SAR Test Report

Report No.: AGC00552180404EH01

PRODUCT DESIGNATION	:	Smart Phone
BRAND NAME	:	CUBOT
MODEL NAME	:	J3
MANUFACTURER	:	Shenzhen Huafurui Technology Co., Ltd.
DATE OF ISSUE	:	May. 04, 2018
STANDARD(S)	:	EN 50360:2017; EN 62209-1: 2016; EN 62209-2:2010; EN 50566:2017; EN 62479:2010
REPORT VERSION	:	V1.0

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May. 04, 2018	Valid	Initial Release

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Test Report Certification

Manufacturer Name	Shenzhen Huafurui Technology Co., Ltd.
Manufacturer Address	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
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Product Designation	Smart Phone
Brand Name	CUBOT
Model Name	J3
Different Description	N/A
EUT Voltage	DC3.8V by battery
Applicable Standard	EN 50360:2017; EN 62209-1: 2016; EN 62209-2:2010; EN 50566:2017; EN 62479:2010
Test Date	Apr. 19, 2018 to Apr. 24, 2018
Performed Location	Attestation of Global Compliance(Shenzhen) Co., Ltd.
	2 F, Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang Street, Bao'an District, Shenzhen, China
Report Template	AGCRT-EC-3G/SAR (2016-01-01)

Note:The results of testing in this report apply to the product/system which was tested only.

Owen Xiao

Tested By

Qwen Xiao(Xiao Qi) Apr. 24, 2018

Angela Li

Checked By

Angela Li(Li Jiao) May. 04, 2018

Forrest Lei

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May. 04, 2018

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1. SUMMARY OF MAXIMUM SAR VALUE

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

Frequency Band	Highest Reported 10g-SAR(W/Kg)		SAR Test Limit (W/Kg)
	Head	Body-worn(with 5mm separation)	
GSM 900	0.421	1.294	2.0
DCS 1800	0.147	1.312	
WCDMA Band I	0.149	1.225	
WCDMA Band VIII	0.354	0.569	
WIFI 2.4G	0.326	0.450	
Simultaneous Reported SAR	1.762		
SAR Test Result	PASS		

This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (2.0W/Kg).

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2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	Smart Phone
Test Model	J3
Hardware Version	W56A_V2.0K
Software Version	CUBOT_J3_8031C_V01_20_180329
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
GSM and GPRS&EGPRS	
Support Band	☒GSM 900 ☒DCS 1800 (EU Frequency) ☒GSM 850 ☒PCS 1900 (none EU Frequency)
GPRS & EGPRS Type	Class B
GPRS & EGPRS Class	Class 12(1Tx+4Rx, 2Tx+3Rx, 3Tx+2Rx, 4Tx+1Rx)
TX Frequency Range	GSM900:880-915MHz ; DCS1800:1710-1785MHz
RX Frequency Range	GSM900:925-960MHz ; DCS1800:1805-1880MHz
Release Version	R99
Type of modulation	GMSK for GSM/GPRS; GMSK & 8-PSK for EGPRS
Antenna Gain	1.0dBi GSM900:0.28dBi; DCS1800:0.37dBi
Max. Average Power	GSM900:32.83dBm; DCS1800:29.91dBm
Bluetooth	
Bluetooth Version	2402~2480MHz
Operation Frequency	1.0dBi
Type of modulation	BR/EDR, BLE
EIRP	**BR/EDR :**GFSK, π /4-DQPSK, 8-DPSK; **BLE**: GFSK
Antenna Gain	**BR/EDR :**5.32dBm; **BLE**: 4.98dBm

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EUT Description(Continue)

WCDMA	
Support Band	☒UMTS FDD Band I ☒UMTS FDD Band VIII (EU Frequency) ☐UMTS FDD Band II ☐UMTS FDD Band V (none EU Frequency)
HS Type	HSPA(HSUPA/HSDPA)
TX Frequency Range	FDD Band I : 1920-1980MHz; FDD Band VIII : 880-915MHz
RX Frequency Range	FDD Band I : 2110-2170MHz; FDD Band VIII : 925-960MHz
Release Version	Rel-6
Type of modulation	HSDPA:QPSK/16QAM; HSUPA:BPSK; WCDMA:QPSK
Antenna Gain	1.0dBi Band I:23.12dBi; Band VIII:23.12dBi
Max. Average Power	Band I:24.60dBm; Band VIII:23.60dBm
WIFI	
WIFI Specification	☐802.11a ☒802.11b ☒802.11g ☒802.11n(20) ☒802.11n(40)
Operation Frequency	2412~2472MHz
EIRP	11b:15.45dBm,11g:9.89dBm,11n(20):9.60dBm,11n(40):9.59dBm
Antenna Gain	1.0dBi
Li-ion Battery	
Brand Name	CUBOT
Model Name	J3
Manufacturer Name	Zhongshan Tianmao Battery CO., Ltd
Manufacturer Address	NO.208, Qian Jin One Road, The Third Industrial Zone, Tanzhou Town, Zhongshan City, China
Capacitance	2000mAh
Rated Voltage/ Charging Voltage	DC3.8V/ DC4.35V

Note: The sample used for testing is end product.

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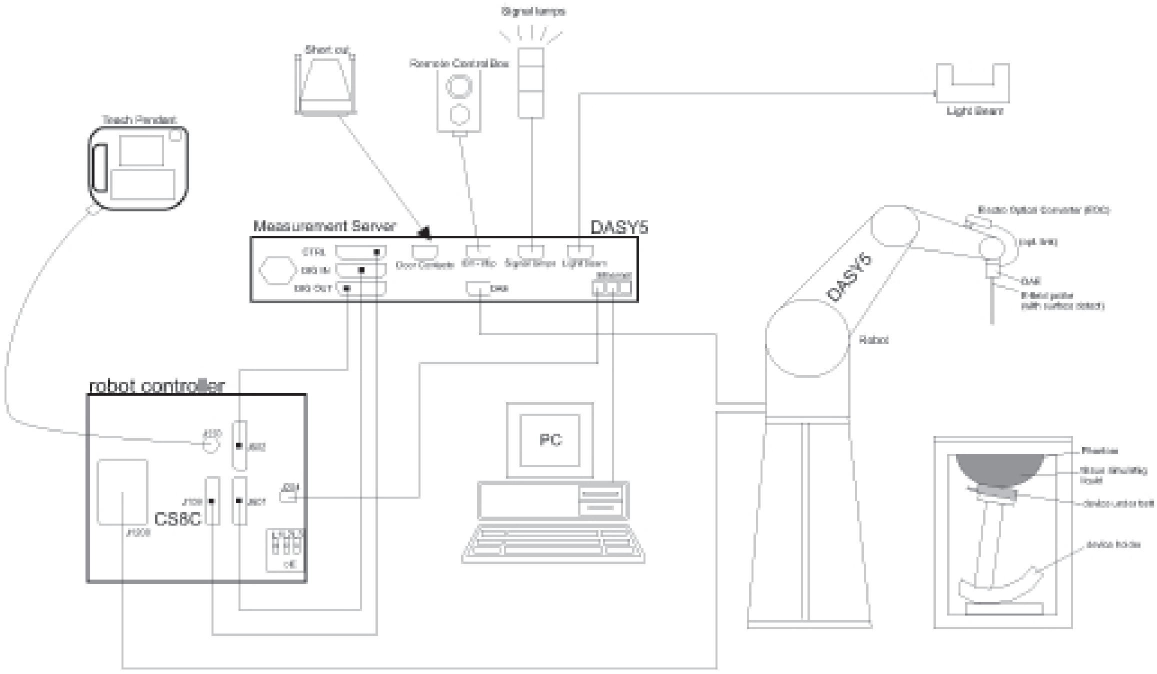
3. SAR MEASUREMENT SYSTEM

3.1. The DASY5 system used for performing compliance tests consists of following items



- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics (DAE) which attached to the robot arm extension. The DAE consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock
- A dosimetric probe equipped with an optical surface detector system.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital Communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- Phantoms, device holders and other accessories according to the targeted measurement.

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3.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. SPEAG conducts the probe calibration in compliance with international and national standards (e.g. EN62209, etc.)Under ISO17025.The calibration data are in Appendix D.

Isotropic E-Field Probe Specification

Model	EX3DV4	
Manufacture	SPEAG	
frequency	0.45GHz-3 GHz Linearity:±0.9%(k=2)(450MHz-3 GHz)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity:±0.9%(k=2)	
Dimensions	Overall length:337mm Tip diameter:2.5mm Typical distance from probe tip to dipole centers:1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 3 GHz with precision of better 30%.	

3.3. Data Acquisition Electronics description

The data acquisition electronics (DAE) consist if a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement sever is accomplished through an optical downlink fir data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

DAE4

Input Impedance	200MOhm	
The Inputs	Symmetrical and floating	
Common mode rejection	above 80 dB	

3.4. Robot

The DASY system uses the high precision robots (DASY5:TX60) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from is used.
The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

3.5. Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.
The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned prob.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position. e, the same position will be reached with another aligned probe within 0

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3.6. Device Holder

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

3.7. Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chip-disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DAYS I/O board, which is directly connected to the PC/104 bus of the CPU board.
The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

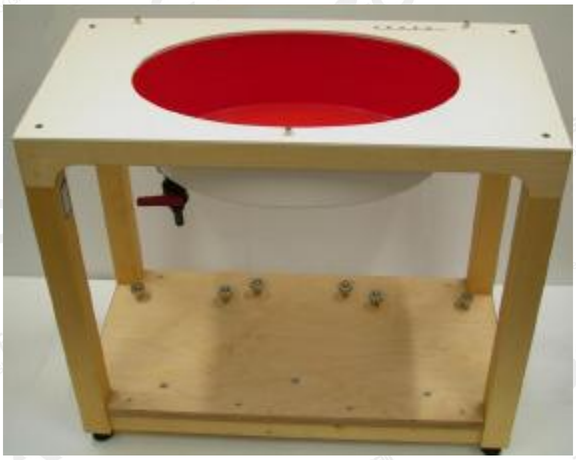
3.8. PHANTOM

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas: □ Left head □ Right head □ Flat phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI4 Phantom

□ Flat phantom a fiberglass shell flat phantom with 2mm+/- 0.2 mm shell thickness. It has only one measurement area for Flat phantom	

4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

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

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

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

SAR is expressed in units of Watts per kilogram (W/Kg)
SAR can be obtained using either of the following equations:

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

$$\mathrm{SAR} = c_h \left.\frac{dT}{dt}\right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
c_h	is the heat capacity of the tissue in joules per kilogram and Kelvin;
$\frac{dT}{dt} \mid t=0$	is the initial time derivative of temperature in the tissue in kelvins per second

4.2. SAR Measurement Procedure

a) Measure the local SAR at a test point within 10 mm of the inner surface of the phantom where the measured local SAR exceeds the lower detection limit of the measurement system. Preferably, the test point will be above the expected peak SAR location within said distance from the phantom surface. As explained at Step f) below, a comparative measurement will be made by the system at the same point after completion of the SAR measurement.

b) The area over which the SAR measurement is performed shall cover at least an area larger than the projection of the handset and antenna. For some handsets, the area projected onto the phantom can be large such that the probe may not reach all points. In this case, rotated phantoms may be used and the area may be assessed by multiple overlapping area scans. Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall be with respect to the SAM phantom requirements. The measurement resolution and spatial resolution for interpolation shall be chosen to allow identification of the local peak locations to within one-half of the linear dimension of the corresponding side of the zoom-scan volume. The maximum grid spacing shall be 20 mm for frequencies equal to or below 3 GHz and (60/f [GHz]) mm for frequencies above 3 GHz. The resolution SAR uncertainity of the measurement can be estimated using the functions in 7.2.10. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be ≤ 5 mm for frequencies equal to or below 3 GHz and δ ln(2)/2 mm for frequencies above 3 GHz, where δ is the plane wave penetration depth and ln(x) is the natural logarithm [80]. The maximum variation of the sensor-phantom surface distance shall be ± 1 mm for frequencies equal to or below 3 GHz and ± 0,5 mm for frequencies above 3 GHz. At all measurement points, the angle of the probe with respect to the line normal to the surface shall be less than 30° for frequencies equal to or below 3 GHz and 20° for frequencies above 3 GHz (see Figure 6). Table 1 provides the measurement parameters required for the area scan.

c) 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 will not be within the zoom scan of other peaks. Additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g. 1 W/kg for 1,6 W/kg, 1 g limit; or 1,26 W/kg for 2 W/kg, 10 g limit).

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in Step c) (zoom scan procedure). The horizontal grid step shall be (24/f [GHz]) mm or less but not more than 8 mm. The minimum zoom scan size is 30 mm by 30 mm by 30 mm for frequencies equal to or below 3 GHz. For higher frequencies, the minimum zoom scan size can be reduced to 22 mm by 22 mm by 22 mm. A smaller volume zoom scan with tighter spacing between the measurement points is allowed due to steeper decay of the E-field, which may reduce the measurement time. For frequencies above 3 GHz, the grid step in the vertical direction shall not exceed (8 − f [GHz]) mm, and for frequencies equal to or below 3 GHz if uniform spacing is used the grid step shall not exceed 5 mm. If variable spacing is used in the vertical direction (non-uniform grids or graded grids), the maximum spacing between the two closest measured points to the phantom shell shall not exceed (12/f [GHz]) mm for frequencies above 3 GHz, and shall not exceed 4 mm for frequencies at or below 3 GHz. Furthermore the spacing between farther adjacent points shall increase by an incremental factor not exceeding 1,5. When graded grids are used, extrapolation routines shall be tested according to 7.2.10.3.2 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 equal to or below 3 GHz and δ ln(2)/2 mm for frequencies above 3 GHz, where δ is the plane wave penetration depth and ln(x) is the natural logarithm. Separate grids shall be centred on each of the local SAR maxima found in Step c). At all measurement points, the angle of the probe with respect to the line normal to the surface shall be less than 30° for frequencies equal to or below 3 GHz and 20° for frequencies above 3 GHz.

e) Use the post-processing, i.e. the interpolation and extrapolation procedures defined in 6.5, to determine peak spatial-average SAR values.

f) Measure the local SAR at exactly the same test point location as in Step a). The SAR drift of the DUT may be estimated by the difference between the two measured single-point SAR values in Steps a) and f). The SAR drift shall be kept within ± 5 %; otherwise, see 7.2.8 for more information on addressing SAR measurement drift.

Table 1 – Area scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz $< f \leq 6$ GHz
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 6 in mm)	5 ± 1	δ ln(2)/2 ± 0,5 [a]
Maximum spacing between adjacent measured points (see 7.2.10.3.1, in mm) [b]	20 or half of the corresponding zoom scan length, whichever is smaller	60/f or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 6) [c]	30°	20°
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] See 7.2.10 on how Δx and Δy may be selected for individual area scan requirements.

[c] The probe angle with respect to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.

Table 2 – Zoom scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz $< f \leq 6$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 6 and Table 1, in mm)	5	δ ln(2)/2 [a]
Maximum angle between the probe axis and the phantom surface normal (α in Figure 6)	30°	20°
Maximum spacing between measured points in the x- and y-directions (7.2.10.3.2, in mm)	8	24/f [b]
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 6, in mm)	5	8 – f

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz $< f \leq 6$ GHz
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 6, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 6)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in 7.2.10.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in 7.2.10.3.2, in mm)	30	22
Tolerance in the probe angle	1°	1°

[a] δ is the penetration depth for a plane-wave incident normally on a planar half-space.

[b] This is the maximum spacing allowed, which may not work for all circumstances.

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5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 5.2.

5.1. The composition of the tissue simulating liquid

Ingredient (% Weight) / Frequency (MHz)	Water	Nacl	Sugar	HEC	Bactericide	DGBE	1,2-Propanediol	Triton X-100
900	34.4	0.79	0.0	0.0	0.0	0.0	64.81	0.0
1800	55.36	0.35	0.0	0.0	0.0	13.84	0.0	30.45
2000	50	0.0	0.0	0.0	0.0	50	0.0	0.0
2450	71.88	0.16	0.0	0.0	0.0	7.99	0.0	19.97

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the EN 62209-1 have been incorporated in the following table. The body tissue dielectric parameters recommended by the EN 62209-2 have been incorporated in the following table.

Target Frequency (MHz)	head		body	
	εr	σ (S/m)	εr	σ (S/m)
300	45.3	0.87	45.3	0.87
450	43.5	0.87	43.5	0.87
835	41.5	0.90	41.5	0.90
900	**41.5**	**0.97**	**41.5**	**0.97**
1450	40.5	1.20	40.5	1.20
1800 – 2000	**40.0**	**1.40**	**40.0**	**1.40**
2450	**39.2**	**1.80**	**39.2**	**1.80**
3000	38.5	2.40	38.5	2.40

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)

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5.3. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and R&S Network Analyzer ZVL6.

Frequency (MHz)	Target Value		Measurement Value		Tissue Temp [°C]	Test Date
	εr	δ[s/m]	εr	δ[s/m]		
900	41.50 39.425-43.575	0.97 0.9225-1.0185	41.08	0.96	21.3	Apr. 24, 2018
1800	40.00 38.00-42.00	1.40 1.33-1.47	40.61	1.41	21.3	Apr. 23, 2018
2000	40.00 38.00-42.00	1.40 1.33-1.47	41.09	1.43	21.5	Apr. 19, 2018
2450	39.2 37.24-41.16	1.80 1.71-1.89	38.94	1.82	21.2	Apr. 20, 2018

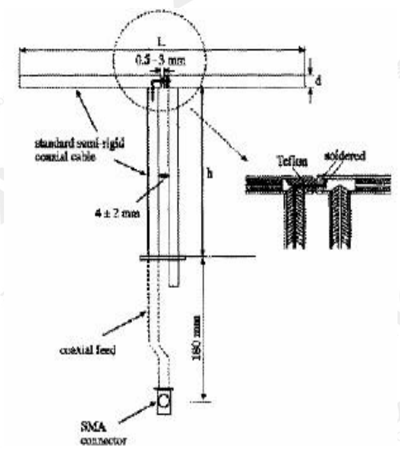
6. SAR SYSTEM CHECK PROCEDURE

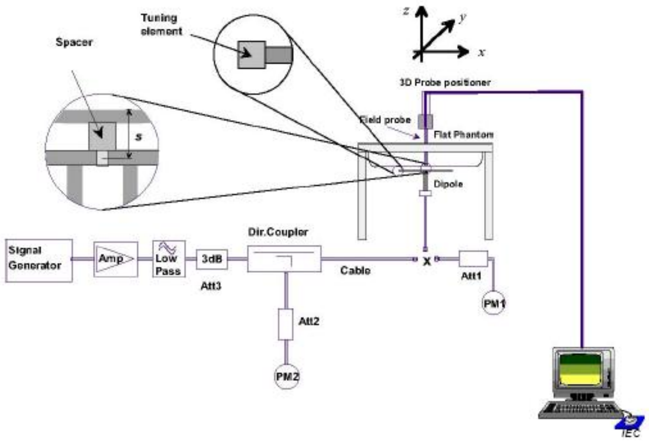
6.1. SAR System Check Procedures

SAR system check is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

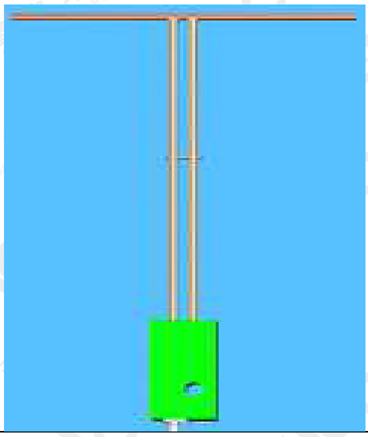
Each DASY system is equipped with one or more system check kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system check and system validation. System kit includes a dipole, and dipole device holder.

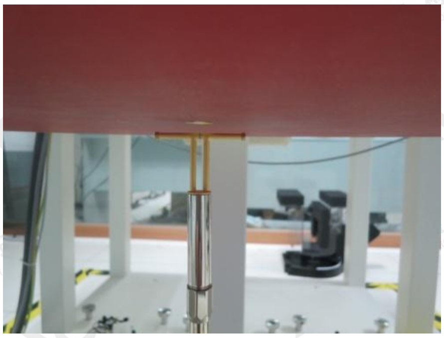
The system check verifies that the system operates within its specifications. It’s performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system check setup is shown as below.





