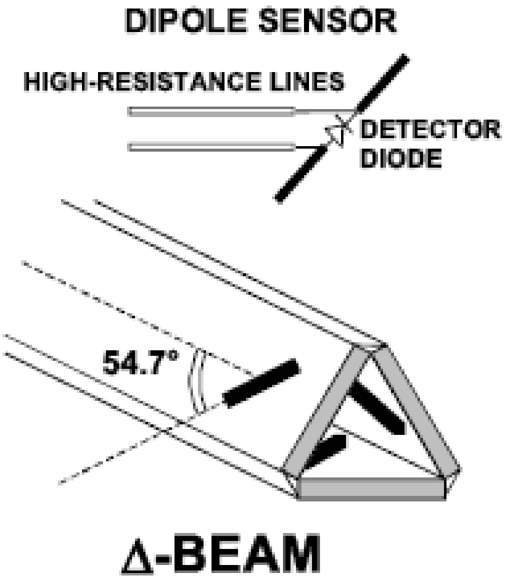
Frequency	700 MHz to 3 GHz; Linearity:0.25dB(700 MHz to 3GHz)
Directivity	0.25 dB in HSL (rotation around probe axis) 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	0.01W/kg to > 100 W/kg; Linearity: 0.25 dB
Dimensions	Overall length: 330 mm (Tip: 16mm) Tip diameter: 5 mm (Body: 8 mm) Distance from probe tip to sensor centers: 2.5 mm
Application	General dosimetry up to 3 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones



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.

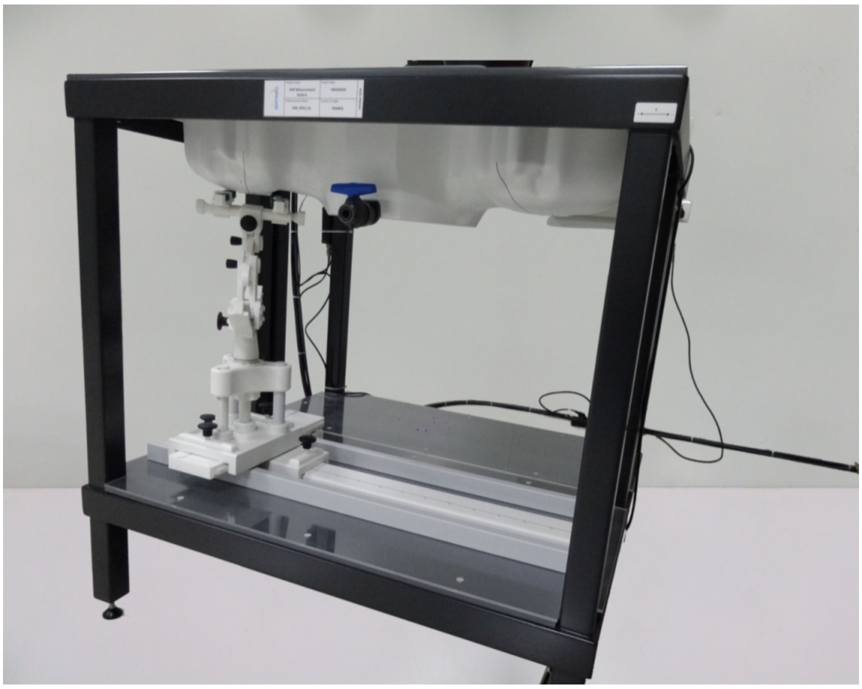
The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



3.3. Phantoms

The SAM Phantom SAM117 is constructed of a fiberglass shell ntegrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC EN62209-1 , EN62209-2:2010.The phantom enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of allpredefined phantom positions and measurement grids by manually teaching three points in the robo

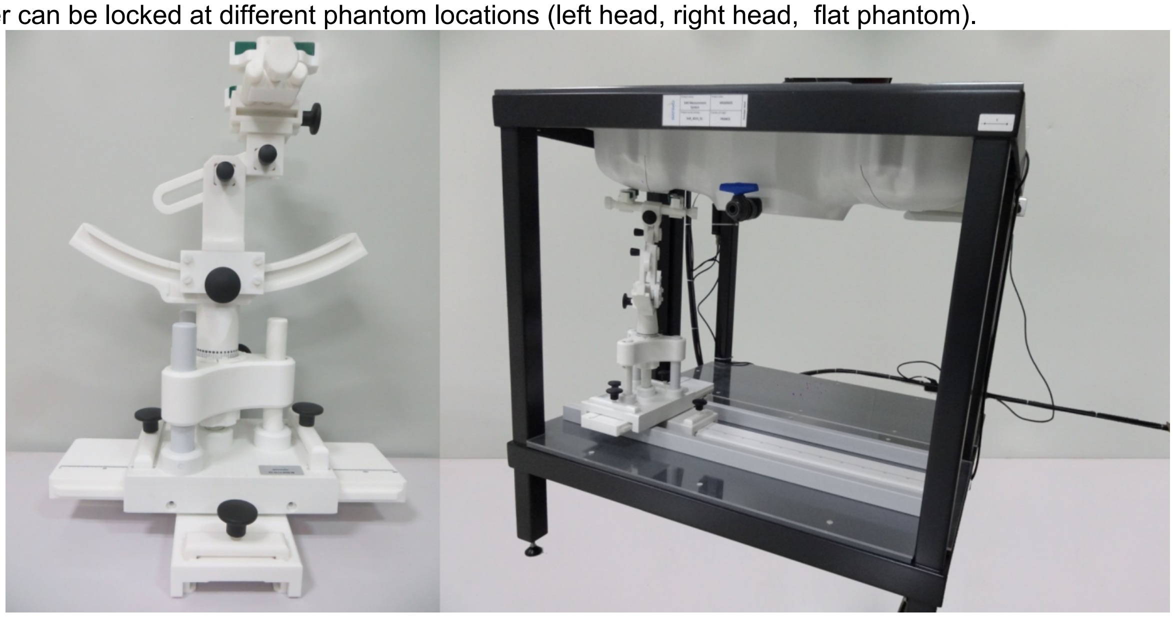
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM Twin Phantom

3.4. Device Holder

In combination with the Generic Twin PhantomSAM117, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Device holder supplied by SATIMO

3.5. Scanning Procedure

The procedure for assessing the peak spatial-average SAR value consists of the following steps

Power Reference Measurement
The referenceand drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

Area Scan
The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot.Thesophisticated interpolation routines implemented in OPENSAR software can find the maximum locations even in relatively coarse grids. The scan area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the area scan's property sheet is brought-up, grid was at to 15 mm by 15 mm and can be edited by a user.

Zoom Scan
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. The default zoom scan measures 5 x 5 x 4 points within a cube whose base faces are centered around the maximum found in a preceding area scan job within the same procedure. If the preceding Area Scan job indicates more then one maximum, the number of Zoom Scans has to be enlarged accordingly (The default number inserted is 1).

Power Drift measurement
The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have OPENSAR software stop the measurements if this limit is exceeded.

3.6. Data Storage and Evaluation

Data Storage
The OPENSAR software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files . The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation
The OPENSAR software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the OPENSAR components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\text{E} - \text{fieldprobes :} \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\text{H} - \text{fieldprobes :} \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

3.7. Position of the wireless device in relation to the phantom

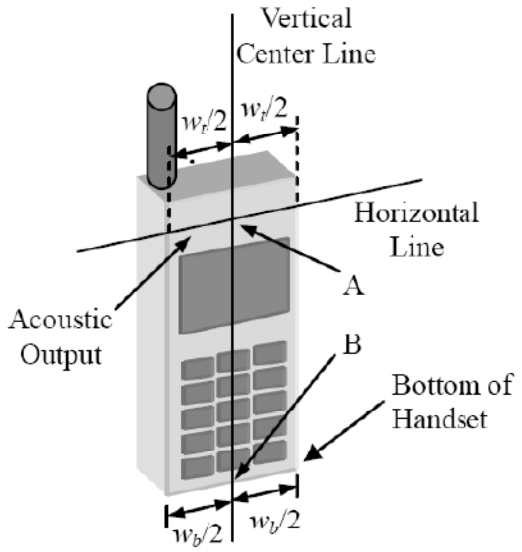
General considerations

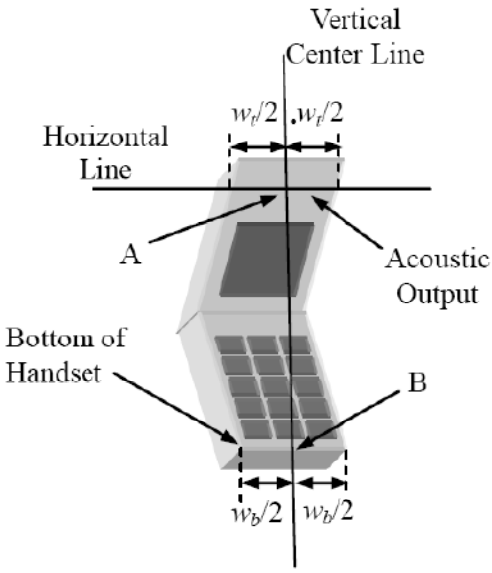
This standard specifies two handset test positions against the head phantom – the "cheek" position and the "tilt" position.

The power flow density is calculated assuming the excitation field as a free space field

$$P_{(\text{pwe})} = \frac{\text{E}_{\text{tot}}^2}{3770} \text{ or } P_{(\text{pwe})} = H_{tot}^2 .37.7$$

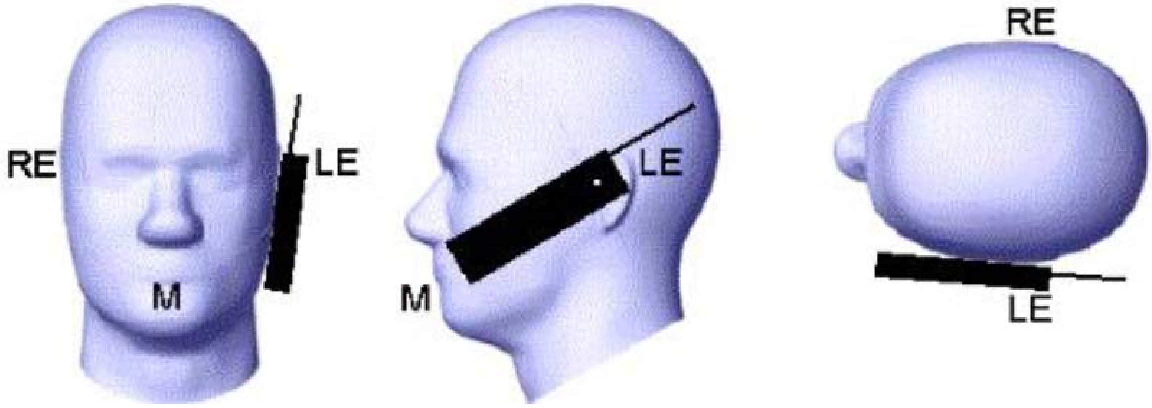
Where P_{pwe}=Equivalent power density of a plane wave in mW/cm2
E_{tot}=total electric field strength in V/m
H_{tot}=total magnetic field strength in A/m



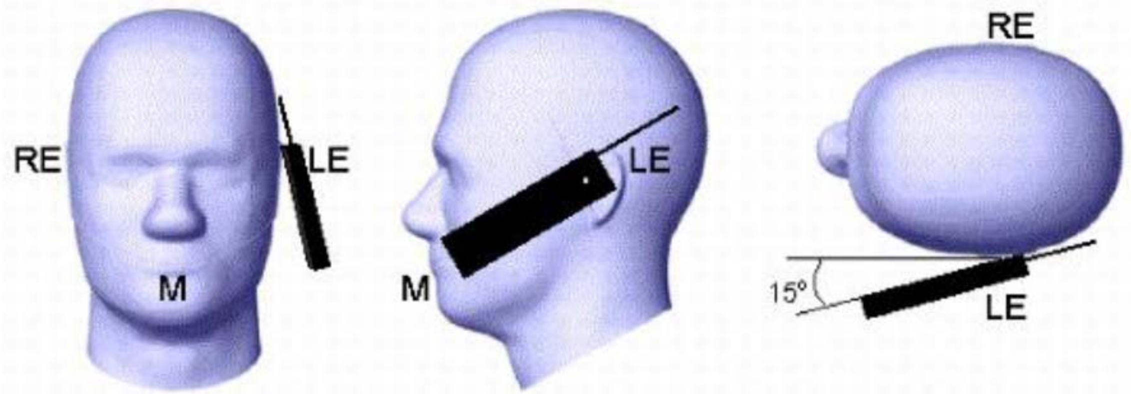


W_t Width of the handset at the level of the acoustic
W_b Width of the bottom of the handset
A Midpoint of the width w_t of the handset at the level of the acoustic output
B Midpoint of the width w_b of the bottom of the handset

Picture 1-a Typical "fixed" case handset Picture 1-b Typical "clam-shell" case handset



Picture 2 Cheek position of the wireless device on the left side of SAM



Picture 3 Tilt position of the wireless device on the left side of SAM

For body SAR test we applied to FCC KDB941225 D03v01, KDB447498 D01v05r02, KDB248227 D01v01r02, KDB616217 D04v01r01, KDB 447498 D01

3.8. Tissue Dielectric Parameters for Head and Body

The liquid used for the frequency range of 100MHz-6G consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The folowing Tableshows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the determine of the dielectric parameter are within the tolerances of the specified target values.The measured conductivity and relative permittivity should be within ±5% of the target values.

The folowing materials are used for producing the tissue-equivalent materials.

Table 2. Composition of the Head Tissue Equivalent Matter

Ingredients (% by weight)	Frequency (MHz)				
	835	900	1800	2000	2450
Water	41.45	40.92	16.33	54.89	46.70
Sugar	56.0	56.5	/	/	/
Salt	4.45	1.48	0.41	0.18	/
Preventol	0.19	0.1	/	/	/
Cellulose	0.1	0.4	/	/	/
Clycol Monobutyl	/	/	65.3	44.93	53.3
Dielectric ParametersTarget Value	f=835MHz ε =41.5 σ =0.90	f=900MHz ε =41.5 σ =0.97	f=1800MHz ε =40.0 σ =1.40	f=1950 MHz ε =40.0 σ =1.40	f=2450 MHz ε =39.2 σ =1.80

Table 3. Composition of the Body Tissue Equivalent Matter

Ingredients (% by weight)	Frequency (MHz)				
	835	1800	1900	2450	2600
Water	52.4	69.91	69.91	73.2	64.493
Sugar	45.0	0.0	0.0	0.0	0.0
Salt	1.4	0.13	0.13	0.04	0.024
HEC	1.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	29.96	29.96	26.7	32.252
Dielectric ParametersTarget Value	f=835MHz ε =55.2 σ =0.97	f=1800MHz ε =53.30 σ =1.52	f=1900MHz ε =53.30 σ =1.52	f=2450 MHz ε =52.7 σ =1.95	f=2450 MHz ε =52.5 σ =2.16

Table 4. Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Liquid Type (σ)	± 5% Range	Permittivity (ε)	± 5% Range
150	Head	0.76	0.72～0.80	52.3	49.69～54.92
300	Head	0.87	0.83～0.91	45.3	43.04～47.57
450	Head	0.87	0.83～0.91	43.5	41.33～45.68
835	Head	0.90	0.86～0.95	41.5	39.43～43.58
900	Head	0.97	0.92～1.02	41.5	39.43～43.58
915	Head	0.98	0.93～1.03	41.5	39.43～43.58
1450	Head	1.20	1.14～1.26	40.5	38.48～42.53
1610	Head	1.29	1.23～1.35	40.3	38.29～42.32
1800-2000	Head	1.40	1.33～1.47	40.0	38.00～42.00
2450	Head	1.80	1.71～1.89	39.2	37.24～41.16
3000	Head	2.40	2.28～2.52	38.5	36.58～40.43
5800	Head	5.27	5.01～5.53	35.3	33.54～37.07
150	Body	0.80	0.76～0.84	61.9	58.81～65.00
300	Body	0.92	0.87～0.97	58.2	55.29～61.11
450	Body	0.94	0.89～0.99	56.7	53.87～59.54
835	Body	0.97	0.92～1.02	55.2	52.44～57.96
900	Body	1.05	1.00～1.10	55.0	52.25～57.75
915	Body	1.06	1.01～1.11	55.0	52.25～57.75
1450	Body	1.30	1.24～1.37	54.0	51.30～56.70
1610	Body	1.40	1.33～1.47	53.8	51.11～56.49
1800-2000	Body	1.52	1.44～1.60	53.3	50.64～55.97
2450	Body	1.95	1.85～2.05	52.7	50.07～55.34
3000	Body	2.73	2.59～2.87	52.0	49.40～54.60
5800	Body	6.00	5.70～6.30	48.2	45.79～50.61

3.9. Dielectric Performance

Dielectric Performance of Head and Body Tissue Simulating Liquid

Measurement is made at temperature 22.0℃and relative humidity 52%.

