ANSI/IEEE Std. C95.1-1992

In accordance with the requirements of

FCC Report and Order: ET Docket 93-62, and OET Bulletin 65 Supplement C

FCC SAR TEST REPORT

For

WIFI phone

Model No.: X10G; X10

Trade Name: ISTAR

Test Report Number:

KS100504B01

Prepared for

SHENZHEN PXHT ELECTRONIC TECHNOLOGY CO., LTD.

Rm 8B,C Tower Electronic Technology Building ShenNan Road((M), FuTian Disrict,ShenZhen.

Issued by

Compliance Certification Services (Kunshan) Inc.
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Kunshan City, Jiangsu Province, P.R.China.
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ACCREDITED
TESTING CERT #2541.01

Testing Laboratory
0363

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1. CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

Product name:	WIFI phone
Model No.:	X10G; X10
Trade name:	ISTAR
Description:	1.Different models are for marketing distinguish, X10G more than the X10 features a GPS and the other exactly the same.. 2.All samples with different models were pretested, then SIM1 was found to transmit the highest SAR value after tested dual SIM1 and SIM2.
Device Category:	May 6, 2010
Exposure Category:	GENERAL POPULATION/UNCONTROLLED EXPOSURE
Date of Test:	May 6, 2010
Applicant:	**SHENZHEN PXHT ELECTRONIC TECHNOLOGY CO., LTD.** Rm 8B,C Tower Electronic Technology Building ShenNan Road((M), FuTian Disrict,ShenZhen.
Manufacturer:	**SHENZHEN PXHT ELECTRONIC TECHNOLOGY CO., LTD.** Rm 8B,C Tower Electronic Technology Building ShenNan Road((M), FuTian Disrict,ShenZhen.
Application Type:	Certification

APPLICABLE STANDARDS AND TEST PROCEDURES	
STANDARDS AND TEST PROCEDURES	**TEST RESULT**
FCC OET Bulletin 65 Supplement C and the following specific Test Procedures: o KDB 248227 D01 SAR measurement procedures for 802.11 a/b/g transmitters o KDB 648474 D01 SAR evaluation considerations for handsets with multiple transmitters and antennas	Pass
Deviation from Applicable Standard	
None	

The device was tested by Compliance Certification Services Inc. in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C(Edition 01-01). The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Miro Chueh
RF Manager
Compliance Certification Service Inc.

Reviewed by:

Spring Zhou
RF Section Manager
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product Name	WIFI phone
Model No.	X10G; X10
Trade Name	ISTAR
FCC ID	XPKX10
Frequency Range	GSM / GPRS: 850: 824.2 ~ 848.8 MHz GSM / GPRS: 1900: 1850.2 ~ 1909.8 MHz Wi-Fi IEEE802.11b / g : 2412 ~ 2462 MHz Bluetooth: 2402 ~ 2483.5 MHz
Operating Mode	Maximum continuous output
Transmit Power(Average)	GSM850 Band: GSM 850: 31.76 GPRS 850: 31.69 GSM1900 Band: GSM 1900: 28.78m GPRS 1900: 28.65 WI-FI IEEE 802.11b:17.59 dBm WI-FI IEEE 802.11g:13.48 dBm Bluetooth:-0.64 dBm
Max. SAR	GSM 850: 0.859W/kg GSM 1900: 0.541 W/kg WI-FI IEEE 802.11b:0.251 W/kg
Modulation Technique	GSM / GPRS : GMSK WI-FI 802.11b / 802.11g: WI-FI IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) WI-FI IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM) Bluetooth:FHSS
Accessories	Battery: 3.5V 1500mAh

3. REQUIREMENTS FOR COMPLIANCE TESTING DEFINED BY THE FCC

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

4. APPLIED STANDARDS

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C the following specific FCC Test Procedures.
o KDB 248227 D01 SAR measurement procedures for 802.11 a/b/g transmitters
o KDB 648474 D01 SAR evaluation considerations for handsets with multiple transmitters and antennas

5. TEST CONFIGURATION

The device was controlled by using a base station emulator R&S CMU200. Communication between the device and the emulator was established by air link. The distance between the DUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of DUT. The DUT was set from the emulator to radiate maximum output power during all tests.

Measurements were performed on the lowest, middle, and highest channel for each testing position.

For SAR testing, EUT is in GSM/GPRS link mode. In GSM link mode, its crest factor is 8, In GPRS link mode, its crest factor is 2, because EUT is set in GPRS multi-slot class 12 with 4 uplink slots.

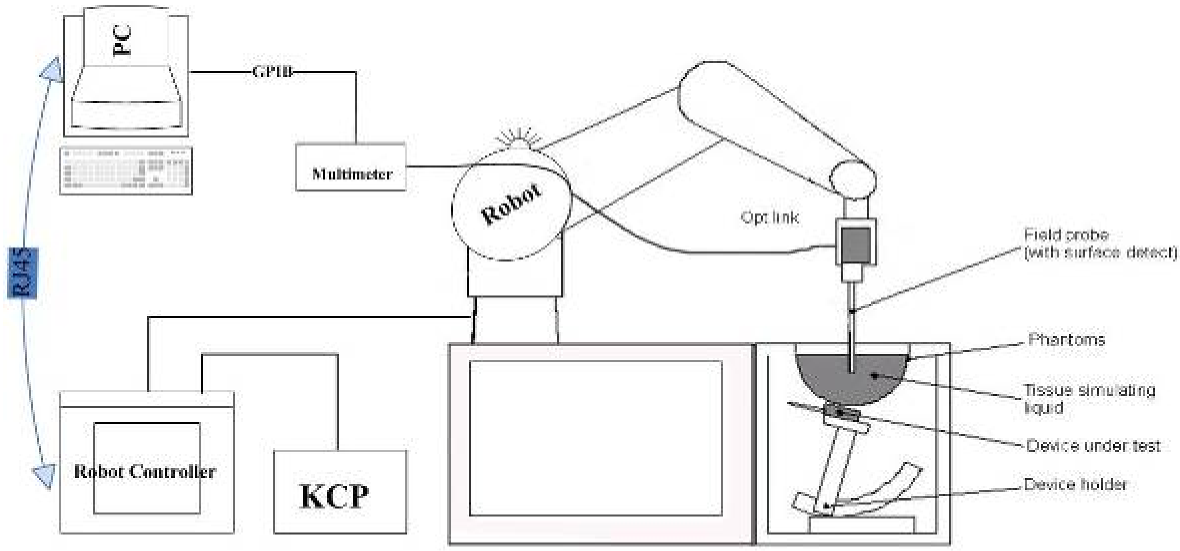
6. DOSIMETRIC ASSESSMENT SETUP

These measurements were performed with the automated near-field scanning system OPENSAR from ATTENNESSA. The system is based on a high precision robot (working range greater than 0.9 m), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetric probe EP100 1109 (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [7] with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure described in [8] and found to be better than ±0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEE P1528 and CENELEC EN50361.

The Tissue simulation liquid used for each test is in according with the FCC OET65 supplement C as listed below.

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	41.45	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

6.1 MEASUREMENT SYSTEM DIAGRAM



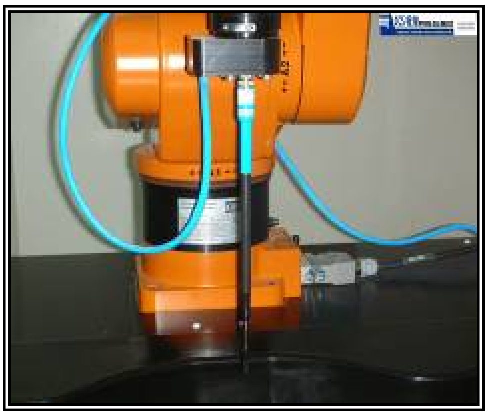
The OPENSAR system for performing compliance tests consist of the following items:

1. A standard high precision 6-axis robot (KUKA) with controller and software.
2. KUKA Control Panel (KCP).
3. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
4. The functions of the PC plug-in card are to perform the time critical task such as signal filtering, surveillance of the robot operation fast movement interrupts.
5. A computer operating Windows 95.
6. OPENSAR software.
7. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.
8. The SAM phantom enabling testing left-hand right-hand and body usage.
9. The Position device for handheld EUT.
10. Tissue simulating liquid mixed according to the given recipes (see Application Note).