6.2. SAR System Check
6.2.1. Dipoles

	The dipoles used are based on the EN62209-1 standard, the table below provides details for the mechanical and electrical specifications for the dipoles.

	The dipole used is based on the EN62209-1 standard, the table below provides details for the mechanical and electrical Specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
900 MHz	149.0	83.3	3.6
1800MHz	72	41.7	3.6
2000 MHz	64.5	37.5	3.6
2450MHz	51.5	30.4	3.6

6.2.2. System Check Result

System Performance Check at 900 MHz &1800MHz&2000MHz&2450MHz								
Validation Kit: SN 15/16DIP 0G900-400 & SN 29/15DIP 1G800-387 & SN 29/15DIP 2G000-390& D2450V2-SN:968								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Normalized to 1W(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
900	10.99	6.88	9.891-12.089	6.192-7.568	10.78	6.77	21.3	Apr. 24, 2018
1800	37.43	19.88	33.687-41.173	17.892-21.868	40.10	20.92	21.3	Apr. 23, 2018
2000	43.15	21.41	38.835-47.465	19.269-23.551	39.46	19.97	21.5	Apr. 19, 2018
2450	53.8	25.4	48.42-59.18	22.86-27.94	52.14	23.77	21.2	Apr. 20, 2018

Note: The values presented are already normalized to 1 Watt and that the measured values can be found in the plots

7. EUT TEST POSITION

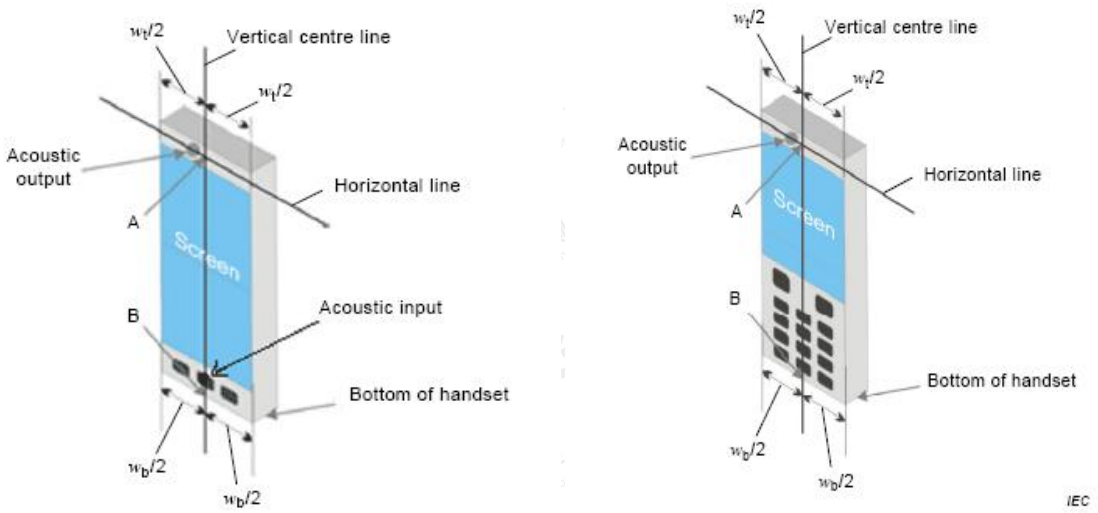
This EUT was tested in **Right Cheek, Right Tilted, Left Cheek, Left Tilted, Body back and Body front.**

7.1. Define Two Imaginary Lines on the Handset

(1) The vertical centreline passes through two points on the front side of the DUT: the midpoint of the width w_t of the handset at the level of the acoustic output (Point A in Figure 1), and the midpoint of the width w_b at the bottom of the handset (Point B).

(2) The horizontal line is perpendicular to the vertical centreline and passes through the centre of the acoustic output.

(3) The two lines intersect at Point A. Note that for many handsets, Point A coincides with the centre of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the DUT, especially for clam-shell handsets, handsets with flip cover pieces, and other irregularly shaped handsets.



7.2. Cheek Position

(1) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center picec in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(2) To move the device towards the phantom with the ear piece aligned with the the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost

7.3. Tilt Position

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

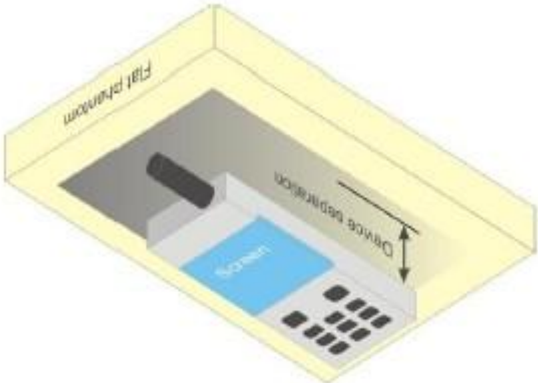
(2) While maintaining the device in the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until with the ear is lost.

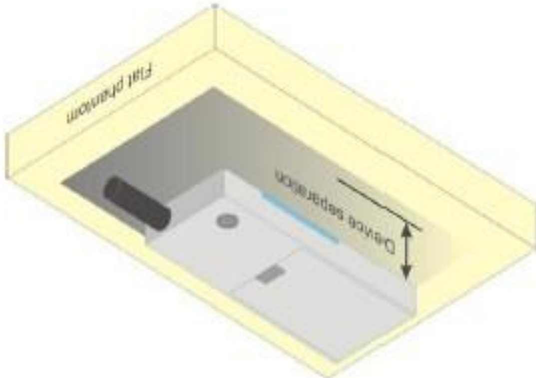
7.4. Body Worn Position

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

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

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





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8. SAR EXPOSURE LIMITS

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

Type Exposure	Uncontrolled Environment Limit (W/kg)
Spatial Peak SAR (10 g cube tissue for brain or body)	2.00
Spatial Average SAR (Whole body)	0.08
Spatial Peak SAR (Limbs)	4.00

Note:
These limits are derived from EN50360 “Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields” and EN50566 “Product standard to demonstrate compliance of radio frequency fields from handheld and body-mounted wireless communication devices used by the general public”

9. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
E-Field Probe	Speag- EX3DV4	SN:3953	Aug. 31,2017	Aug. 30,2018
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	Feb. 08,2018	Feb. 07,2019
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Radio Communication Tester	R&S-CMU200	069Y7-158-13-712	Mar. 01,2018	Feb. 28,2019
Dipole	SATIMO SID900	SN15/16 DIP 0G900-400	July 05,2016	July 04,2019
Dipole	SATIMO SID1800	SN29/15 DIP 1G800-387	July 05,2016	July 04,2019
Dipole	SATIMO SID2000	SN 29/15DIP 2G000-390	July 05,2016	July 04,2019
Dipole	D2450V2	SN968	June 12,2015	June 11,2018
Signal Generator	Agilent-E4438C	US41461365	Mar. 01,2018	Feb. 28,2019
Vector Analyzer	Agilent / E4440A	US41421290	Mar. 01,2018	Feb. 28,2019
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	Mar. 01,2018	Feb. 28,2019
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	Mar. 01,2018	Feb. 28,2019
Directional Couple	Werlatone/ C5571-10	SN99463	June 20,2017	June 19,2018
Directional Couple	Werlatone/ C6026-10	SN99482	June 20,2017	June 19,2018
Power Sensor	NRP-Z21	1137.6000.02	Oct. 12,2017	Oct. 11,2018
Power Sensor	NRP-Z23	US38261498	Mar. 01,2018	Feb. 28,2019
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per EN62209-1/2 Dipole SAR Validation, AGC Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:
1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement; 4. Impedance is within 5Ω of calibrated measurement.

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10. MEASUREMENT UNCERTAINTY

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table as follow.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor(a)	1/k(b)	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) Standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution (above table)

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

DASY Uncertainty- EX3DV4

Measurement uncertainty for DUT averaged over 1 gram / 10 gram.

Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	Annex B	6.05	N	1	1	1	6.05	6.05	∞
Axial Isotropy	7.2.2.2	0.6	R	$\sqrt{3}$	√0.5	√0.5	0.24	0.24	∞
Hemispherical Isotropy	7.2.2.2	1.6	R	$\sqrt{3}$	√0.5	√0.5	0.65	0.65	∞
Boundary effect	7.2.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	7.2.2.3	0.45	R	$\sqrt{3}$	1	1	0.26	0.26	∞
System detection limits	7.2.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	7.2.2.4	3.3	R	$\sqrt{3}$	1	1	1.91	1.91	∞
Readout Electronics	7.2.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	7.2.2.7	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	7.2.2.8	1.7	R	$\sqrt{3}$	1	1	0.98	0.98	∞
RF ambient conditions-Noise	7.2.9	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	7.2.9	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	7.2.3.1	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	7.2.3.2	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Post-processing	7.2.10	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Test sample Related									
Test sample positioning	7.2.5.3	2.9	N	1	1	1	2.90	2.90	∞
Device holder uncertainty	7.2.5.2	3.6	N	1	1	1	3.60	3.60	∞
SAR drift measurement	7.2.8	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	7.2.11	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and set-up									
Phantom uncertainty （shape and thickness uncertainty）	7.2.4	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	7.2.7.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity （temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity （measured）	7.2.6.3 7.2.6.5	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity （temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity （measured）	7.2.6.4 7.2.6.5	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty			RSS				11.473	11.303	
Expanded Uncertainty (95% Confidence interval)			K=2				22.946	22.606	

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DASY Uncertainty- EX3DV4 System validation uncertainty for Dipole averaged over 1 gram / 10 gram.									
Uncertainty Component	Sec.	Tol (±%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	Annex B	6.05	N	1	1	1	6.05	6.05	∞
Axial Isotropy	7.2.2.2	0.6	R	$\sqrt{3}$	1	1	0.35	0.35	∞
Hemispherical Isotropy	7.2.2.2	1.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	7.2.2.5	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	7.2.2.3	0.45	R	$\sqrt{3}$	1	1	0.26	0.26	∞
System detection limits	7.2.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	7.2.2.4	3.3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	7.2.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	7.2.2.7	0	R	1	0	0	0.00	0.00	∞
Integration Time	7.2.2.8	1.7	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	7.2.9	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	7.2.9	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	7.2.3.1	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	7.2.3.2	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Post-processing	7.2.10	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
System validation source									
Deviation of experimental dipole from numerical dipole	7.2.12	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	7.2.8	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Other source contribution Uncertainty	7.2.13	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and set-up									
Phantom uncertainty （shape and thickness uncertainty）	7.2.4	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	7.2.7.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity （temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity （measured）	7.2.6.3 7.2.6.5	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity （temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity （measured）	7.2.6.4 7.2.6.5	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty			RSS				11.113	10.938	
Expanded Uncertainty (95% Confidence interval)			K=2				22.226	21.876	

DASY Uncertainty- EX3DV4

System Check uncertainty for Dipole averaged over 1 gram / 10 gram.

Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration drift	Table 13 note a	0.5	N	1	1	1	0.5	0.5	∞
Axial Isotropy	7.2.2.2	0.6	R	√3	0	0	0.00	0.00	∞
Hemispherical Isotropy	7.2.2.2	1.6	R	√3	0	0	0.00	0.00	∞
Boundary effect	7.2.2.5	1.0	R	√3	0	0	0.00	0.00	∞
Linearity	7.2.2.3	0.45	R	√3	0	0	0.00	0.00	∞
System detection limits	7.2.2.3	1.0	R	√3	0	0	0.00	0.00	∞
Modulation response	7.2.2.4	3.3	R	√3	0	0	0.00	0.00	∞
Readout Electronics	7.2.2.6	0.15	N	1	0	0	0.00	0.00	∞
Response Time	7.2.2.7	0	R	√3	0	0	0.00	0.00	∞
Integration Time	7.2.2.8	1.7	R	√3	0	0	0.00	0.00	∞
RF ambient conditions-Noise	7.2.9	3.0	R	√3	0	0	0.00	0.00	∞
RF ambient conditions-reflections	7.2.9	3.0	R	√3	0	0	0.00	0.00	∞
Probe positioner mechanical tolerance	7.2.3.1	0.4	R	√3	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	7.2.3.2	6.7	R	√3	1	1	3.87	3.87	∞
Post-processing	7.2.10	4	R	√3	0	0	0.00	0.00	∞
System check source									
Deviation between experimental dipoles	7.2.12	2.0	N	1	1	1	2.00	2.00	∞
Input power and SAR drift measurement	7.2.8	5.0	R	√3	1	1	2.89	2.89	∞
Other source contribution Uncertainty	7.2.13	2.0	R	√3	1	1	1.15	1.15	∞
Phantom and set-up									
Phantom uncertainty（shape and thickness uncertainty）	7.2.4	6.6	R	√3	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	7.2.7.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity（temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid conductivity（measured）	7.2.6.3 7.2.6.5	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity（temperature uncertainty）	7.2.6.6 7.2.6.5	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Liquid permittivity（measured）	7.2.6.4 7.2.6.5	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty			RSS				7.344	7.076	
Expanded Uncertainty (95% Confidence interval)			K=2				14.689	14.153	

11. CONDUCTED POWER MEASUREMENT

GSM BAND

Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
Maximum Power <1>				
GSM 900	880.2	**32.83**	-9	23.83
	897.4	32.45	-9	23.45
	914.8	31.88	-9	22.88
GPRS 900 (1 Slot)	880.2	31.56	-9	22.56
	897.4	31.39	-9	22.39
	914.8	31.17	-9	22.17
GPRS 900 (2 Slot)	880.2	28.47	-6	22.47
	897.4	28.58	-6	22.58
	914.8	28.21	-6	22.21
GPRS 900 (3 Slot)	880.2	26.21	-4.26	21.95
	897.4	26.11	-4.26	21.85
	914.8	26.09	-4.26	21.83
GPRS 900 (4 Slot)	880.2	29.07	-3	26.07
	897.4	28.43	-3	25.43
	914.8	27.84	-3	24.84
EGPRS 900 (1 Slot)	880.2	22.48	-9	13.48
	897.4	22.15	-9	13.15
	914.8	21.79	-9	12.79
EGPRS 900 (2 Slot)	880.2	21.36	-6	15.36
	897.4	21.45	-6	15.45
	914.8	21.58	-6	15.58
EGPRS 900 (3 Slot)	880.2	22.16	-4.26	17.90
	897.4	22.21	-4.26	17.95
	914.8	22.09	-4.26	17.83
EGPRS 900 (4 Slot)	880.2	21.75	-3	18.75
	897.4	21.68	-3	18.68
	914.8	21.25	-3	18.25

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Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
Maximum Power <2>				
GSM 900	880.2	32.45	-9	23.45
	897.4	32.39	-9	23.39
	914.8	31.28	-9	22.28
GPRS 900 (1 Slot)	880.2	31.21	-9	22.21
	897.4	31.11	-9	22.11
	914.8	31.08	-9	22.08
GPRS 900 (2 Slot)	880.2	28.39	-6	22.39
	897.4	28.45	-6	22.45
	914.8	28.11	-6	22.11
GPRS 900 (3 Slot)	880.2	26.18	-4.26	21.92
	897.4	26.09	-4.26	21.83
	914.8	26.04	-4.26	21.78
GPRS 900 (4 Slot)	880.2	29.01	-3	26.01
	897.4	28.21	-3	25.21
	914.8	27.56	-3	24.56
EGPRS 900 (1 Slot)	880.2	22.32	-9	13.32
	897.4	22.10	-9	13.10
	914.8	21.45	-9	12.45
EGPRS 900 (2 Slot)	880.2	21.12	-6	15.12
	897.4	21.21	-6	15.21
	914.8	21.14	-6	15.14
EGPRS 900 (3 Slot)	880.2	22.09	-4.26	17.83
	897.4	22.11	-4.26	17.85
	914.8	22.04	-4.26	17.78
EGPRS 900 (4 Slot)	880.2	21.36	-3	18.36
	897.4	21.21	-3	18.21
	914.8	21.14	-3	18.14

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Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
Maximum Power <1>				
DCS1800	1710.2	**29.91**	-9	20.91
	1747.4	29.69	-9	20.69
	1784.8	28.59	-9	19.59
GPRS1800 (1 Slot)	1710.2	28.56	-9	19.56
	1747.4	28.29	-9	19.29
	1784.8	28.11	-9	19.11
GPRS1800 (2 Slot)	1710.2	25.45	-6	19.45
	1747.4	25.68	-6	19.68
	1784.8	25.74	-6	19.74
GPRS1800 (3 Slot)	1710.2	24.13	-4.26	19.87
	1747.4	24.27	-4.26	20.01
	1784.8	24.19	-4.26	19.93
GPRS1800 (4 Slot)	1710.2	25.66	-3	22.66
	1747.4	25.99	-3	22.99
	1784.8	26.06	-3	23.06
EGPRS1800 (1 Slot)	1710.2	24.64	-9	15.64
	1747.4	23.62	-9	14.62
	1784.8	22.99	-9	13.99
EGPRS1800 (2 Slot)	1710.2	23.45	-6	17.45
	1747.4	23.39	-6	17.39
	1784.8	23.57	-6	17.57
EGPRS1800 (3 Slot)	1710.2	23.20	-4.26	18.94
	1747.4	23.38	-4.26	19.12
	1784.8	23.35	-4.26	19.09
EGPRS1800 (4 Slot)	1710.2	20.68	-3	17.68
	1747.4	20.29	-3	17.29
	1784.8	20.17	-3	17.17

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Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
Maximum Power <2>				
DCS1800	1710.2	29.45	-9	20.45
	1747.4	29.36	-9	20.36
	1784.8	28.29	-9	19.29
GPRS1800 (1 Slot)	1710.2	28.35	-9	19.35
	1747.4	28.18	-9	19.18
	1784.8	28.05	-9	19.05
GPRS1800 (2 Slot)	1710.2	25.35	-6	19.35
	1747.4	25.45	-6	19.45
	1784.8	25.39	-6	19.39
GPRS1800 (3 Slot)	1710.2	24.10	-4.26	19.84
	1747.4	24.11	-4.26	19.85
	1784.8	24.14	-4.26	19.88
GPRS1800 (4 Slot)	1710.2	25.35	-3	22.35
	1747.4	25.78	-3	22.78
	1784.8	26.00	-3	23.00
EGPRS1800 (1 Slot)	1710.2	24.45	-9	15.45
	1747.4	23.39	-9	14.39
	1784.8	22.58	-9	13.58
EGPRS1800 (2 Slot)	1710.2	23.28	-6	17.28
	1747.4	23.14	-6	17.14
	1784.8	23.40	-6	17.40
EGPRS1800 (3 Slot)	1710.2	23.11	-4.26	18.85
	1747.4	23.21	-4.26	18.95
	1784.8	23.18	-4.26	18.92
EGPRS1800 (4 Slot)	1710.2	20.45	-3	17.45
	1747.4	20.17	-3	17.17
	1784.8	20.09	-3	17.09

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

UMTS BAND I

Mode	Frequency(MHz)	Avg. Burst Power (dBm)
WCDMA 2100 RMC(12.2kbps)	1922.4	23.65
	1950	23.64
	1977.6	23.61
HSDPA Subtest 1	1922.4	**24.60**
	1950	24.53
	1977.6	24.44
HSDPA Subtest 2	1922.4	23.39
	1950	23.24
	1977.6	23.04
HSDPA Subtest 3	1922.4	23.15
	1950	23.21
	1977.6	23.05
HSDPA Subtest 4	1922.4	22.17
	1950	22.10
	1977.6	22.17
HSUPA Subtest 1	1922.4	20.59
	1950	21.07
	1977.6	20.47
HSUPA Subtest 2	1922.4	18.65
	1950	19.13
	1977.6	18.49
HSUPA Subtest 3	1922.4	19.95
	1950	20.27
	1977.6	19.68
HSUPA Subtest 4	1922.4	19.41
	1950	19.68
	1977.6	19.24
HSUPA Subtest 5	1922.4	22.34
	1950	23.02
	1977.6	21.25

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UMTS BAND VIII

Mode	Frequency (MHz)	Avg. Burst Power (dBm)
WCDMA 900 RMC(12.2kbps)	882.4	22.65
	897.6	21.97
	912.6	21.34
HSDPA Subtest 1	882.4	21.42
	897.6	21.07
	912.6	**23.60**
HSDPA Subtest 2	882.4	20.64
	897.6	22.60
	912.6	22.52
HSDPA Subtest 3	882.4	20.63
	897.6	19.78
	912.6	22.76
HSDPA Subtest 4	882.4	20.61
	897.6	19.74
	912.6	19.00
HSUPA Subtest 1	882.4	19.56
	897.6	19.05
	912.6	18.76
HSUPA Subtest 2	882.4	19.59
	897.6	19.06
	912.6	18.72
HSUPA Subtest 3	882.4	21.30
	897.6	21.37
	912.6	19.73
HSUPA Subtest 4	882.4	19.06
	897.6	18.56
	912.6	18.20
HSUPA Subtest 5	882.4	20.82
	897.6	20.87
	912.6	21.01

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According to 3GPP 25.101 sub-clause 6.2.2, the maximum output power is allowed to be reduced by following the table.