Liquid temperature during the test: 22.0℃

Measurement Date: 835 MHz April 07, 2015;1900 MHz April 07, 2015;2450 MHz April 08, 2015;

Frequency (MHz)	Body Tissue		Head Tissue	
	O'(S/m)	εr	O'(S/m)	εr
835	0.97	55.20	0.91	41.50
1900	1.52	53.30	1.42	40.13
2450	1.94	52.72	1.84	39.22

3.10. Basic SAR system validation requirements

The SAR syetem must be validated against its performance specifications before it is deployed.when SAR probe and system component or sorftware are changed,upgraded or recalibrated,these must be validated with the SAR system(s) that operates with such component. Reference dipoles are used with the required tissure-equivalent media for system validation

The detailed syetem validation result are maintained by each test laboratory,which are normally not required for equip-ment approval. Only a tabulated summary of the system validation status, according to the validation date(s)measure-ment frequencies,SAR probe and tissue dielectric parameters is required in the SAR report.

LCS lab has performed the system validation at 10/28/2014,and all the measured results within ±10% of the system calibrated SAR targets.

3.11. System setup

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected.It is recommended that the system performance check be performed prior to any usage of system in order to guarantee reproducieble results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensivity to all parameters that might fail or vary over time. The system check does not intend to replace the cali-bration of component, but indicates situations where the system uncertainty is exceeded due to drift or failure.

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed benea-th the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

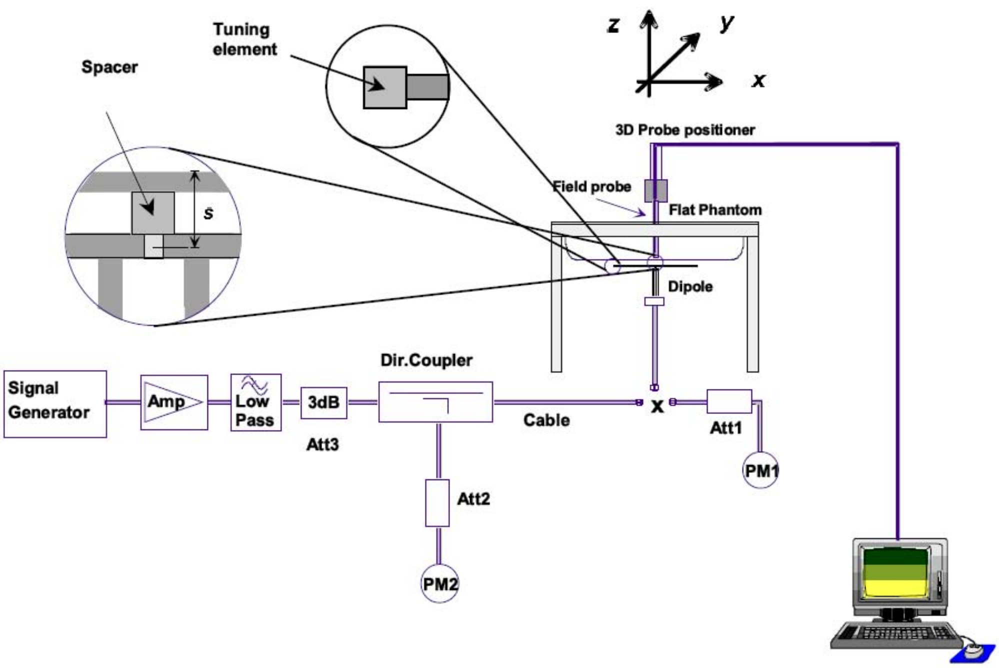


Photo of Dipole Setup

System Validation of Head

Measurement is made at temperature 22.0 ℃ and relative humidity 52%.							
Measurement is made at temperature 22.0℃ and relative humidity 54%.							
Measurement Date: 835 MHz April 07, 2015; 1900 MHz April 07, 2015;2450 MHz April 08, 2015							
Verification Results	Frequency (MHz)	Target value (W/kg)		Measured value(W/kg)		Deviation	
		1 g Average	10 g Average	1 g Average	10 g Average	1 g Average	10 g Average
Body	835	9.90	6.39	9.85	6.42	0.505	0.469
	1900	43.33	21.59	39.15	20.76	0.307	0.533
	2450	54.65	24.58	54.53	24.95	0.219	1.51
Head	835	9.60	6.20	9.51	6.25	0.523	0.482
	1900	39.84	20.20	38.35	20.21	0.130	0.547
	2450	53.89	24.15	52.35	24.32	0.095	1.333

3.12. Measurement procedure

The following procedure shall be performed for each of the test conditions

1. Measure the local SAR at a test point within 4 mm or less in the normal direction from the inner surface of the phantom.
2. Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of localmaximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδln(2)/2 mm for frequencies of 3 GHz and greater, whereδis theplane wave skin depth and ln(x) is the natural logarithm. The maximum variation of thesensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm forfrequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect tothe line normal to the surface should be less than 5°. If this cannot be achieved for ameasurement distance to the phantom inner surface shorter than the probe diameter, additionalmeasurement distance to the phantom inner surface shorter than the probe diameter, additional
3. From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;
4. Measure the three-dimensional SAR distribution at the local maxima locations identified in step
5. The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδln(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and ln(x)is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima foundin step c). Uncertainties due to field distortion between the media boundary and the dielectricenclosure of the probe should also be minimized, which is achieved is the distance between thephantom surface and physical tip of the probe is larger than probe tip diameter. Other methodsmay utilize correction procedures for these boundary effects that enable high precisionmeasurements closer than half the probe diameter. For all measurement points, the angle of theprobe with respect to the flat phantom surface shall be less than 5. If this cannot be achievedan additional uncertainty evaluation is needed.
6. Use post processing(e.g. interpolation and extrapolation) procedures to determine the localSAR values at the spatial resolution needed for mass averaging.

4.OUTPUT POWER VERIFICATION

4.1. Test condition:

1. All test measurements carried out are traceable to national standard. The uncertainty of the measurement at a confidence level of approximately 95%(in the case where distributions are nomal),with a coverage factor of 2, In the range of 30MHz-40GHz is±1.5dB.
2. Evironment conditions:
   Temperature 23℃
   Relative Humidy 53%
   Atmospheric Pressure 1019mbar
3. Test Date: April 02,2015~April 11,2015
   Tested By:Dick

4.2. Test Procedure:

EUT radio output power measurement

1. The transmitter output port was connected to base station emulator.
2. Establish communication link between emulator and EUT and Set EUT to operate at maximum output power all the time.
3. Select lowest, middle, and highest channels for each band and different possible test mode.
4. Measure the conducted peak burst power and conducted average bust power from EUT antenna port.

4.3. Conducted Power Measurement

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU200) to ensure the maximum power transmission and proper modulation. Max Conducted power measurement results and power drift from the 2G report by Shenzhen LCS Compliance Testing Laboratory Ltd.
Note: CMU200 measures GSM peak and average output power for active timeslots.for SAR the timebased average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

Source-based Time Averaged Bust Power calculation:

Number of Time slot	1	2	3	4
Duty cycle	1:8	1:4	1:2.66	1:2
Duty cycle factor	-9.03dB	-6.02dB	-4.26dB	-3.01dB
Crest factor	8	4	2.66	2

Remark:Time slot duty cycle factor=10*log(1/Time slot Duty Cycle)

Source based time averaged power=Maximum bust averaged power (1 Uplink)-9.03dB
Source based time averaged power=Maximum bust averaged power (2 Uplink)-6.02dB
Source based time averaged power=Maximum bust averaged power (3 Uplink)-4.26dB
Source based time averaged power=Maximum bust averaged power (4 Uplink)-3.01dB

The signalling modes differ as follows:

Mode	Code Scheme	Modulation	Mode	Code Scheme
GPRS	CS1 to CS4	GMSK	GPRS	CS1 to CS4

Conducted power measurement results for GSM850/PCS1900

GSM850	Conducted Power (dBm)		
	Channel 128 (824.2MHz)	Channel 190 (836.6MHz)	Channel 251 (848.8MHz)
	32.60	32.70	32.82
PCS1900	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	Channel 661 (1880.0MHz)	Channel 810 (1909.8MHz)
	28.45	29.01	29.77

Conducted power measurements of GSM850

GPRS	Measured Power (dBm)			Calculation (dB)	Averaged Power (dBm)		
	824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
1 Txslot	32.59	32.68	32.80	-9.03	23.56	23.65	23.77
2 Txslot	31.63	31.70	31.82	-6.02	25.61	25.68	25.8
3 Txslot	29.91	29.92	30.04	-4.26	25.65	25.66	25.78
4 Txslot	29.10	29.02	29.15	-3.01	26.09	26.01	26.14

Note：

1. *The conducted power of GSM850 is measured with RMS dector.*
2. *Frame-averaged output power was calculated from the measured bust-averaged output power by converting the slot powers into liner units and calculating the energy over 8 timeslots.*
3. *According the KDB941225 D03 ,the bolded GPRS 4TX mode was selected for SAR testing according to the highest frame-averaged output power table.*

Conducted power measurements of PCS1900

GPRS	Measured Power (dBm)			Calculation (dB)	Averaged Power (dBm)		
	1850.2MHz	1880.0MHz	1909.8MHz		1850.2MHz	1880.0MHz	1909.8MHz
1 Txslot	28.40	28.99	29.76	-9.03	19.37	19.96	20.73
2 Txslot	27.65	28.26	29.00	-6.02	21.63	22.24	22.98
3 Txslot	25.91	26.53	27.33	-4.26	21.65	22.27	23.07
4 Txslot	25.13	25.79	26.56	-3.01	22.12	22.78	23.55

Note：

1. *The conducted power of GSM1900 is measured with RMC dector.*
2. *Frame-averaged output power was calculated from the measured bust-averaged output power by converting the slot powers into liner units and calculating the energy over 8 timeslots.*
3. *According the KDB941225 D03 ,the bolded GPRS 4TX mode was selected for SAR testing according to the highest frame-averaged output power table.*

Conducted power measurements of UMTS Band V

Item	Band	FDD Band V result (dBm)		
		Test Channel		
		4132CH	4182CH	4223CH
WCDMA	12.2kbps RMC	23.04	**23.07**	22.98
HSDPA	Subtest 1	21.95	21.99	21.91
	Subtest 2	22.02	22.03	21.97
	Subtest 3	21.81	21.88	21.78
	Subtest 4	22.04	22.06	22.03
HSUPA	Subtest 1	22.15	22.08	22.01
	Subtest 2	21.97	21.98	21.86
	Subtest 3	21.93	21.89	21.85
	Subtest 4	21.78	21.67	21.77
	Subtest 5	21.83	21.84	21.73

Note:

1. *The conducted power of UMTS Band V is measured with RMS detector.*
2. *According to KDB941225 D01v02, when maximum output of each RF channel with HSDPA/HSUPA active is ≤1/4 dB higher than without HSDPA/HSUPA using 12.2kbps RMC and maximum SAR for 12.2kbps RMC is ≤75% of SAR limit, SAR evaluation for HSDPA/HSUPA is not required.*
3. *According to KBD941225 D02v02r02, when the maximum average output power of each RF channel with (uplink) HSPA+/DC-HSDPS active is ≤1/4 dB higher than without HSPA+/DC-HSDPS using 12.2kbps RMC or the maximum reported SAR for 12.2kbps RMC without HSPA+/DC-HSDPS is ≤75% of SAR limit, SAR evalution for HSPA+/DC-HSDPS is not required.*

Conducted power measurements of UMTS Band II

Item	Mode	FDD Band II result (dBm)		
		Test Channel		
		9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	21.10	**22.57**	21.82
HSDPA	Subtest 1	20.33	21.45	21.52
	Subtest 2	20.24	21.43	21.50
	Subtest 3	20.13	21.38	21.74
	Subtest 4	20.36	21.34	21.62
HSUPA	Subtest 1	20.66	21.43	21.55
	Subtest 2	20.53	21.26	21.32
	Subtest 3	20.42	21.31	21.21
	Subtest 4	20.31	21.27	21.43
	Subtest 5	20.13	21.12	21.26

Note:

1. *The conducted power of UMTS Band II is measured with RMS detector.*
2. *According to KDB941225 D01v02, when maximum output of each RF channel with HSDPA/HSUPA active is ≤1/4 dB higher than without HSDPA/HSUPA using 12.2kbps RMC and maximum SAR for 12.2kbps RMC is ≤75% of SAR limit, SAR evaluation for HSDPA/HSUPA is not required.*
3. *According to KBD941225 D02v02r02, when the maximum average output power of each RF channel with (uplink) HSPA+/DC-HSDPS active is ≤1/4 dB higher than without HSPA+/DC-HSDPS using 12.2kbps RMC or the maximum reported SAR for 12.2kbps RMC without HSPA+/DC-HSDPS is ≤75% of SAR limit, SAR evalution for HSPA+/DC-HSDPS is not required.*

Conducted power measurements of Wifi 2.4GHz

Mode	channel	Frequency (MHz)	Conducted output power(dBm)	Test Rate Date
802.11b	1	2412	13.04	1Mbps
	6	2437	13.15	1Mbps
	11	2462	13.31	1Mbps
802.11g	1	2412	9.63	6Mbps
	6	2437	11.83	6Mbps
	11	2462	9.97	6Mbps
802.11n 20MHz	1	2412	9.17	6.5Mbps
	6	2.437	11.60	6.5Mbps
	11	2462	9.88	6.5Mbps
802.11n 40MHz	3	2422	8.25	13Mbps
	6	2437	10.10	13Mbps
	9	2452	8.83	13Mbps

Note:

1. *The average conducted power of WiFi is measured with RMS dector.*
2. *According to the KDB248227, for WiFi 2.4G, highest average RF output power channel for the lowest date rate of 802.11b mode was selected for SAR evaluation. SAR test at higher date rates and higher order modulations(including 802.11g/n) were not required since the maximum average output powerfor each of these configurations is not more than 1/4dB higher than the tested channnel for the lowest date rate of 802.11b mode.*

Conducted power measurement of BluetoothV4.0/V3.0

Mode	channel	Frequency (MHz)	Conducted output power (dBm)
BT V4.0 (GFSK)	1	2402	-7.23
	20	2440	-6.97
	40	2480	-6.90
BT V3.0 (GFSK)	0	2402	1.48
	39	2441	0.26
	78	2480	0.34
BT V3.0 (π/4-DQPSK)	0	2402	2.23
	39	2441	1.24
	78	2480	0.76
BT V3.0 (8-DPSK)	0	2402	2.46
	39	2441	1.59
	78	2480	1.50

Note:

According to KDB447498 D01 General RF Exposure Guidence v05r01 standalone SAR test exclusion considerations,SAR test is not required in 100MHz to 6GHz at test separation distances≤50mm , if the output of EUT satisfay the fllowing eqation:

[(max power of channel,including tune-up tolerance,mW)/(min test separation distance,mm)].[$f^{1/2}_{(GHz)}$].≤3.0 For 1-g SAR and ≤7.5 for 10-g extremity SAR.

a. $f_{(GHz)}$is the RF channel transmit frequency in GHz.
b. Power and distance are rounded to the nearest mW and mm before calculation
c. The result is rounded to one decimal place for comparison
d. 3.5 and 7.5 are referred to as the numeric thresholds

5.SAR TEST RESULT

5.1. Test condition:

1. SAR Measuremnt
   The distance between the EUT and the antenna of the emulator is more than 50cm and the out put power radiated from the emulator antenna is at least 30dB less than the output power of EUT.
2. Measurement Uncertainty: See page 36and37 for detail
3. Environmental Conditions

Temperature	23℃
Relative Humidity	53%
Atmospheric Pressure	1019mbar

4. Test Date: April 02,2015~April 11,2015
   Test By：Dick

5.2. Operation Mode

・According to KDB 447498 D01 v05r01 ,for each exposure position, if the highest 1-g SAR is ≤0.8 W/kg, testing for low and high channel is optional.