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

6.2 SYSTEM COMPONENTS

SN11/09 EP100 Probe Specification



Construction Symmetrical design with triangular core

Built-in optical fiber for surface detection System

Built-in shielding against static charges

Calibration in air from 100 MHz to 2.5 GHz

In brain and muscle simulating tissue at frequencies of 835 MHz, 897MHz ,1747 MHz,1880 MHz,1950 MHz and 1.8 GHz (accuracy of ± 8%)

Frequency 100 MHz to > 30GHz; Linearity: ± 0.25 dB (100 MHz to 30 GHz)

Directivity ± 0.25 dB in brain tissue (rotation around probe axis)

± 0.5 dB in brain tissue (rotation normal probe axis)

Dynamic 0.001W/kg to > 100 W/kg;

Range Linearity: ± 0.25 dB

Surface ± 0.2 mm repeatability in air and clear liquids

Detection over diffuse reflecting surfaces

Dimensions Overall length: 330 mm

Tip length: 16 mm

Body diameter: 8 mm

Tip diameter: 6.5 mm

Distance from probe tip to dipole centers: <2.7 mm

Application General dosimetric up to 3 GHz

Compliance tests of mobile phones

Fast automatic scanning in arbitrary phantoms

Inside View of SN11/09 EP100 E-field Probe

The SAR measurements were conducted with the dosimetric probe SN11/09 EP100designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique, with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the KRC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The OPENSAR software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

E-Field Probe Calibration Process

Each probe is calibrated according to a dosimetric assessment procedure described in [6] with accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [7] and found to be better than +/-0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

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

SAM Phantom

The SAM Phantom SAM29 is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC EN62209-1. 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 all predefined phantom positions and measurement grids by manually teaching three points in the robot.

SAM Phantom

Shell Thickness: 2 ± 0.2 mm

Filling Volume: Approx. 25 liters

Dimensions (H x L x W): 810 x 1000 x 500 mm

Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, 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).

Note: *A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations [10]. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.*

7. EVALUATION PROCEDURES

DATA EVALUATION

The OPENSAR4 post processing 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	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
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 be imported into the software from the configuration files issued for the OPENSAR components. In the direct measuring mode of the multi-meter 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 V_i = Compensated signal of channel i (i = x, y, z)
U_i = Input signal of channel i (i = x, y, z)
cf = Crest factor of exciting field (OPENSAR parameter)
dcp_i = Diode compression point (OPENSAR parameter)

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

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \bullet ConvF}}$$

H-field probes:

$$H_i = \sqrt{Vi} \cdot \frac{a_{i10} + a_{i11} f + a_{i12} f^2}{f}$$

with V_i = Compensated signal of channel i (i = x, y, z)
$Norm_i$ = Sensor sensitivity of channel i (i = x, y, z)
$\mu V/(V/m)^2$ for E0field 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.

$$SAR = E_{tot}^{2} \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

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.

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

$$P_{pwe} = \frac{E_{tot}^{2}}{3770} \quad \text{or} \quad P_{pwe} = H_{tot}^{2} \cdot 37.7$$

with P_{pwe} = Equivalent power density of a plane wave in mW/cm^2

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

SAR EVALUATION PROCEDURES

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

- **Power Reference Measurement**

  The reference and 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. The sophisticated 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 7 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.

SPATIAL PEAK SAR EVALUATION

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1529 standard. It can be conducted for 1 g and 10 g.

The OPENSAR4 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maximum searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation.

Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Cube Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 5x5x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1 g and 10 g cubes.

Boundary effect

For measurements in the immediate vicinity of a phantom surface, the field coupling effects between the probe and the boundary influence the probe characteristics. Boundary effect errors of different dosimetric probe types have been analyzed by measurements and using a numerical probe model. As expected, both methods showed an enhanced sensitivity in the immediate vicinity of the boundary. The effect strongly depends on the probe dimensions and disappears with increasing distance from the boundary. The sensitivity can be approximately given as:

$$S \approx S_o + S_b exp(-\frac{z}{a}) cos(\pi \frac{z}{\lambda})$$

Since the decay of the boundary effect dominates for small probes ($a<<\lambda$), the cos-term can be omitted. Factors *Sb* (parameter Alpha in the OPENSAR software) and *a* (parameter Delta in the OPENSAR software) are assessed during probe calibration and used for numerical compensation of the boundary effect. Several simulations and measurements have confirmed that the compensation is valid for different field and boundary configurations.

This simple compensation procedure can largely reduce the probe uncertainty near boundaries. It works well as long as:

- the boundary curvature is small
- the probe axis is angled less than 30_ to the boundary normal
- the distance between probe and boundary is larger than 25% of the probe diameter
- the probe is symmetric (all sensors have the same offset from the probe tip)

Since all of these requirements are fulfilled in a OPENSAR system, the correction of the probe boundary effect in the vicinity of the phantom surface is performed in a fully automated manner via the measurement data extraction during post processing.

8. MEASUREMENT UNCERTAINTY

UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

a	b	c	d	e= f(d,k)	f	g	h= cxf/e	i= cxg/e	k
Uncertainty Component	Sec.	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	E.2.1.	7	N	1	1	1	7	7	∞
Axial Isotropy	E.2.2.	2,5	R	√3	$(1-c_p)^{1/2}$	$(1-c_p)^{1/2}$	1,02062	1,02062	∞
Hemispherical Isotropy	E.2.2.	4	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	1,63299	1,63299	∞
Boundary Effect	E.2.3.	1	R	√3	1	1	0,57735	0,57735	∞
Linearity	E.2.4.	5	R	√3	1	1	2,88675	2,88675	∞
System Detection Limits	E.2.5.	1	R	√3	1	1	0,57735	0,57735	∞
Readout Electronics	E.2.6.	0,02	N	1	1	1	0,02	0,02	∞
Response Time	E.2.7.	3	R	√3	1	1	1,73205	1,73205	∞
Integration Time	E.2.8.	2	R	√3	1	1	1,1547	1,1547	∞
RF Ambient Conditions	E.6.1.	3	R	√3	1	1	1,73205	1,73205	∞
Probe Positioner Mechanical Tolerance	E.6.2.	2	R	√3	1	1	1,1547	1,1547	∞
Probe Positioning with respect to Phantom Shell	E.6.3.	0,05	R	√3	1	1	0,02887	0,02887	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5.2.	5	R	√3	1	1	2,88675	2,88675	∞
Test sample Related									
Test Sample Positioning	E.4.2.1.	0,03	N	1	1	1	0,03	0,03	N-1
Device Holder Uncertainty	E.4.1.1.	5	N	1	1	1	5	5	N-1
Output Power Variation - SAR drift measurement	6.6.2.	3	R	√3	1	1	1,73205	1,73205	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1.	0,05	R	√3	1	1	0,02887	0,02887	∞
Liquid Conductivity - deviation from target values	E.3.2.	5	R	√3	0,64	0,43	1,84752	1,2413	∞
Liquid Conductivity - measurement uncertainty	E.3.3.	5	N	1	0,64	0,43	3,2	2,15	M
Liquid Permittivity - deviation from target values	E.3.2.	3	R	√3	0,6	0,49	1,03923	0,8487	∞
Liquid Permittivity - measurement uncertainty	E.3.3.	10	N	1	0,6	0,49	6	4,9	M
Combined Standard Uncertainty			RSS				11,1265	10,5799	
Expanded Uncertainty (95% CONFIDENCE INTERVAL)			k=2				21,8079	20,7366	

9. EXPOSURE LIMIT

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

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

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

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

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

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

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

NOTE GENERAL POPULATION/UNCONTROLLED EXPOSURE PARTIAL BODY LIMIT 1.6 W/kg

10. EUT ARRANGEMENT

Please refer to IEEE P1528 illustration below.

10.1 ANTHROPOMORPHIC HEAD PHANTOM

Figure 7-1a shows the front, back and side views of SAM. The point “M” is the reference point for the center of mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERPs are 15 mm posterior to the entrance to ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 7-1b. The plane passing through the two ear reference points and M is defined as the Reference Plane. The line N-F (Neck-Front) perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 7-1c). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines should be marked on the external phantom shell to facilitate handset positioning. Posterior to the N-F line, the thickness of the phantom shell with the shape of an ear is a flat surface 6 mm thick at the ERPs. Anterior to the N-F line, the ear is truncated as illustrated in Figure 7-1b. The ear truncation is introduced to avoid the handset from touching the ear lobe, which can cause unstable handset positioning at the cheek.