Table 6.1Aa: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	0≤ CM≤3.5	MAX(CM-1,0)
Note: CM=1 for β_c/β_d=12/15, β_{hs}/β_c=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done. However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensation for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

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WIFI

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	EIRP (dBm)
802.11b	1	1	2412	15.29
		2	2417	14.36
		7	2442	**15.45**
		12	2467	14.59
		13	2472	15.25
802.11g	6	1	2412	9.54
		7	2442	9.64
		13	2472	9.89
802.11n(20)	6.5	1	2412	9.50
		7	2442	9.60
		13	2472	9.09
802.11n(40)	13.5	3	2422	9.59
		7	2442	9.42
		11	2462	9.41

Note: For wifi RF test, there is no required about band edge; we had test the power for channel 2&12, the power is lower than channel 1&13, so SAR need to test at low &high channel 1&13.

12. TEST RESULTS

12.1. SAR Test Results Summary

12.1.1. Test position and configuration

Head SAR was performed with the device configured in the positions according to EN62209-1, and Body SAR was performed with the device 5mm from the phantom according to EN62209-2.

12.1.2. Operation Mode

1 For GSM900, the power control is set to Maximum Power Class. For GPRS 900(GMSK, CS1), the power control level is set to Maximum Power Class. For E-GPRS 900(GMSK: MCS1, 8PSK:MCS5), the power control is set to Maximum Power Class. For DCS 1800, the power control is set to Maximum Power Class. For GPRS 1800(GMSK, CS1), the power control level is set to Maximum Power Class. For E-GPRS 1800 (GMSK: MCS1, 8PSK:MCS5), the power control level is set to Maximum Power Class.

This is a multi-slot class 12 device capable of 4 uplink timeslots During the head SAR test, the device was transmitting with maximum 1 uplink timeslot; during the body SAR test, it was transmitting with maximum 4 uplink timeslots. Additionally, this device doesn't support dual transfer mode (DTM)

Testing with the headset was performed at the position and channels that resulted in the highest body SAR. This testing was performed with GPRS transmitting with 2/3/4 uplink timeslots. In the Body SAR test result table, body-worn means display of device down, body-front means display of device up.

2 For WCDMA, head and body SAR is tested under RMC 12.2k mode with power control set all up bits SAR for AMR is not required since its power is less than RMC. For HSDPA/HSUPA, SAR is test with its maximum power mode.

3 For WIFI SAR testing, the EUT has installed WIFI engineering testing software which can provide continuous transmitting RF signal.

4 Sensors have no any influence on power level or SAR result.

5 The portion of the EUT which area scan did not scan has been off the phantom

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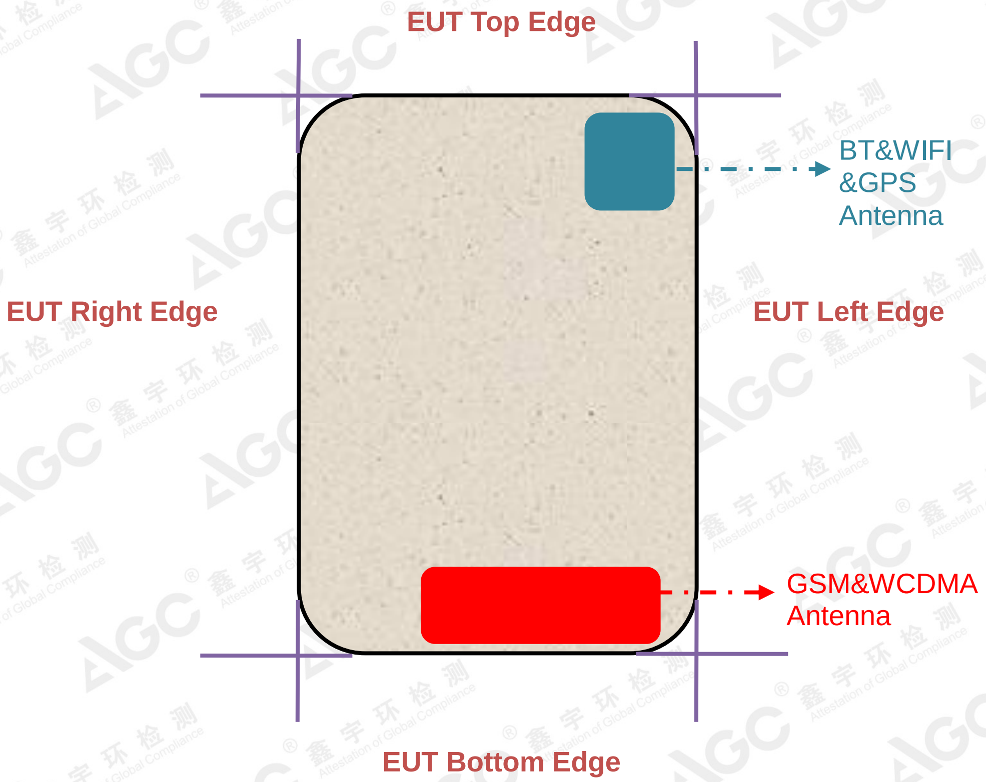
12.1.3. Antenna Location: (back view)



12.1.4. SAR Test Results Summary

SAR MEASUREMENT									
Depth of Liquid (cm):>15					Relative Humidity (%): 49.4				
Product: Smart Phone									
Test Mode: GSM900 with GMSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (10g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit (W/Kg)**
SIM 1 Card									
Left Cheek	voice	975	880.2	0.03	0.244	32.90	32.83	0.248	2.0
Left Cheek	voice	37	897.4	-0.06	**0.380**	32.90	32.45	**0.421**	2.0
Left Cheek	voice	124	914.8	-0.07	0.258	32.90	31.88	0.326	2.0
Left Tilt	voice	37	897.4	-0.01	0.248	32.90	32.45	0.275	2.0
Right Cheek	voice	37	897.4	-0.10	0.368	32.90	32.45	0.408	2.0
Right Tilt	voice	37	897.4	-0.03	0.247	32.90	32.45	0.274	2.0
Body back	GPRS-4 slots	975	880.2	-0.03	1.020	29.10	29.07	1.027	2.0
Body back	GPRS-4 slots	37	897.4	0.06	**1.090**	29.10	28.43	1.272	2.0
Body back	GPRS-4 slots	124	914.8	0.04	0.968	29.10	27.84	**1.294**	2.0
Body Front	GPRS-4 slots	37	897.4	-0.01	0.660	29.10	28.43	0.770	2.0
Body back+ Ear.	voice	37	897.4	-0.11	0.382	32.90	32.45	0.424	2.0

Note:
- When the 10-g SAR is ≤ 1.0W/kg, testing for low and high channel is optional.
- The test separation of all above table(body part) is 5mm.
- Since GPRS with 4 TX provides the highest outputpower, only this mode was considered for SAR assessment in body worn configuration
- Measurements for SIM Card 2 are not conducted since SIM Card 1 show the higest output power
- Plots are only shown for the bold markered worst case SAR results

SAR MEASUREMENT									
Depth of Liquid (cm):>15					Relative Humidity (%):51.1				
Product: Smart Phone									
Test Mode: DCS1800 with GMSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (10g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit (W/Kg)**
SIM 1 Card									
Left Cheek	voice	698	1747.4	0.13	0.076	30.00	29.69	0.082	2.0
Left Tilt	voice	698	1747.4	-0.04	0.047	30.00	29.69	0.050	2.0
Right Cheek	voice	512	1710.2	0.05	0.096	30.00	29.91	0.098	2.0
Right Cheek	voice	698	1747.4	-0.02	**0.108**	30.00	29.69	0.116	2.0
Right Cheek	voice	885	1784.8	-0.07	0.106	30.00	28.59	**0.147**	2.0
Right Tilt	voice	698	1747.4	0.06	0.037	30.00	29.69	0.040	2.0
Body back	GPRS-4 slots	512	1710.2	0.04	0.880	26.10	25.66	0.974	2.0
Body back	GPRS-4 slots	698	1747.4	0.08	1.060	26.10	25.99	1.087	2.0
Body back	GPRS-4 slots	885	1784.8	0.15	**1.300**	26.10	26.06	**1.312**	2.0
Body Front	GPRS-4 slots	698	1747.4	-0.09	0.699	26.10	25.62	0.781	2.0
Body back+ Ear.	voice	885	1784.8	0.13	0.701	30.00	28.59	0.970	2.0

Note:
- When the 10-g SAR is ≤ 1.0W/kg, testing for low and high channel is optional.
- The test separation of all above table(body part) is 5mm.
- Since GPRS with 4 TX provides the highest outputpower, only this mode was considered for SAR assessment in body worn configuration
- Measurements for SIM Card 2 are not conducted since SIM Card 1 show the higest output power
- Plots are only shown for the bold markered worst case SAR results

SAR MEASUREMENT									
Depth of Liquid (cm):>15				Relative Humidity (%): 50.6					
Product: Smart Phone									
Test Mode: WCDMA Band I with QPSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2 dB)**	**SAR (10g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
SIM 1 Card									
Left Cheek	RMC12.2kbps	9612	1922.4	-0.03	**0.147**	23.70	23.65	**0.149**	2.0
Left Cheek	RMC12.2kbps	9750	1950	-0.17	0.144	23.70	23.64	0.146	2.0
Left Cheek	RMC12.2kbps	9888	1977.6	0.18	0.140	23.70	23.61	0.143	2.0
Left Tilt	RMC12.2kbps	9750	1950	0.02	0.057	23.70	23.64	0.058	2.0
Right Cheek	RMC12.2kbps	9750	1950	-0.14	0.132	23.70	23.64	0.134	2.0
Right Tilt	RMC12.2kbps	9750	1950	-0.18	0.051	23.70	23.64	0.052	2.0
Body back	RMC12.2kbps	9612	1922.4	0.14	1.090	23.70	23.65	1.103	2.0
Body back	RMC12.2kbps	9750	1950	-0.11	1.070	23.70	23.64	1.085	2.0
Body back	RMC12.2kbps	9888	1977.6	0.12	**1.200**	23.70	23.61	**1.225**	2.0
Body front	RMC12.2kbps	9750	1950	-0.04	0.627	23.70	23.64	0.636	2.0
Body back	HSDPA Subtest 1	9750	1950	0.11	0.967	24.60	24.53	0.983	2.0
Body back	HSUPA Subtest 1	9750	1950	0.07	0.818	21.10	21.07	0.824	2.0
Body back+ Ear.	RMC12.2kbps	9888	1977.6	0.14	1.120	23.70	23.61	1.143	2.0

Note:
- When the 10-g SAR is ≤ 1.0W/kg, testing for low and high channel is optional.
- The test separation of all above table(body part) is 5mm.
- Plots are only shown for the bold markered worst case SAR results

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SAR MEASUREMENT									
Depth of Liquid (cm):>15				Relative Humidity (%): 49.4					
Product: Smart Phone									
Test Mode: WCDMA Band VIII with QPSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2 dB)**	**SAR (10g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
SIM 1 Card									
Left Cheek	RMC12.2kbps	2712	882.4	0.01	**0.291**	23.50	22.65	**0.354**	2.0
Left Cheek	RMC12.2kbps	2788	897.6	0.16	0.236	23.50	21.97	0.336	2.0
Left Cheek	RMC12.2kbps	2863	912.6	0.20	0.182	23.50	21.34	0.299	2.0
Left Tilt	RMC12.2kbps	2788	897.6	0.04	0.127	23.50	21.97	0.181	2.0
Right Cheek	RMC12.2kbps	2788	897.6	0.13	0.226	23.50	21.97	0.321	2.0
Right Tilt	RMC12.2kbps	2788	897.6	0.15	0.152	23.50	21.97	0.216	2.0
Body back	RMC12.2kbps	2712	882.4	0.02	**0.369**	23.50	22.65	0.449	2.0
Body back	RMC12.2kbps	2788	897.6	0.12	0.368	23.50	21.97	0.523	2.0
Body back	RMC12.2kbps	2863	912.6	0.07	0.346	23.50	21.34	**0.569**	2.0
Body front	RMC12.2kbps	2788	897.6	0.02	0.256	23.50	21.97	0.364	2.0
Body back	HSDPA Subtest 1	2788	897.6	-0.06	0.304	23.60	21.07	0.544	2.0
Body back	HSUPA Subtest 1	2788	897.6	0.15	0.361	19.60	19.05	0.410	2.0
Body back+ Ear.	RMC12.2kbps	2712	882.4	0.09	0.228	23.50	22.65	0.277	2.0

Note:
- When the 10-g SAR is ≤ 1.0W/kg, testing for low and high channel is optional.
- The test separation of all above table(body part) is 5mm.
- Plots are only shown for the bold markered worst case SAR results

WIFI Health Evaluation:

Per EN 62209-2:2010 Annex K, Test reduction based on simultaneous multi-band transmission considerations. For secondary transmitter (i.e. lower power transmitters), we use the following formula to evaluate the threshold power for the secondary transmitter that allows it to be excluded from SAR testing:

$$P_{\text{available}} = P_{\text{max}_m} \times (SAR_{\text{lim}} - SAR_1) / SAR_{\text{lim}}$$

Where

$P_{max,m}$ is the maximum threshold exclusion power level, which is calculated by $SAR_{lim} \times m$, where m is an averaging mass.

$P_{available}$ is the threshold value there need to be tested;

SAR_{lim} is the SAR limit;

SAR_1 is the maximum SAR value of first transmitter mode result;

Restrictive power threshold;

$P_{available} = P_{th,m} \times (SAR_{lim} - SAR_1) / SAR_{lim} = 20mW \times (2W/Kg - 1.312\ W/Kg) / 2W/Kg$

$= 6.88mW < 35.075mW (15.45dBm)$ for WIFI

There is need to test WIFI SAR and need to evaluate simultaneous transmission

SAR MEASUREMENT									
Depth of Liquid (cm):>15				Relative Humidity (%): 48.3					
Product: Smart Phone									
Test Mode: 802.11b									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (10g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
Left Cheek	DTS	7	2442	0.08	0.302	15.50	15.45	0.305	2.0
Left Tilt	DTS	7	2442	0.04	0.223	15.50	15.45	0.226	2.0
Right Cheek	DTS	1	2412	-0.03	0.270	15.50	15.29	0.283	2.0
Right Cheek	DTS	7	2442	-0.05	**0.315**	15.50	15.45	0.319	2.0
Right Cheek	DTS	13	2472	-0.03	0.308	15.50	15.25	**0.326**	2.0
Right Tilt	DTS	7	2442	-0.03	0.167	15.50	15.45	0.169	2.0
Body back	DTS	1	2412	-0.00	**0.429**	15.50	15.29	**0.450**	2.0
Body back	DTS	7	2442	-0.10	0.368	15.50	15.45	0.372	2.0
Body back	DTS	13	2472	0.12	0.357	15.50	15.25	0.378	2.0
Body front	DTS	7	2442	-0.08	0.263	15.50	15.45	0.266	2.0
Body back + Ear.	DTS	1	2412	0.06	0.227	15.50	15.29	0.238	2.0

Note:
- When the 10-g SAR is ≤ 1.0W/kg, testing for low and high channel is optional.
- The test separation of all above table(body part) is 5mm.
- Plots are only shown for the bold markered worst case SAR results

BT Health Evaulation:

Per EN 62209-2:2010 Annex K, Test reduction based on simultaneous multi-band transmission considerations.

For secondary transmitter (i.e. lower power transmitters), we use the following Formula to evaluate the threshold power for the secondary transmitter that allows it to be excluded from SAR testing:

$$P_{\text{available}} = P_{\max_m} \times (SAR_{\text{lim}} - SAR_1) / SAR_{\text{lim}}$$

Where

$P_{max,m}$ is the maximum threshold exclusion power level, which is calculated by $SAR_{lim} \times m$, where m is an averaging mass.

$P_{available}$ is the threshold value there need to be tested;

SAR_{lim} is the SAR limit;

SAR_1 is the maximum SAR value of first transmitter mode result;

Restrictive power threshold;

$P_{available} = P_{th,m} \times (SAR_{lim} - SAR_1) / SAR_{lim} = 20mW \times (2W/Kg - 1.318 W/Kg) / 2W/Kg$

$= 6.88mW > 3.404mW (5.32dBm)$ for BT

According to EN62479:2010, the maximum output powerof BT is 5.32dBm (3.404mW less than 20mW) refer to ETSI EN 300328 (V2.1.1) Test report (AGC00552180404EE04) for the result of Maximum Transmit Power, which deemed to comply with the basic restrictions without testing.

Simultaneous Multi-band Transmission Evaluation:

According to EN62209-1:2016 section 6.4.3, when the handsets with multiple antennas or multiple transmitters (with single or multiple antennas), transmitting simultaneously require special test considerations;

(1) The EUT has GSM/WCDMA antenna, BT/ WIFI antenna;

(2) BT and WIFI share one antenna, and cannot transmit simultaneously;

(3) GSM and GPRS/WCDMA can't work at the same time;

(4) EN 62209-1:2016 section 6.4.3.2 ,SAR measurements for non-correlated signals, Alternative 1: Summation of peak spatial-average SAR values – simplest but most conservative method to find upper bound is always applicable:

a) For a test combination where simultaneous operation is intended, add the peak spatial-average SAR values for each antenna and frequency band where simultaneous operation is intended

b) Check if the maximum summed SAR value is within 3 dB of the applicable SAR limit. If so, ensure that all of the required test frequency channels have been measured in all frequency bands and for all antennas at which simultaneous operation is intended and repeat Step a).

c) The maximum summed SAR value in Steps a) and b) is the combined SAR.

