S T S L A B

FCC SAR TEST REPORT

Report No.: STS2007237H01

Issued for

4G NET INC

3000 NW 72 AVENUE MIAMI FL 33122

Product Name:	Mobile phone	
Brand Name:	UNIQCELL	
Model Name:	Q5 Pro	
Series Model:	N/A	
FCC ID:	2AWCN-Q5PRO	
Test Standard:	ANSI/IEEE Std. C95.1	
	FCC 47 CFR Part 2 (2.1093)	
	IEEE 1528: 2013	
Max. Report SAR (1g):	Head: 0.207 W/kg	
	Body: 1.271 W/kg	

TESTING • CONSULTING • CERTIFICATION • SOLUTION
APPROVAL

ShenZhen STS Test Services Co.,Ltd.
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Test Report Certification

Applicant's name ....:	4G NET INC
Address ....:	3000 NW 72 AVENUE MIAMI FL 33122
Manufacture's Name ....:	METELL TECHNOLOGY CO.,LIMITED
Address ....:	FLAT 1506.15/F LUCKY CTR NO 165-171 WAN CHAI RD WAN CHAI HONG KONG

Product description

Product name ....:	Mobile phone
Brand name ....:	UNIQCELL
Model name ....:	Q5 Pro
Series Model..........................:	N/A
Standards ....:	ANSI/IEEE Std. C95.1-1992 FCC 47 CFR Part 2 (2.1093) IEEE 1528: 2013

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

Date of Test

Date (s) of performance of tests ....:	14 July 2020 ~ 16 July 2020
Date of Issue ....:	17 July 2020
Test Result..:	**Pass**

Testing Engineer :

(Aaron Bu)

Technical Manager :

(Jason Lu)

Authorized Signatory :

(Vita Li)

Table of Contents

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	17 July 2020	STS2007237H01	ALL	Initial Issue
Note: **Format version** of the report - V01				

1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

1.1 EUT Description

Product Name	Mobile phone			
Brand Name	UNIQCELL			
Model Name	Q5 Pro			
Series Model	N/A			
Model Difference	N/A			
Battery	Rated Voltage: 3.8V Charge Limit: 4.35V Capacity: 2050mAh			
Device Category	Portable			
Product stage	Production unit			
RF Exposure Environment	General Population / Uncontrolled			
Hardware Version	S29 V4.0			
Software Version	DW_W12_64V8D2_B1258_WVGA_THX_H5_A_UNIQ_Q4_V1.0_202004141556			
Frequency Range	GSM 850: 824.2~848.8MHz PCS1900: 1850.2~1909.8MHz WCDMA Band II: 1852.4~1907.6MHz WCDMA Band V: 826.4~846.6MHz WLAN 802.11b/g/n(HT20/40): 2412~2462MHz Bluetooth: 2402~ 2480MHz			
Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Head (W/kg)	Body Worn and Hotspot(W/kg)
	PCE	GSM 850	0.207	0.891
	PCE	GSM 1900	0.122	1.271
	PCE	WCDMA Band II	0.106	0.460
	PCE	WCDMA Band V	0.093	0.388
	DTS	2.4GHz WLAN	0.062	0.021
	DSS	Bluetooth [Note]	0.105	0.053
1-g Sum SAR			0.312	1.324
FCC Equipment Class	Licensed Portable Transmitter Held to Ear (PCE) Part 15 Spread Spectrum Transmitter (DSS) Digital Transmission System (DTS)			
Operating Mode	GSM: GSM Voice; GPRS; EGPRS Class 12 WCDMA: RMC, HSDPA, HSUPA Release 6 WLAN: 802.11 b/g/n(HT20/40) Bluetooth: V4.0 + EDR (GFSK, π/4DQPSK, 8DPSK) BLE			
Antenna Specification	GSM,WCDMA: PIFA Antenna BT,WLAN: PIFA Antenna			

SIM Card	Support dual-SIM, dual standby, the multiple SIM card with two lines cannot transmitting at the same time
Hotspot Mode	Support
DTM Mode	Not Support

Note:
1. Bluetooth SAR was estimated
2. The dual SIM card mobile has 2 SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (Single active)
3. After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose SIM1 card to perform all tests.
4. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power

1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (℃)	18-25
Humidity (%RH)	30-70

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01

2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 941225 D01 v03r01	SAR Measurement Procedures for 3G Devices
8	FCC KDB 941225 D06 v02r01	Hotspot Mode SAR
9	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
10	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

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

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

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

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

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

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

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

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

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.
The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

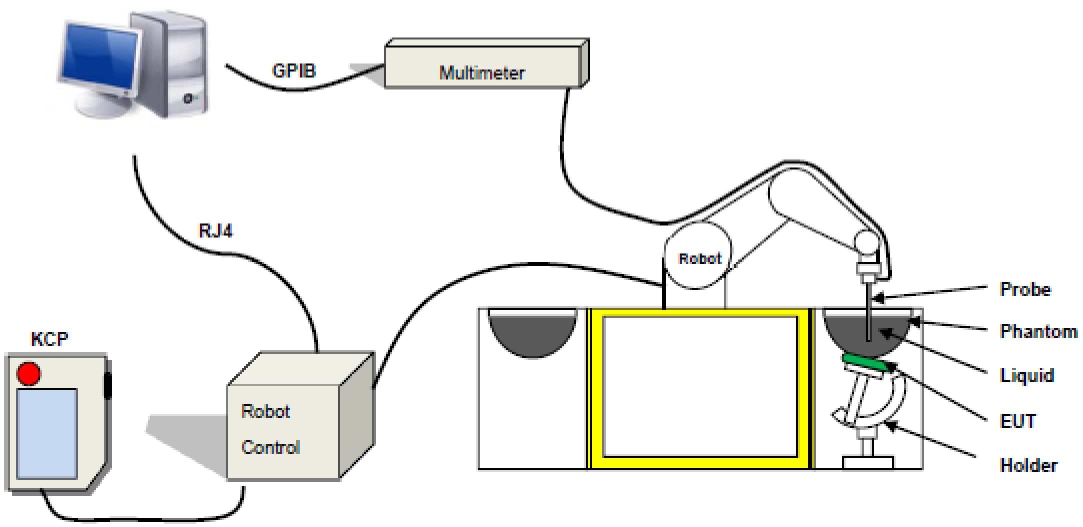
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SAR System

MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

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The following figure shows the system.

The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The Open SAR software computes the results to give a SAR value in a 1g or 10g mass.

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 41/18 EPGO334 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 450 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

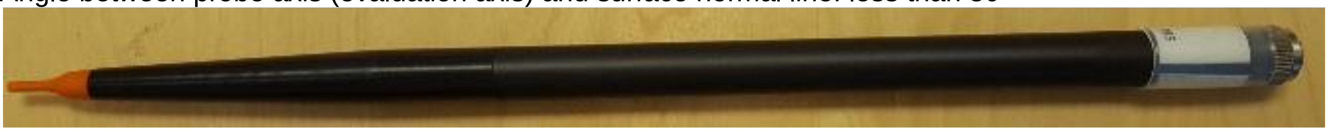


Figure 1-MVG COMOSAR Dosimetric E field Dipole

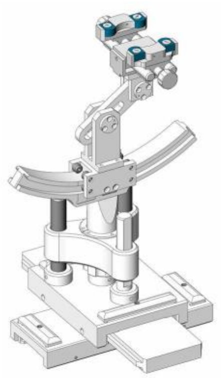
3.2.2 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

Figure-SN 32/14 SAM115

Figure-SN 32/14 SAM116

3.2.3 Device Holder



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

4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Head Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
750	0.2	/	/	1.4	0.2	57.0	/	41.1	0.89	41.9
835	0.2	/	/	1.4	0.2	57.9	/	40.3	0.90	41.5
900	0.2	/	/	1.4	0.2	57.9	/	40.3	0.97	41.5
1800	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
1900	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
2000	/	44.5	/	0.3	/	/	/	55.2	1.4	40.0
2450	/	44.9	/	0.1	/	/	/	55.0	1.80	39.2
2600	/	45.0	/	0.1	/	/	/	54.9	1.96	39.0