・Per KDB 865664 D01 v01r01,for each frequency band, if the measured SAR is ≥0.8W/Kg, testing for repeated SAR measurement is required , that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.
(1) When the original highest measured SAR is ≥0.8W/Kg, repeat that measurement once.
(2) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is ＞1.20 or when the original or repeated measurement is ≥1.45 W/Kg.
(3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥

1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥1.20.

・Body-worn exposure conditions are intended to voice call operations, therefore GSM voice call mode is selected to be test.
(1) the procedures explained in footnote 11 of the standard may be applied to reduce SAR test requirements for GPRS and EDGE modes when the source-based time-averaged output power for each data mode is lower than that in the normal GSM voice mode.
(2) when multiple slots can be used, the device should be tested to account for the maximum source-based time-averaged output power.
(3) when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.

・According to 616217 D04 the procedures are applicable only when the overall diagonal dimen of the keyboard and/or display section of a laptop or tablet is＞20cm.

・According to 248227 D01, SAR is not required for 802.11g channels when the maximum average output power is less than 1/4dB higher than measured on the corresponding 802.11b channels.

・Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
Maximum Scaling SAR =tested SAR (Max.) ×GSM[maximum turn-up power (mw)/ maximum measurement output power(mw)]

5.3. SAR summary Test result

SAR Values for GSM850 Band

Frequency		Test Position	Test Mode	SAR 1g(W/kg)	Power Drift (%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1g(W/kg)	Limit 1g(W/kg)
MHz	Channel								
836.0	190	Front	GPRS(4TX)	0.024	0.79	29.02	30.00	0.025	1.60
836.0	**190**	**Rear**	**GPRS(4TX)**	**0.037**	**0.37**	**29.02**	**30.00**	**0.038**	**1.60**
836.0	190	Left Cheek	GSM	0.220	2.52	32.70	33.00	0.222	1.60
836.0	190	Left Tilt	GSM	0.054	3.21	32.70	33.00	0.054	1.60
836.0	**190**	**Right Cheek**	**GSM**	**0.331**	**2.12**	**32.70**	**33.00**	**0.334**	**1.60**
836.0	190	Right Tilt	GSM	0.062	3.67	32.70	33.00	0.063	1.60

Note:

1.SAR test was performed in the middle channel only the measured leve was<50% of the SAR of limit,test in the low and high channel is optional.

2.The EUT is a Class B mobile phone which can be attached to both GPRS and GSM services,using one service at a time

3.The Multi-slot Classes of EUT is Class12 which has maximum 1 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 1DL+4UL is the worse case base on the out put power measurements above.

SAR Values for PCS1900 Band

Frequency		Test Position	Test Mode	SAR 1g(W/kg)	Power Drift (%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1g(W/kg)	Limit 1g(W/kg)
MHz	Channel								
1880.0	661	Front	GPRS(4TX)	0.242	2.61	29.01	30.00	0.250	1.60
1880.0	**661**	**Rear**	**GPRS(4TX)**	**0.431**	**-2.58**	**29.01**	**30.00**	**0.446**	**1.60**
1880.0	661	Left Cheek	GSM	0.317	-2.60	25.79	26.00	0.320	1.60
1880.0	661	Left Tilt	GSM	0.137	3.81	25.79	26.00	0.138	1.60
1880.0	**661**	**Right Cheek**	**GSM**	**0.547**	**-1.39**	**25.79**	**26.00**	**0.551**	**1.60**
1880.0	661	Right Tilt	GSM	0.231	2.17	25.79	26.00	0.233	1.60

Note:

1. SAR test was performed in the middle channel only the measured leve was<50% of the SAR of limit,test in the low and high channel is optional.

2.The EUT is a Class B mobile phone which can be attached to both GPRS and GSM services,using one service at a time

3. The Multi-slot Classes of EUT is Class12 which has maximum 1 Downlink slots and 4 Uplink slots, the maximum active slots is 5, when perform the multiple slots scan, 1DL+4UL is the worse case base on the out put power measurements above.

SAR Values forWCDMABand V

Frequency		Test Position	Test Mode	SAR 1g(W/kg)	Power Drift (%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1g(W/kg)	Limit 1g(W/kg)
MHz	Channel								
836.8	**4183**	**Left Cheek**	**WCDMA**	**0.570**	**-3.45**	**23.07**	**23.50**	**0.581**	**1.60**
836.8	4183	Left Tilt	WCDMA	0.234	2.51	23.07	23.50	0.238	1.60
836.8	4183	Right Cheek	WCDMA	0.466	1.94	23.07	23.50	0.475	1.60
836.8	4183	Right Tilt	WCDMA	0.195	2.51	23.07	23.50	0.199	1.60
836.8	4183	Front	WCDMA	0.156	2.57	23.07	23.50	0.159	1.60
836.8	**4183**	**Rear**	**WCDMA**	**0.273**	**-3.99**	**23.07**	**23.50**	**0.278**	**1.60**

Note:

1.When the SAR measured for the middle channel is ≤ 50% of the limit, test in the low and high channel is optional.

2.The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2kbps RMC(reference measurement channel) configuration in test loop mode

SAR Values forWCDMABand II

Frequency		Test Position	Test Mode	SAR 1g(W/kg)	Power Drift (%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1g(W/kg)	Limit 1g(W/kg)
MHz	Channel								
1880	**9400**	**Left Cheek**	**WCDMA**	**0.539**	**-3.17**	**22.57**	**23.00**	**0.549**	**1.60**
1880	9400	Left Tilt	WCDMA	0.216	2.18	22.57	23.00	0.220	1.60
1880	9400	Right Cheek	WCDMA	0.454	2.48	22.57	23.00	0.462	1.60
1880	9400	Right Tilt	WCDMA	0.193	3.46	22.57	23.00	0.197	1.60
1880	9400	Front	WCDMA	0.264	1.94	22.57	23.00	0.269	1.60
1880	**9400**	**Rear**	**WCDMA**	**0.398**	**-4.15**	**22.57**	**23.00**	**0.406**	**1.60**

Note:

1.When the SAR measured for the middle channel is ≤ 50% of the limit, test in the low and high channel is optional.

2.The default test configuration is to measure SAR with an established radio link between the EUT and a communication test set using a 12.2kbps RMC(reference measurement channel) configuration in test loop mode

SAR Values for WLAN2450 Band -Body

Frequency		Mode/Band	Test Position	SAR(1g) (W/kg)	Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1g(W/kg)	Limit 1g(W/kg)
MHz	Channel								
2437	6	802.11b	Front	0.037	1.56	13.15	14.00	0.039	1.60
2437	**6**	**802.11b**	**Rear**	**0.048**	**-1.99**	**13.15**	**14.00**	**0.051**	**1.60**
2437	6	802.11b	Left Cheek	0.173	1.79	13.15	14.00	0.184	1.60
2437	6	802.11b	Left Tilt	0.081	2.34	13.15	14.00	0.086	1.60
2437	**6**	**802.11b**	**Right Cheek**	**0.209**	**-2.49**	**13.15**	**14.00**	**0.223**	**1.60**
2437	6	802.11b	Right Tilt	0.095	3.46	13.15	14.00	0.101	1.60

Note:

1.When the SAR measured for the middle channel is ≤ 50% of the limit, test in the low and high channel is optional.

2. The result was tested under the lowest data rate 1Mbps for 802.11b.

5.4. Testreduction procedure

Simultaneous multi-band transmission

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB447498D01 General RF Exposure Guidence v05r02.

Figure 1:The diagonal dimension of the DUT

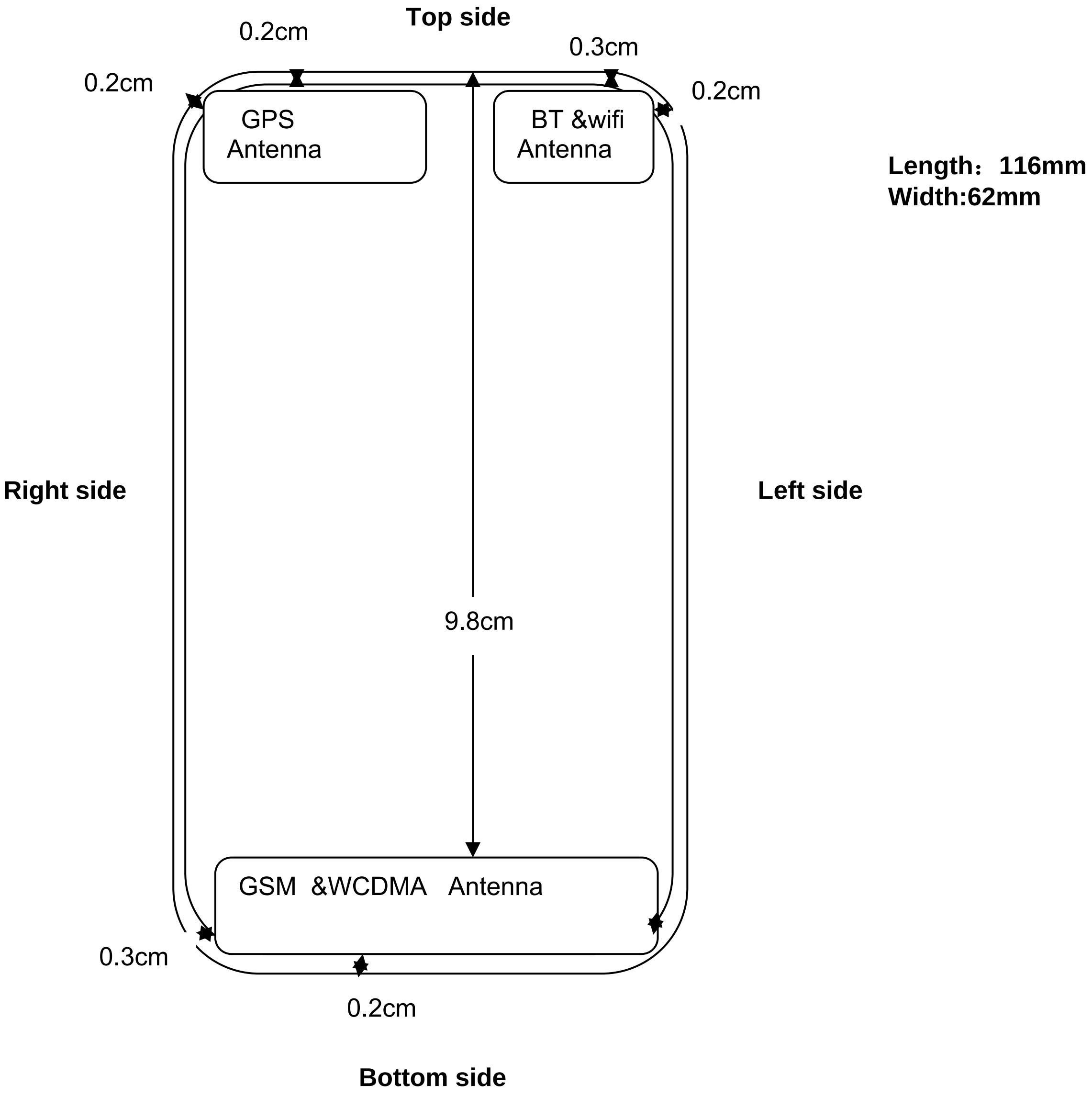


Figure1:The antenna position of the DUT

Simultaneous Transmission SAR Analysis

No	Applicable Simultaneous Transmission Combination
1.	GSM/WCDMA+BT
2.	GSM/WCDMA+WiFi

Note:1) WLAN2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
2) The Reported SAR summation is calculated based on the same configuration and test position.
3) Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
a) Scalar SAR summation < 1.6W/kg.
b) SPLSR = (SAR1 + SAR2) 1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of \[(x1-x2) 2 + (y1-y2) 2 + (z1-z2) 2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
c) If SPLSR≦0.04, simultaneously transmission SAR measurement is not necessary
d) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg
4) For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05r02 based on the formula below.
a) (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.
b) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
c) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.
d) Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

5) BT's maximum conducted power is 2.46 dBm(1.762mW) and the estimated SAR is listed below.

Test position	Head(0cm)	Body-worn(0cm)
BT Estimated SAR(W/kg)	0.066	0.066

For Bluetooth the Estimated SAR for Head at 5mm for estimate and 15mm to Estimated Body SAR

Estimated SAR_{Head}=((1.762mW)/5mm)*(1.5498/7.5)=0.0728W/Kg

Estimated SAR_{Body}=((1.762mW)/15mm)*(1.5498/7.5)=0.0242W/Kg

GSM & WLAN Mode

Test Position	GSM850 Reported SAR1g (W/Kg)	GSM1900 Reported SAR1g (W/Kg)	WLAN Reported SAR1g (W/Kg)	Summation Reported SAR(1g) (W/kg)	SAR –to-peak-location Separation Ratio	Simultaneous Measurement Required?
Left Hand Touch	0.220	0.317	0.173	0.490	N/A	No
Left Hand Title	0.054	0.137	0.081	0.218	N/A	No
Right Hand Touch	0.331	0.547	0.209	0.756	N/A	No
Right Hand Title	0.062	0.231	0.095	0.326	N/A	No
Body-Front Side	0.024	0.242	0.037	0.279	N/A	No
Body-Rear Side	0.037	0.431	0.048	0.479	N/A	No

GSM & BT Mode

Test Position	GSM850 Reported SAR1g (W/Kg)	GSM1900 Reported SAR1g (W/Kg)	Bluetooth Estimated SAR (W/Kg)	Summation Reported SAR(1g) (W/kg)	SAR –to-peak-location Separation Ratio	Simultaneous Measurement Required?
Left Hand Touch	0.220	0.317	0.073	0.390	N/A	No
Left Hand Title	0.054	0.137	0.073	0.210	N/A	No
Right Hand Touch	0.331	0.547	0.073	0.620	N/A	No
Right Hand Title	0.062	0.231	0.073	0.304	N/A	No
Body-Front Side	0.024	0.242	0.024	0.266	N/A	No
Body-Rear Side	0.037	0.431	0.024	0.455	N/A	No

WCDMA & WLAN Mode

Test Position	WCDMA 850 Reported SAR1g (W/Kg)	WCDMA 1900 Reported SAR1g (W/Kg)	WLAN Reported SAR1g (W/Kg)	Summation Reported SAR(1g) (W/kg)	SAR –to-peak-location Separation Ratio	Simultaneous Measurement Required?
Left Hand Touch	0.570	0.539	0.173	0.743	N/A	No
Left Hand Title	0.234	0.216	0.081	0.315	N/A	No
Right Hand Touch	0.466	0.454	0.209	0.675	N/A	No
Right Hand Title	0.195	0.193	0.095	0.290	N/A	No
Body-Front Side	0.156	0.264	0.037	0.301	N/A	No
Body-Rear Side	0.273	0.398	0.048	0.446	N/A	No

WCDMA & BT Mode

Test Position	WCDMA 850 Reported SAR1g (W/Kg)	WCDMA 1900 Reported SAR1g (W/Kg)	Bluetooth Estimated SAR (W/Kg)	Summation Reported SAR(1g) (W/kg)	SAR –to-peak-location Separation Ratio	Simultaneous Measurement Required?
Left Hand Touch	0.570	0.539	0.073	0.643	N/A	No
Left Hand Title	0.234	0.216	0.073	0.307	N/A	No
Right Hand Touch	0.466	0.454	0.073	0.539	N/A	No
Right Hand Title	0.195	0.193	0.073	0.268	N/A	No
Body-Front Side	0.156	0.264	0.024	0.268	N/A	No
Body-Rear Side	0.273	0.398	0.024	0.422	N/A	No

Note: The above numeral summed SAR results is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with volume scans is not required according to KDB447498 D01v05r02.