Simultaneous Multi-band Transmission SAR:

NO	Simultaneous state	Portable Handset	
		Head	Body-worn
1	GSM(voice)+WIFI 2.4GHz (data)	Yes	Yes
2	GSM(Data)+WIFI 2.4GHz (data)	Yes	Yes
3	WCDMA(RMC12.2kbps)+WIFI 2.4GHz (data)	Yes	Yes

Frequency	RF Exposure Conditions	Test Position	Simultaneous Transmission Scenario		Σ10-g SAR (W/Kg)	Limit (W/Kg)
			GSM/WCDMA	WIFI		
GSM 900	Head (voice)	Left Touch	0.421	0.305	0.726	2.0
		Left Tilt	0.275	0.226	0.501	2.0
		Right Touch	0.408	0.326	0.734	2.0
		Right Tilt	0.274	0.169	0.443	2.0
		Body back	1.294	0.450	1.744	2.0
		Body Front	0.749	0.266	1.015	2.0
		Earphone	0.424	0.238	0.662	2.0
DCS 1800	Head (voice)	Left Touch	0.082	0.305	0.387	2.0
		Left Tilt	0.050	0.226	0.276	2.0
		Right Touch	0.147	0.326	0.473	2.0
		Right Tilt	0.040	0.169	0.209	2.0
		Body back	1.312	0.450	**1.762**	2.0
		Body Front	0.837	0.266	1.103	2.0
		Earphone	0.970	0.238	1.208	2.0
WCDMA Band I	Head	Left Touch	0.149	0.305	0.454	2.0
		Left Tilt	0.058	0.226	0.284	2.0
		Right Touch	0.134	0.326	0.460	2.0
		Right Tilt	0.052	0.169	0.221	2.0
	Body-worn	Body back	1.225	0.450	1.675	2.0
		Body Front	0.636	0.266	0.902	2.0
		HSDPA	0.983	0.450	1.433	2.0
		HSUPA	0.824	0.450	1.274	2.0
		Earphone	1.143	0.238	1.381	2.0
WCDMA Band VIII	Head	Left Touch	0.354	0.305	0.659	2.0
		Left Tilt	0.181	0.226	0.407	2.0
		Right Touch	0.321	0.326	0.647	2.0
		Right Tilt	0.216	0.169	0.385	2.0
	Body-worn	Body back	0.569	0.450	1.019	2.0
		Body Front	0.364	0.266	0.630	2.0
		HSDPA	0.544	0.450	0.994	2.0
		HSUPA	0.410	0.450	0.860	2.0
		Earphone	0.277	0.238	0.515	2.0

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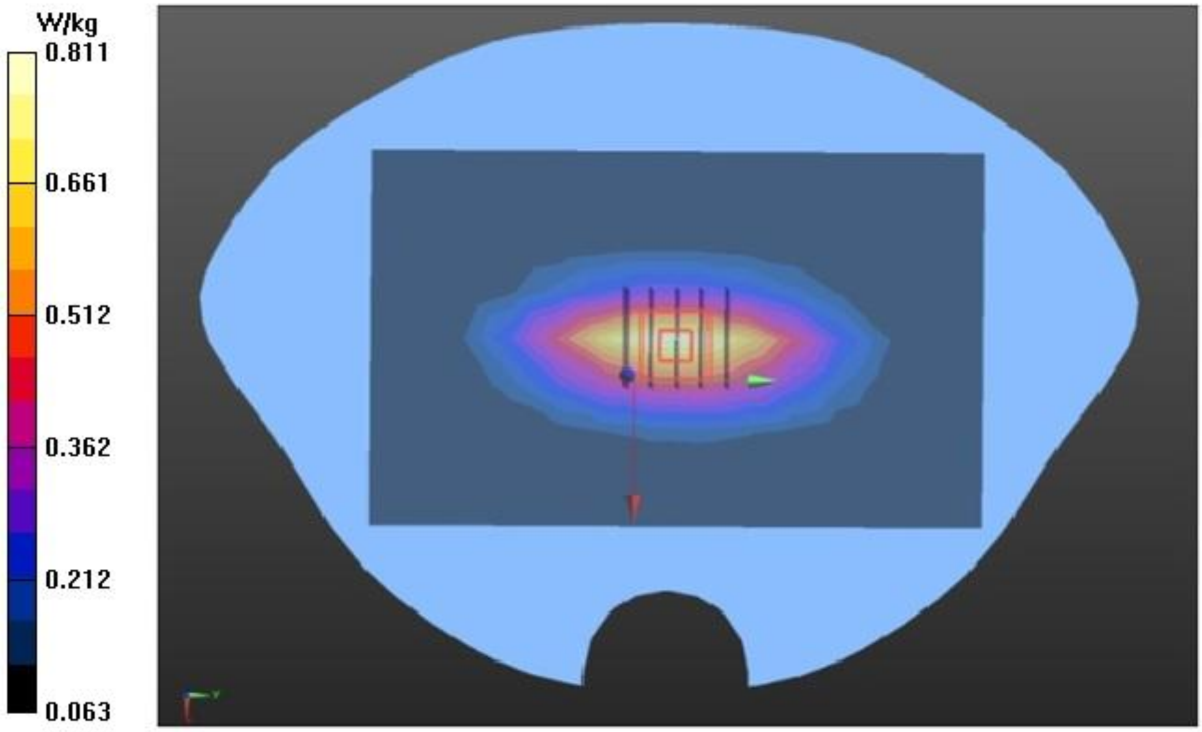
APPENDIX A. SAR SYSTEM CHECK DATA

Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
System Check Head 900 MHz
DUT: Dipole 900 MHz Type: SID 900

Communication System: CW; Communication System Band: D900 (900.0 MHz); Duty Cycle: 1:1;
Frequency: 900 MHz; Medium parameters used: f = 900 MHz; σ=0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 900MHz Head /Area Scan(9x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.805 W/kg
Configuration/System Check 900MHz Head /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.244 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.680 W/kg; SAR(10 g) = 0.427 W/kg
Maximum value of SAR (measured) = 0.811 W/kg



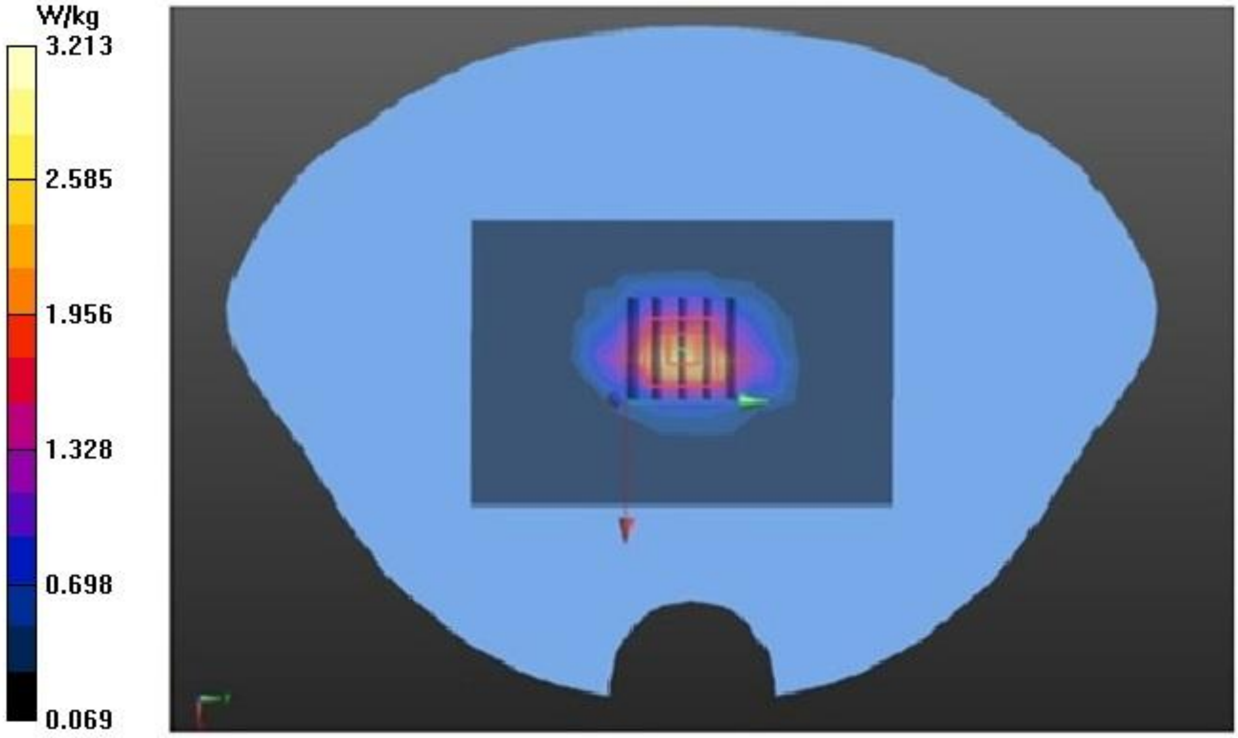
Test Laboratory: AGC Lab **Date: Apr. 23, 2018**
System Check Head 1800MHz
DUT: Dipole 1800 MHz; Type: SID 1800

Communication System: CW; Communication System Band: D1800 (1800.0 MHz); Duty Cycle: 1:1;
Frequency: 1800 MHz; Medium parameters used: f = 1810 MHz; σ= 1.41 mho/m; εr =40.61; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.16, 8.16, 8.16); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 1800MHz Head/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.21 W/kg

Configuration/System Check 1800MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.582 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 4.55 W/kg
SAR(1 g) = 2.53 W/kg; SAR(10 g) = 1.32 W/kg



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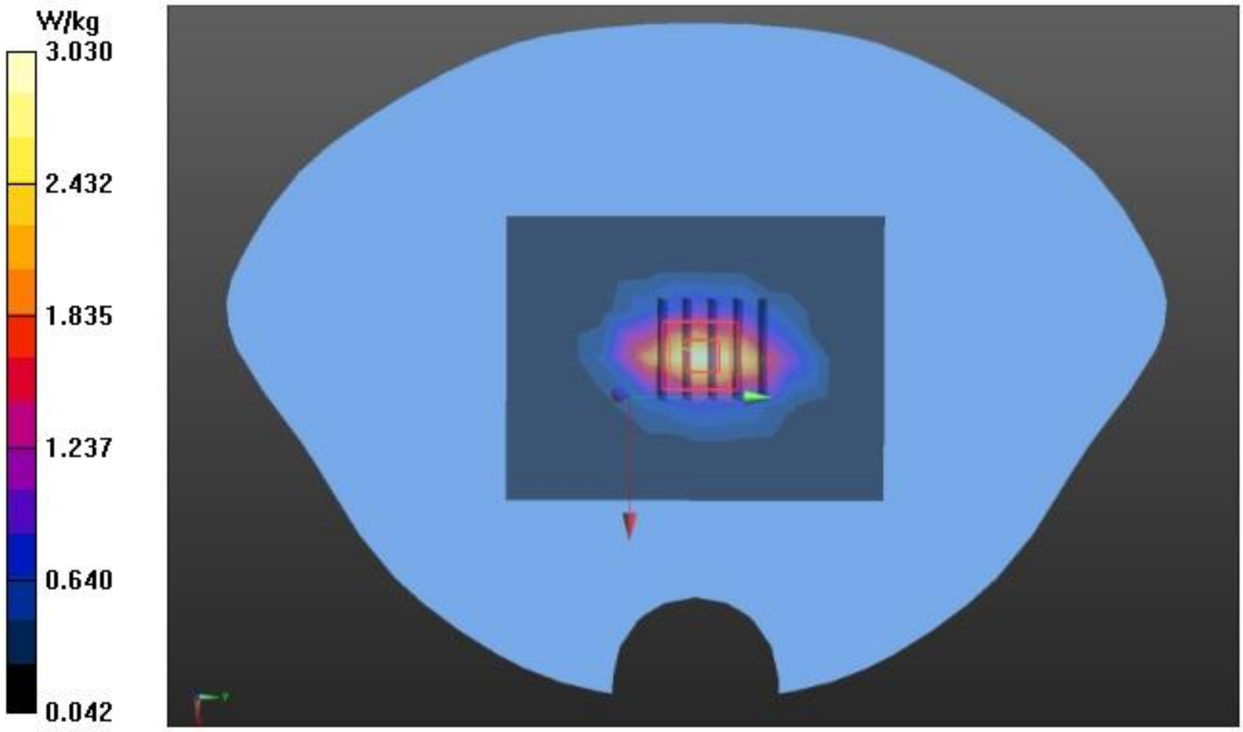
Test Laboratory: AGC Lab **Date: Apr. 19, 2018**
System Check Head 2000MHz
DUT: Dipole 2000 MHz; Type: SID 2000

Communication System: CW; Communication System Band: D2000 (2000.0 MHz); Duty Cycle: 1:1;
Frequency: 2000 MHz; Medium parameters used: f = 1900MHz; σ=1.43 mho/m; εr =41.09; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.5

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.08, 8.08, 8.08); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration / System Check 2000MHz Head/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.03 W/kg

Configuration / System Check 2000MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.689 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 4.49 W/kg
SAR(1 g) = 2.49 W/kg; SAR(10 g) = 1.26 W/kg

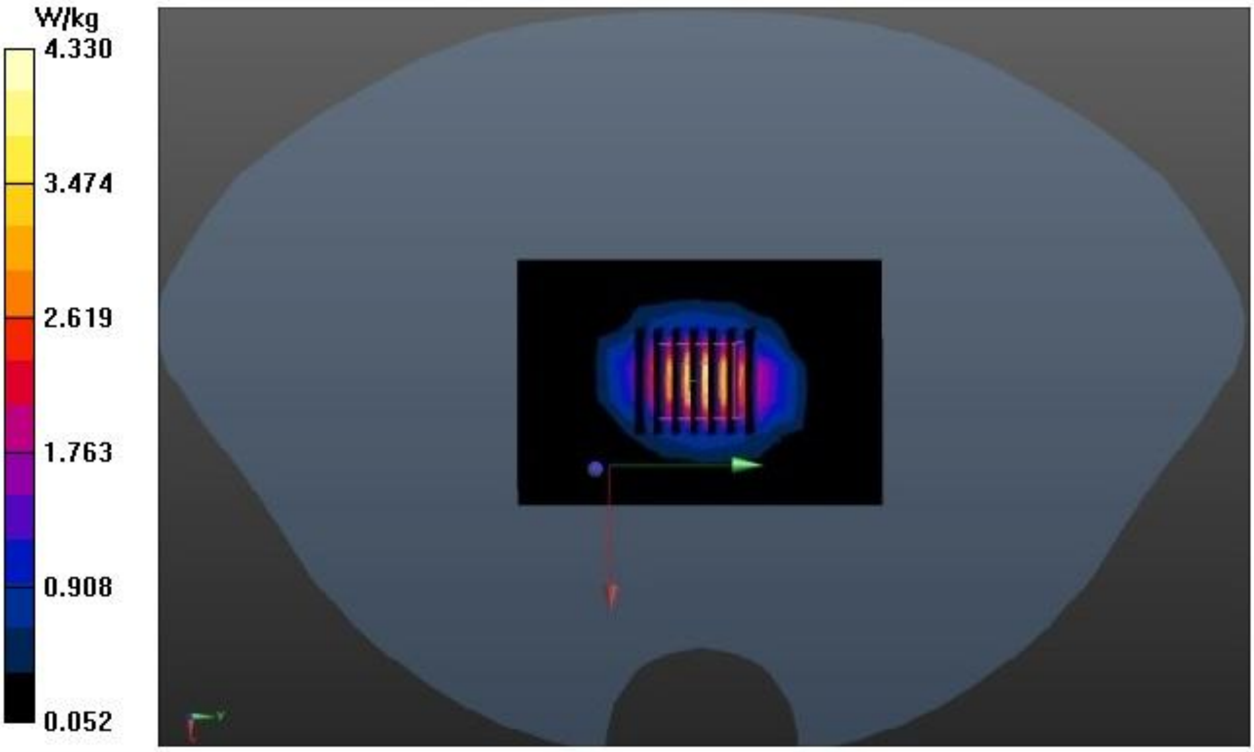


Test Laboratory: AGC Lab **Date: Apr. 20, 2018**
System Check Head 2450 MHz
DUT: Dipole 2450 MHz Type: D2450V2

Communication System: CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;
Frequency: 2450 MHz; Medium parameters used: f = 2450 MHz; σ =1.82 mho/m; εr =38.94; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃): 21.7, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.61, 7.61, 7.61); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check Head 2450MHz /Area Scan (7x12x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 4.05 W/kg
Configuration/System Check Head 2450MHz /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.167 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 6.89 W/kg
SAR(1 g) = 3.29 W/kg; SAR(10 g) = 1.5 W/kg
Maximum value of SAR (measured) = 4.33 W/kg



APPENDIX B. SAR MEASUREMENT DATA

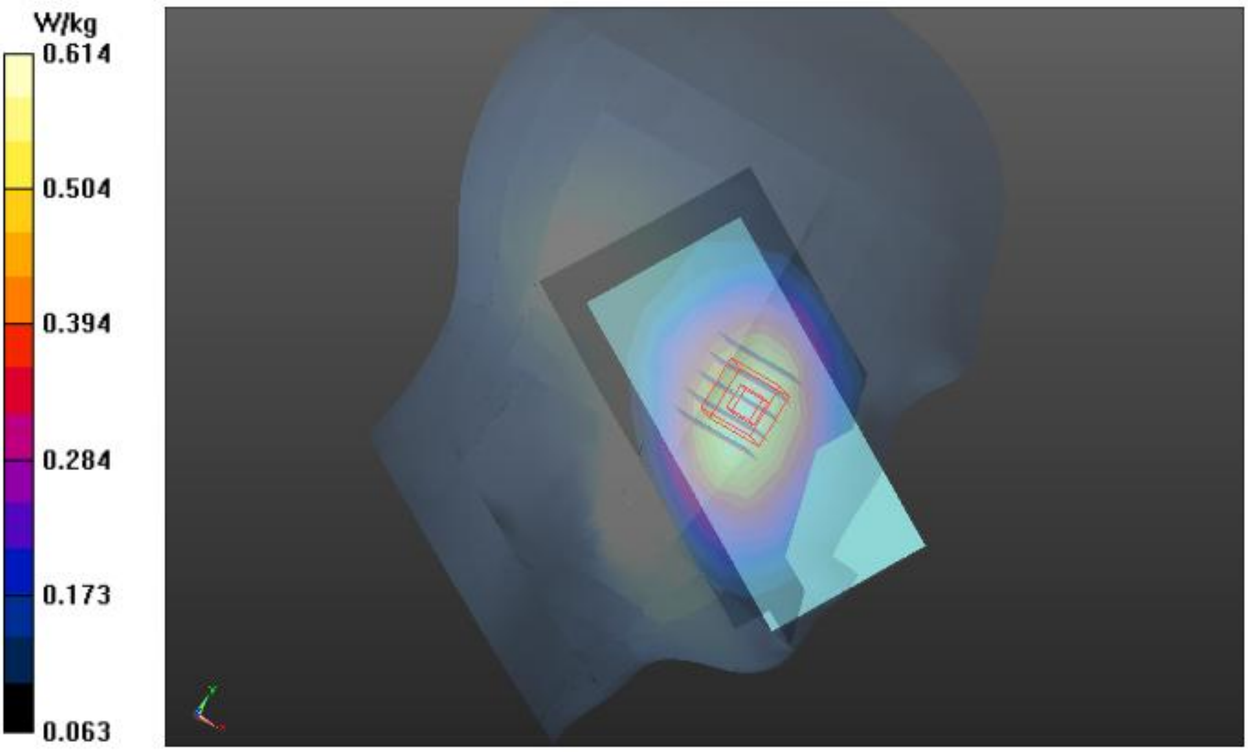
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
GSM 900 Mid-Touch-Left <SIM 1>
DUT: Smart Phone; Type: J3

Communication System: Generic GSM; Communication System Band: GSM 900; Duty Cycle: 1:8.3;
Frequency: 897.4 MHz; Medium parameters used: f = 900 MHz; σ=0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Left Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
• Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
• Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
• Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
• Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
• DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

LEFT HEAD/L-C/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.614 W/kg

LEFT HEAD/L-C/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.281 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.678 W/kg
SAR(1 g) = 0.521 W/kg; SAR(10 g) = 0.380 W/kg