Body Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
750	0.2	/	/	0.9	0.1	47.2	/	51.7	0.96	55.5
835	0.2	/	/	0.9	0.1	48.2	/	50.8	0.97	55.2
900	0.2	/	/	0.9	0.1	48.2	/	50.8	1.05	55.0
1800	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
1900	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
2000	/	29.4	/	0.4	/	/	/	70.2	1.52	53.3
2450	/	31.3	/	0.1	/	/	/	68.6	1.95	52.7
2600	/	31.7	/	0.1	/	/	/	68.2	2.16	52.3

Tissue dielectric parameters for head and body phantoms				
Frequency	εr		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
900	41.5	55.0	0.97	1.05
1450	40.5	54.0	1.20	1.30
1800	40.0	53.3	1.40	1.52
2450	39.2	52.7	1.80	1.95
3000	38.5	52.0	2.40	2.73
5800	35.3	48.2	5.27	6.00

LIQUID MEASUREMENT RESULTS

Date	Ambient condition		Head Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-07-14	24.2	59	835 MHz	23.8	Permittivity:	41.50	41.35	-0.36	±5
					Conductivity:	0.90	0.90	0.00	± 5
2020-07-15	24.2	59	1900 MHz	23.5	Permittivity:	40.00	39.11	-2.24	± 5
					Conductivity:	1.40	1.42	1.60	± 5
2020-07-16	23.5	59	2450 MHz	23.1	Permittivity:	39.20	38.92	-0.72	± 5
					Conductivity:	1.80	1.78	-1.10	± 5

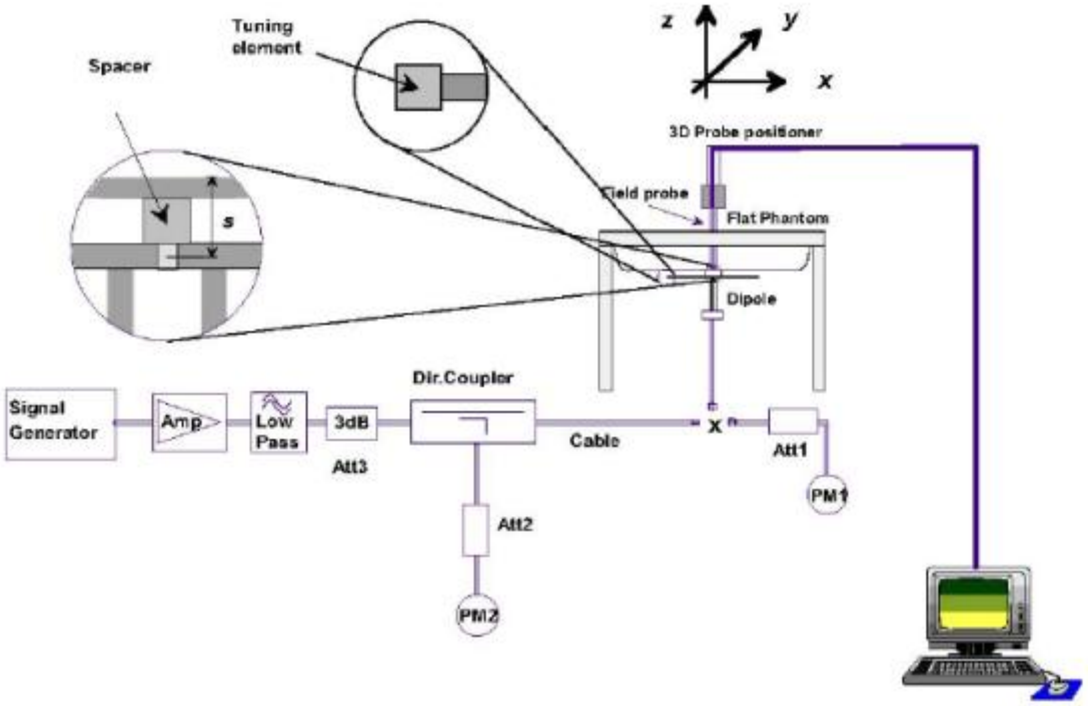
Date	Ambient condition		Body Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-07-14	24.2	59	835 MHz	23.8	Permittivity:	55.20	54.33	-1.58	± 5
					Conductivity	0.97	0.98	0.73	± 5
2020-07-15	24.2	59	1900 MHz	23.5	Permittivity:	53.30	53.39	0.17	± 5
					Conductivity	1.52	1.54	1.27	± 5
2020-07-16	23.5	59	2450 MHz	23.1	Permittivity:	52.70	53.01	0.59	± 5
					Conductivity	1.95	1.93	-0.86	± 5

5. SAR System Validation

5.1 Validation System

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

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



5.2 Validation Result

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

Freq.(MHz)	Power(mW)	Tested Value (W/Kg)	Normalized SAR (W/kg)	Target(W/Kg)	Tolerance(%)	Date
835 Head	100	0.952	9.52	9.56	-0.45	2020-07-14
835 Body	100	0.912	9.12	9.56	-4.57	2020-07-14
1900 Head	100	3.984	39.84	39.7	0.34	2020-07-15
1900 Body	100	4.174	41.74	39.7	5.14	2020-07-15
2450 Head	100	5.312	53.12	52.4	1.38	2020-07-16
2450 Body	100	5.266	52.66	52.4	0.50	2020-07-16

Note:

1. The tolerance limit of System validation ±10%.
2. The dipole input power (forward power) was 100 mW.
3. The results are normalized to 1 W input power.

6. SAR Evaluation Procedures

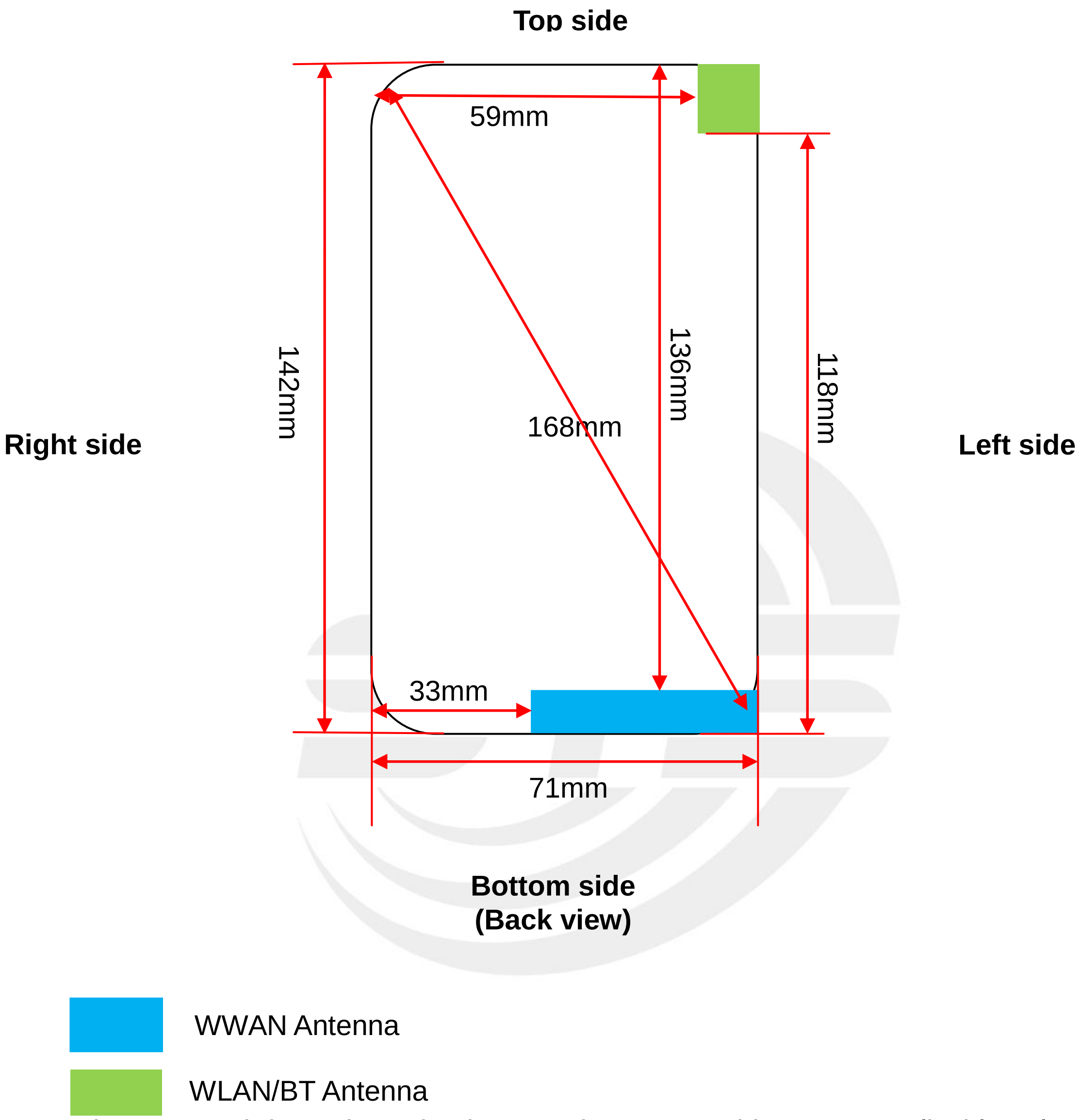
The procedure for assessing the average SAR value consists of the following steps:
The following steps are used for each test position
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

Area Scan& Zoom Scan:

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR -distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r01 quoted below.
When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

7. EUT Antenna Location Sketch

It is a Mobile, support GSM/WCDMA mode.