Figure 7-1a
Front, back and side view of SAM (model for the phantom shell)

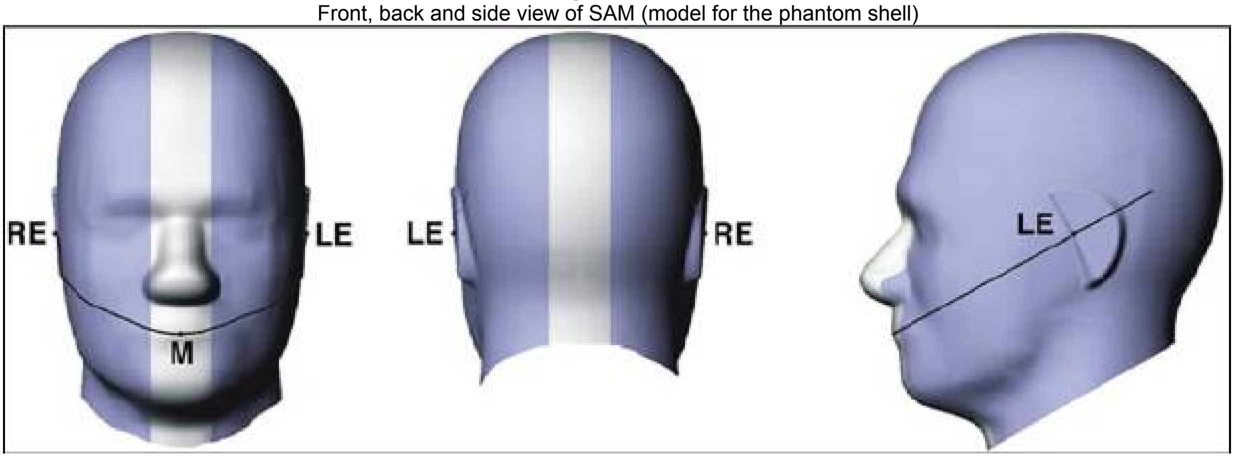
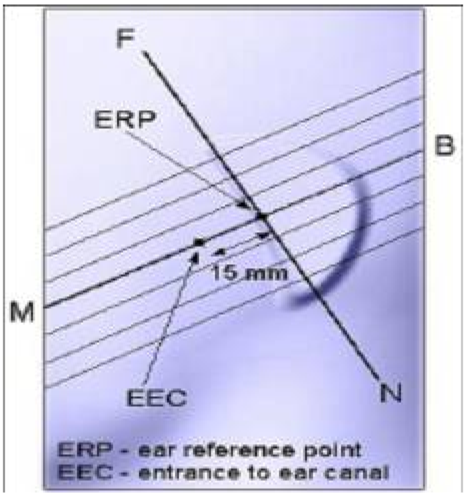


Figure 7-1b
Close up side view of phantom showing the ear region

Figure 7-1c
Side view of the phantom showing relevant markings and the 7 cross sectional plane locations



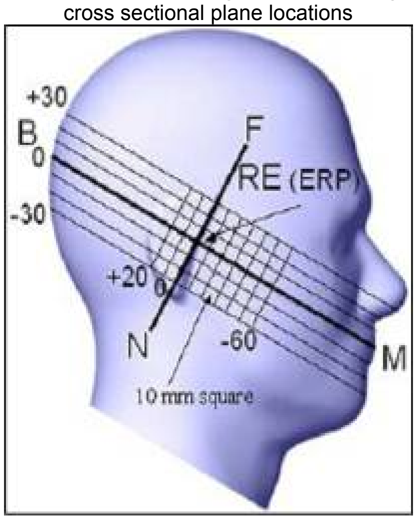


Figure 7-1b
Close up side view of phantom showing the ear region

Figure 7-1c
Side view of the phantom showing relevant markings and the 7 cross sectional plane locations

10.2 DEFINITION OF THE "CHEEK/TOUCH" POSITION

The "cheek" or "touch" position is defined as follows:

a. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece, open the cover. (If the handset can also be used with the cover closed both configurations must be tested.)

b. Define two imaginary lines on the handset: the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset: the midpoint of the width wt of the handset at the level of the acoustic output (point A on Figures 7-2a and 7-2b), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 7-2a). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 7-2b), especially for clamshell handsets, handsets with flip pieces, and other irregularly-shaped handsets.

c. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 7-2c), such that the plane defined by the vertical center line and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.

d. Translate the handset towards the phantom along the line passing through RE and LE until the handset touches the pinna.

e. e) While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to MB-NF including the line MB (called the reference plane).

f. Rotate the handset around the vertical centerline until the handset (horizontal line) is symmetrical with respect to the line NF.

g. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE and maintaining the handset contact with the pinna, rotate the handset about the line NF until any point on the handset is in contact with a phantom point below the pinna (cheek). See Figure 7-2c. The physical angles of rotation should be noted.

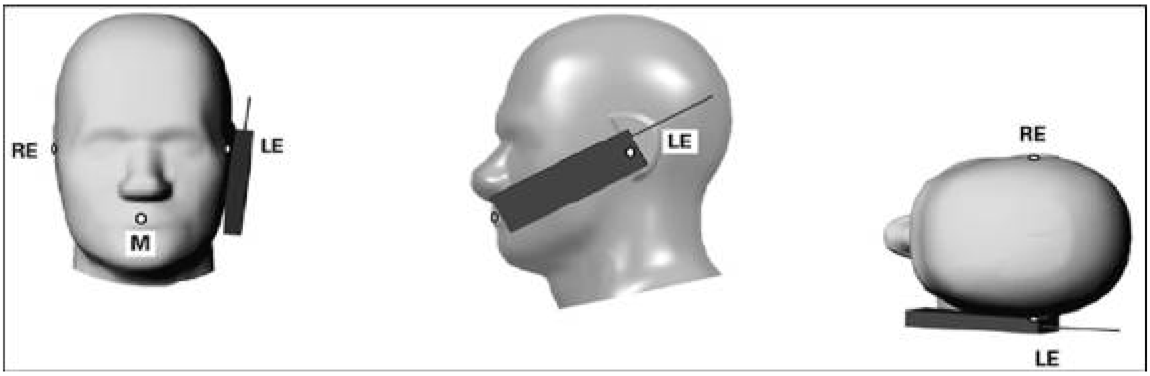


Figure 7.2c
Phone "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for handset positioning, are indicated.

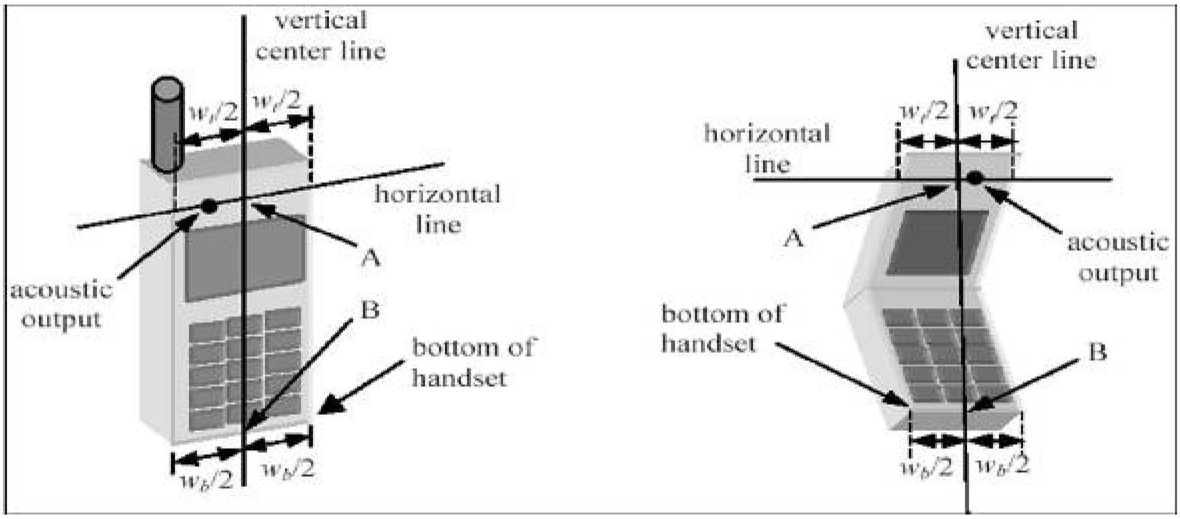


Figure 7.2a Figure 7.2b

10.3 DEFINITION OF THE "TILTED" POSITION

The "tilted" position is defined as follows:

a. Repeat steps (a) – (g) of 7.2 to place the device in the "cheek position."

b. While maintaining the orientation of the handset move the handset away from the pinna along the line passing through RE and LE in order to enable a rotation of the handset by 15 degrees.

c. Rotate the handset around the horizontal line by 15 degrees.

d. While maintaining the orientation of the handset, move the handset towards the phantom on a line passing through RE and LE until any part of the handset touches the ear. The tilted position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna (e.g., the antenna with the back of the phantom head), the angle of the handset should be reduced. In this case, the tilted position is obtained if any part of the handset is in contact with the pinna as well as a second part of the handset is contact with the phantom (e.g., the antenna with the back of the head).