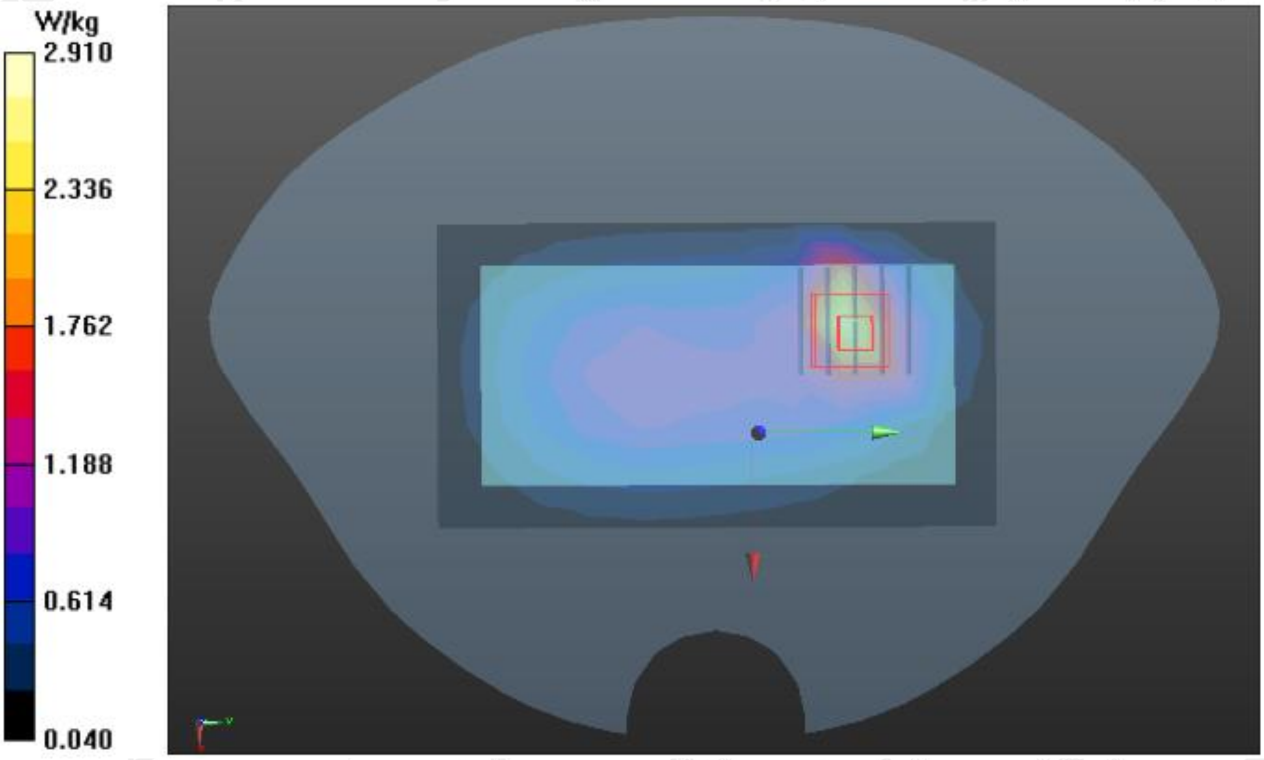
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
GPRS 900 Mid-Body-Back (4up) <SIM 1>
DUT: Smart Phone; Type: J3

Communication System: GPRS -4 Slot; Communication System Band: GSM 900; Duty Cycle: 1:2.1 ;
Frequency: 897.4 MHz; Medium parameters used: f = 900 MHz; σ=0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY 4ST/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.69 W/kg

BODY /4ST/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.357 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.80 W/kg
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.09 W/kg
Maximum value of SAR (measured) = 2.91 W/kg



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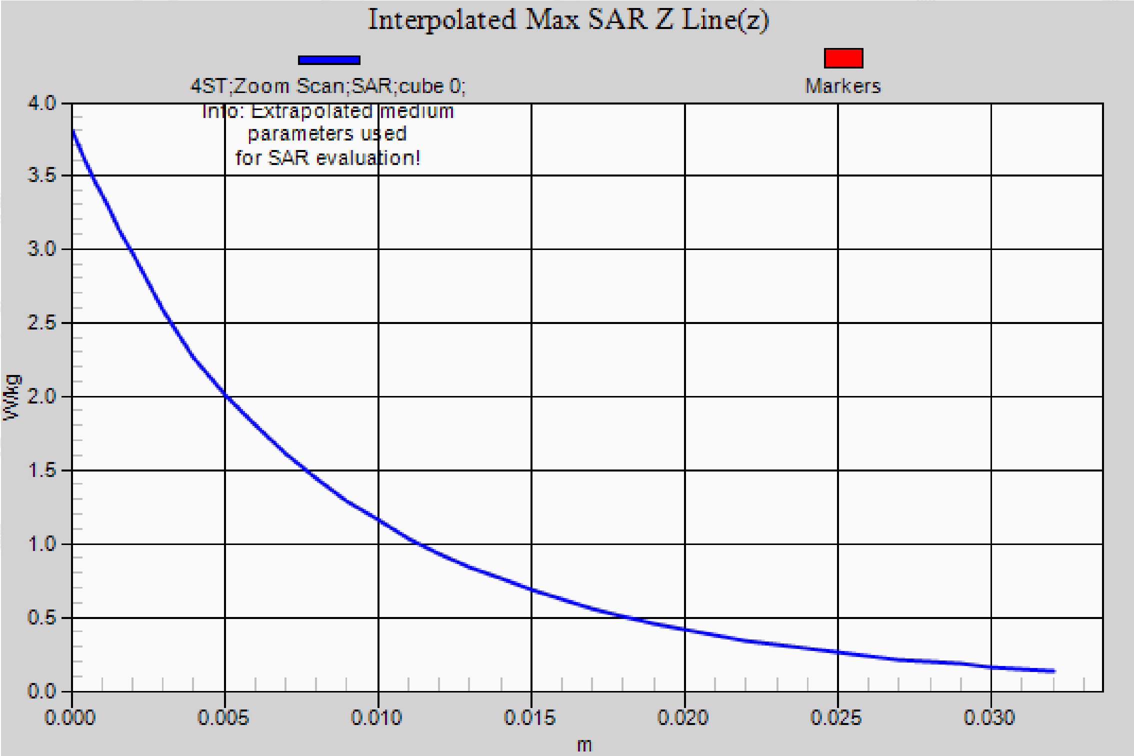

Interpolated Max SAR Z Line(z)
4ST;Zoom Scan;SAR;cube 0;
Markers
Info: Extrapolated medium parameters used for SAR evaluation!
W/kg
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

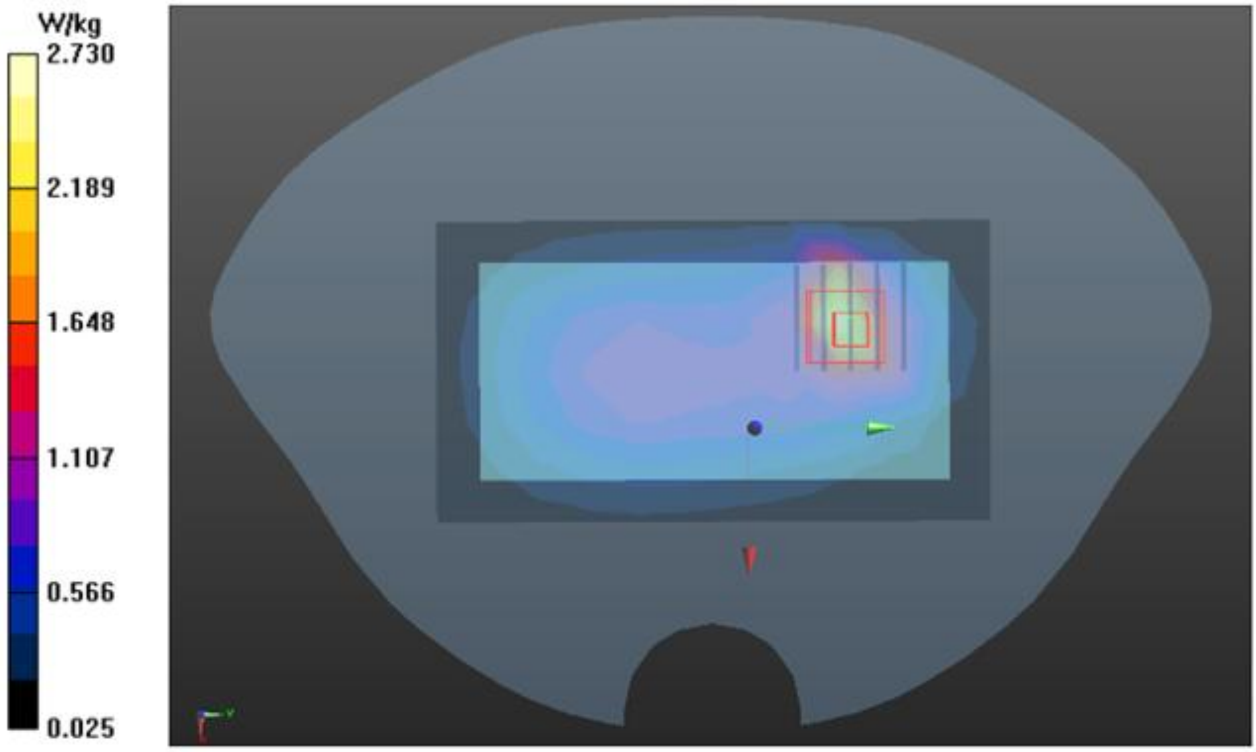
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
GPRS 900 High-Body-Back (4up) <SIM 1>
DUT: Smart Phone; Type: J3

Communication System: GPRS -4 Slot; Communication System Band: GSM 900; Duty Cycle: 1:2.1 ;
Frequency: 914.8 MHz; Medium parameters used: f = 900 MHz; σ=0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/4ST-H/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.55 W/kg

BODY/4ST-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.774 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.68 W/kg
SAR(1 g) = 1.89 W/kg; SAR(10 g) = 0.968 W/kg
Maximum value of SAR (measured) = 2.73 W/kg



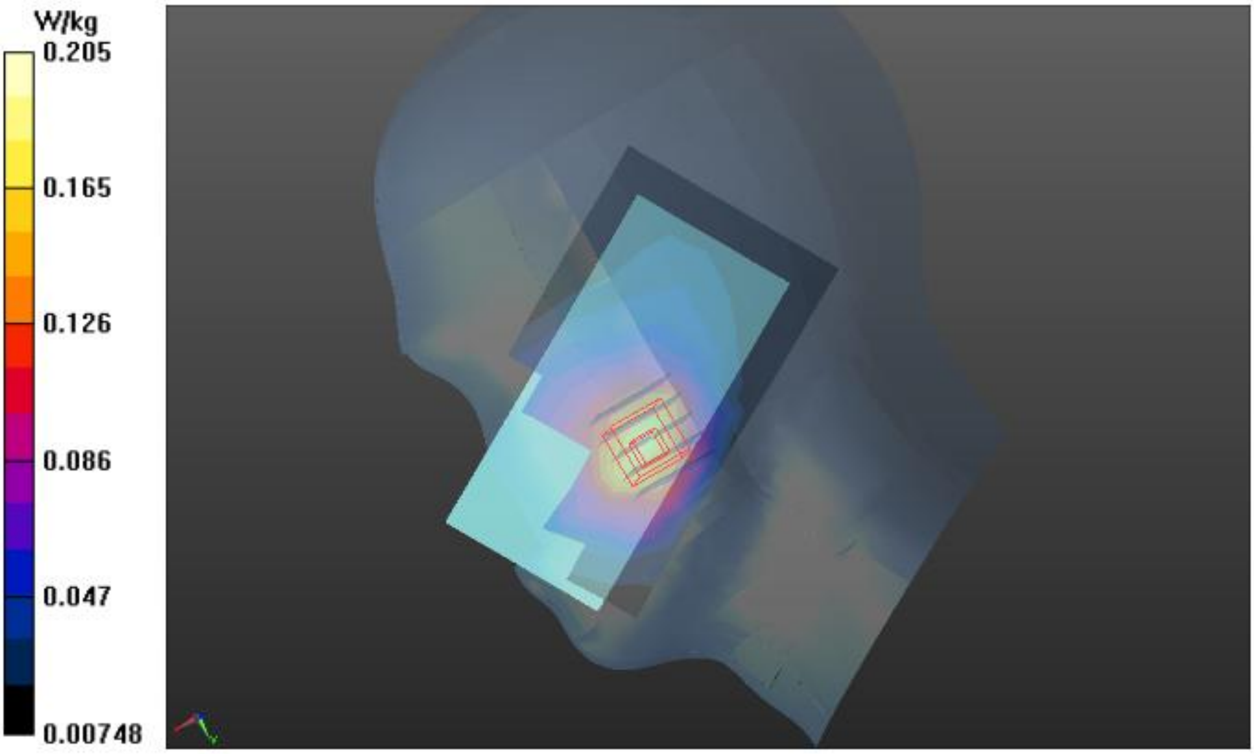
Test Laboratory: AGC Lab **Date: Apr. 23, 2018**
DCS 1800 Mid-Touch-Right <SIM 1>
DUT: Smart Phone; Type: J3

Communication System: Generic GSM; Communication System Band: DCS 1800; Duty Cycle: 1:8.3;
Frequency: 1747.4 MHz; Medium parameters used: f = 1810 MHz; σ= 1.41 mho/m; εr =40.61; ρ= 1000 kg/m³ ;
Phantom section: Right Section
Ambient temperature (℃): 22.0, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.16, 8.16, 8.16); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

RIGHT HEAD/R-C/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.198 W/kg

RIGHT HEAD/R-C/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.358 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.166 W/kg; SAR(10 g) = 0.108 W/kg
Maximum value of SAR (measured) = 0.205 W/kg



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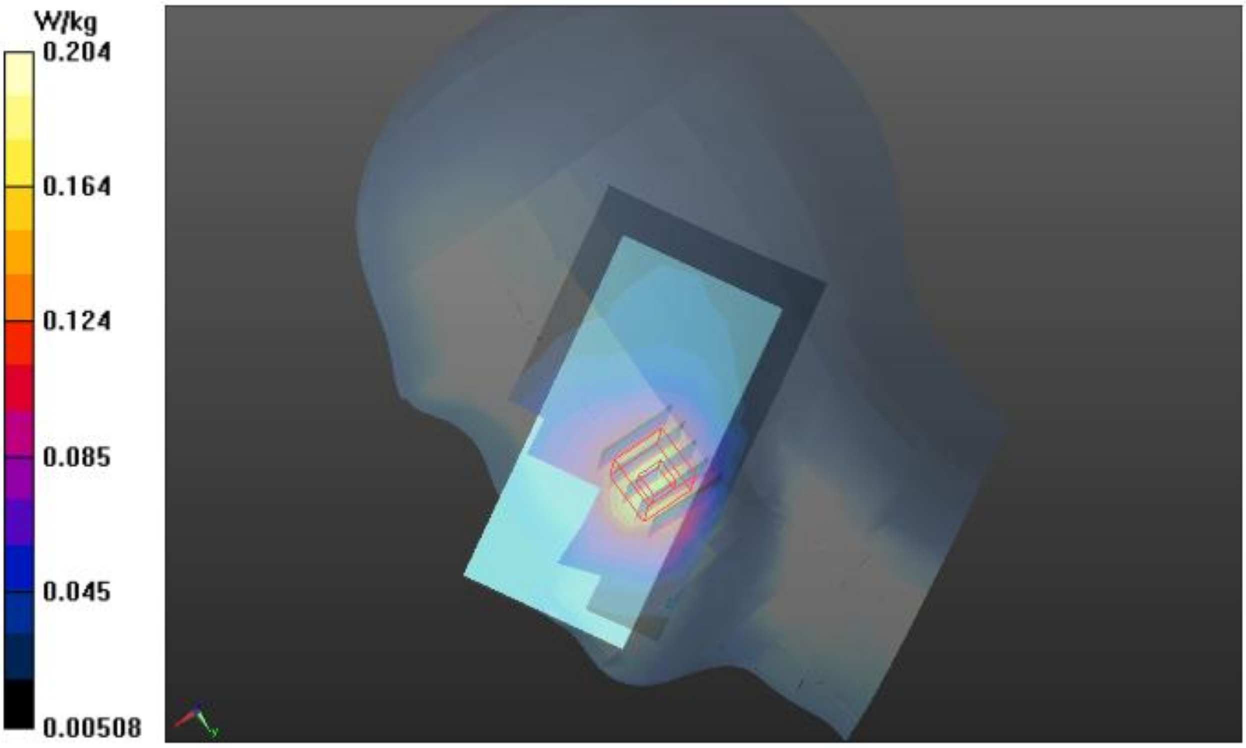
Test Laboratory: AGC Lab **Date: Apr. 23, 2018**
DCS 1800 High-Touch-Right <SIM 1>
DUT: Smart Phone; Type: J3

Communication System: Generic GSM; Communication System Band: DCS 1800; Duty Cycle: 1:8.3;
Frequency: 1784.8 MHz; Medium parameters used: f = 1810 MHz; σ= 1.41 mho/m; εr =40.61; ρ= 1000 kg/m³ ;
Phantom section: Right Section
Ambient temperature (℃): 22.0, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.16, 8.16, 8.16); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

RIGHT HEAD/R-C-H/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.195 W/kg

RIGHT HEAD/R-C-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.308 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.106 W/kg
Maximum value of SAR (measured) = 0.204 W/kg



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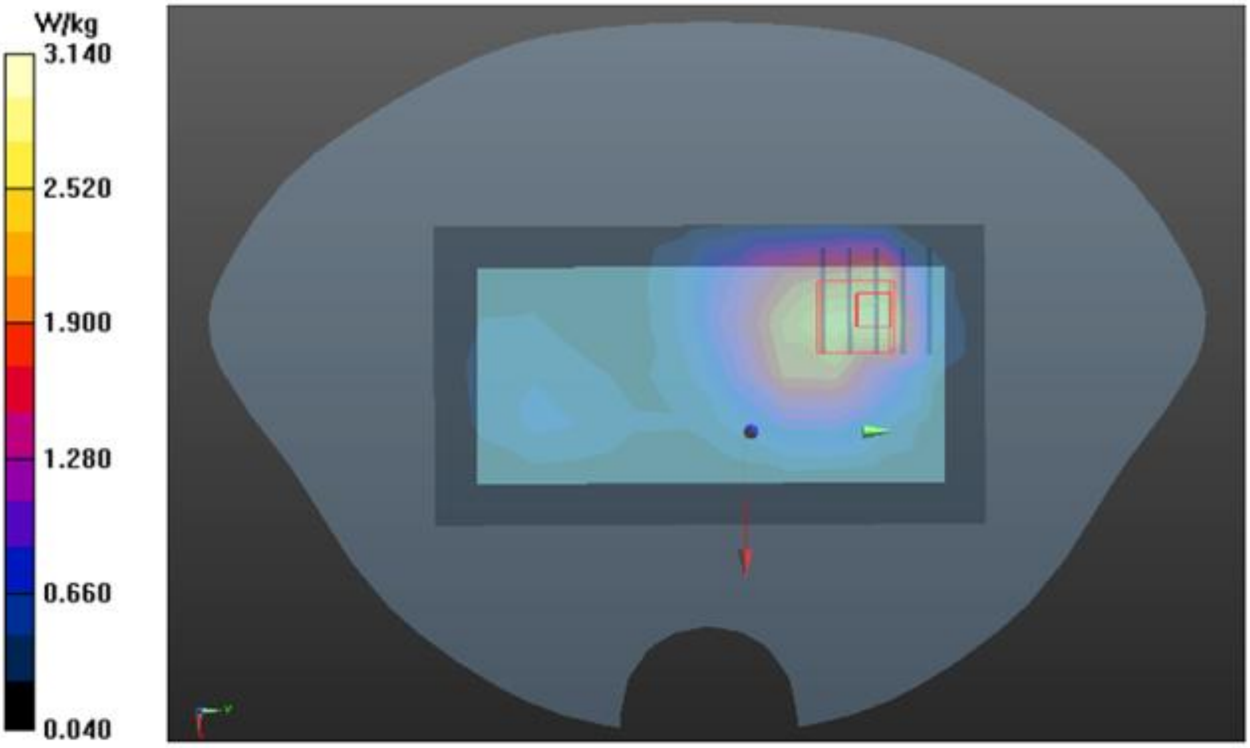
Test Laboratory: AGC Lab **Date: Apr. 23, 2018**
GPRS 1800 High-Body- Back (4up) <SIM 1>
DUT: Smart Phone; Type: J3