Note 1: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.

7.1 SAR test exclusion consider table

According with FCC KDB 447498 D01, appendix A, <SAR test exclusion thresholds for 100MHz ~ 6GHz and≤50mm＞table, this device SAR test configurations consider as following:

Band	Test position configurations					
	Front	Back	Right edge	Left edge	Top edge	Bottom edge
WWAN	＜5mm	＜5mm	33mm	＜5mm	136mm	＜5mm
	Yes	Yes	Yes	Yes	No	Yes
WLAN/BT	＜5mm	＜5mm	59mm	＜5mm	＜5mm	118mm
	Yes	Yes	No	Yes	Yes	No

Note：

1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. per KDB 447498 D01, standalone SAR test exclusion threshold is applied; if the distance of the antenna to the user is <5mm, 5mm is user to determine SAR exclusion threshold
4. per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distance ≤50mm are determined by:
   [(max. power of channel, including tune-up tolerance, Mw)/(min. test separation distance, mm)]*[√f(GHZ））≤3.0 for 1-g SAR and≤7.5 for10-g extremity SAR ,f(GHz) is the RF channel transmit frequency in GHz. Power and distance are rounded to the nearest mW and mm before calculation. The result is rounded to one decimal place for comparison
   For <50mm distance, we just calculate mW of the exclusion threshold value(3.0)to do compare
5. per KDB 447498 D01, at 100 MHz to 6GHz and for test separation distances >50mm, the SAR test exclusion threshold is determined according to the following
   a)[threshold at 50mm in step 1]+(test separation distance -50mm)*(f (MHz)/150)]Mw, at 100 MHz to 1500 MHz
   b) [threshold at 50mm in step1]+(test separation distance -50mm) *10]mW at＞1500MHz and≤6GHz
6. Per KDB 447498 D02, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/ HSUPA/DC-HSDPA output power is<0.25db higher than RMC 12.2Kbps,or reported SAR with RMC 12.2kbps setting is ≤1.2W/Kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded.
7. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8.for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.

8. EUT Test Position

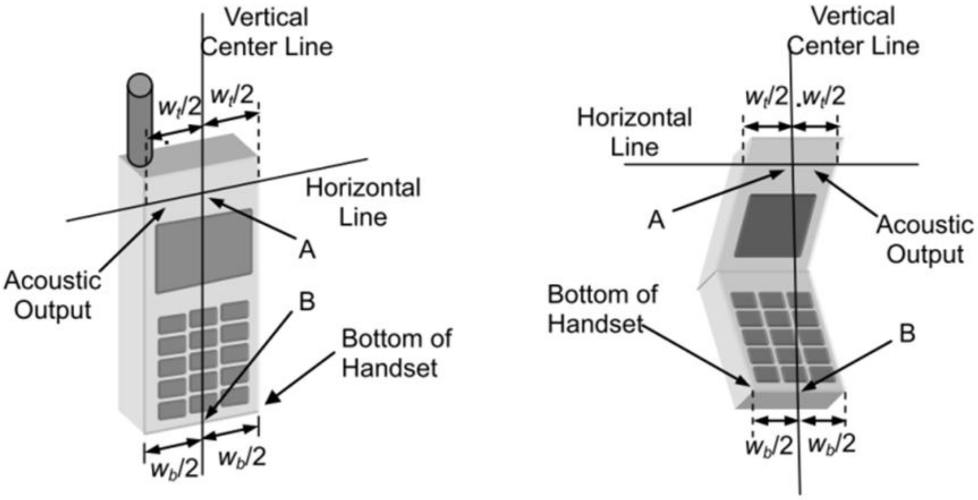
This EUT was tested in Right Cheek, Right Titled, Left Cheek, Left Titled, Front Face and Rear Face.

8.1 Define Two Imaginary Lines On The Handset

(1) The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.

(2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

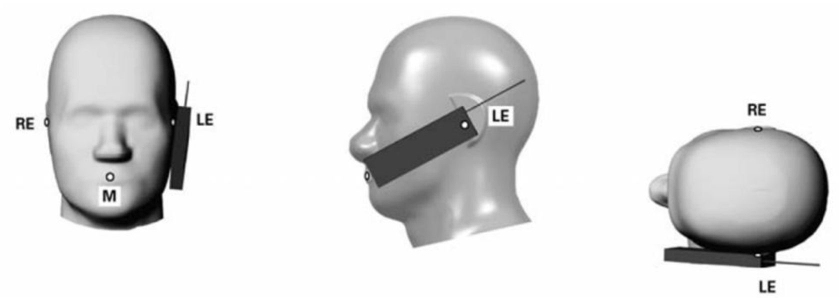
(3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



Cheek Position

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

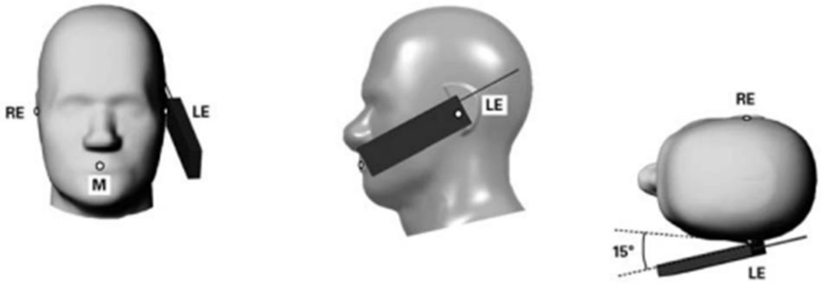
2) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with the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



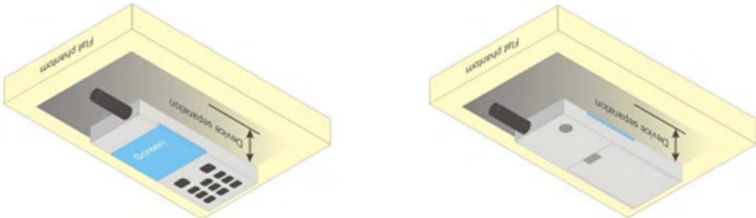
Title Position

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

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

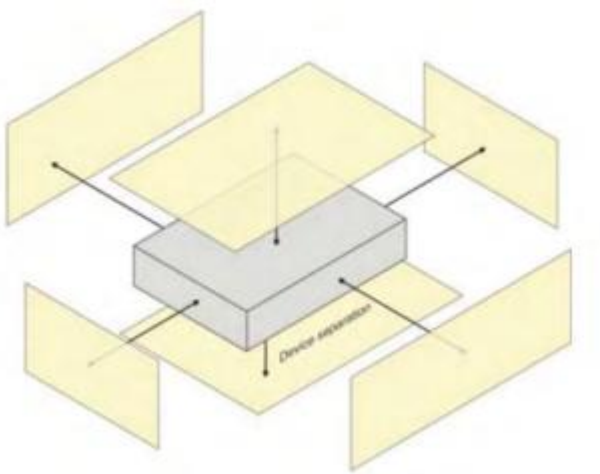


Body-worn Position Conditions:
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



8.2 Hotspot mode exposure position condition

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing function, the relevant hand and body exposure condition are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surface and edges with a transmitting antenna located within 25 mm form that surface or edge.
When form factor of a handset is smaller than 9cm x 5cm, a test separation distance of 5mm (instead of 10mm)is required for testing hotspot mode. When the separate distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration(surface).