5.5. Measurement Uncertainty (700MHz-3GHz)

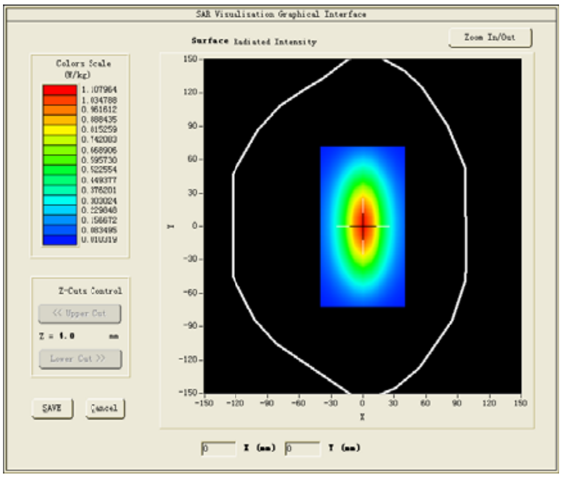
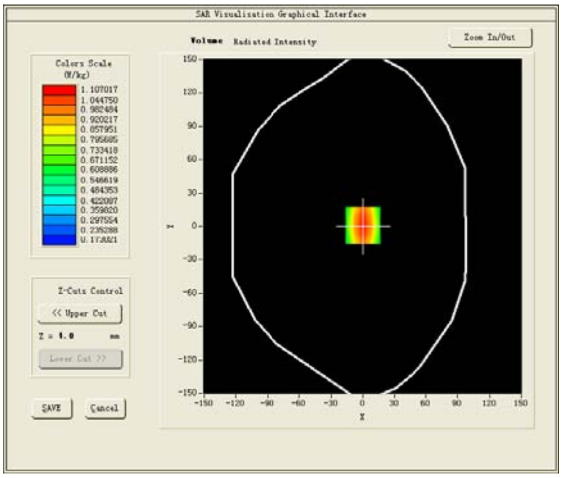
UNCERTAINTY FOR SYSTEM PERFORMANCE CHECK									
Uncertainty Component		Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (± %)	10 g u_i (± %)	v_i
Measurement System									
Probe Calibration	7.2.1	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	7.2.1.1	3.5	R	√3	$(1-c_p)^{1/2}$	$(1-c_p)^{1/2}$	1.43	1.43	∞
Hemispherical Isotropy	7.2.1.1	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
Boundary Effect	7.2.1.4	1	R	√3	1	1	0.58	0.58	∞
Linearity	7.2.1.2	4.7	R	√3	1	1	2.71	2.71	∞
System Detection Limits	7.2.1.2	1	R	√3	1	1	0.58	0.58	∞
Modulation response	7.2.1.3	0	N	1	1	1	0.00	0.00	∞
Readout Electronics	7.2.1.5	0.5	N	1	1	1	0.50	0.50	∞
Response Time	7.2.1.6	0	R	√3	1	1	0.00	0.00	∞
Integration Time	7.2.1.7	1.4	R	√3	1	1	0.81	0.81	∞
RF Ambient Conditions - Noise	7.2.3.7	3	R	√3	1	1	1.73	1.73	∞
RF Ambient Conditions - Reflections	7.2.3.7	3	R	√3	1	1	1.73	1.73	∞
Probe Positioner Mechanical Tolerance	7.2.2.1	1.4	R	√3	1	1	0.81	0.81	∞
Probe Positioning with respect to Phantom Shell	7.2.2.3	1.4	R	√3	1	1	0.81	0.81	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	7.2.4	2.3	R	√3	1	1	1.33	1.33	∞
Dipole									
Deviation of experimental source from numerical source		4	N	1	1	1	4.00	4.00	∞
Input Power and SAR drift measurement	7.2.3.6	5	R	√3	1	1	2.89	2.89	∞
Dipole Axis to Liquid Distance		2	R	√3	1	1			∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)		4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation (in permittivity and conductivity)	7.2.6	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	5
Liquid Conductivity - measurement uncertainty	7.2.3.3	4	N	1	0.23	0.26	0.92	1.04	5
Liquid Permittivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid Permittivity - measurement uncertainty	7.2.3.4	5	N	1	0.23	0.26	1.15	1.30	∞
Combined Standard Uncertainty			RSS				10.15	10.05	
Expanded Uncertainty (95% CONFIDENCE INTERVAL)			k				20.29	20.10	

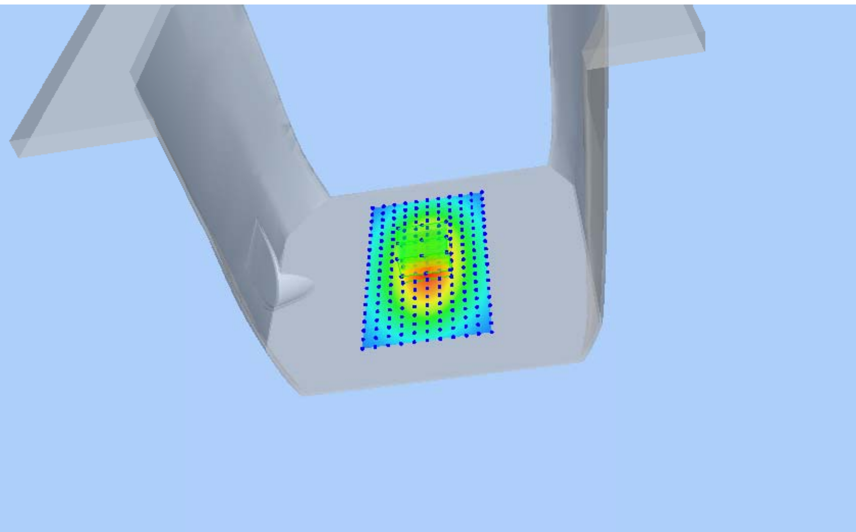
UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

Uncertainty Component	Description	Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (± %)	10 g u_i (± %)	v_i
Measurement System									
Probe Calibration	7.2.1	5.8	N	1	1	1	5.8	5.8	∞
Axial Isotropy	7.2.1.1	3.5	R	√3	$(1-c_p)^{1/2}$	$(1-c_p)^{1/2}$	1.43	1.43	∞
Hemispherical Isotropy	7.2.1.1	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
Boundary Effect	7.2.1.4	1	R	√3	1	1	0.58	0.58	∞
Linearity	7.2.1.2	4.7	R	√3	1	1	2.71	2.71	∞
System Detection Limits	7.2.1.2	1	R	√3	1	1	0.58	0.58	∞
Modulation response	7.2.1.3	3	N	1	1	1	3.00	3.00	∞
Readout Electronics	7.2.1.5	0.5	N	1	1	1	0.50	0.50	∞
Response Time	7.2.1.6	0	R	√3	1	1	0.00	0.00	∞
Integration Time	7.2.1.7	1.4	R	√3	1	1	0.81	0.81	∞
RF Ambient Conditions - Noise	7.2.3.7	3	R	√3	1	1	1.73	1.73	∞
RF Ambient Conditions - Reflections	7.2.3.7	3	R	√3	1	1	1.73	1.73	∞
Probe Positioner Mechanical Tolerance	7.2.2.1	1.4	R	√3	1	1	0.81	0.81	∞
Probe Positioning with respect to Phantom Shell	7.2.2.3	1.4	R	√3	1	1	0.81	0.81	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	7.2.4	2.3	R	√3	1	1	1.33	1.33	∞
Test sample Related									
Test Sample Positioning	7.2.2.4.4	2.6	N	1	1	1	2.60	2.60	11
Device Holder Uncertainty	7.2.2.4.2 7.2.2.4.3	3	N	1	1	1	3.00	3.00	7
Output Power Variation - SAR drift measurement	7.2.3.6	5	R	√3	1	1	2.89	2.89	∞
SAR scaling	7.2.5	2	R	√3	1	1	1.15	1.15	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	7.2.2.2	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation (in permittivity and conductivity)	7.2.6	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	5
Liquid Conductivity - measurement uncertainty	7.2.3.3	4	N	1	0.23	0.26	0.92	1.04	5
Liquid Permittivity (temperature uncertainty)	7.2.3.5	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid Permittivity - measurement uncertainty	7.2.3.4	5	N	1	0.23	0.26	1.15	1.30	∞
Combined Standard Uncertainty			RSS				10.63	10.54	
Expanded Uncertainty (95% CONFIDENCE INTERVAL)			k				21.26	21.08	

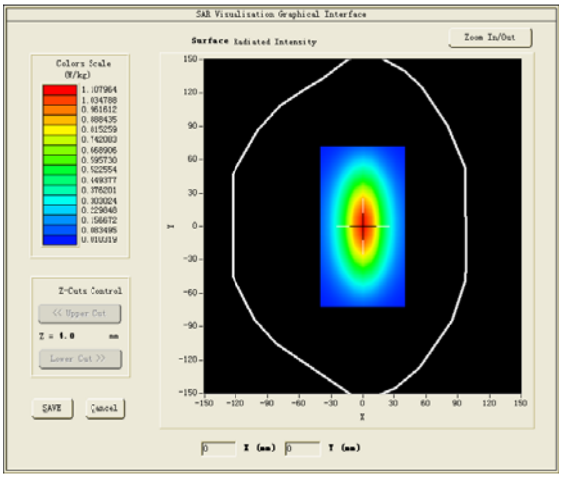
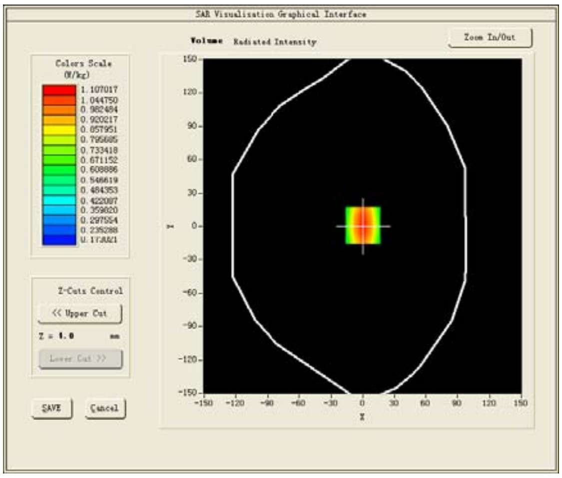
5.6. System Check Results

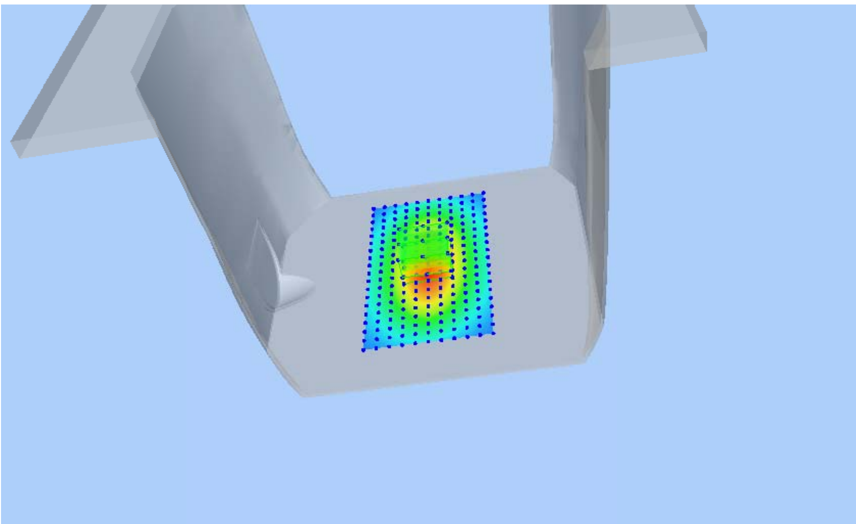
Test mode:835MHz(Head)
Product Description:Validation
Model:Dipole SID835
E-Field Probe:SSE5(SN17/14 EP220)
Test Date: April 07, 2015

Medium(liquid type)	HSL_900
Frequency (MHz)	835.0000
Relative permittivity (real part)	41.50
Conductivity (S/m)	0.91
Input power	100mW
Crest Factor	1.0
Conversion Factor	4.86
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.625383
SAR 1g (W/Kg)	0.951341
SURFACE SAR	**VOLUME SAR**
	

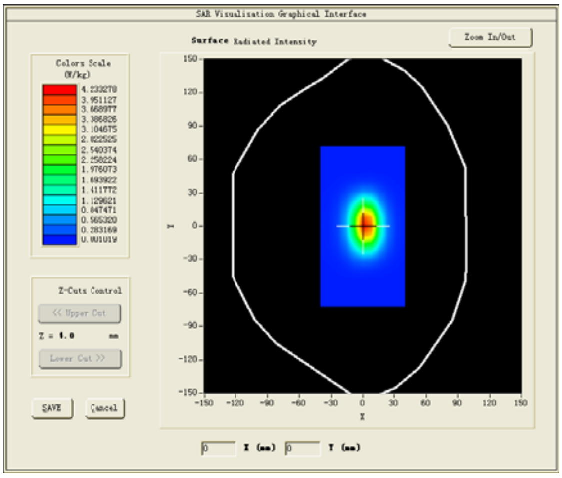
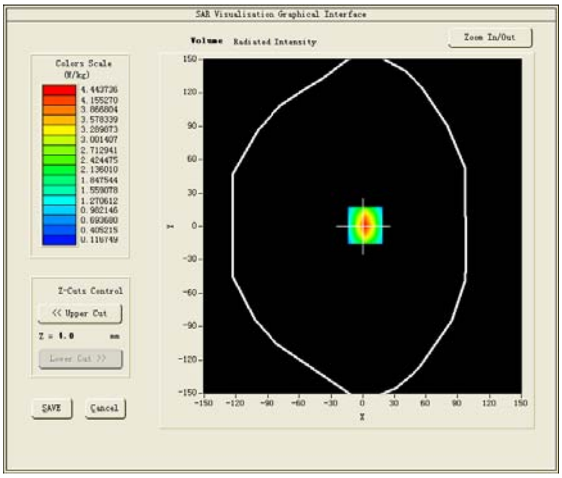
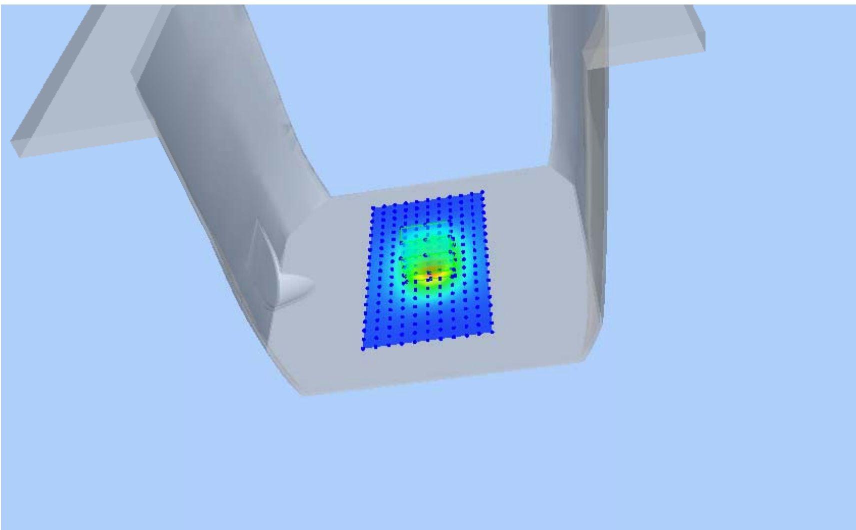