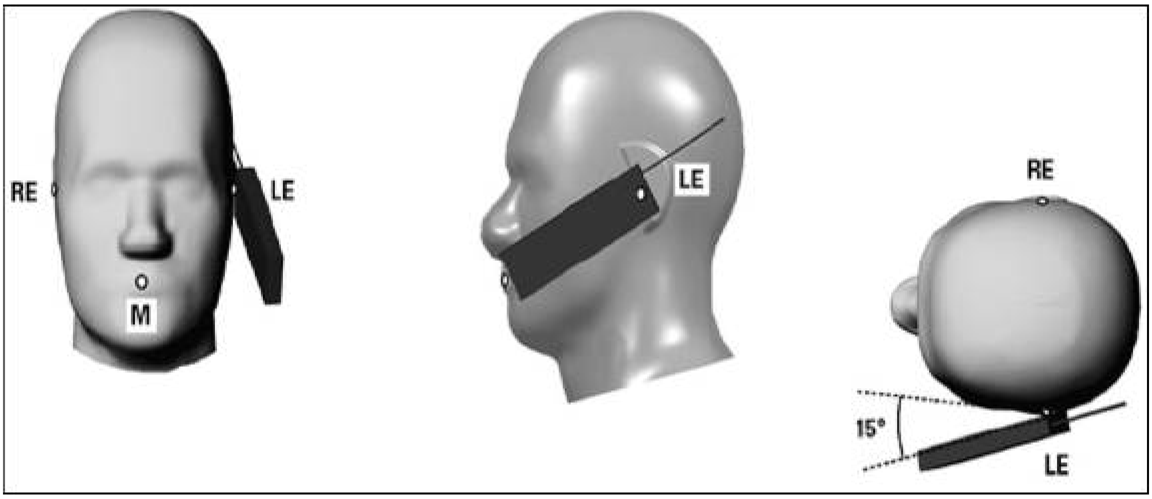


Figure 7-3
Phone "tilted" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for handset positioning, are indicated.

11. MEASUREMENT RESULTS

11.1 TEST LIQUIDS CONFIRMATION

SIMULATED TISSUE LIQUID PARAMETER CONFIRMATION

The dielectric parameters were checked prior to assessment using the HP85070C dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

IEEE SCC-34/SC-2 P1528 RECOMMENDED TISSUE DIELECTRIC PARAMETERS

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

Target Frequency (MHz)	Head		Body	
	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	45.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

LIQUID MEASUREMENT RESULTS

Ambient condition: Temperature: 21 °C Relative humidity: 58%

Liquid Type	Frequency	Temp. [°C]	Depth [cm]	Parameters	Target	Measured	Deviation[%]	Limited[%]	Measured Date
Head850	835 MHz	20	15	Permitivity	41.50	41.426	0.18	± 5	May 6,2010
		20	15	Conductivity	0.90	0.869	3.44	± 5	May 6,2010
Body850	835 MHz	20	15	Permitivity	55.20	55.242	-2.32	± 5	May 6,2010
		20	15	Conductivity	0.97	0.964	0.62	± 5	May 6,2010
Head1900	1950 MHz	20	15	Permitivity	40.00	41.097	-2.72	± 5	May 6,2010
		20	15	Conductivity	1.40	1.375	1.79	± 5	May 6,2010
Body1900	1950 MHz	20	15	Permitivity	53.30	54.019	1.35	± 5	May 6,2010
		20	15	Conductivity	1.52	1.549	-1.91	± 5	May 6,2010
Head2450	2450 MHz	20	15	Permitivity	39.20	40.36	-2.96	± 5	May 6,2010
		20	15	Conductivity	1.80	1.86	-3.33	± 5	May 6,2010
Body2450	2450 MHz	20	15	Permitivity	52.70	51.69	1.92	± 5	May 6,2010
		20	15	Conductivity	1.95	1.89	3.08	± 5	May 6,2010

11.2 SYSTEM PERFORMANCE CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of ±10%. The system performance check results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

SYSTEM PERFORMANCE CHECK MEASUREMENT CONDITIONS

- The measurements were performed in the flat section of the SAM twin phantom filled with head and body simulating liquid of the following parameters.
- The OPENSAR system with an E-field probe EP_100 SN:1109 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 10mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube integration (dx= 5 mm, dy= 5 mm, dz= 5 mm).
- Distance between probe sensors and phantom surface was set to 2.5 mm.
- The dipole input power was 1W±3%.
- The results are normalized to 1 W input power.

Reference SAR values

The reference SAR values were using measurement results indicated in the dipole calibration document (see table below)

Frequency (MHz)	1g SAR	10g SAR	Local SAR at Surface (Above Feed Point)	Local SAR at Surface (y = 2cm offset from feed point)
835 Head	9.41	6.27	14.1	4.9
835 Body	9.79	6.63		
1950 Head	41.35	21.39	67.6	6.6
1950 Body	38.95	20.51		
2450 Head	53.49	24.46	104.2	7.7
2450 Body	50.22	23.04		

SYSTEM PERFORMANCE CHECK RESULTS

Ambient conduction

Temperature: 21 °C Relative humidity: 58%

System Validation Dipole: DIPOLE850 SN:SN 48/05 DIPC32 **Date**: May 6, 2010

Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Head 835 MHz	20.00	15.00	Permitivity	41.50	41.426	0.18	± 5
			Conductivity	0.90	0.869	3.44	± 5
			1g SAR	9.41	9.324	0.91	± 10

Temperature: 21 °C Relative humidity: 58%

System Validation Dipole: DIPOLE850SN:SN 48/05 DIPC32 **Date**: May 6, 2010

Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Body 835 MHz	20.00	15.00	Permitivity	55.20	55.242	-2.32	± 5
			Conductivity	0.97	0.964	0.62	± 5
			1g SAR	9.79	9.695	0.98	± 10

Temperature: 21 °C Relative humidity: 58%

System Validation Dipole: DIPOLE1900 SN:SN 48/05 DIPI36 **Date**: May 6, 2010

Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Head 1950 MHz	20.00	15.00	Permittivity	40.00	41.097	-2.72	± 5
			Conductivity	1.40	1.375	1.79	± 5
			1g SAR	40.73	39.497	3.03	± 10

Temperature: 21 °C Relative humidity: 58%

System Validation Dipole: DIPOLE1900 SN: SN 48/05 DIPI36 **Date**: May 6, 2010

Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Body 1950 MHz	20.00	15.00	Permittivity	53.30	54.019	1.35	± 5
			Conductivity	1.52	1.549	-1.91	± 5
			1g SAR	40.36	39.497	2.14	± 10

Temperature: 21 °C Relative humidity: 58%

Dipole: DIPOLE2450 SN:SN 48/05 DIPJ37 **Date:** May 6, 2010

Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Head 2450 MHz	20.00	15.00	Permittivity	39.20	40.36	-2.96	± 5
			Conductivity	1.80	1.86	-3.33	± 5
			1g SAR	53.49	51.385	3.94	± 5