9. Uncertainty

9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	√3	√0.5	√0.5	0.28	0.28	∞
Hemispherical Isotropy	1.045	R	√3	√0.5	√0.5	0.43	0.43	∞
Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
Linearity	0.685	R	√3	1	1	0.40	0.40	∞
System detection limits	1.0	R	√3	1	1	0.58	0.58	∞
Modulation response	3.0	R	√3	1	1	1.73	1.73	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0	R	√3	1	1	0	0	∞
Integration Time	1.4	R	√3	1	1	0.81	0.81	∞
RF ambient conditions-Noise	3.0	R	√3	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	√3	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
Post-processing	2.3	R	√3	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.6	2.6	∞
Device holder uncertainty	3	N	1	1	1	3	3	∞
SAR drift measurement	5	R	√3	1	1	2.89	2.89	∞
SAR scaling	5	R	√3	1	1	2.89	2.89	∞
Phantom and tissue parameters								
Phantom uncertainty（shape and thickness uncertainty）	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity（temperature uncertainty）	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid conductivity（measured）	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity（temperature uncertainty）	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Liquid permittivity（measured）	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.79	9.59	
Expanded Uncertainty (95% Confidence interval)		K=2				19.58	19.18	

9.2 System validation Uncertainty

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	√3	1	1	0.40	0.40	∞
Hemispherical Isotropy	1.045	R	√3	0	0	0.00	0.00	∞
Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
Linearity	0.685	R	√3	1	1	0.40	0.40	∞
System detection limits	1.0	R	√3	1	1	0.58	0.58	∞
Modulation response	3.0	R	√3	0	0	0.00	0.00	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0.0	R	√3	0	0	0.00	0.00	∞
Integration Time	1.4	R	√3	0	0	0.00	0.00	∞
RF ambient conditions-Noise	3.0	R	√3	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	√3	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	√3	1	1	0.81	0.81	∞
Post-Processing	2.3	R	√3	1	1	1.33	1.33	∞
System validation source								
Deviation of experimental dipole from numerical dipole	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	5.0	R	√3	1	1	2.89	2.89	∞
Other source contribution Uncertainty	2.0	R	√3	1	1	1.15	1.15	∞
Phantom and set-up								
Phantom uncertainty（shape and thickness uncertainty）	4.0	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity（temperature uncertainty）	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid conductivity（measured）	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity（temperature uncertainty）	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Liquid permittivity（measured）	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.718	9.517	
Expanded Uncertainty (95% Confidence interval)		K=2				19.44	19.04	

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10. Conducted Power Measurement

10.1 Test Result

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	31.74	31.28	32.50	26.05	26.41	26.46
GPRS (GMSK, 1-Slot)	31.74	32.25	32.46	26.03	26.35	26.40
GPRS (GMSK, 2-Slot)	31.26	31.85	31.97	25.54	25.91	25.93
GPRS (GMSK, 3-Slot)	30.82	31.43	31.50	25.10	25.51	25.47
GPRS (GMSK, 4-Slot)	30.36	30.99	31.01	24.64	25.07	25.04
EGPRS(8PSK, 1-Slot)	25.71	26.33	26.55	22.83	23.49	24.63
EGPRS(8PSK, 2-Slot)	24.92	25.58	25.76	22.09	22.79	23.85
EGPRS(8PSK, 3-Slot)	24.14	24.78	25.03	21.30	22.06	23.10
EGPRS(8PSK, 4-Slot)	23.39	24.04	24.29	20.55	21.36	22.38

Remark: GPRS, CS4 coding scheme. EGPRS, MCS5 coding scheme.
Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link
Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link
Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link

Fram- Average Power(dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	22.71	22.25	23.47	17.02	17.38	17.43
GPRS (GMSK, 1-Slot)	22.71	23.22	23.43	17.00	17.32	17.37
GPRS (GMSK, 2-Slot)	25.24	25.83	25.95	19.52	19.89	19.91
GPRS (GMSK, 3-Slot)	26.56	27.17	27.24	20.84	21.25	21.21
GPRS (GMSK, 4-Slot)	27.35	27.98	28.00	21.63	22.06	22.03
EGPRS(8PSK, 1-Slot)	16.68	17.30	17.52	13.80	14.46	15.60
EGPRS(8PSK, 2-Slot)	18.90	19.56	19.74	16.07	16.77	17.83
EGPRS(8PSK, 3-Slot)	19.88	20.52	20.77	17.04	17.80	18.84
EGPRS(8PSK, 4-Slot)	20.38	21.03	21.28	17.54	18.35	19.37

Remark :
1. SAR testing was performed on the maximum frame-averaged power mode.
2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum
burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power = Burst averaged power (1 TX Slot) – 9.03 dB
Frame-averaged power = Burst averaged power (2 TX Slots) – 6.02 dB
Frame-averaged power = Burst averaged power (3 TX Slots) - 4.26 dB
Frame-averaged power = Burst averaged power (4 TX Slots) – 3.01 dB

WCDMA

Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4183	4233	9262	9400	9538
Frequency (MHz)	826.4	836.6	846.6	1852.4	1880.0	1907.6
AMR 12.2Kbps	21.11	21.81	21.99	21.13	21.17	22.36
RMC 12.2Kbps	21.14	21.88	22.03	21.22	21.23	22.43
HSDPA Subtest-1	19.92	20.75	20.96	18.62	18.90	19.24
HSDPA Subtest-2	19.51	20.27	20.48	18.12	18.44	18.82
HSDPA Subtest-3	19.16	19.87	20.13	17.71	18.00	18.52
HSDPA Subtest-4	18.79	19.39	19.81	17.39	17.64	18.13
HSUPA Subtest-1	19.90	20.77	20.89	18.66	18.95	19.22
HSUPA Subtest-2	19.02	19.79	19.91	17.73	18.02	18.24
HSUPA Subtest-3	18.89	19.37	19.52	17.57	17.56	17.94
HSUPA Subtest-4	18.46	18.90	19.13	17.11	17.17	17.59
HSUPA Subtest-5	16.98	17.45	17.72	15.70	15.67	16.09

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

Table 6.1A: 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 βc/βd=12/15, βhs/ βc=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.

WLAN

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
802.11b	1	2412	16.18
	6	2437	15.46
	11	2462	15.54
802.11g	1	2412	12.12
	6	2437	13.05
	11	2462	12.90
802.11n(HT 20)	1	2412	11.93
	6	2437	12.96
	11	2462	12.90
802.11n(HT 40)	3	2422	11.89
	6	2437	11.57
	9	2452	11.74

Bluetooth

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	2.25
	39	2441	2.84
	78	2480	3.41
π/4-DQPSK(2Mbps)	0	2402	0.03
	39	2441	0.47
	78	2480	0.89
8DPSK(3Mbps)	0	2402	0.10
	39	2441	0.52
	78	2480	0.91

BLE

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	-6.41
	19	2440	-6.17
	39	2480	-5.83

10.2 SAR Test Exclusions Applied

Per FCC KDB 447498D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHZ)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- f(GHZ) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of **Bluetooth Head** (rounded to the nearest mW) and the antenna to user separation distance,

Bluetooth Head SAR was not required; [(2.512/5)* √2.480] = **0.79** < 3.0.

Based on the maximum conducted power of **Bluetooth Body** (rounded to the nearest mW) and the antenna to user separation distance,

Bluetooth Body SAR was not required; [2.512/10)* √2.480] = **0.40** < 3.0.