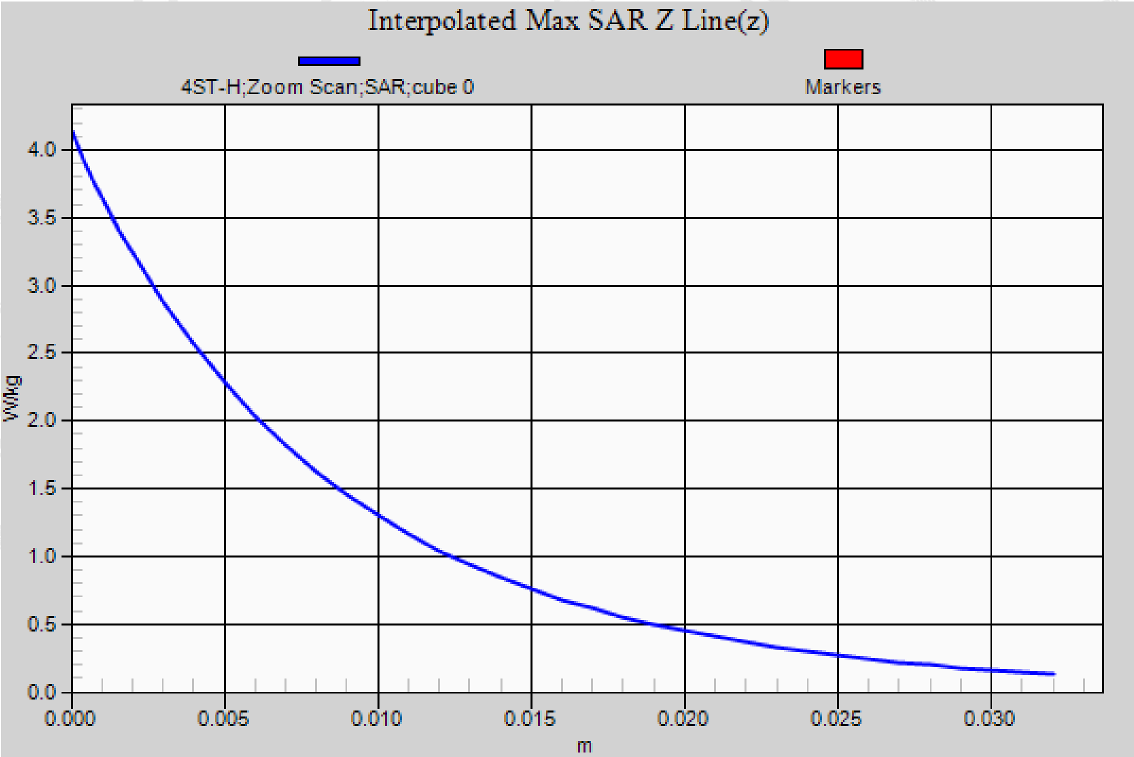
Communication System: GPRS-4 Slot; Communication System Band: DCS 1800; Duty Cycle: 1:2.1;
Frequency: 1784.8 MHz; Medium parameters used: f = 1810 MHz; σ= 1.41 mho/m; εr =40.61; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 22.0, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.16, 8.16, 8.16); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/4ST-H/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.75 W/kg

BODY/4ST-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.952 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 4.13 W/kg
SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.3 W/kg
Maximum value of SAR (measured) = 3.14 W/kg




Interpolated Max SAR Z Line(z)
4ST-H;Zoom Scan;SAR;cube 0
Markers
W/kg
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

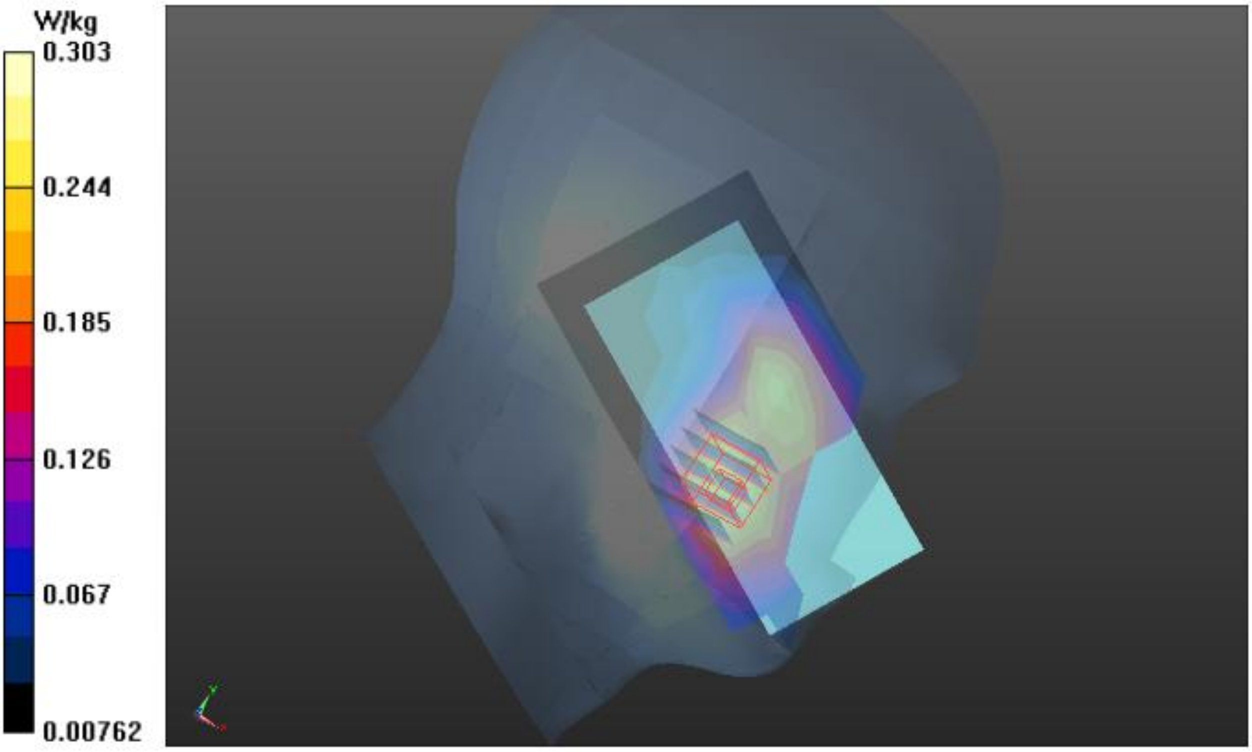
Test Laboratory: AGC Lab **Date: Apr. 19, 2018**
WCDMA Band I Low-Touch-Left (RMC)
DUT: Smart Phone; Type: J3

Communication System: UMTS; Communication System Band: Band Ⅰ UTRA/FDD ; Duty Cycle: 1:1; ;
Frequency: 1922.4MHz; Medium parameters used: f = 1900MHz; σ= 1.43 mho/m; εr =41.09; ρ= 1000 kg/m³ ;
Phantom section: Left Section
Ambient temperature (℃):22.0, Liquid temperature (℃):21.5

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.08, 8.08, 8.08); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

LEFT HEAD/L-C-L/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.268 W/kg

LEFT HEAD/L-C-L/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.483 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.361 W/kg
SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.147 W/kg
Maximum value of SAR (measured) = 0.303 W/kg



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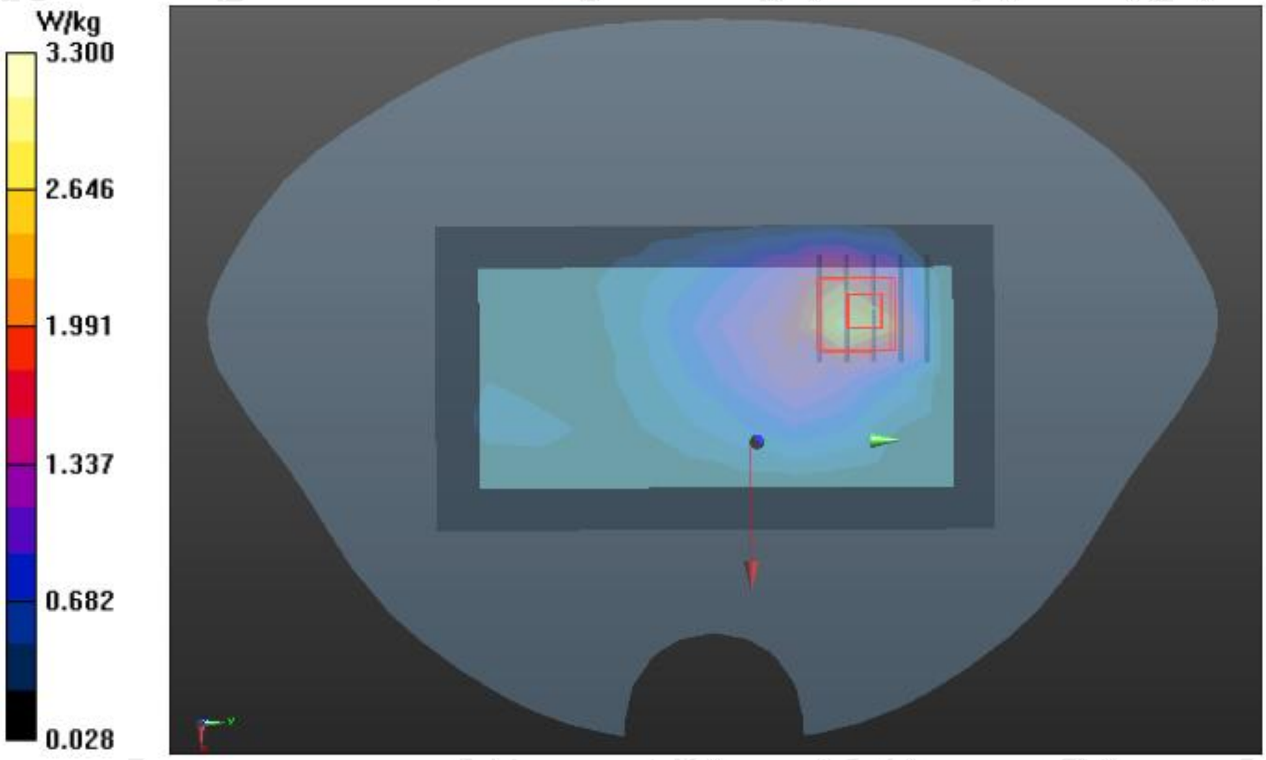
Test Laboratory: AGC Lab **Date: Apr. 19, 2018**
WCDMA Band I High-Body-Towards Grounds (RMC)
DUT: Smart Phone; Type: J3

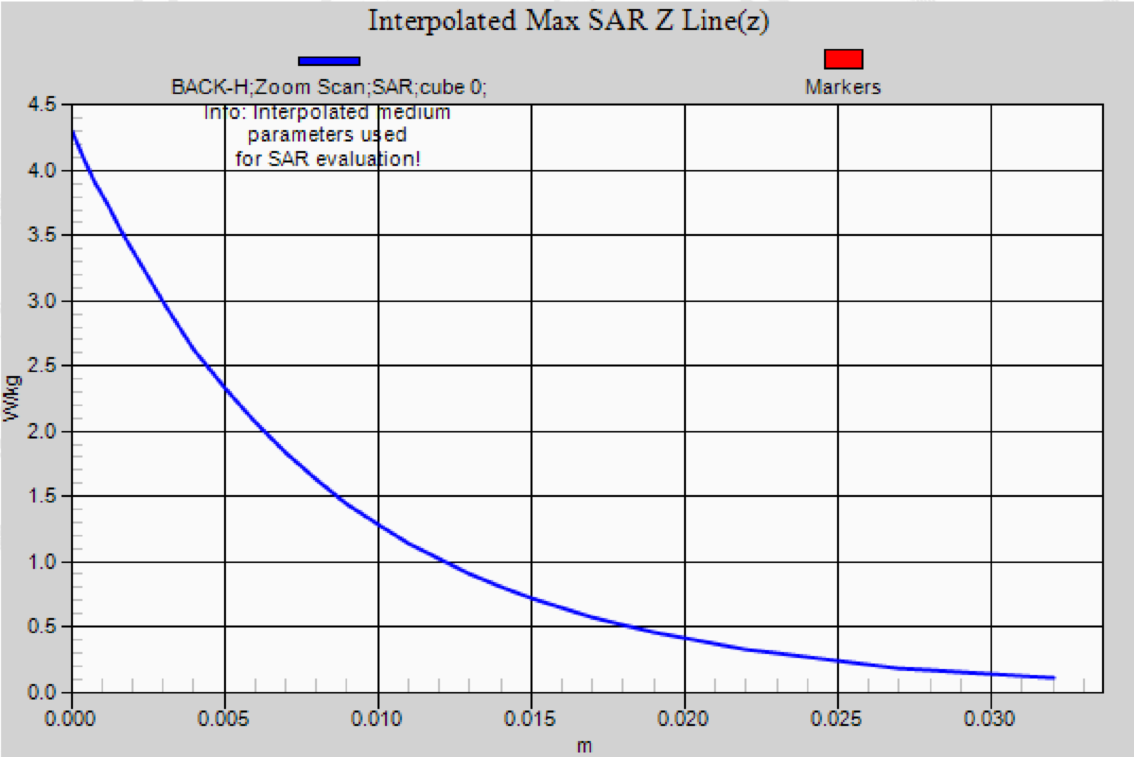
Communication System: UMTS; Communication System Band: Band Ⅰ UTRA/FDD ;Duty Cycle:1:1;
Frequency: 1977.6MHz; Medium parameters used: f = 1900MHz; σ= 1.43 mho/m; εr =41.09; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃):21.5

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(8.08, 8.08, 8.08); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK-H/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.56 W/kg

BODY/BACK-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.019 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 4.30 W/kg
SAR(1 g) = 2.3 W/kg; SAR(10 g) = 1.2 W/kg
Maximum value of SAR (measured) = 3.30 W/kg





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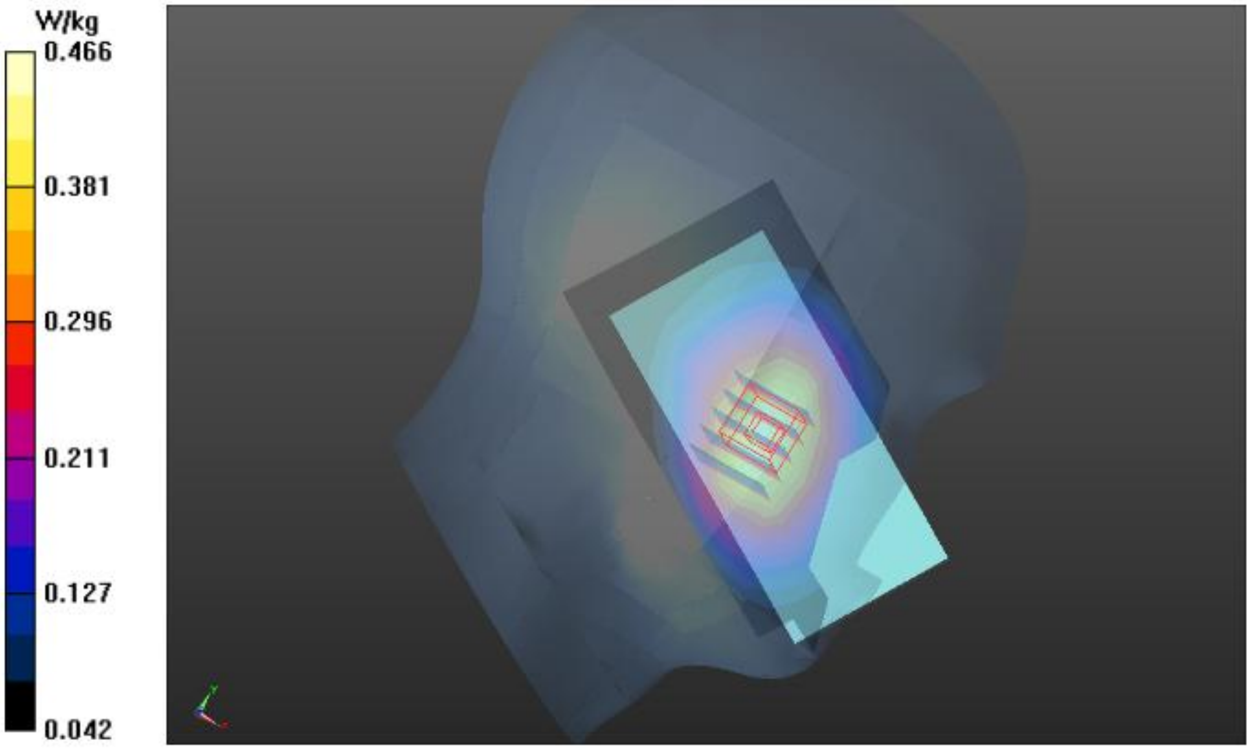
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
WCDMA Band VIII Low-Touch-Left (RMC)
DUT: Smart Phone; Type: J3

Communication System: UMTS; Communication System Band: BAND VIII UTRA/FDD; Duty Cycle:1:1;
Frequency: 882.4 MHz; Medium parameters used: f = 900 MHz; σ=0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Left Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

LEFT HEAD/L-C-L/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.449 W/kg

LEFT HEAD/L-C-L/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.326 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.523 W/kg
SAR(1 g) = 0.399 W/kg; SAR(10 g) = 0.291 W/kg
Maximum value of SAR (measured) = 0.466 W/kg



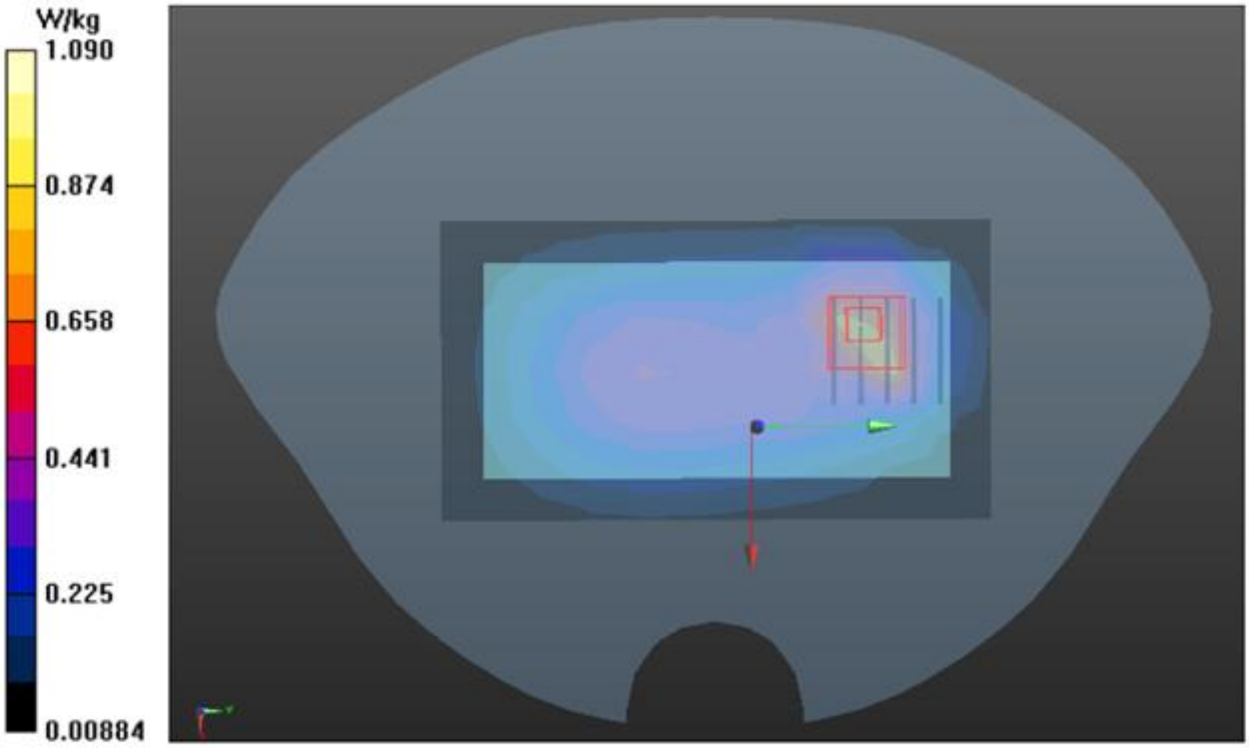
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
WCDMA Band VIII Low-Body-Towards Grounds (RMC)
DUT: Smart Phone; Type: J3