Test mode:835MHz(Body)
Product Description:Validation
Model:Dipole SID835
E-Field Probe:SSE5(SN17/14 EP220)
Test Date:April 07, 2015

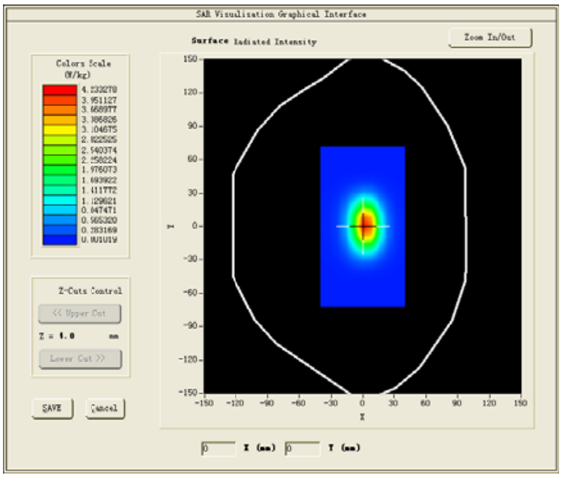
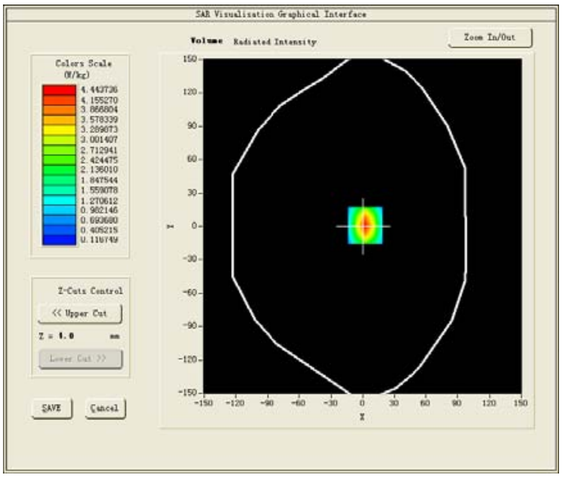
Medium(liquid type)	MSL_900
Frequency (MHz)	835.0000
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
Input power	100mW
Crest Factor	1.0
Conversion Factor	5.04
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.642383
SAR 1g (W/Kg)	0.985159
SURFACE SAR	**VOLUME SAR**
	

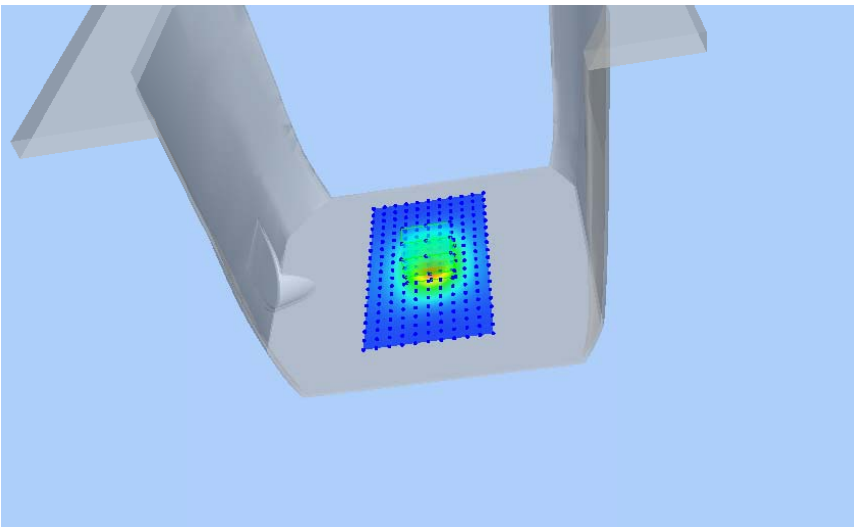


Test mode:1900MHz(Head)
Product Description:Validation
Model :Dipole SID1900
E-Field Probe:SSE5(SN17/14 EP221)
Test Date: April 07, 2015

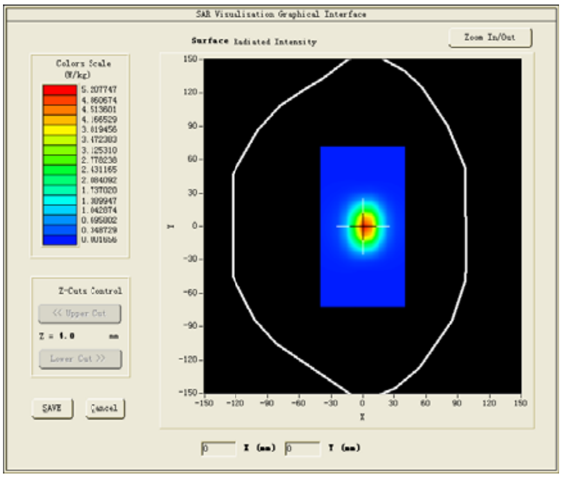
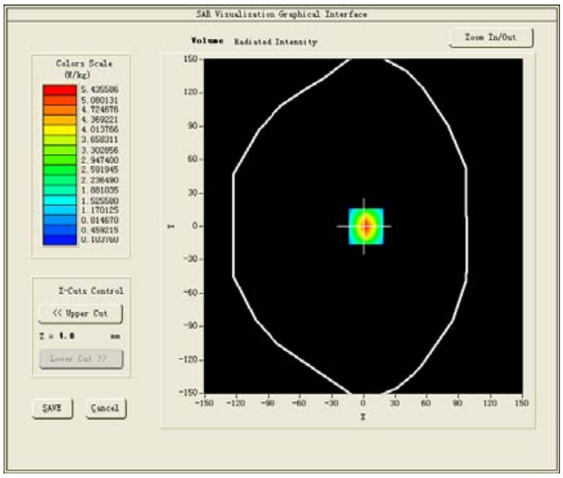
Medium(liquid type)	HSL_1800
Frequency (MHz)	1900.0000
Relative permittivity (real part)	40.13
Conductivity (S/m)	1.42
Input power	100mW
Crest Factor	1.0
Conversion Factor	4.71
Variation (%)	-0.240000
SAR 10g (W/Kg)	2.021450
SAR 1g (W/Kg)	3.835374
SURFACE SAR	**VOLUME SAR**
	
	

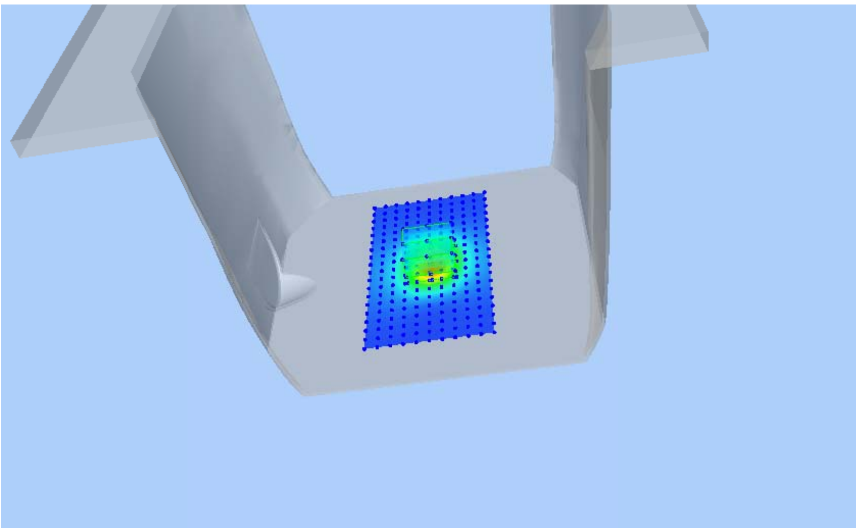
Test mode:1900MHz(Body)
Product Description:Validation
Model :Dipole SID1900
E-Field Probe:SSE5(SN17/14 EP221)
Test Date:April 07, 2015

Medium(liquid type)	MSL_1800
Frequency (MHz)	1900.0000
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.54
Input power	100mW
Crest Factor	1.0
Conversion Factor	4.85
Variation (%)	-0.240000
SAR 10g (W/Kg)	2.076450
SAR 1g (W/Kg)	3.915374
SURFACE SAR	**VOLUME SAR**
	

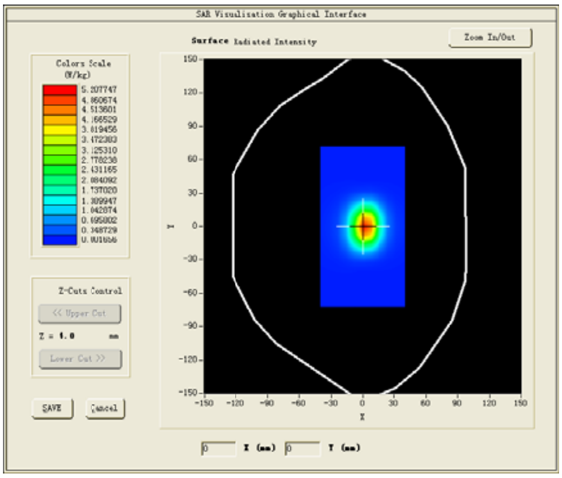
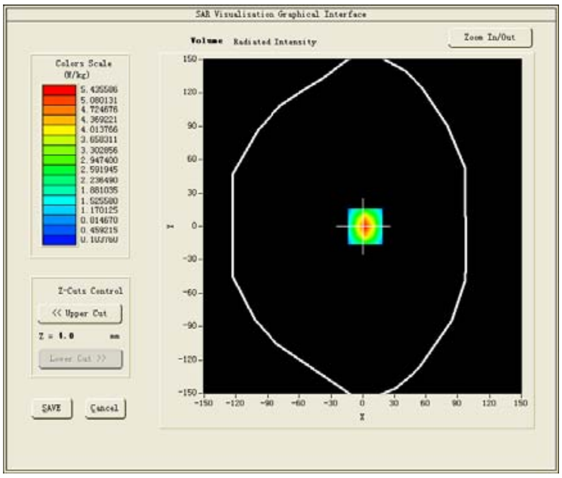


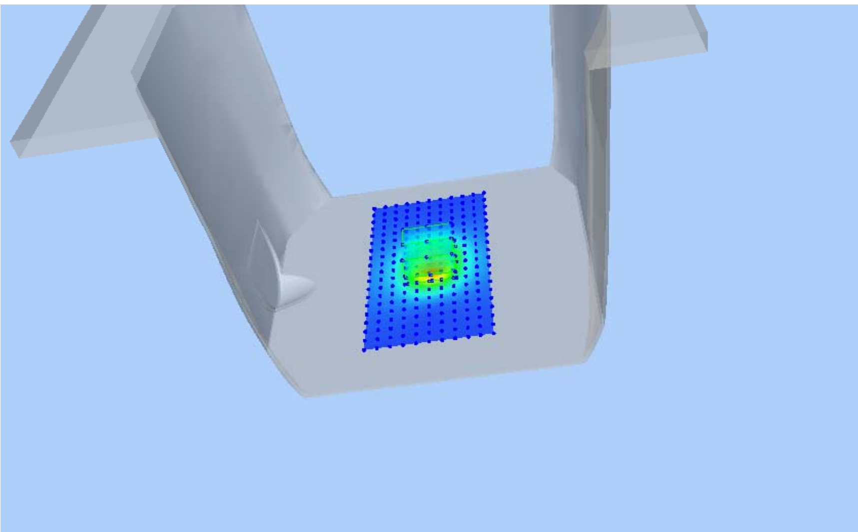
Test mode:2450MHz(Head)
Product Description:Validation
Model:Dipole SID2450
E-Field Probe:SSE5(SN17/14 EP220)
Test Date: April 08, 2015

Medium(liquid type)	HSL_2450
Frequency (MHz)	2450.0000
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.84
Input power	100mW
Crest Factor	1.0
Conversion Factor	3.94
Variation (%)	-0.340000
SAR 10g (W/Kg)	2.432042
SAR 1g (W/Kg)	5.235439
SURFACE SAR	**VOLUME SAR**
	



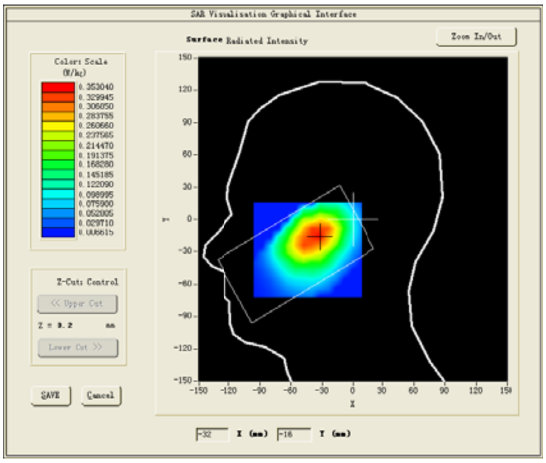
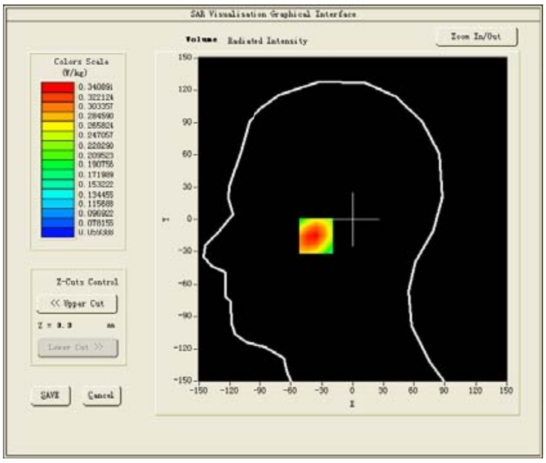
Test mode:2450MHz(Body)
Product Description:Validation
Model:Dipole SID2450
E-Field Probe:SSE5(SN17/14 EP220)
Test Date:April 08, 2015

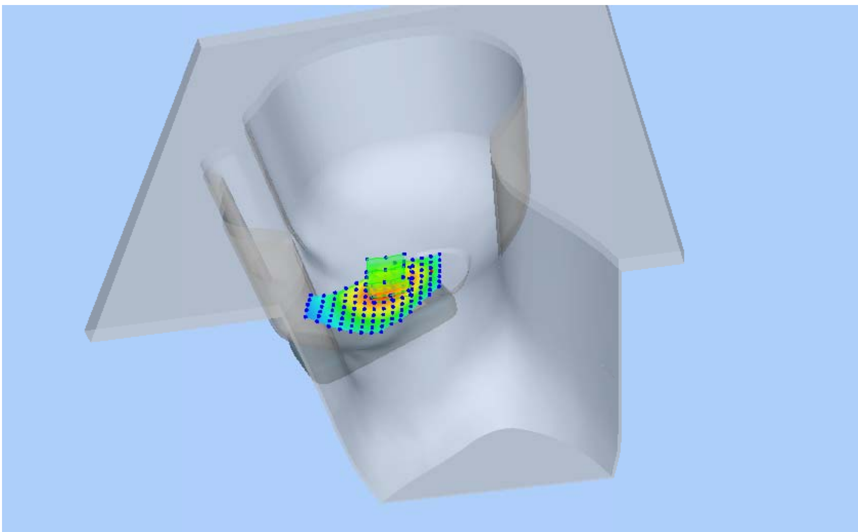
Medium(liquid type)	MSL_2450
Frequency (MHz)	2450.0000
Relative permittivity (real part)	52.72
Conductivity (S/m)	1.94
Input power	100mW
Crest Factor	1.0
Conversion Factor	4.05
Variation (%)	-0.340000
SAR 10g (W/Kg)	2.495042
SAR 1g (W/Kg)	5.45339
SURFACE SAR	**VOLUME SAR**
	