Temperature: 21 °C Relative humidity: 58%

Dipole: DIPOLE2450 SN:SN 48/05 DIPJ37 **Date:** May 6, 2010

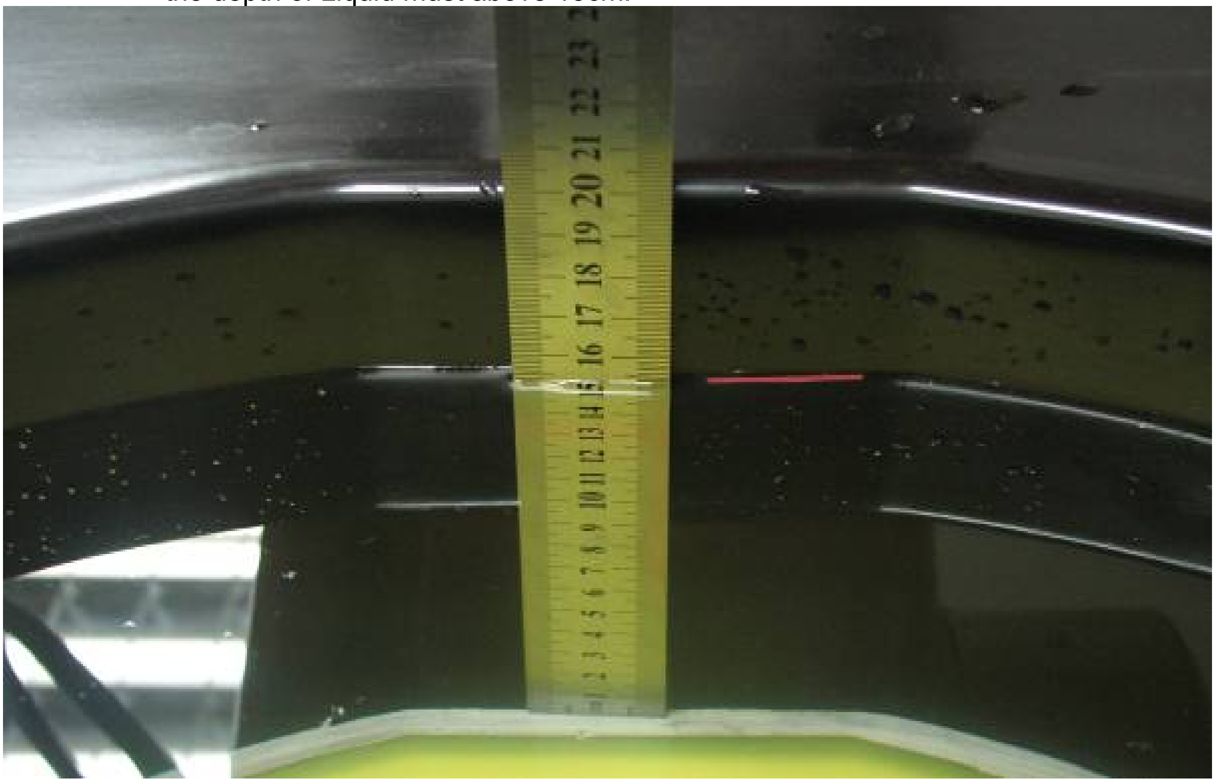
Medium			Parameter	Target	Measured	Deviation (%)	Limit (%)
Type	Temp (°C)	Depth (± 0.5 cm)					
Body 2450 MHz	20.00	15.00	Permittivity	52.70	51.69	1.92	± 5
			Conductivity	1.95	1.89	3.08	± 5
			1g SAR	50.22	49.60	1.23	± 5

11.3 EUT TUNE-UP PROCEDURES AND TEST MODE

The following procedure had been used to prepare the EUT for the SAR test.

- o The client supplied a special driver to program the EUT, allowing it to continually transmit the specified maximum power and change the channel frequency.
- o The conducted power was measured at the high, middle and low channel frequency before and after the SAR measurement.
- o During SAR test, the highest output channel per band measured first.

the depth of Liquid must above 15cm.



11.4 RF POWER OUTPUT

The respectively maximum output powers of each RF modes are as below:

Conducted output power (Average)(dBm)

GSM		GSM mode		GPRS mode	
		before	after	before	after
GSM850	Ch 128	**31.76**	31.73	**31.69**	31.67
	Ch 190	31.54	31.52	31.58	31.55
	Ch 251	31.39	31.37	31.31	31.30
GSM		GSM mode		GPRS mode	
		before	after	before	after
GSM1900	Ch 512	**28.73**	28.71	**28.65**	28.62
	Ch 661	28.54	28.52	28.58	28.56
	Ch 810	28.35	28.31	28.28	28.25

Wi-Fi IEEE802.11b/g output power (Average)(dBm)

Mode / Frequency	802.11b 1M		802.11g 6M	
	before test	after test	before test	after test
1(2412 MHz)	**17.59**	17.57	**13.48**	*N/A SAR measurement is not required*
6(2437 MHz)	17.47	17.45	13.30	
11(2462 MHz)	16.20	16.17	12.39	

*Ps. (1)17.59dBm=57.41mW is higher than 24.5mW(60/f), so **802.11b stand-alone SAR is required**.*
*(2)13.48dBm=22.28mW is less than 24.5mW(60/f), so **802.11g stand-alone SAR is not required**.*

Bluetooth output power (Average)(dBm)

Mode / Frequency	DATA1 1M		DATA3 3M	
	before test	after test	before test	after test
2402 MHz	-0.79	*N/A SAR measurement is not required*	-3.34	*N/A SAR measurement is not required*
2441 MHz	**-0.64**		-2.67	
2480 MHz	-1.77		-3.81	

*Ps. (1)-0.64dBm=0.86mW is less than 24.58mW(60/f), so **Bluetooth stand-alone SAR is not required**.*

Notice1: According to KDB 648474**,** For Bluetooth module transmitter that does not transmit simultaneously with other transmitters and its output is ≤ 60/f(GHz) mW***(-0.64dBm=0.86mW is less than 24.58mW(60/f))***, 1-g SAR evaluation is not required.

Notice 2: According to KDB 648474, For Wi-Fi module transmitter,the 802.11b output power > 60/f***(17.57dBm=57.41mW is higher than 24.5mW(60/f))****, so 802.11b stand-alone SAR is required.* the 802.11g output power > 60/f***(13.48dBm=22.28mW is less than 24.5mW(60/f))****, so 802.11g stand-alone SAR is not required.*

Notice 3: The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

	GSM 850 head	*GSM 850 body*	*GPRS 850 body*
GSM 850 SAR(worst)	0.859	0.336	0.358
802.11b SAR(worst)	0.251	0.156	0.156
Σ1g-SAR	*1.110*	*0.492*	*0.514*
remark	Less than 1.6W/kg(limit)	Less than 1.6W/kg(limit)	Less than 1.6W/kg(limit)

	GSM 1900 head	*GSM 1900 body*	*GPRS 1900 body*
GSM 1900 SAR(worst)	0.541	0.369	0.465
802.11b SAR(worst)	0.251	0.156	0.156
Σ1g-SAR	*0.792*	*0.846*	*1.025*
remark	Less than 1.6W/kg(limit	Less than 1.6W/kg(limit)	Less than 1.6W/kg(limit)