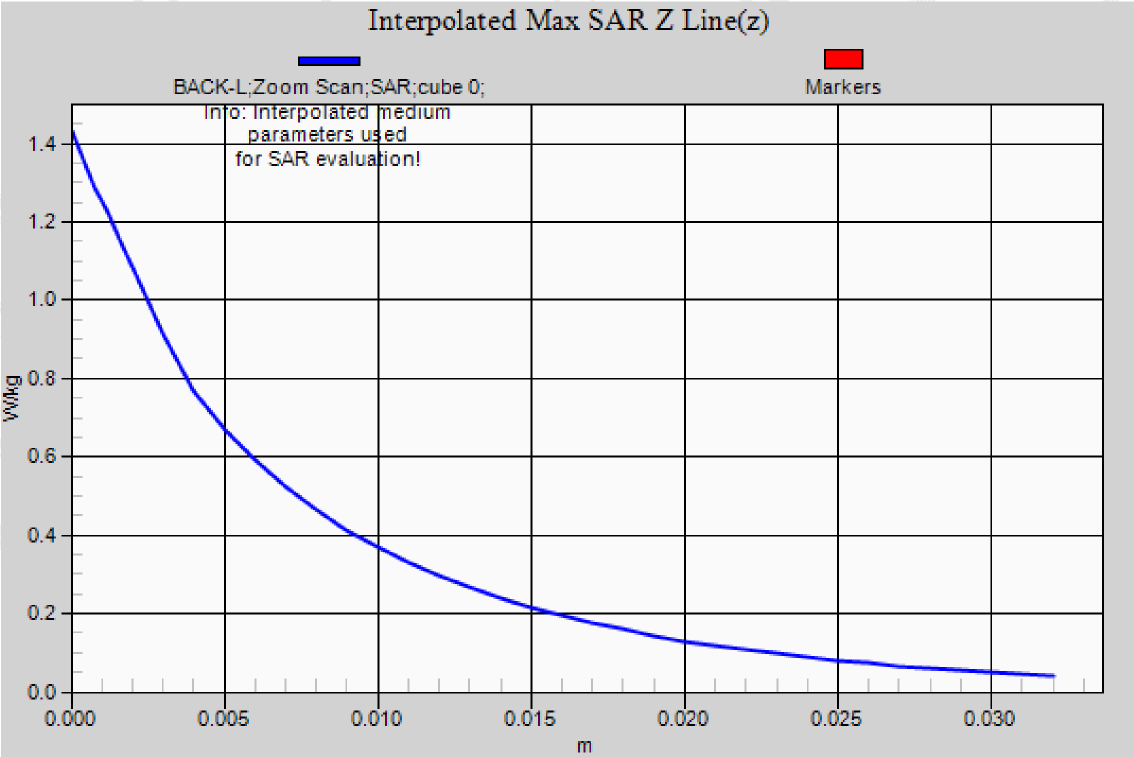
Communication System: UMTS; Communication System Band: BAND VIII UTRA/FDD; Duty Cycle:1:1;
Frequency: 882.4MHz; Medium parameters used: f = 900 MHz; σ= 0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK-L/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.931 W/kg

BODY/BACK-L/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.468 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.369 W/kg
Maximum value of SAR (measured) = 1.09 W/kg




Interpolated Max SAR Z Line(z)
BACK-L;Zoom Scan;SAR;cube 0;
Markers
Info: Interpolated medium parameters used for SAR evaluation!
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

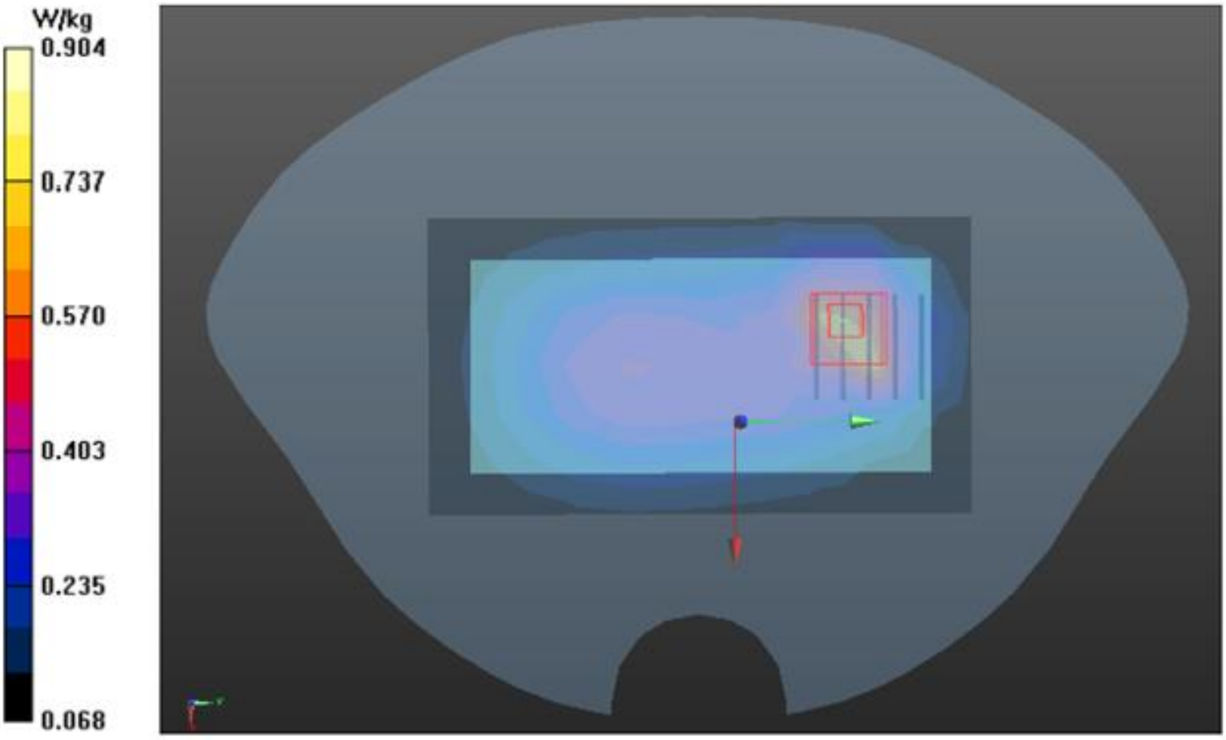
Test Laboratory: AGC Lab **Date: Apr. 24, 2018**
WCDMA Band VIII High-Body-Towards Ground (RMC)
DUT: Smart Phone; Type: J3

Communication System: UMTS; Communication System Band: BAND VIII UTRA/FDD; Duty Cycle:1:1;
Frequency:912.6MHz; Medium parameters used: f = 900 MHz; σ= 0.96 mho/m; εr =41.08; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.9, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(9.84, 9.84, 9.84); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK-H/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.872 W/kg

BODY/BACK-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.294 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.647 W/kg; SAR(10 g) = 0.346 W/kg
Maximum value of SAR (measured) = 0.904 W/kg



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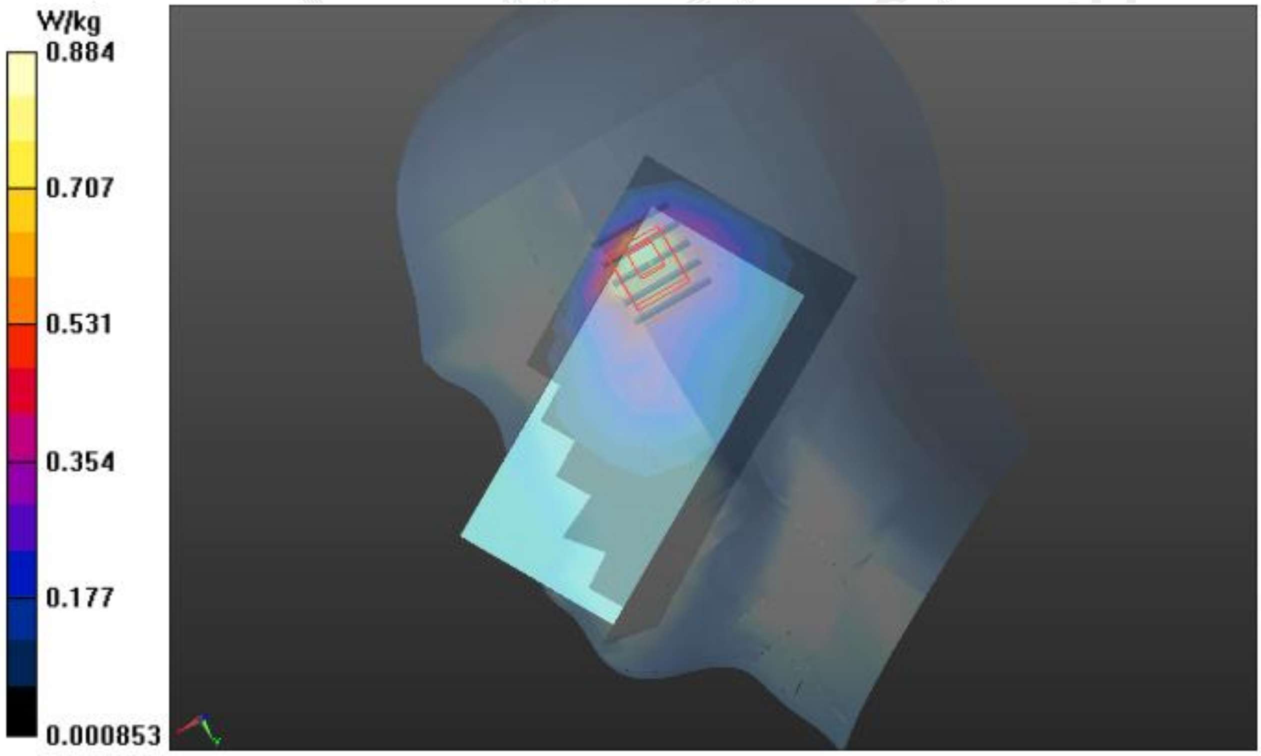
WIFI MODE
Test Laboratory: AGC Lab **Date: Apr. 20, 2018**
802.11b Mid- Touch-Right
DUT: Smart Phone; Type: J3

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2442 MHz; Medium parameters used: f = 2450 MHz; σ =1.82 mho/m; εr =38.94; ρ= 1000 kg/m³ ;
Phantom section: Right Section
Ambient temperature (℃):21.7, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.61, 7.61, 7.61); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

RIGHT HEAD/R-C/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.827 W/kg

RIGHT HEAD/R-C/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.409 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.611 W/kg; SAR(10 g) = 0.315 W/kg
Maximum value of SAR (measured) = 0.884 W/kg



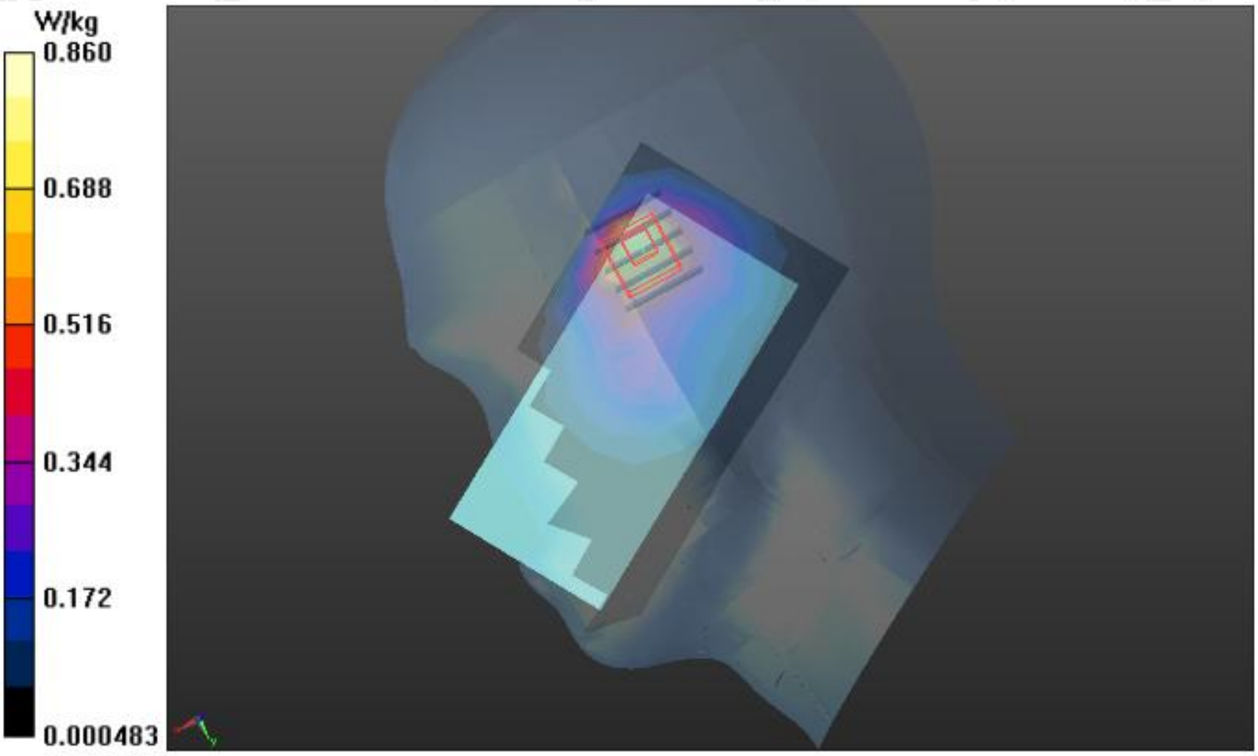
Test Laboratory: AGC Lab **Date: Apr. 20, 2018**
802.11b High- Touch-Right
DUT: Smart Phone; Type: J3

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2472 MHz; Medium parameters used: f = 2450 MHz; σ =1.82 mho/m; εr =38.94; ρ= 1000 kg/m³ ;
Phantom section: Right Section
Ambient temperature (℃):21.7, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.61, 7.61, 7.61); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

RIGHT HEAD/R-C-H/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.801 W/kg

RIGHT HEAD/R-C-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.114 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.595 W/kg; SAR(10 g) = 0.308 W/kg
Maximum value of SAR (measured) = 0.860 W/kg



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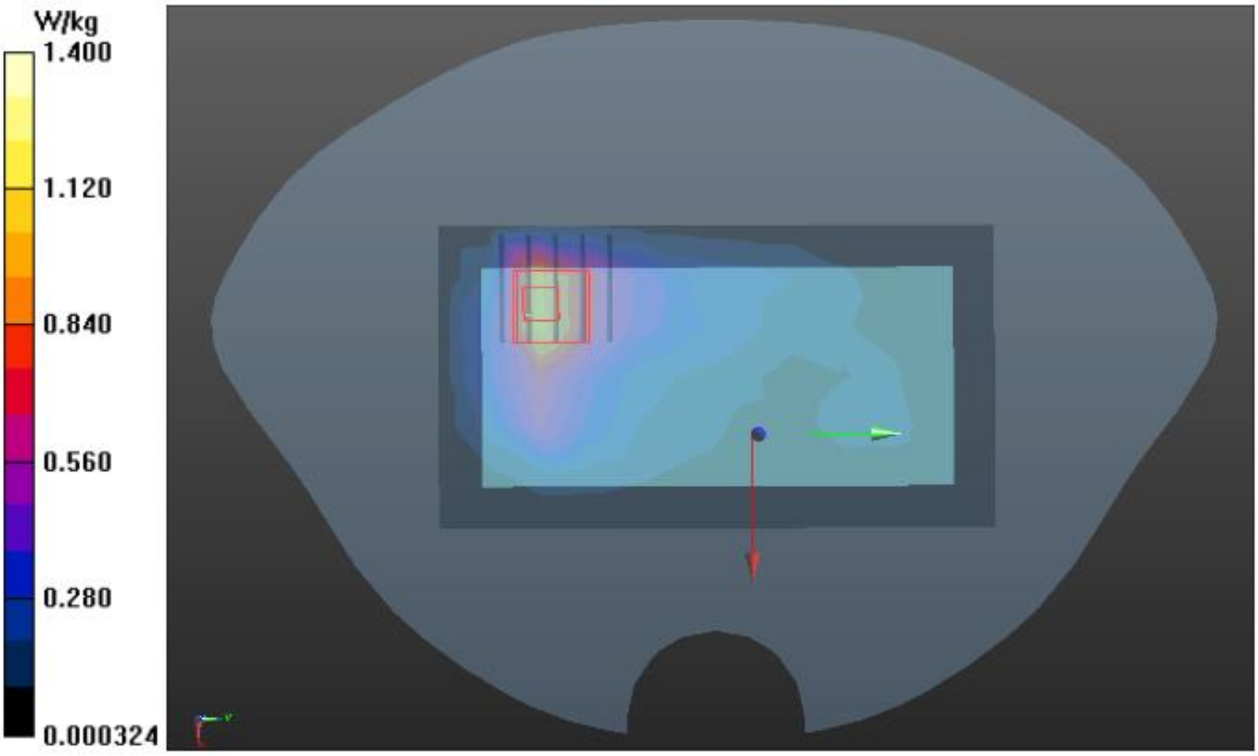
Test Laboratory: AGC Lab **Date: Apr. 20, 2018**
802.11b Low-Body-Worn- Back
DUT: Smart Phone; Type: J3

Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2412 MHz; Medium parameters used: f = 2450 MHz; σ =1.82 mho/m; εr =38.94; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.7, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.61, 7.61, 7.61); Calibrated:Aug. 31,2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: Feb. 08, 2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK-L/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.10 W/kg

BODY/BACK-L/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.517 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 0.959 W/kg; SAR(10 g) = 0.429 W/kg
Maximum value of SAR (measured) = 1.40 W/kg