5.7. SAR Test Graph Results

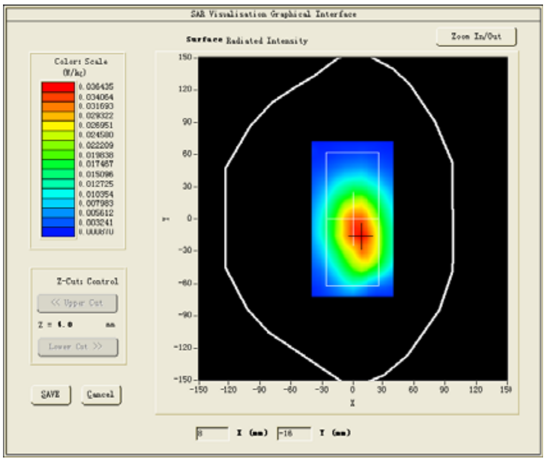
Test Mode:GSM 850MHz,Mid channel(Head Right Cheek)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

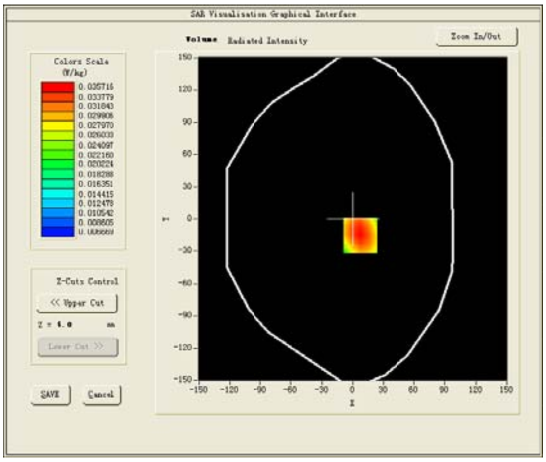
Medium(liquid type)	MSL_900
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.5
Conductivity (S/m)	0.91
E-Field Probe	SN 17/14 EP220
Crest Factor	2.0
Conversion Factor	4.86
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	2.120000
SAR 10g (W/Kg)	0.234042
SAR 1g (W/Kg)	0.331247
SURFACE SAR	**VOLUME SAR**
	

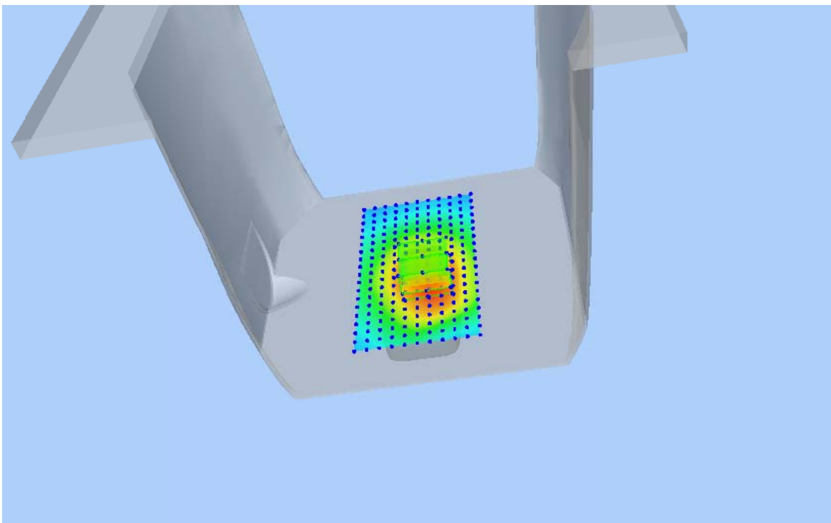


Test Mode:GPRS850MHz,Mid channel(Body SAR-LCDDown)
Product Description:SMART PHONE
Model:COOL
Test Date:April 07,2015

Medium(liquid type)	MSL_900
Frequency (MHz)	836.400024
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
E-Field Probe	SN 17/14 EP220
Crest Factor	2.0
Conversion Factor	5.04
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	0.370000
SAR 10g (W/Kg)	0.027712
SAR 1g (W/Kg)	0.037329
SURFACE SAR	**VOLUME SAR**

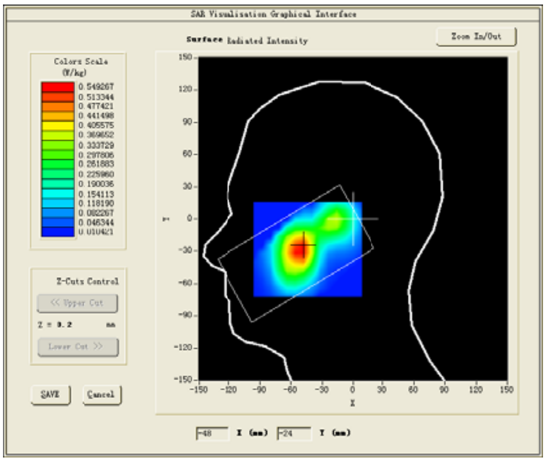


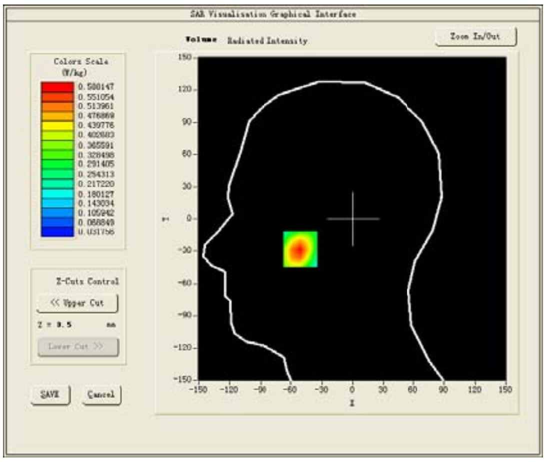


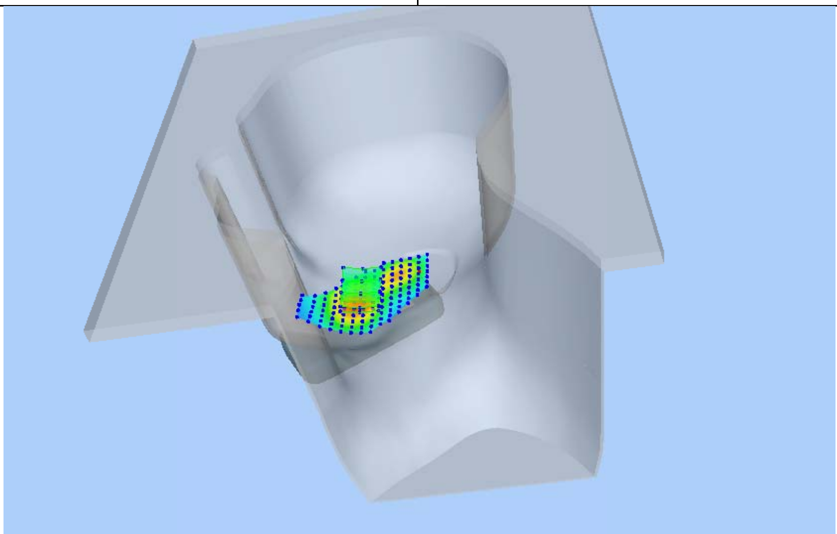


Test Mode:GSM 1900MHz,Mid channel(Head Right Cheek)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

Medium(liquid type)	MSL_1800
Frequency (MHz)	1909.599976
Relative permittivity (real part)	40.13
Conductivity (S/m)	1.42
E-Field Probe	SN 17/14 EP221
Crest Factor	2.0
Conversion Factor	4.71
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-1.3900000
SAR 10g (W/Kg)	0.324797
SAR 1g (W/Kg)	0.546754
SURFACE SAR	**VOLUME SAR**

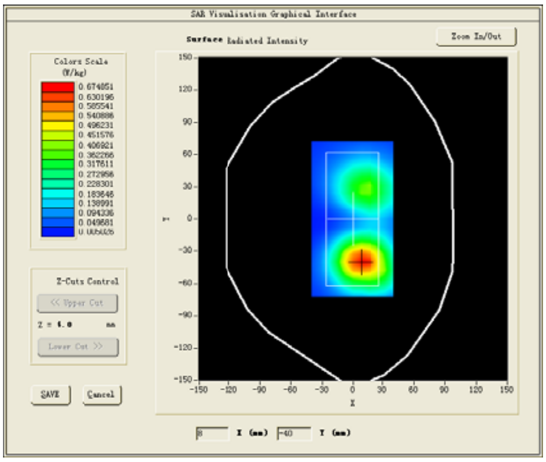


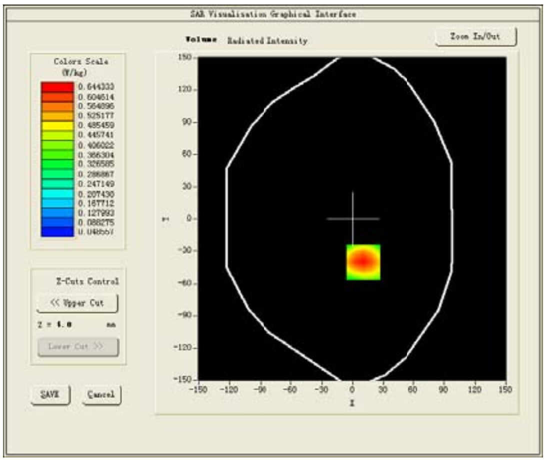


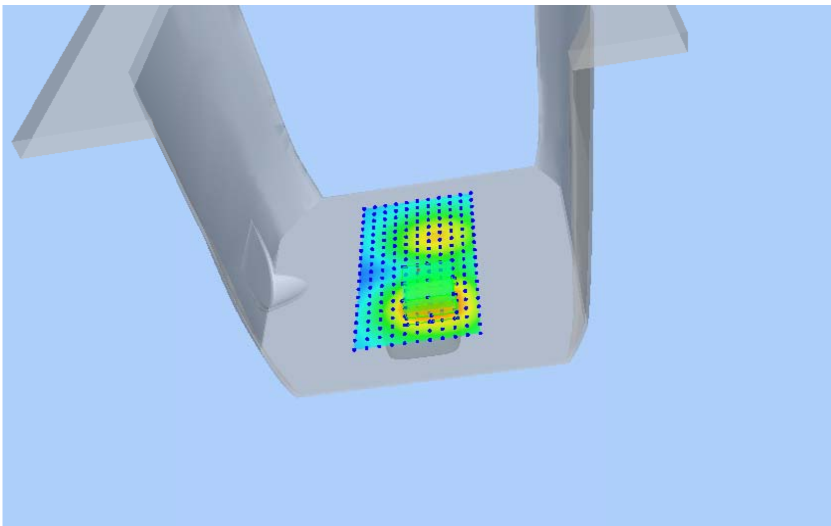


Test Mode:GPRS1900MHz,Mid channel(Body SAR-LCD Down)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

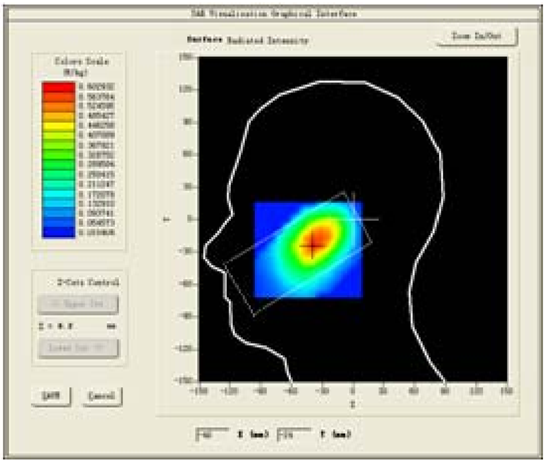
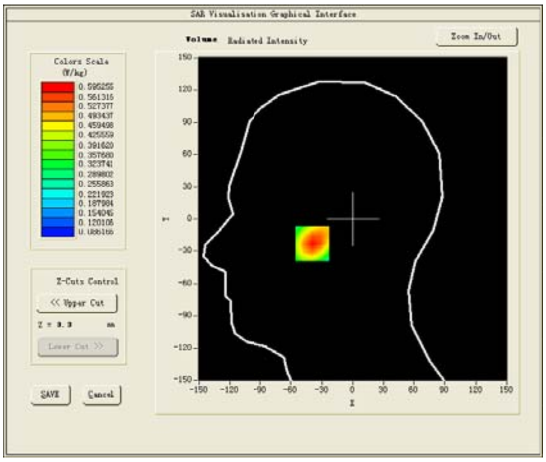
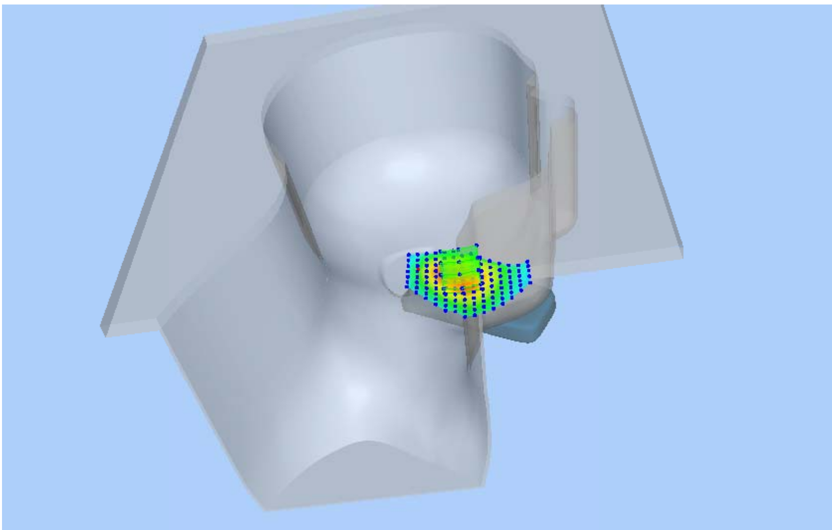
Medium(liquid type)	MSL_1800
Frequency (MHz)	1909.599976
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.54
E-Field Probe	SN 17/14 EP221
Crest Factor	2.0
Conversion Factor	4.85
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-2.580000
SAR 10g (W/Kg)	0.286570
SAR 1g (W/Kg)	0.43091
SURFACE SAR	**VOLUME SAR**





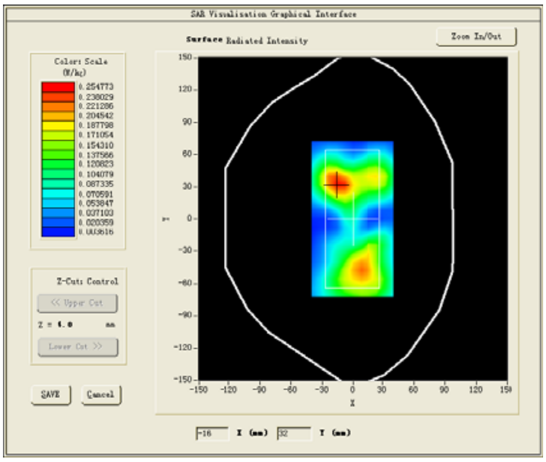


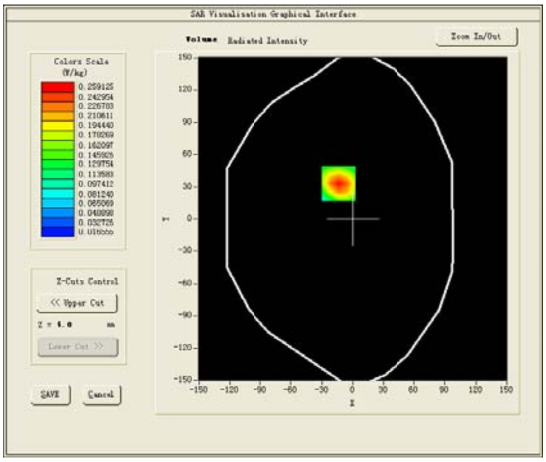
Test Mode:WCDMA 850MHz,Mid channel(Head Left Cheek)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