Based on the maximum conducted power of **2.4 GHz WLAN Head** (rounded to the nearest mW) and the antenna to user separation distance,

2.4 GHz WLAN SAR was required; [(50.119/5)* √2.462] = **15.73** > 3.0.

Based on the maximum conducted power of **2.4 GHz WLAN Body** (rounded to the nearest mW) and the antenna to user separation distance,

2.4 GHz WLAN SAR was required; [(50.119/10)* √2.462] = **7.86** >3.0.

11. EUT And Test Setup Photo

11.1 EUT Photo

Front side

Back side

Top side

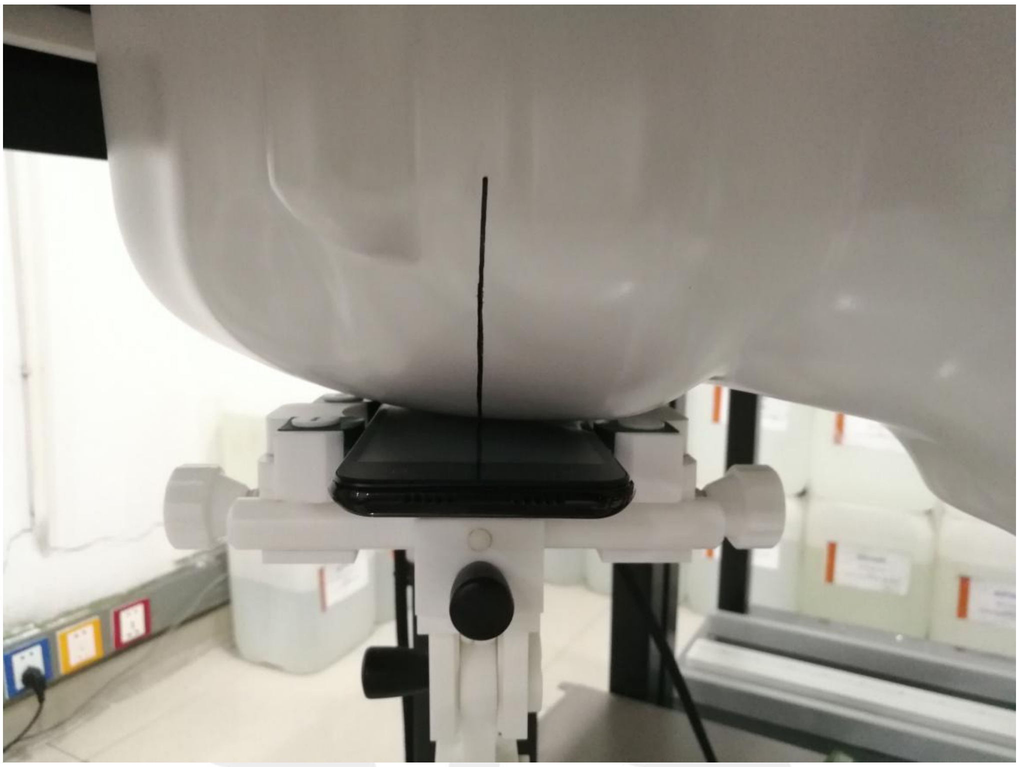
Bottom side

Left side

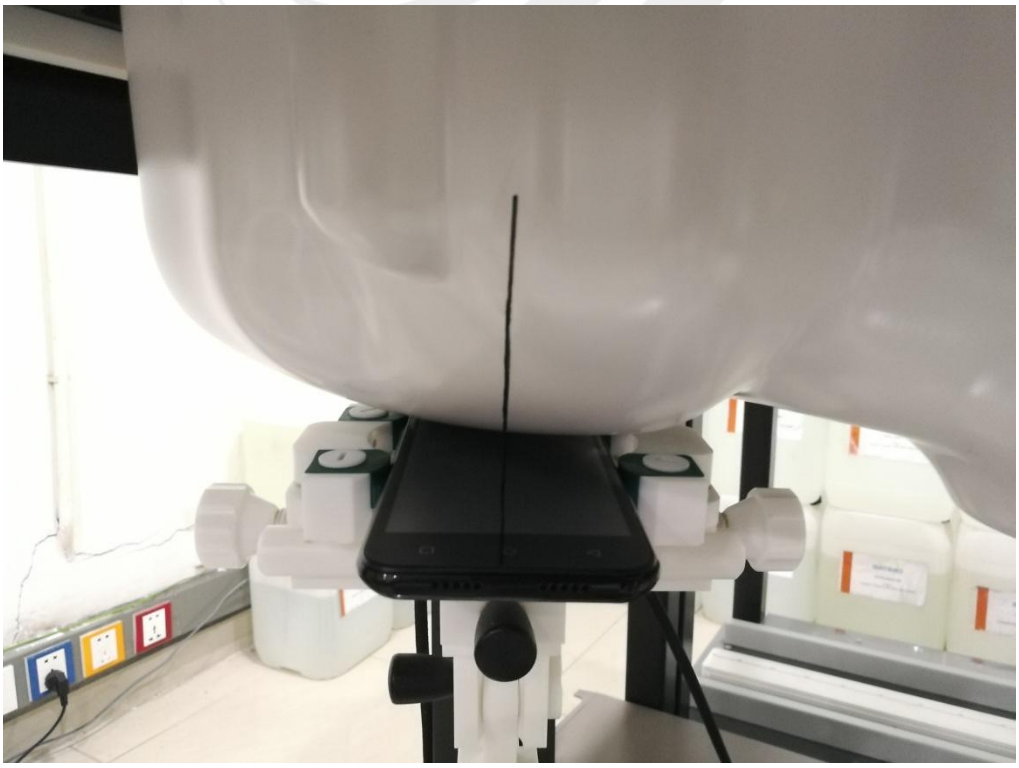
Right side

11.2 Setup Photo

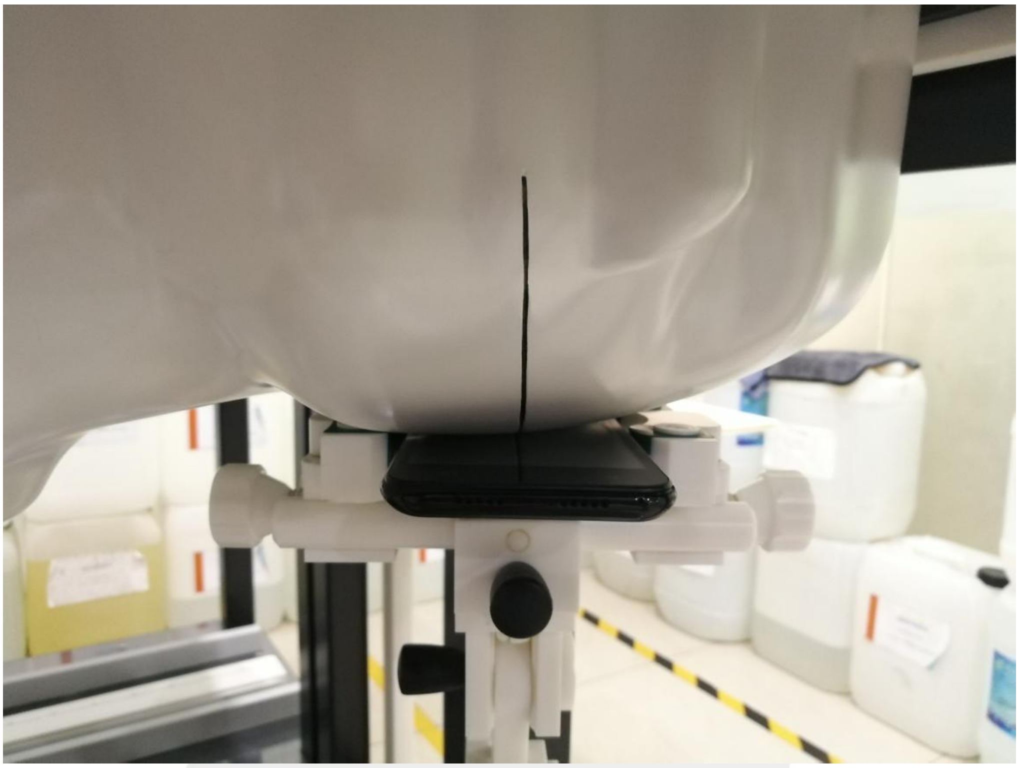
Right Touch



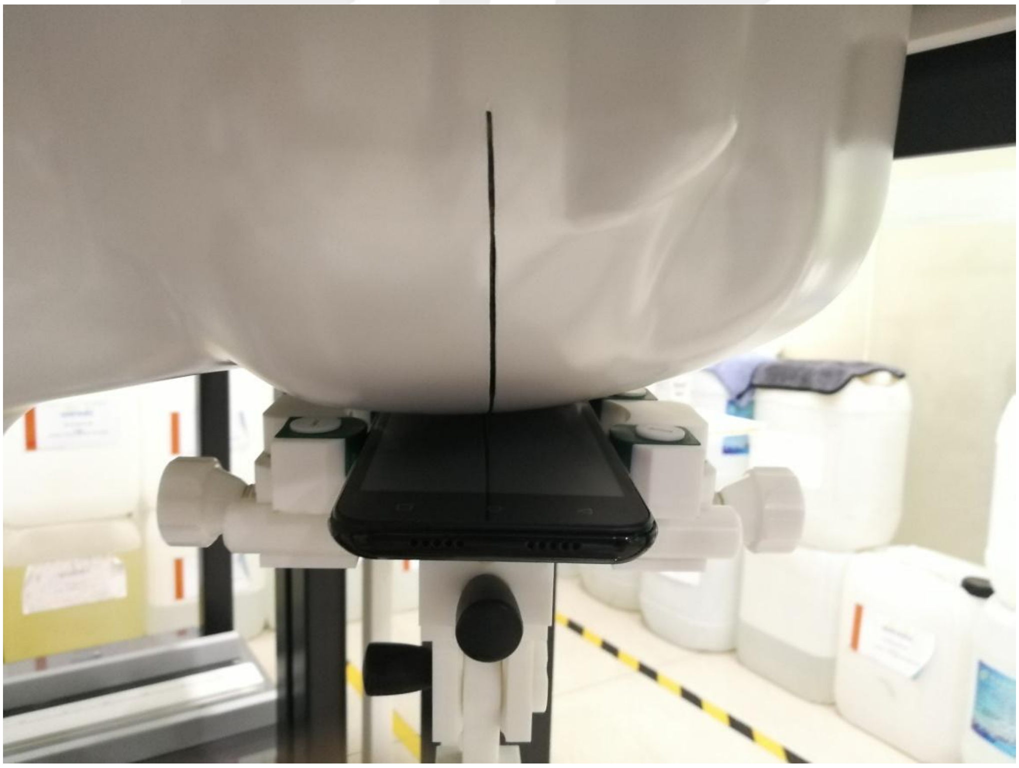
Right Tilt



Left Touch



Left Tilt



Body Front side(separation distance is 10mm)

Body Back side(separation distance is 10mm)

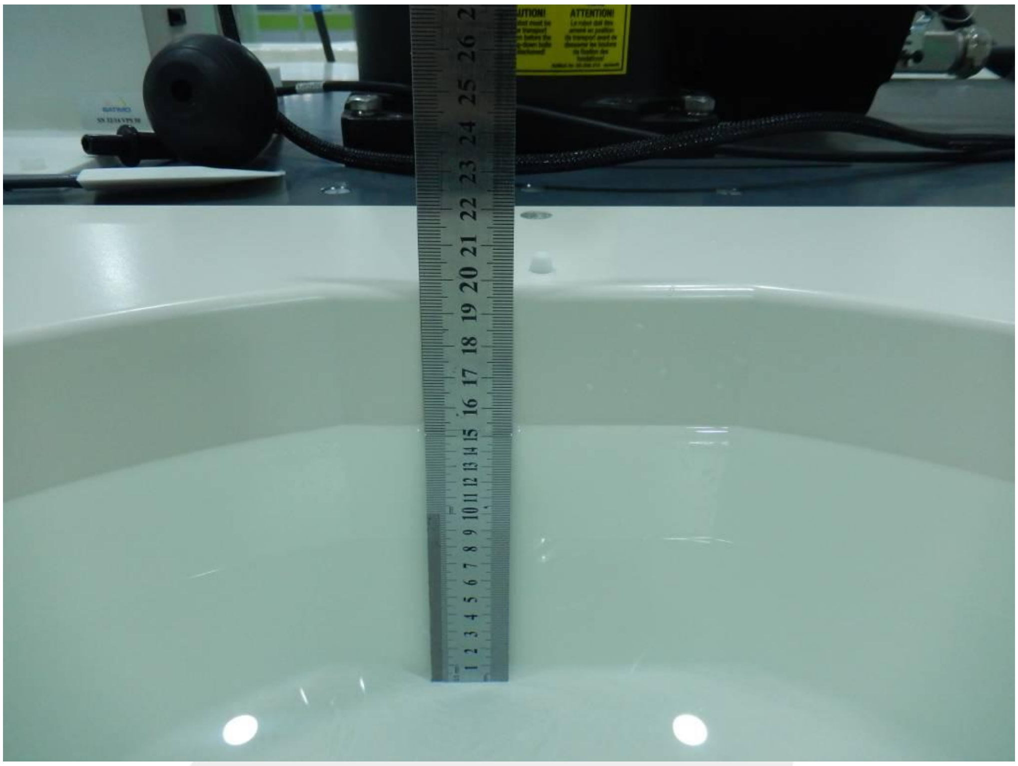
Body left side(separation distance is 10mm)

Body right side(separation distance is 10mm)

Body top side(separation distance is 10mm)

Body Bottom side(separation distance is 10mm)

Liquid depth (15 cm)



12. SAR Result Summary

12.1 Head SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Right Cheek	251	0.165	-3.14	32	31.01	**0.207**	1
		Right Tilt	251	0.083	-1.23	32	31.01	0.104	/
		Left Cheek	251	0.142	-3.30	32	31.01	0.178	/
		Left Tilt	251	0.071	2.96	32	31.01	0.089	/
GSM1900	GPRS Data-4 Slot	Right Cheek	661	0.121	0.18	25.1	25.07	**0.122**	3
		Right Tilt	661	0.062	1.33	25.1	25.07	0.062	/
		Left Cheek	661	0.114	1.31	25.1	25.07	0.115	/
		Left Tilt	661	0.059	0.76	25.1	25.07	0.059	/
WCDMA II	RMC	Right Cheek	9538	0.093	0.24	23	22.43	**0.106**	5
		Right Tilt	9538	0.045	-2.91	23	22.43	0.051	/
		Left Cheek	9538	0.081	2.66	23	22.43	0.092	/
		Left Tilt	9538	0.041	-0.87	23	22.43	0.047	/
WCDMA V	RMC	Right Cheek	4233	0.074	0.15	23	22.03	**0.093**	7