	head	*body*
Bluetooth SAR(worst)	0.000	0.000

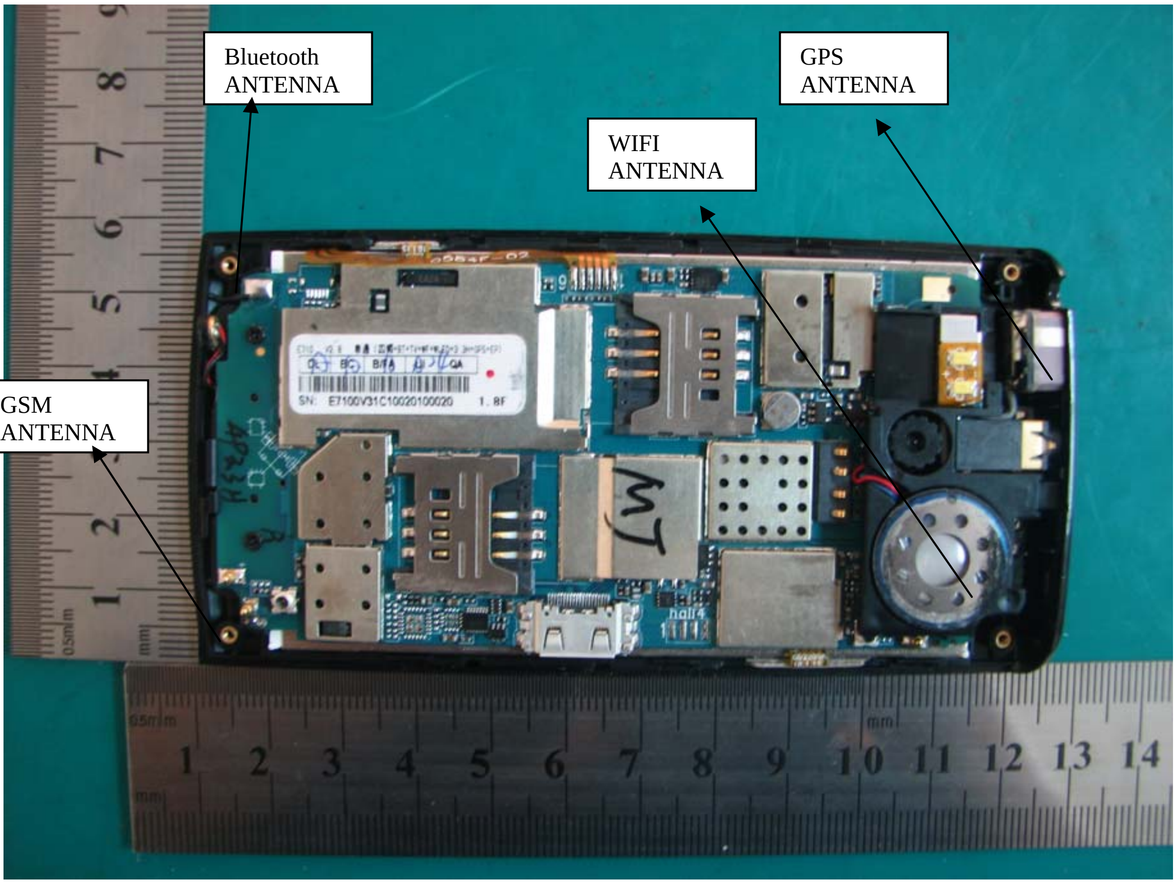
Described above, Σ1g-SAR<1.6W/kg so no Simultaneous Transmission SAR.

11.5 KDB 648474 SAR HANDSETS MULTI XMITER ASSESSMENT

EUT Description	(GSM/GPRS) with 802.11 b/g and Bluetooth embedded.
Co-located Tx	• WWAN can transmit simultaneously with 802.11g • WWAN can transmit simultaneously with Bluetooth • 802.11g can transmit simultaneously with Bluetooth
Antenna Separation distances	• 4.0 cm - GSM antenna-to-Bluetooth antenna • 9.0 cm - GSM antenna-to-WiFi (802.11g) • 10.0 cm - Bluetooth antenna-to-WiFi (802.11g)
Highest 1-g SAR @ Right hand side touch position	**GSM: 0.859** mW/g; WiFi (802.11g): 0.167 mW/g The sum of the 1-g SAR: 1.026 (<1.6 mW/g)
Highest 1-g SAR @ Left hand side touch position	**GSM: 0.846** mW/g; WiFi (802.11g): 0.251 mW/g The sum of the 1-g SAR: 1.097(<1.6 mW/g) **Bluetooth:** Conducted average power is below Pref/12mW, stand alone SAR evaluation is not required
Simultaneous TX SAR	☒No ☐Yes (Measure Simultaneous Transmission SAR with Volume Scans for All Required Antennas)

CONCLUSION:

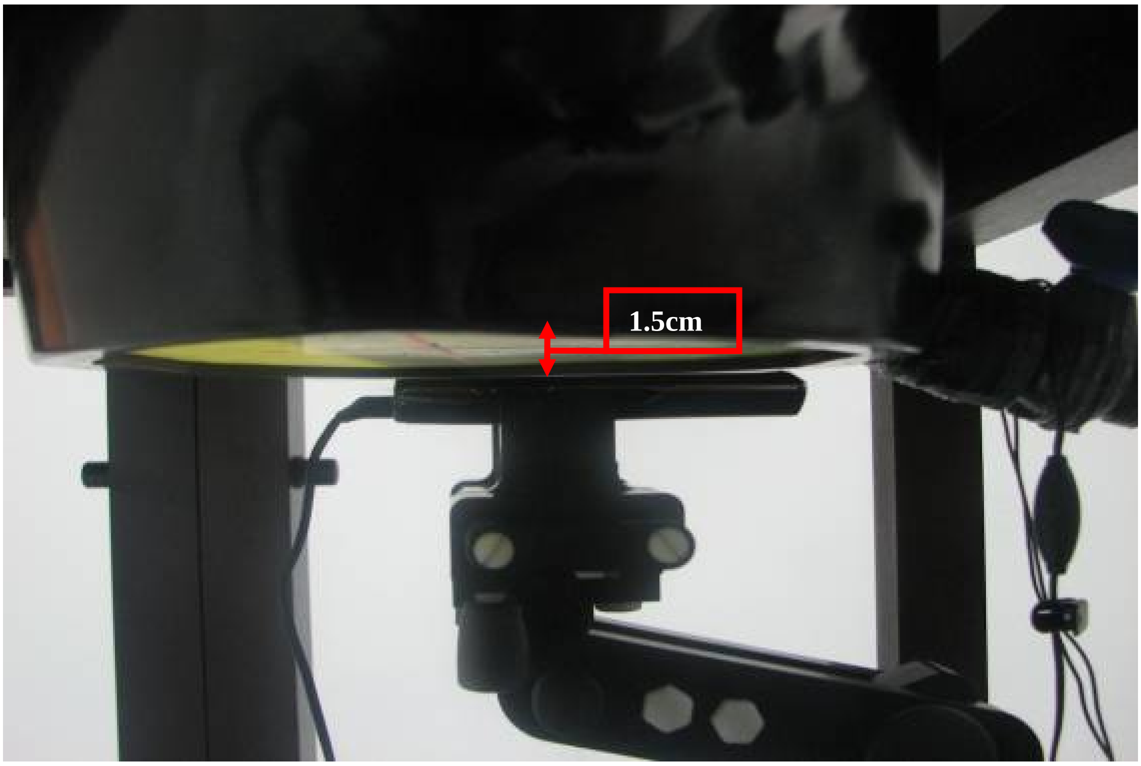
• Based upon KDB 628591 TCB exclusion list, smart phone with embedded 802.11 b/g radio and BT radios is not subject to TCB exclusion list.



11.6 EUT SETUP PHOTOS

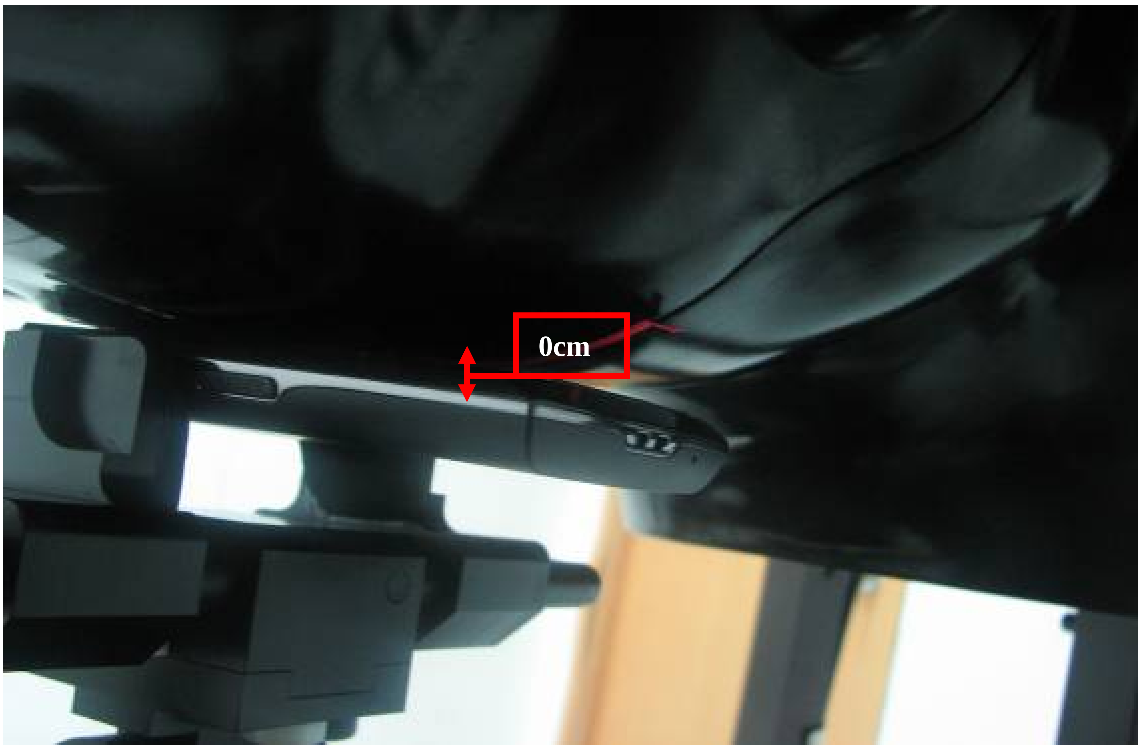
EUT Setup Configuration 1

the back side of the EUT in body position with GSM



EUT Setup Configuration 2

Cheek device with head phantom.