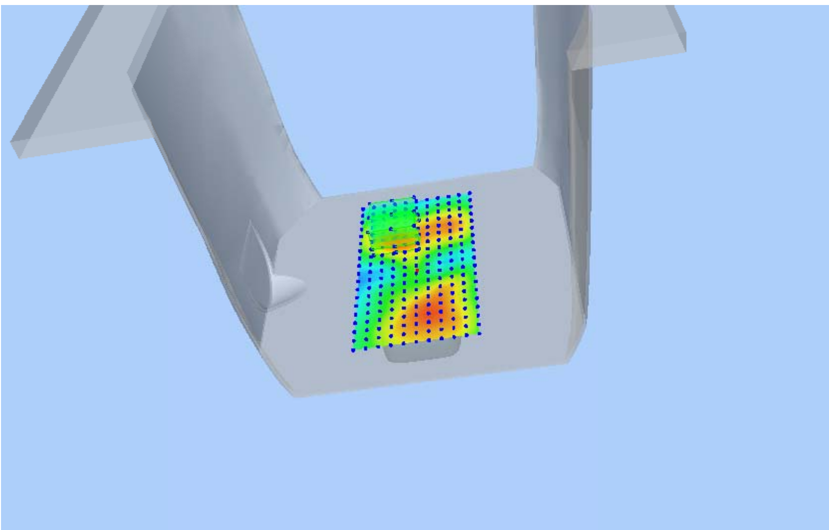
Medium(liquid type)	MSL_900
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.5
Conductivity (S/m)	0.91
E-Field Probe	SN 17/14 EP220
Crest Factor	2.0
Conversion Factor	4.86
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-3.4500000
SAR 10g (W/Kg)	0.398101
SAR 1g (W/Kg)	0.570390
SURFACE SAR	**VOLUME SAR**
	
	

Test Mode:WCDMA850MHz,Mid channel(Body SAR-LCDDown)
Product Description:SMART PHONE
Model:COOL
Test Date:April 07,2015

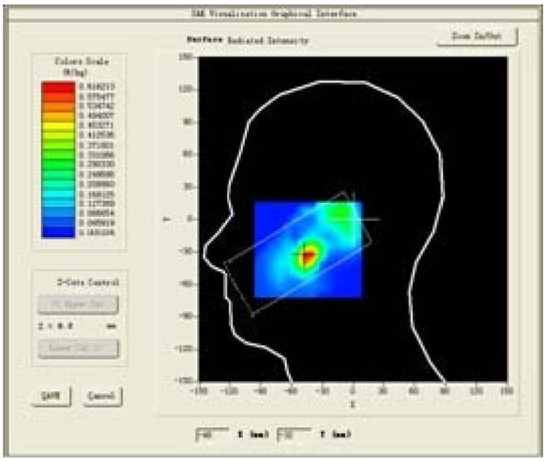
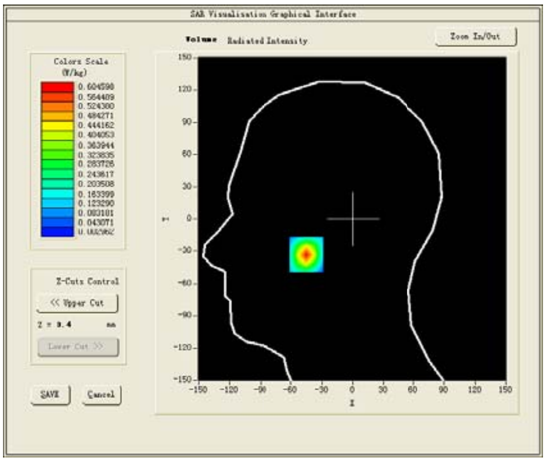
Medium(liquid type)	MSL_900
Frequency (MHz)	836.400024
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
E-Field Probe	SN 17/14 EP220
Crest Factor	2.0
Conversion Factor	5.04
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-3.990000
SAR 10g (W/Kg)	0.161329
SAR 1g (W/Kg)	0.272820
SURFACE SAR	**VOLUME SAR**

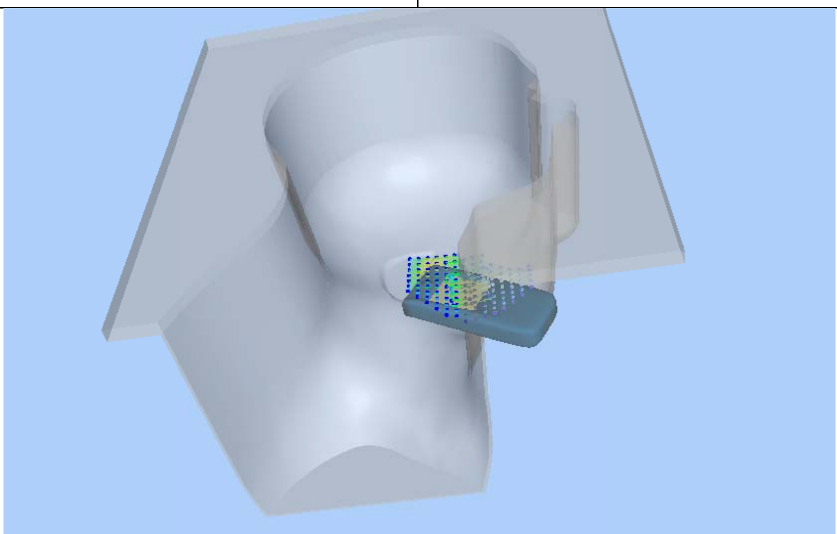




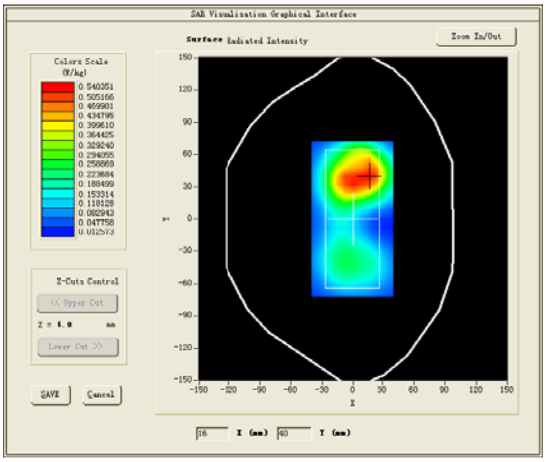
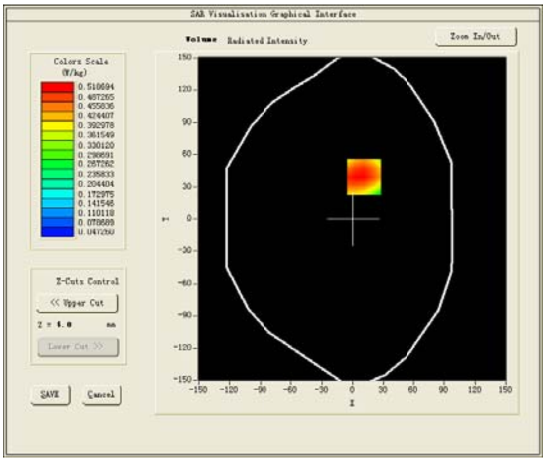


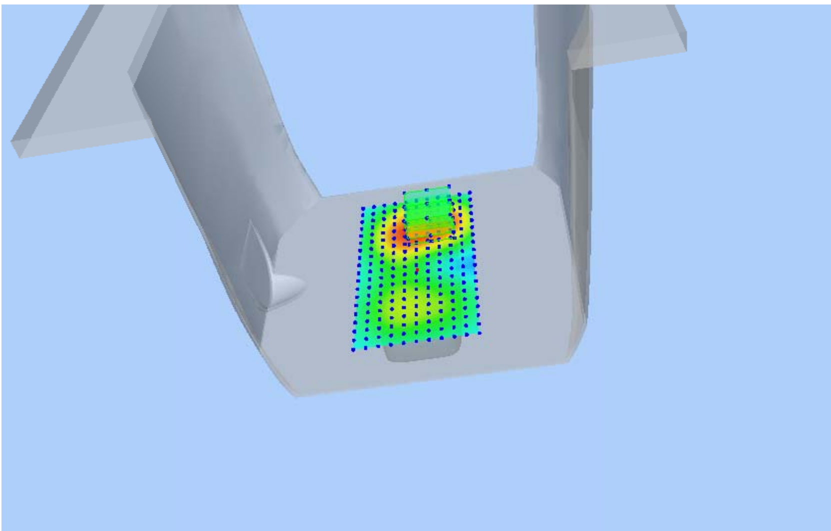
Test Mode:WCDMA 1900MHz,Mid channel(Head Left Cheek)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

Medium(liquid type)	MSL_1800
Frequency (MHz)	1909.599976
Relative permittivity (real part)	40.13
Conductivity (S/m)	1.42
E-Field Probe	SN 17/14 EP221
Crest Factor	2.0
Conversion Factor	4.71
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-3.170000
SAR 10g (W/Kg)	0.278303
SAR 1g (W/Kg)	0.539529
SURFACE SAR	**VOLUME SAR**
	

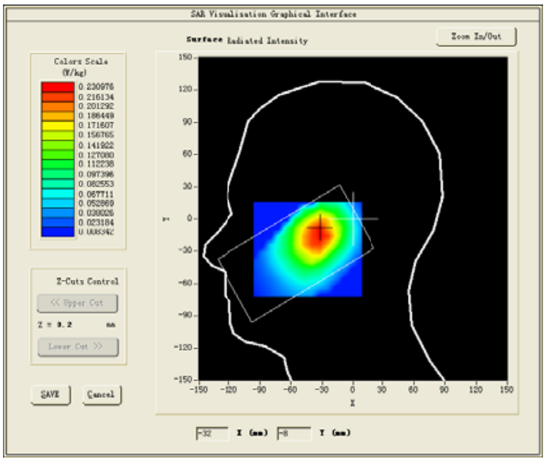
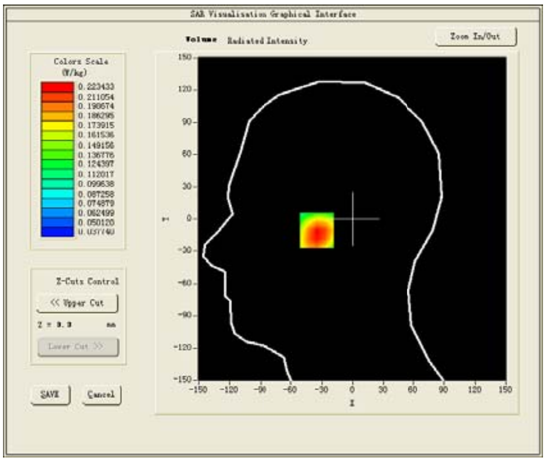
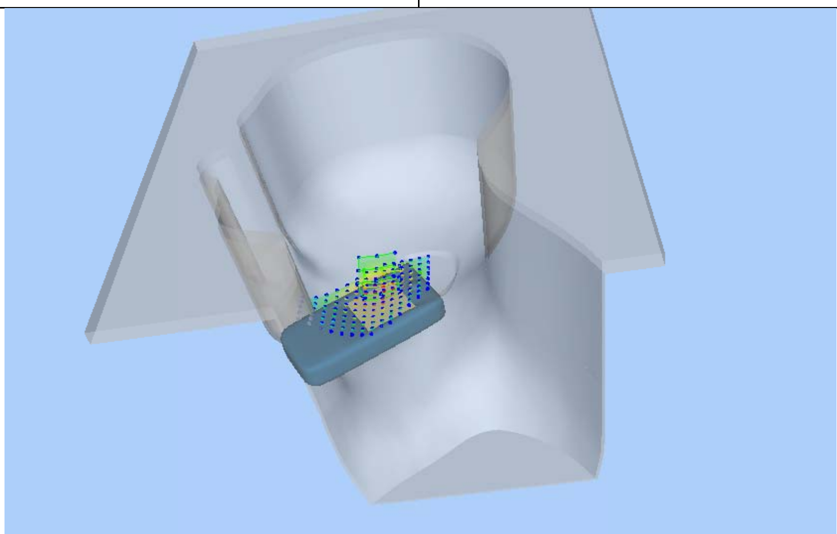


Test Mode:GPRS1900MHz,Mid channel(Body SAR-LCD Down)
Product Description: SMART PHONE
Model:COOL
Test Date:April 07, 2015

Medium(liquid type)	MSL_1800
Frequency (MHz)	1909.599976
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.54
E-Field Probe	SN 17/14 EP221
Crest Factor	2.0
Conversion Factor	4.85
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-4.150000
SAR 10g (W/Kg)	0.269357
SAR 1g (W/Kg)	0.3981084
SURFACE SAR	**VOLUME SAR**
	

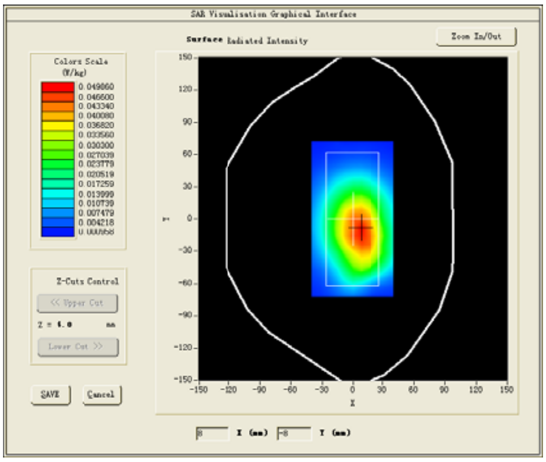


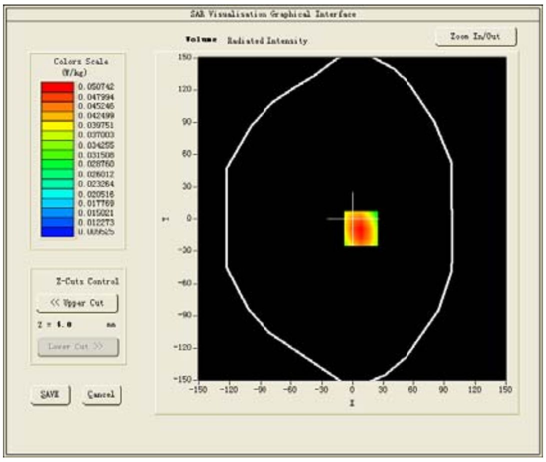
Test Mode:802.11b,Mid channel(Head Right Cheek)
Product Description: SMART PHONE
Model:COOL
Test Date:April 08, 2015

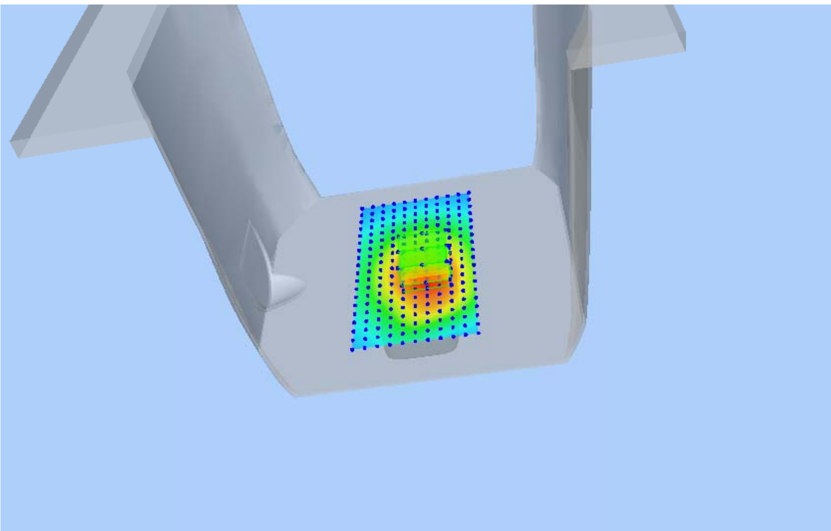
Medium(liquid type)	MSL_2450
Frequency (MHz)	2437.000000
Relative permittivity (real part)	39.22
Conductivity (S/m)	1.84
E-Field Probe	SN 17/14 EP220
Crest Factor	1.0
Conversion Factor	3.94
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-2.490000
SAR 10g (W/Kg)	0.153925
SAR 1g (W/Kg)	0.208512
SURFACE SAR	**VOLUME SAR**
	
	

Test Mode:802.11b,Mid channel(Body SAR-LCD DOWN)
Product Description: SMART PHONE
Model:COOL
Test Date:April 08,2015

Medium(liquid type)	MSL_2450
Frequency (MHz)	2437.000000
Relative permittivity (real part)	52.72
Conductivity (S/m)	1.94
E-Field Probe	SN 17/14 EP220
Crest Factor	1.0
Conversion Factor	4.05
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-1.990000
SAR 10g (W/Kg)	0.032119
SAR 1g (W/Kg)	0.048097
SURFACE SAR	**VOLUME SAR**







6.CALIBRATION CERTIFICATES

SARTIMO Calibration Certificate-Extended Dipole Calibrations

According to KDB 450824 D02, Dipoles must be recalibrated at least once every three years; however, immediate re-calibration is required for following conditions. The test laboratory must ensure that the required supporting information and documentation have been included in the SAR report to qualify for extended 3-year calibration interval.