		Right Tilt	4233	0.039	-2.40	23	22.03	0.049	/
		Left Cheek	4233	0.067	-3.01	23	22.03	0.084	/
		Left Tilt	4233	0.031	3.79	23	22.03	0.039	/

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WLAN	802.11b	Right Cheek	1	0.051	-2.09	17	16.18	100	**0.062**	9
		Right Tilt	1	0.047	-0.36	17	16.18	100	0.057	/
		Left Cheek	1	0.039	-1.05	17	16.18	100	0.047	/
		Left Tilt	1	0.032	1.17	17	16.18	100	0.039	/

Note:

1. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.030** W/Kg for Head)
3. Per KDB865664 D01, Repeated measurement is not required when the original highest measured SAR is <0.80 W/kg

12.2 Body-worn and Hotspot SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Front side	251	0.539	0.77	32	31.01	0.677	/
		Back side	128	0.683	2.75	32	31.01	0.858	/
		Back side	190	0.659	2.75	32	31.01	0.828	/
		Back side	251	0.709	2.75	32	31.01	**0.891**	2
		Left side	251	0.564	-2.97	32	31.01	0.708	/
		Right side	251	0.486	-0.67	32	31.01	0.610	/
		Bottom side	251	0.504	-3.02	32	31.01	0.633	/
GSM1900	GPRS Data-4 Slot	Front side	661	0.715	-0.38	25.1	25.07	0.720	/
		Back side	512	1.137	0.45	25.1	24.64	1.264	/
		Back side	661	1.262	0.45	25.1	25.07	**1.271**	4
		Back side	810	1.075	0.45	25.1	25.04	1.090	/
		Left side	661	0.683	1.66	25.1	25.07	0.688	/
		Right side	661	0.543	-0.36	25.1	25.07	0.547	/
		Bottom side	661	0.576	-1.98	25.1	25.07	0.580	/
WCDMA II	RMC	Front side	9538	0.119	-1.31	23	22.43	0.136	/
		Back side	9538	0.403	-4.00	23	22.43	**0.460**	6
		Left side	9538	0.237	3.09	23	22.43	0.270	/
		Right side	9538	0.106	-3.88	23	22.43	0.121	/
		Bottom side	9538	0.214	-0.41	23	22.43	0.244	/
WCDMA V	RMC	Front side	4233	0.298	-1.37	23	22.03	0.373	/
		Back side	4233	0.310	-3.77	23	22.03	**0.388**	8
		Left side	4233	0.283	-2.05	23	22.03	0.354	/
		Right side	4233	0.231	2.86	23	22.03	0.289	/
		Bottom side	4233	0.251	-0.64	23	22.03	0.314	/