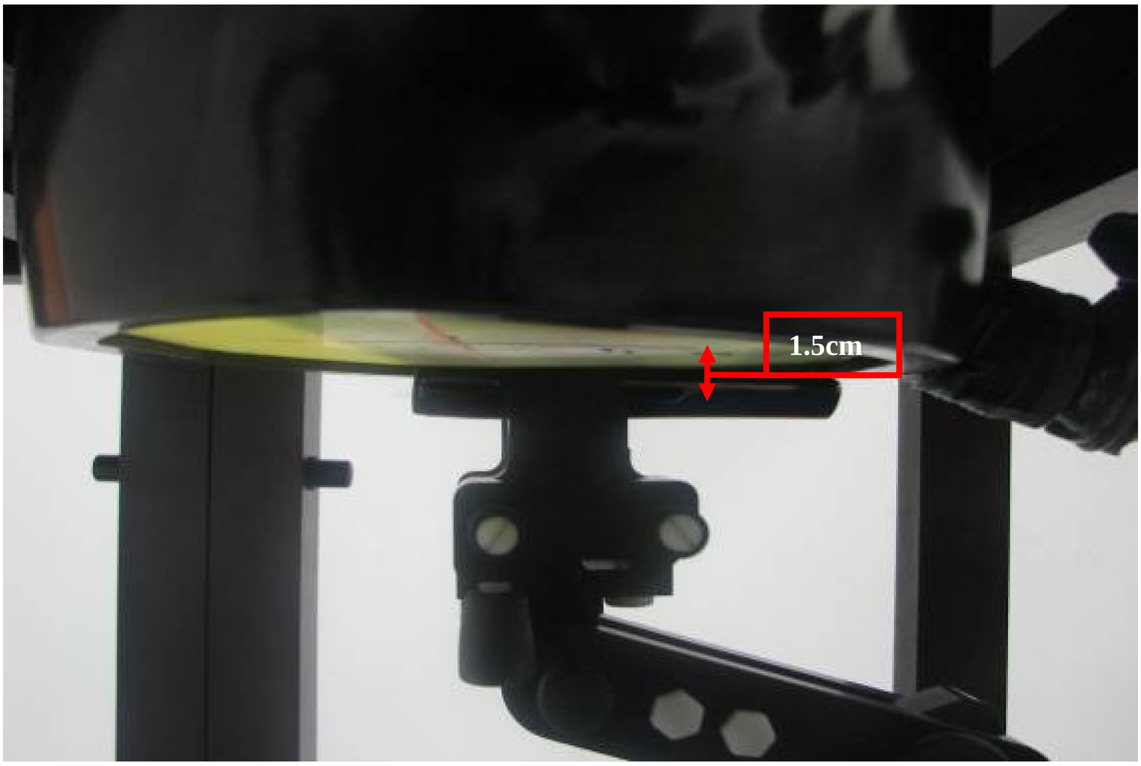


EUT Setup Configuration 3

Tilt device with head phantom.

EUT Setup Configuration 4

the back side of the EUT in body position with GPRS



11.7 SAR MEASUREMENT RESULTS

Date of Measurement: April 23, 2010

SAR Measurement GSM 850

Crest Factor: 8 (Duty cycle: 12.5%) Depth of Liquid: 15.0 cm

EUT Configuration 1

EUT Setup Condition		Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position	Antenna	Channel	MHz	Before	After			
Flat (1.5cm)	Fixed	128	824.2	**31.76**	31.73	20.0	0.239	1.6
		180	836.6	31.54	31.52	20.0	0.268	
		251	848.8	31.39	31.37	20.0	0.336	

EUT Configuration 2

EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
cheek	**Righthead**	Fixed	128	824.2	31.76	31.73	20.0	0.849	1.6
			180	836.6	31.54	31.52	20.0	**0.859**	
			251	848.8	31.39	31.37	20.0	0.827	
	Left_head	Fixed	128	824.2	31.76	31.73	20.0	0.846	
			180	836.6	31.54	31.52	20.0	0.841	
			251	848.8	31.39	31.37	20.0	0.814	

EUT Configuration 3

EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
tilt	**Righthead**	Fixed	128	824.2	31.76	31.73	20.0	0.574	1.6
			180	836.6	31.54	31.52	20.0	0.643	
			251	848.8	31.39	31.37	20.0	0.643	
	Left_head	Fixed	128	824.2	31.76	31.73	20.0	0.498	
			180	836.6	31.54	31.52	20.0	0.533	
			251	848.8	31.39	31.37	20.0	0.557	

Remarks: For SAR testing, EUT is in GSM link mode. In GSM850 link mode, its crest factor is 8. (Duty cycle: 1:8)

Date of Measurement: April 23, 2010

SAR Measurement GPRS 850 Class 12								
Crest Factor: 2 (Duty cycle: 50%)					Depth of Liquid: 15.0 cm			
EUT Configuration 4								
EUT Setup Condition		Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position	Antenna	Channel	MHz	Before	After			
Flat (1.5cm)	Fixed	128	824.2	**31.69**	31.67	20.0	0.297	1.6
		180	836.6	31.58	31.55	20.0	0.342	
		251	848.8	31.31	31.30	20.0	0.358	

Remarks: For SAR testing, EUT is in GPRS link mode. In GPRS850 link mode, its crest factor is 2. (Duty cycle: 1:2)

Date of Measurement: April 23, 2010

SAR Measurement GSM 1900

Crest Factor: 8 (Duty cycle: 12.5%) Depth of Liquid: 15.0 cm

EUT Configuration 1

EUT Setup Condition		Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position	Antenna	Channel	MHz	Before	After			
Flat (1.5cm)	Fixed	512	1850.2	**28.73**	28.71	20.0	0.369	1.6
		661	1880.0	28.54	28.52	20.0	0.347	
		810	1910.0	28.35	28.31	20.0	0.344	

EUT Configuration 2

EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
cheek	**Righthead**	Fixed	512	1850.2	28.73	28.71	20.0	0.485	1.6
			661	1880.0	28.54	28.52	20.0	0.534	
			810	1910.0	28.35	28.31	20.0	0.533	
	Left_head	Fixed	512	1850.2	28.73	28.71	20.0	0.397	
			661	1880.0	28.54	28.52	20.0	0.527	
			810	1910.0	28.35	28.31	20.0	0.488	

EUT Configuration 3

EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
tilt	**Righthead**	Fixed	512	1850.2	28.73	28.71	20.0	0.457	1.6
			661	1880.0	28.54	28.52	20.0	0.449	
			810	1910.0	28.35	28.31	20.0	**0.541**	
	Left_head	Fixed	512	1850.2	28.73	28.71	20.0	0.344	
			661	1880.0	28.54	28.52	20.0	0.459	
			810	1910.0	28.35	28.31	20.0	0.485	

Remarks: For SAR testing, EUT is in GSM link mode. In GSM1900 link mode, its crest factor is 8. (Duty cycle: 1:8)

Date of Measurement: April 23, 2010

SAR Measurement GPRS 1900 Class 12									
Crest Factor: 2 (Duty cycle: 50%)						Depth of Liquid: 15.0 cm			
EUT Configuration 4									
EUT Setup Condition		Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position	Antenna	Channel	MHz	Before	After			
Flat (1.5cm)	Fixed	512	1850.2	**28.65**	28.62	20.0	0.424	1.6
		661	1880.0	28.58	28.56	20.0	0.370	
		810	1910.0	28.28	28.25	20.0	0.465	

Remarks: For SAR testing, EUT is in GPRS link mode. In GPRS 1900 link mode, its crest factor is 2. (Duty cycle: 1:2)

Date of Measurement: May 6, 2010

SAR Measurement IEEE802.11b (WI-FI)