1) When the most recent return-loss, measured at least annually, deviates by more than 20% from theprevious measurement (i.e. 0.2 of the dB value) or not meeting the required -20 dB return-loss specification
2) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 ∩ from the previous measurement

Summary Result:

SID835			
Frquency	Return Loss(dB)	Requirement(dB)	Impedence
835	-24.46	-20	55.4Ω+2.4jΩ

SID1900			
Frquency	Return Loss(dB)	Requirement(dB)	Impedence
1900	-23.68	-20	51.2Ω+6.4jΩ

SID 2450			
Frquency	Return Loss(dB)	Requirement(dB)	Impedence
2450	-25.61	-20	44.9Ω-0.9jΩ

6.1. Probe Calibration Ceriticate

SATIMO
The microwave vision company

COMOSAR E-Field Probe Calibration Report

Ref : ACR.287.1.14.SATU.A

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.
1F., XINGYUAN INDUSTRIAL PARK, TONGDA ROAD, BAO'AN BLVD
BAO'AN DISTRICT, SHENZHEN, GUANGDONG, CHINA
SATIMO COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 17/14 EP220

Calibrated at SATIMO US
2105 Barrett Park Dr. - Kennesaw, GA 30144

ilac-MRA
A2LA ACCREDITED
Calibration CERT #2246-02

10/01/2014

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	10/14/2014	[signature]
Checked by :	Jérôme LUC	Product Manager	10/14/2014	[signature]
Approved by :	Kim RUTKOWSKI	Quality Manager	10/14/2014	[signature]

	Customer Name
Distribution :	Shenzhen LCS Compliance Testing Laboratory Ltd.

Issue	Date	Modifications
A	10/14/2014	Initial release

TABLE OF CONTENTS

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	Satimo
Model	SSE5
Serial Number	SN 17/14 EP220
Product Condition (new / used)	New
Frequency Range of Probe	0.7 GHz-3GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.179 MΩ Dipole 2: R2=0.175 MΩ Dipole 3: R3=0.180 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

Satimo's COMOSAR E field Probes are built in accordance to the IEEE 1528, OET 65 Bulletin C and CEI/IEC 62209 standards.

Figure 1 – *Satimo COMOSAR Dosimetric E field Dipole*

Probe Length	330 mm
Length of Individual Dipoles	4.5 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	5 mm
Distance between dipoles / probe extremity	2.7 mm

3 MEASUREMENT METHOD

The IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

3.2 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards.

3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 - 360 degrees in 15 degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

3.5 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%

Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					12.0%

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

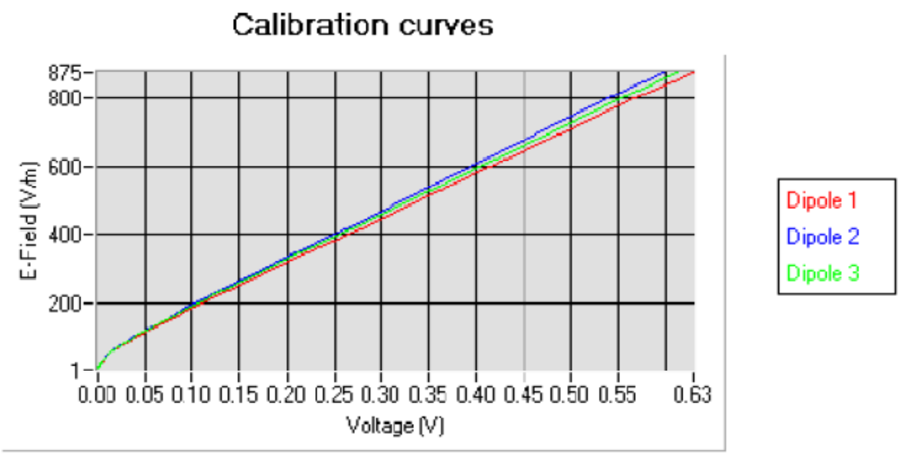
5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu V/(V/m)^2$)	Normy dipole 2 ($\mu V/(V/m)^2$)	Normz dipole 3 ($\mu V/(V/m)^2$)
6.02	5.52	5.72

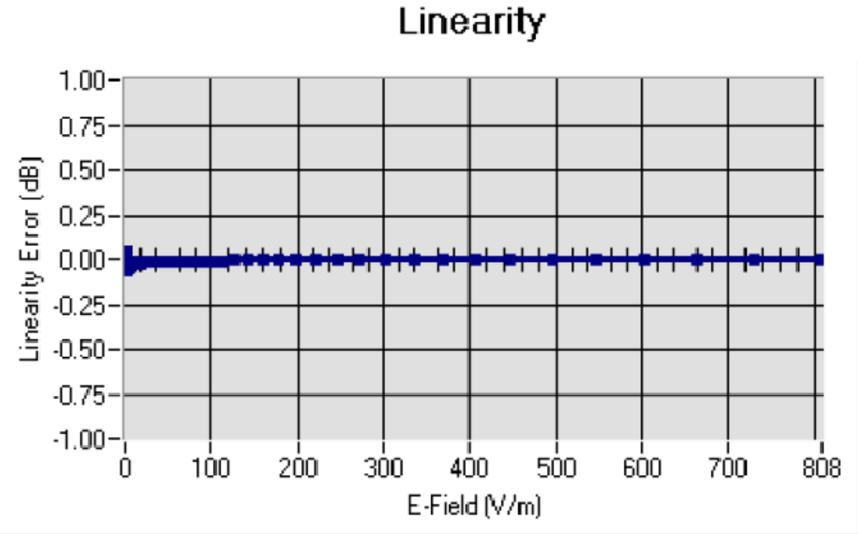
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
99	98	99

Calibration curves ei=f(V) (i=1,2,3) allow to obtain H-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



5.2 LINEARITY



Linearity: +/-1.47% (+/-0.06dB)

5.3 SENSITIVITY IN LIQUID

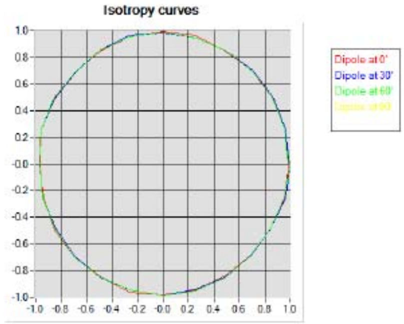
Liquid	Frequency (MHz +/- 100MHz)	Permittivity	Epsilon (S/m)	ConvF
HL750	750	42.06	0.89	4.58
BL750	750	56.57	0.99	4.71
HL850	835	42.81	0.89	4.86
BL850	835	53.46	0.96	5.04
HL900	900	42.47	0.96	4.74
BL900	900	56.69	1.08	4.92
HL1800	1800	41.31	1.38	4.16
BL1800	1800	53.27	1.51	4.29
HL2000	2000	39.72	1.43	4.19
BL2000	2000	53.91	1.53	4.28
HL2450	2450	39.05	1.77	3.94
BL2450	2450	52.97	1.93	4.05

LOWER DETECTION LIMIT: 7mW/kg

5.4 ISOTROPY

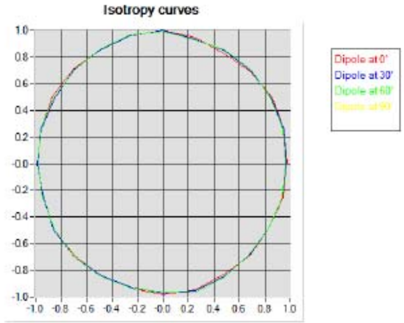
HL900 MHz

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.07 dB



HL1800 MHz

- Axial isotropy: 0.06 dB
- Hemispherical isotropy: 0.08 dB



6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
Flat Phantom	Satimo	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rhode & Schwarz ZVA	SN100132	02/2013	02/2016
Reference Probe	Satimo	EP 94 SN 37/08	10/2013	10/2014
Multimeter	Keithley 2000	1188656	12/2013	12/2016
Signal Generator	Agilent E4438C	MY49070581	12/2013	12/2016
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	HP E4418A	US38261498	12/2013	12/2016
Power Sensor	HP ECP-E26A	US37181460	12/2013	12/2016
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	Mega Industries	069Y7-158-13-712	Validated. No cal required.	Validated. No cal required.
Waveguide Transition	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Waveguide Termination	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Control Company	11-661-9	8/2012	8/2015

SATIMO
The microwave vision company

COMOSAR E-Field Probe Calibration Report

Ref : ACR.262.1.14.SATU.A

SHENZHEN STS TEST SERVICES CO., LTD.
1/F, BUILDING 2, ZHUOKE SCIENCE PARK, CHONGQING ROAD
FUYONG, BAO' AN DISTRICT, SHENZHEN,CHINA
SATIMO COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 17/14 EP221

Calibrated at SATIMO US
2105 Barrett Park Dr. - Kennesaw, GA 30144

ilac-MRA
ACCREDITED
Calibration CERT #2246-02

09/01/2014

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	9/19/2014	JS
Checked by :	Jérôme LUC	Product Manager	9/19/2014	JS
Approved by :	Kim RUTKOWSKI	Quality Manager	9/19/2014	Kim Rutkowski

	Customer Name
Distribution :	Shenzhen STS Test Services Co., Ltd.

Issue	Date	Modifications
A	9/19/2014	Initial release

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1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	Satimo
Model	SSE5
Serial Number	SN 17/14 EP221
Product Condition (new / used)	New
Frequency Range of Probe	0.4 GHz- 6 GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.179 MΩ Dipole 2: R2=0.167 MΩ Dipole 3: R3=0.178 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

Satimo's COMOSAR E field Probes are built in accordance to the IEEE 1528, OET 65 Bulletin C and CEI/IEC 62209 standards.

Figure 1 – *Satimo COMOSAR Dosimetric E field Dipole*

Probe Length	330 mm
Length of Individual Dipoles	4.5 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	5 mm
Distance between dipoles / probe extremity	2.7 mm

3 MEASUREMENT METHOD

The IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

3.2 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards.

3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 - 360 degrees in 15 degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

3.5 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	**Uncertainty value (%)**	**Probability Distribution**	**Divisor**	**ci**	**Standard Uncertainty (%)**
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%

Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					12.0%

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

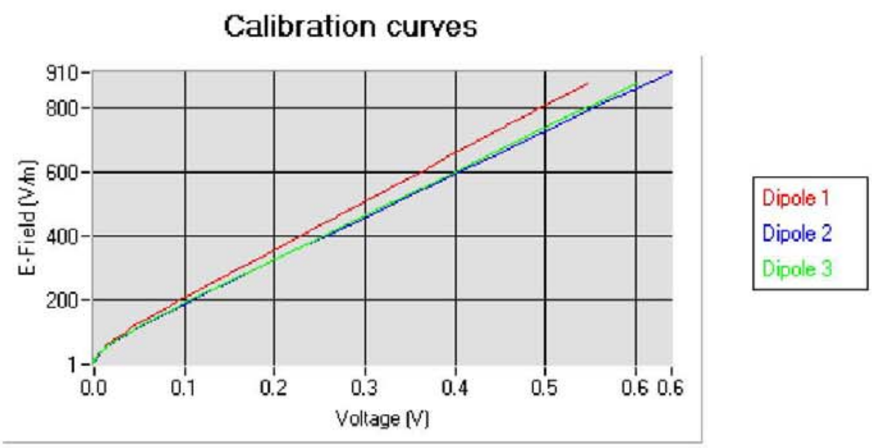
5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu V/(V/m)^2$)	Normy dipole 2 ($\mu V/(V/m)^2$)	Normz dipole 3 ($\mu V/(V/m)^2$)
4.81	6.15	6.02

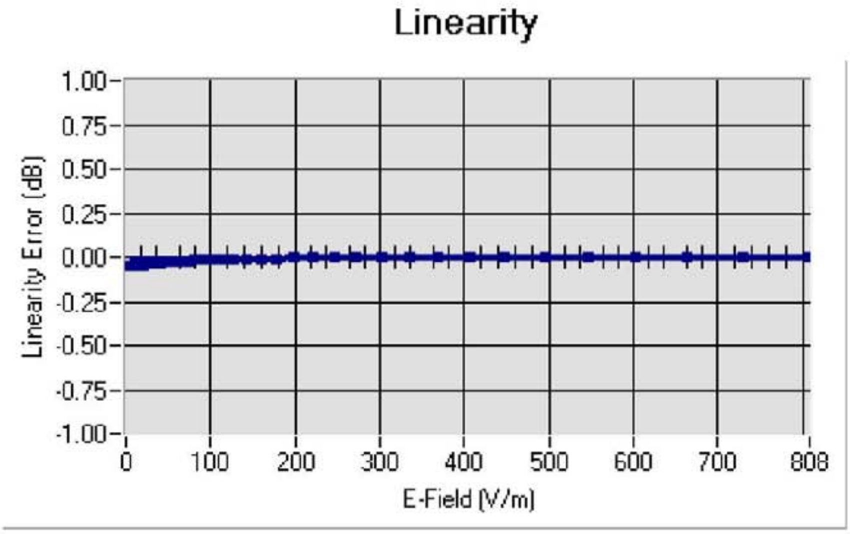
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
95	100	90

Calibration curves ei=f(V) (i=1,2,3) allow to obtain H-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



5.2 LINEARITY



Linearity: +/-1.16% (+/-0.05dB)

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	Permittivity	Epsilon (S/m)	ConvF
HL450	450	43.90	0.87	4.84
BL450	450	58.63	0.98	4.98
HL750	750	42.06	0.89	4.53
BL750	750	56.57	0.99	4.70
HL850	835	42.81	0.89	4.83
BL850	835	53.46	0.96	5.02
HL900	900	42.47	0.96	4.74
BL900	900	56.69	1.08	4.89
HL1800	1800	41.31	1.38	4.25
BL1800	1800	53.27	1.51	4.34
HL1900	1900	41.09	1.42	4.71
BL1900	1900	54.20	1.54	4.85
HL2000	2000	39.72	1.43	4.27
BL2000	2000	53.91	1.53	4.44
HL2450	2450	39.05	1.77	4.11
BL2450	2450	52.97	1.93	4.25
HL2600	2600	38.35	1.92	4.20
BL2600	2600	51.81	2.19	4.32

LOWER DETECTION LIMIT: 7mW/kg