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Duty cycle(%)	Scaled SAR (W/Kg)	Meas. No.
WLAN	802.11b	Front side	1	0.011	1.12	17	16.18	100	0.013	/
		Back side	1	0.017	2.20	17	16.18	100	**0.021**	10
		Left side	1	0.009	-2.22	17	16.18	100	0.011	/
		Top side	1	0.007	2.09	17	16.18	100	0.008	/

Note:

1. The test separation of all above table is 10mm.
2. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Scaled SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
3. Per KDB 248227- When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg. (The highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power was **0.010** W/Kg for Body)
4. 3. When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The “Portable Hotspot” feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

Repeated SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR(W/Kg)	Meas. No.
GSM 850	GPRS Data-4 Slot	Back side	251	0.695	1.26	32	31.01	0.873	/
GSM 1900	GPRS Data-4 Slot	Back side	661	1.227	0.95	25.1	25.07	1.236	/

12.3 repeated SAR measurement

Band	Mode	Test Position	Ch.	Original Measured SAR 1g(mW/g)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(mW/g)	2nd Repeated SAR 1g	Ratio
GSM 850	GPRS Data-4 Slot	Back side	251	0.695	0.709	1.02	-	-	-
GSM 1900	GPRS Data-4 Slot	Back side	661	1.227	1.262	1.03	-	-	-

Note:
1. Per KDB 865664 D01V01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is≥0.8W/Kg.
2. Per KDB 865664 D01V01,if the ratio of largest to smallest SAR for the original and first repeated measurement is≤1.2and the measured SAR<1.45W/Kg, only one repeated measurement is required.
3. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is>1.20 or when the original or repeated measurement is ≥ 1.45W/Kg
4. The ratio is the difference in percentage between original and repeated measured SAR.

Simultaneous Multi-band Transmission Evaluation:

Application Simultaneous Transmission information:

Position	Simultaneous State
Head	1. GSM + WLAN
	2. GSM + Bluetooth
	3. WCDMA + WLAN
	4. WCDMA + Bluetooth
Body	1. GSM + WLAN
	2. GSM + Bluetooth
	3. WCDMA + WLAN
	4. WCDMA + Bluetooth

NOTE:

1. Bluetooth and WLAN can't simultaneous transmission at the same time.
2. For simultaneous transmission at head and body exposure position, 2 transmitters simultaneous transmission was the worst state.
3. Based upon KDB 447498 D01, BT SAR is excluded as below table.
4. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
5. For minimum test separation distance≦50mm,Bluetooth standalone SAR is excluded according to [(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)·[√f (GHz) /x] ≦3.0 for 1-g SAR and ≦7.5 for 10-g extremity SAR
6. The reported SAR summation is calculated based on the same configuration and test position.
7. KDB 447498 / 4.3.2 (2) when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
   a) (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f (GHz) /x] W/kg for test separation distances≤ 50 mm;
   Where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
   b) 0.4W/Kg for 1-g SAR and 1.0W/Kg for 10-g SAR, when the separation distance is >50mm.

Estimated SAR		Maximum Power		Antenna to user(mm)	Frequency(GHz)	Stand Alone SAR(1g) [W/kg]
		dBm	mW			
BT	Head	4	2.512	5	2.480	0.105
	Body			10	2.480	0.053

Simultaneous Mode	Position	Mode	Max. 1-g SAR (W/kg)	1-g Sum SAR (W/kg)
GSM + 2.4GHz WLAN	Head	GSM	0.207	0.269
		2.4GHz WLAN	0.062	
	Body	GSM	1.271	1.292
		2.4GHz WLAN	0.021	
GSM + Bluetooth	Head	GSM	0.207	0.312
		Bluetooth	0.105	
	Body	GSM	1.271	1.324
		Bluetooth	0.053	
WCDMA + 2.4GHz WLAN	Head	WCDMA	0.106	0.168
		2.4GHz WLAN	0.062	
	Body	WCDMA	0.460	0.481
		2.4GHz WLAN	0.021	
WCDMA + Bluetooth	Head	WCDMA	0.106	0.211
		Bluetooth	0.105	
	Body	WCDMA	0.460	0.513
		Bluetooth	0.053	

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

13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
835MHz Dipole	MVG	SID835	SN 30/14 DIP0G835-332	2017.08.15	2020.08.14
1900MHz Dipole	MVG	SID1900	SN 30/14 DIP1G900-333	2017.08.15	2020.08.14
2450MHzDipole	MVG	SID2450	SN 30/14 DIP2G450-335	2017.08.15	2020.08.14
E-Field Probe	MVG	SSE2	SN 41/18 EPGO334	2020.06.03	2021.06.02
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2019.11.25	2020.11.24
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2019.10.11	2020.10.10
Multi Meter	Keithley	Multi Meter 2000	4050073	2019.10.11	2020.10.10
Signal Generator	Agilent	N5182A	MY50140530	2019.10.09	2020.10.08
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2019.10.09	2020.10.08
Wireless Communication Test Set	R&S	CMW500	117239	2019.10.09	2020.10.08
Power Amplifier	DESAY	ZHL-42W	9638	2019.10.09	2020.10.08
Power Meter	R&S	NRP	100510	2019.10.16	2020.10.15
Power Meter	Agilent	E4418B	GB43312526	2019.10.16	2020.10.15
Power Sensor	R&S	NRP-Z11	101919	2019.10.09	2020.10.08
Power Sensor	Agilent	E9301A	MY41497725	2019.10.09	2020.10.08
Temperature hygrometer	SuWei	SW-108	N/A	2019.10.13	2020.10.12
Thermograph	Elitech	RC-4	S/N EF7176501537	2019.10.11	2020.10.10

Note:
Per KDB 865664 D01, Dipole SAR Validation Verification, STS 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

Return-loss in within 20% of calibrated measurement

Appendix A. System Validation Plots

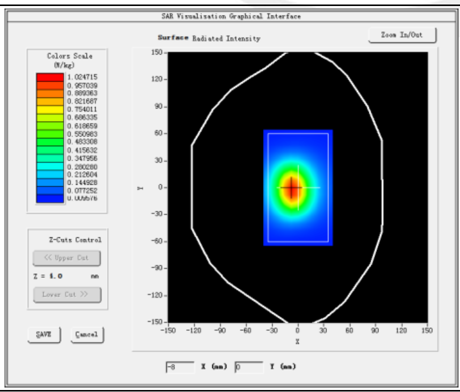
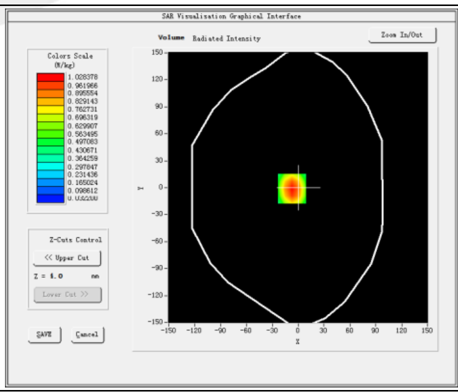
System Performance Check Data (835MHz Head)

Type: Phone measurement (Complete)

Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-14

Experimental conditions

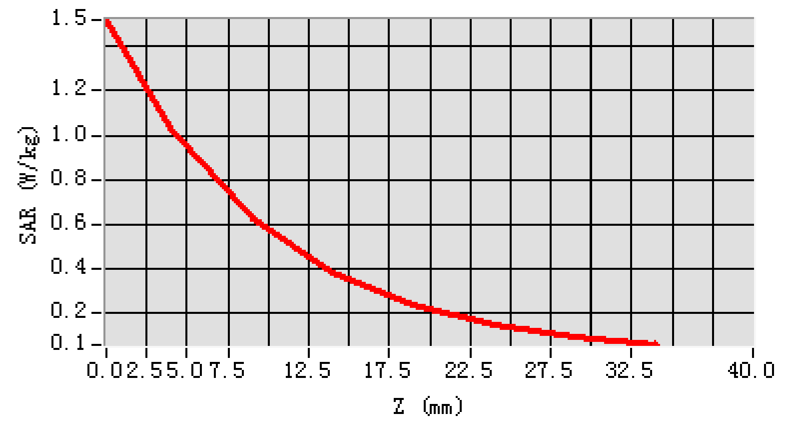
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	41.35
Conductivity (S/m)	0.90
Power drift (%)	-0.77
Probe	SN 41/18 EPGO334
ConvF	1.48
Crest factor	1:1