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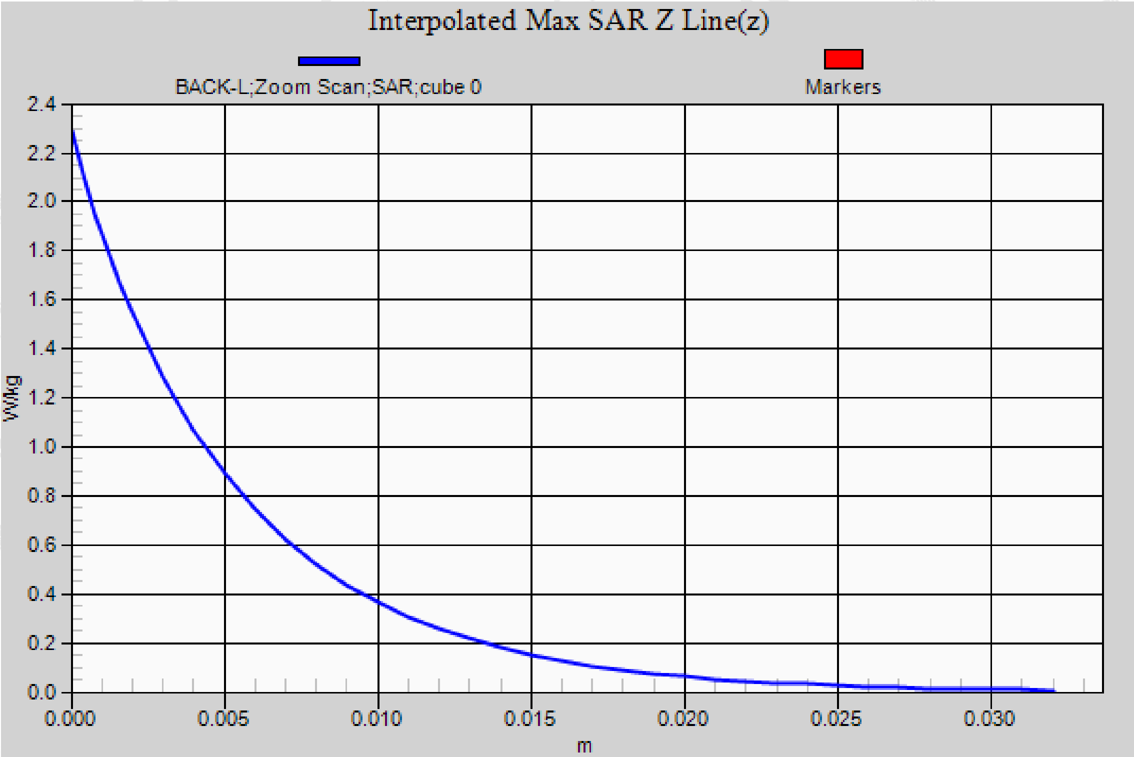
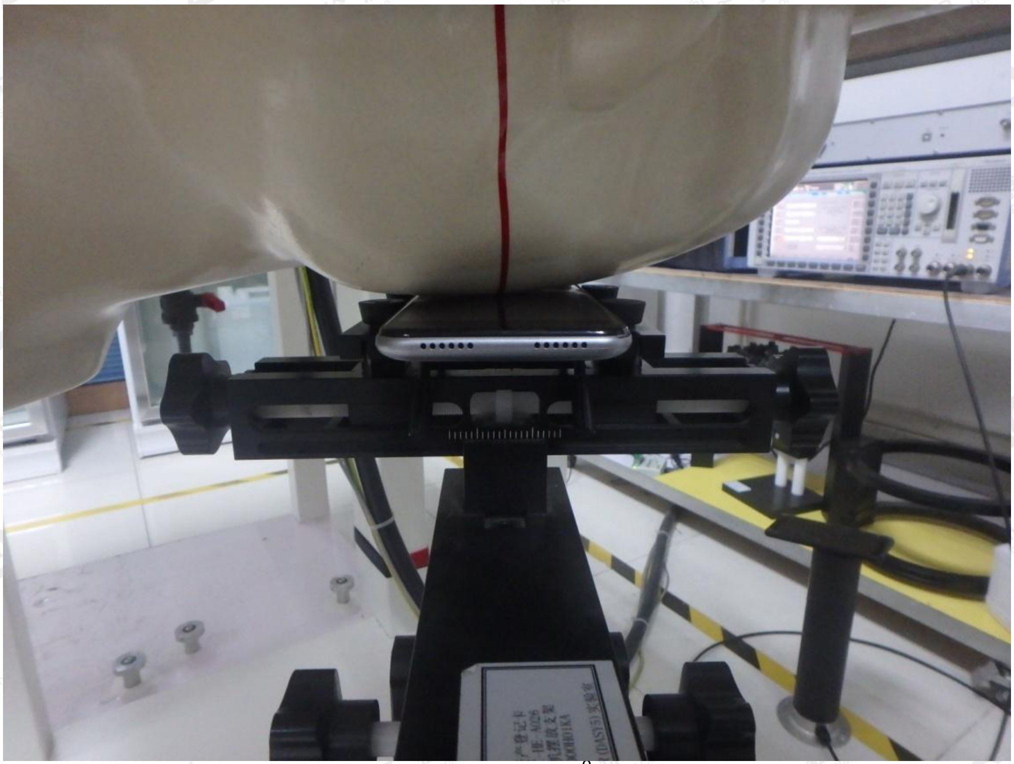
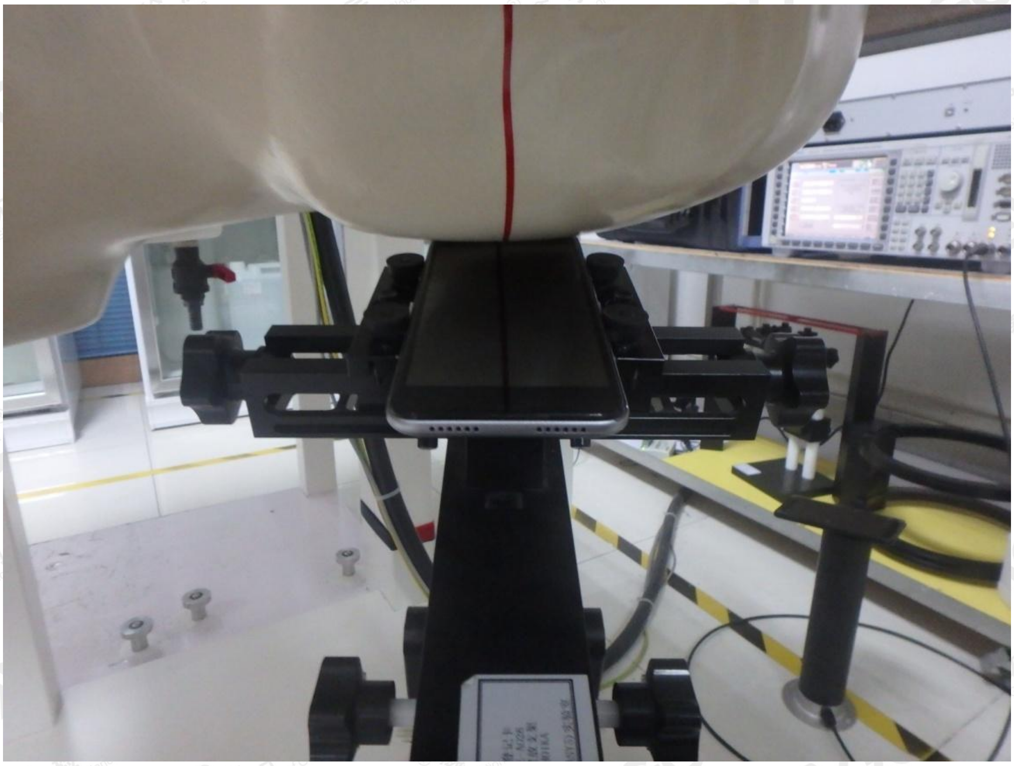

Interpolated Max SAR Z Line(z)
BACK-L;Zoom Scan;SAR;cube 0
Markers
W/kg
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

APPENDIX C. TEST SETUP PHOTOGRAPHS

LEFT-CHEEK TOUCH



LEFT-TILT 15^0



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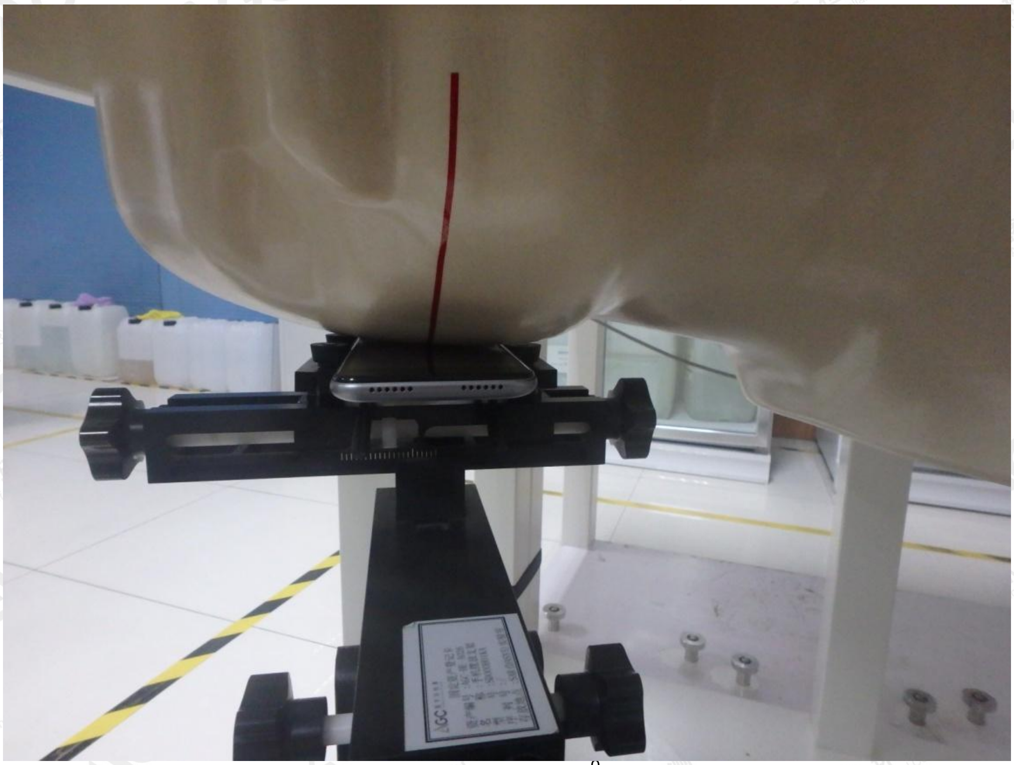
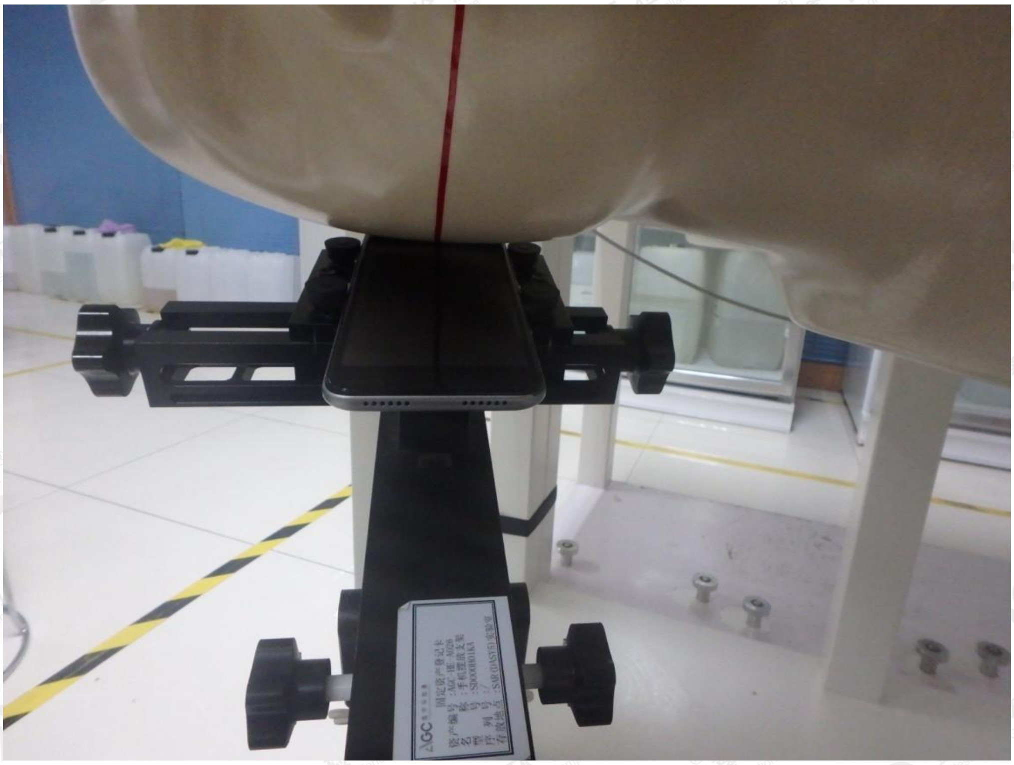
RIGHT-CHEEK TOUCH



RIGHT-TILT 15^0

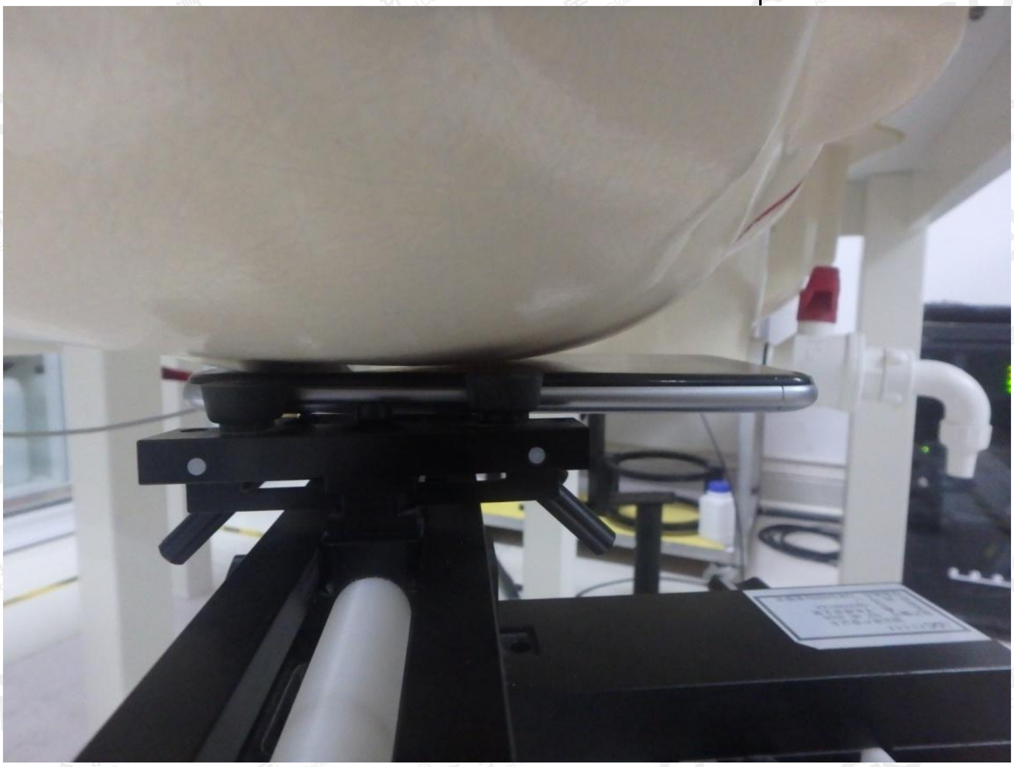


Body Back 5mm

Body Front 5mm

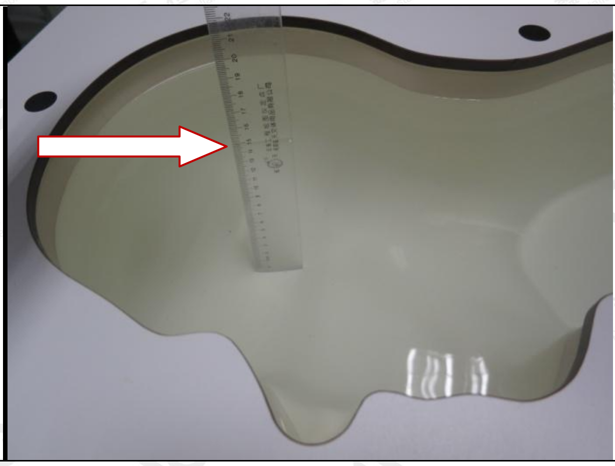
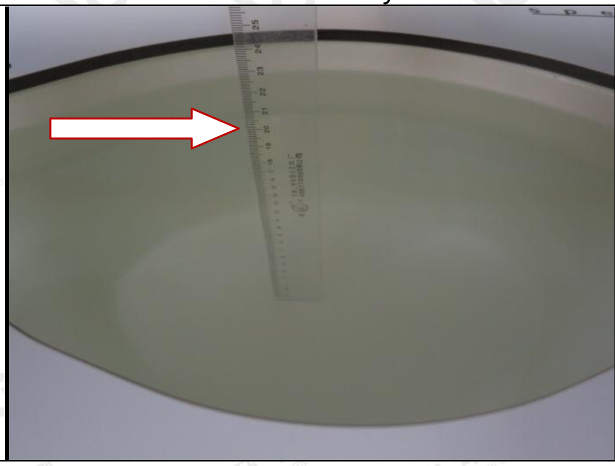
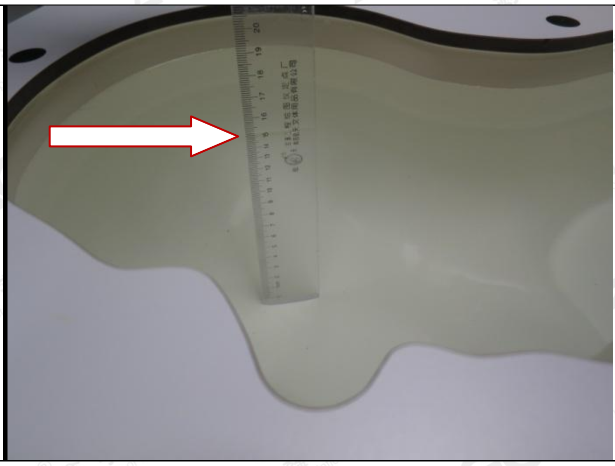
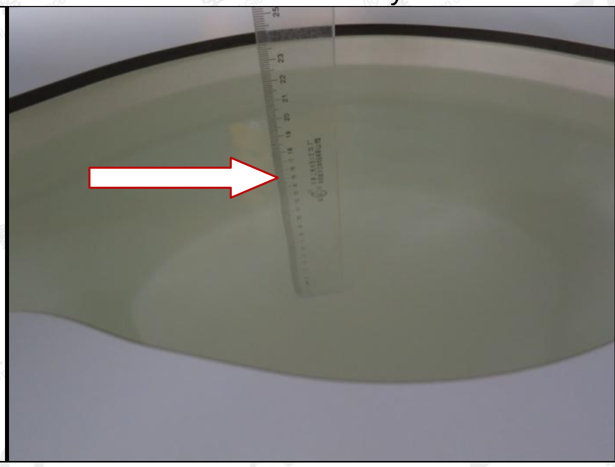
Body back with Headset 5mm

Position of the device under test in relation to the phantom



DEPTH OF THE LIQUID IN THE PHANTOM—ZOOM IN

Note：The position used in the measurement were according to EN62209-1/2

900MHz head	900MHz body
	
1800MHz head	1800MHz body
	

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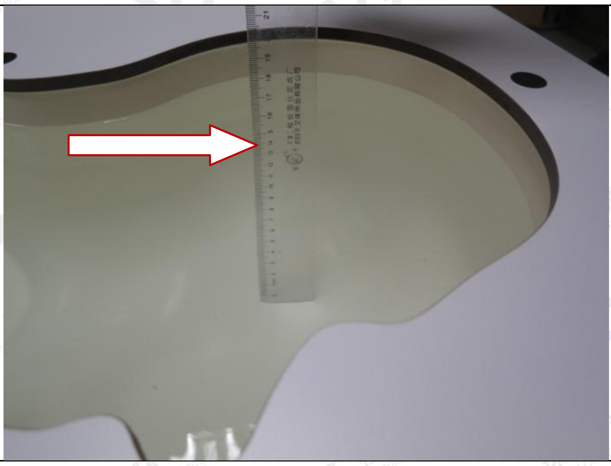
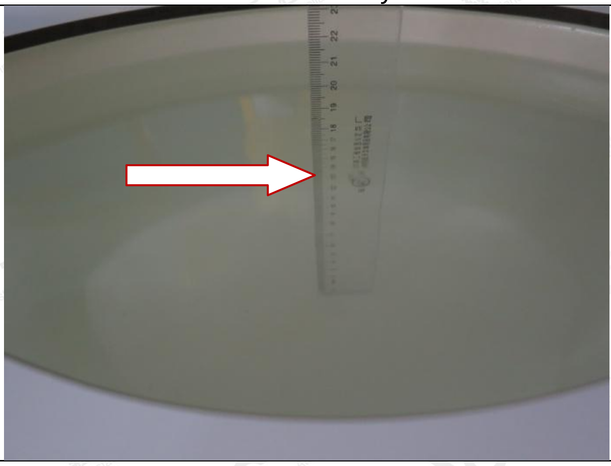
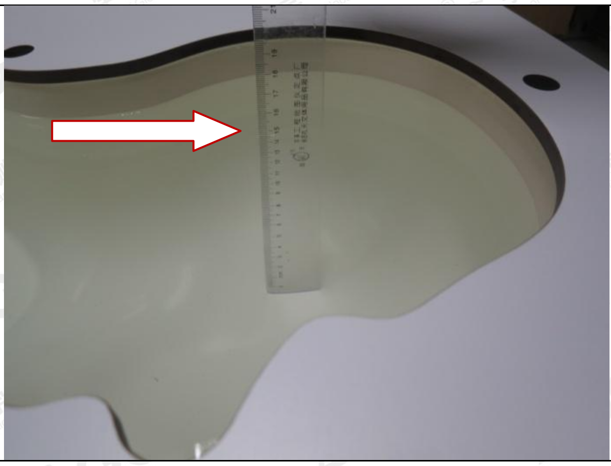
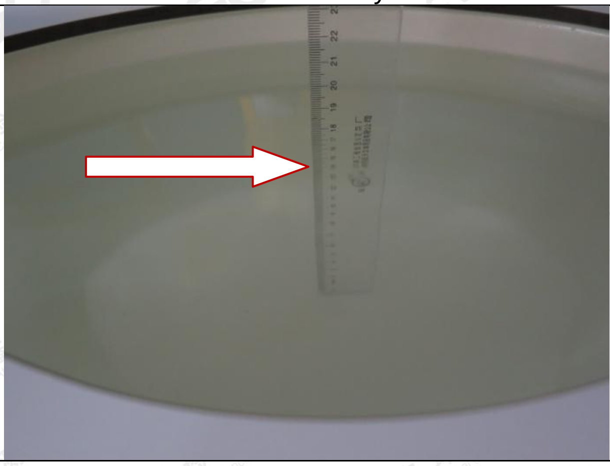
2000MHz head	2000MHz body
	
2450MHz head	2450MHz body
	

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APPENDIX D. CALIBRATION DATA

Refer to Attached files.

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