Crest Factor: 1 (Duty cycle: 100%) — Depth of Liquid: 15.0 cm

EUT Configuration 1

EUT Setup Condition		Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position	Antenna	Channel	MHz	Before	After			
Flat (1.5cm)	Fixed	1	2412	17.59	17.57	20.0	0.090	1.6
		6	2437	17.47	17.45	20.0	0.156	
		11	2462	16.20	16.17	20.0	0.095	

EUT Configuration 2

EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
cheek	Righthead	Fixed	1	2412	17.59	17.57	20.0	0.126	1.6
			6	2437	17.47	17.45	20.0	0.141	
			11	2462	16.20	16.17	20.0	0.137	
	Left_head	Fixed	1	2412	17.59	17.57	20.0	0.179	
			6	2437	17.47	17.45	20.0	0.199	
			11	2462	16.20	16.17	20.0	0.188	

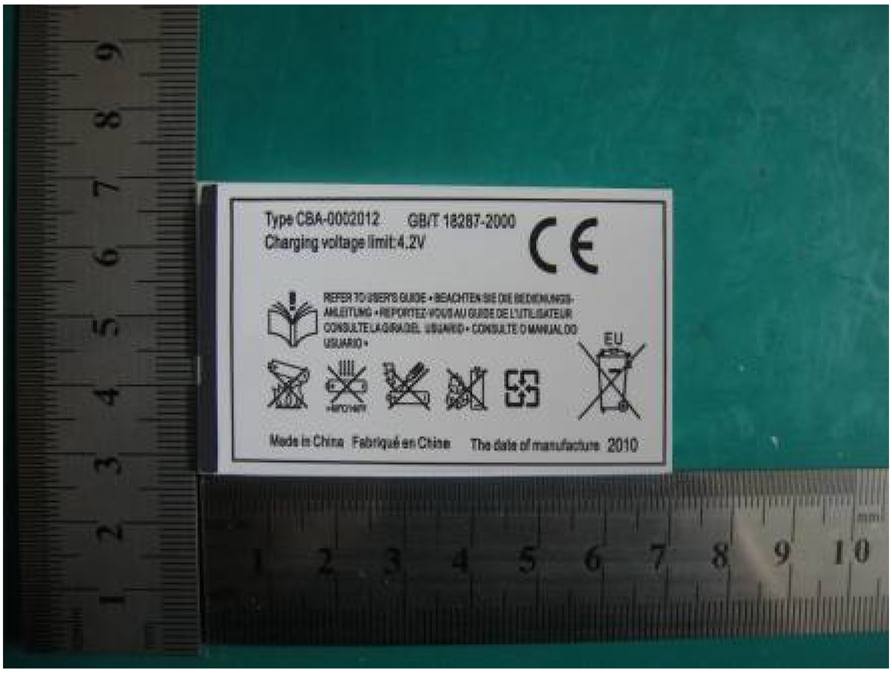
EUT Configuration 3

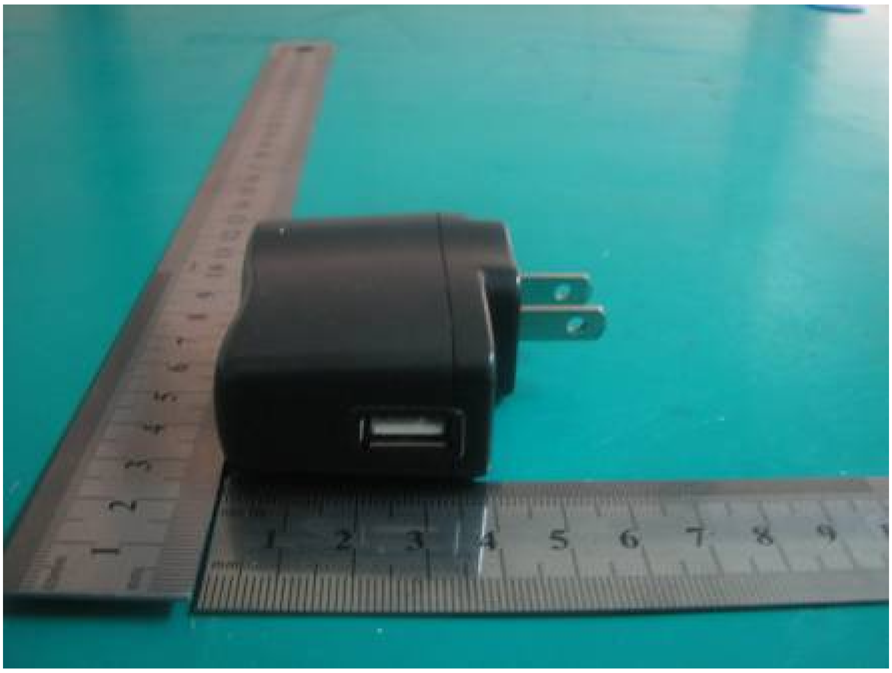
EUT Setup Condition			Frequency		Conducted Power (dBm)		Liquid Temp [°C]	**SAR**(1g) (W/kg)	Limit (W/kg)
Position		Antenna	Channel	MHz	Before	After			
tilt	Righthead	Fixed	1	2412	17.59	17.57	20.0	0.148	1.6
			6	2437	17.47	17.45	20.0	0.167	
			11	2462	16.20	16.17	20.0	0.127	
	Left_head	Fixed	1	2412	17.59	17.57	20.0	0.246	
			6	2437	17.47	17.45	20.0	0.217	
			11	2462	16.20	16.17	20.0	0.251	

Remarks: For SAR testing, EUT is in WIFI link mode. In WIFI link mode, its crest factor is 1. (Duty cycle: 1:1)

EUT PHOTO


LITHIUM ION BATTERY
Li-ion 3.7V 1500mAh
Charge limit voltage: 4.2V
Carries out the standard: GB-18287-2000
Production Date: In March, 2010


Type CBA-0002012 GB/T 18287-2000
Charging voltage limit:4.2V
EU
Made in China Fabriqué en Chine The date of manufacture 2010



12. EQUIPMENT LIST & CALIBRATION STATUS

Name of Equipment	**Manufacturer**	**Type/Model**	**Serial Number**	**Calibration Due**
P C	HP	PV 3.06GHz	375052-AA1	N/A
Signal Generator	Agilent	E8257C	MY43321570	05/05/2011
MultiMeter	Keithley	2000	1015843	05/01/2011
S-Parameter Network Analyzer	Agilent	E5071B	MY42301382	08/07/2010
Wireless Communication Test Set	R&S	CMU200	SN:B23-03291	06/17/2010
Power Meter	Agilent	E4416A	QB41292714	07/29/2010
E-field PROBE	ANTENNESSA	EP_100	SN1109	04/16/2011
DIPOLE 835	ANTENNESSA	DIPC32	SN 48/05	12/10/2010
DIPOLE 900	ANTENNESSA	DIPD33	SN 48/05	12/10/2010
DIPOLE 1800	ANTENNESSA	DIPF34	SN 48/05	12/10/2010
DIPOLE 1900	ANTENNESSA	DIPI36	SN 48/05	12/10/2010
DIPOLE 2450	ANTENNESSA	DIPJ37	SN 48/05	12/10/2010
POSITIONING DEVICE	ANTENNESSA	MSH_14	SN 41_05	N/A
DUMMY PROBE	ANTENNESSA	DP_12	SN 39_05	N/A
SAM PHANTOM	ANTENNESSA	SAM29	SN 41_05	N/A
PHANTON WOOD TABLE	ANTENNESSA	N/A	N/A	N/A
6 AXIS ROBOT	KUKA	KR3	846428	N/A
ROBOT KRC	KUKA	KCP2	01436	N/A
CHANELS SCAN CARD	KEITHLEY	2000	2000-172-01B	N/A
PROBE/ROBOT POSITIONING DEVICE	ANTENNESSA	MSH14	SN 41_05	N/A
LIQUID CALIBRATION KIT	ANTENNESSA	41/05 OCP9	00425167	N/A

13. FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ No.10, Weiye Rd., Innovation Park, Eco & Tec. Development Part, Kunshan City, Jiangsu Province, China.

14. REFERENCES

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15. ATTACHMENTS

Exhibit	Content
1	System Validation Plots
2	SAR Test Plots
3	Dipole calibration report (850MHz/1900MHz)
4	E-field calibration report

END OF REPORT