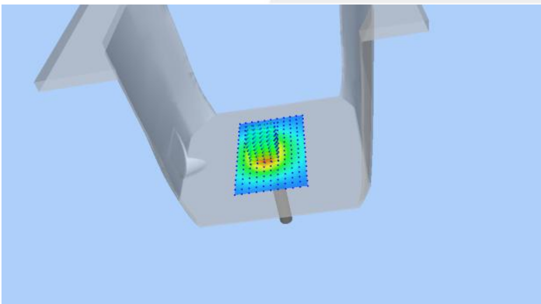
SURFACE SAR	VOLUME SAR
	

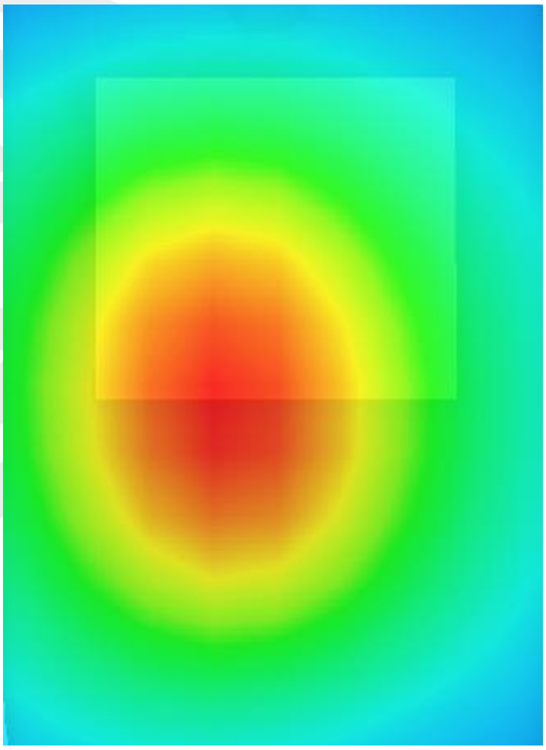
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.653871
SAR 1g (W/Kg)	0.952146

Z Axis Scan


1.5
1.2
1.0
0.8
0.6
0.4
0.2
0.1
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



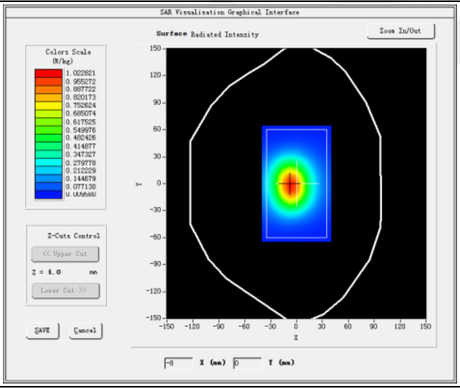
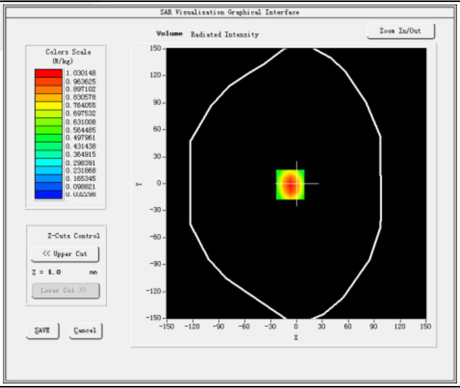


System Performance Check Data (835MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-14

Experimental conditions.

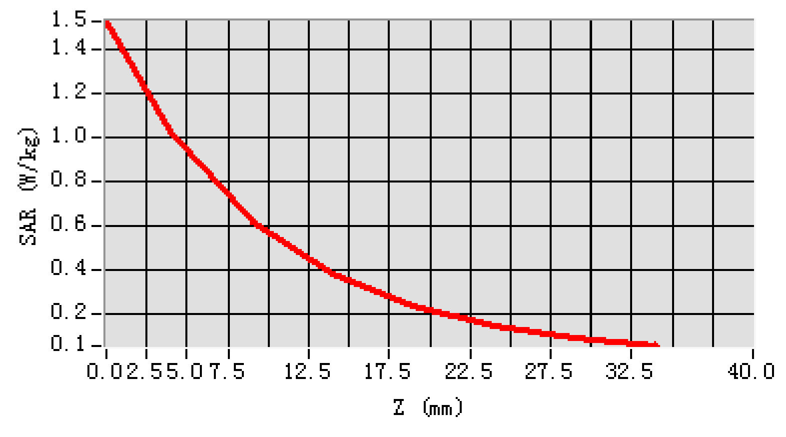
Phantom	Validation plane
Device Position	-
Band	835MHz
Channels	-
Signal	CW
Frequency (MHz)	835MHz
Relative permittivity	54.33
Conductivity (S/m)	0.98
Power drift (%)	-0.75
Probe	SN 41/18 EPGO334
ConvF	1.53
Crest factor	1:1

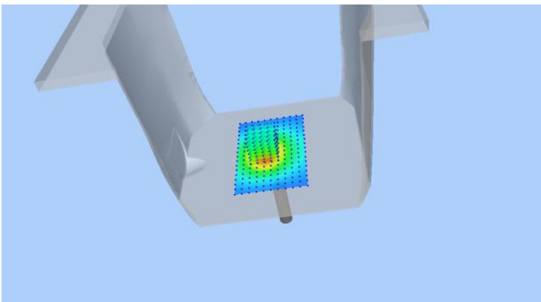
SURFACE SAR	VOLUME SAR
	

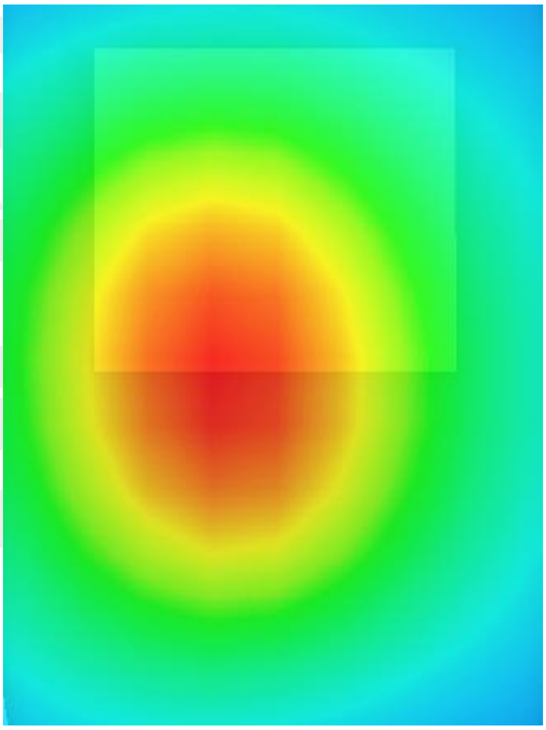
Maximum location: X=-7.00, Y=-1.00

SAR 10g (W/Kg)	0.664381
SAR 1g (W/Kg)	0.912437

Z Axis Scan


1.5
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.1
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



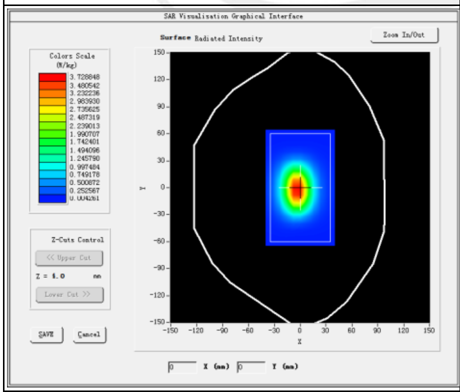
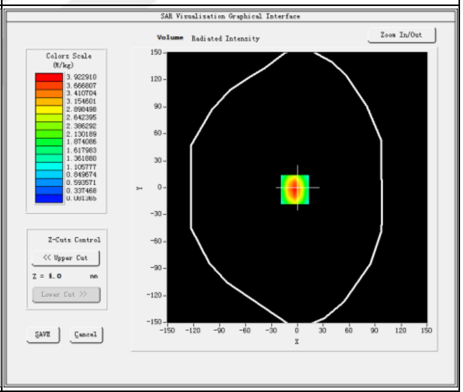


System Performance Check Data (1900MHz Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-15

Experimental conditions.

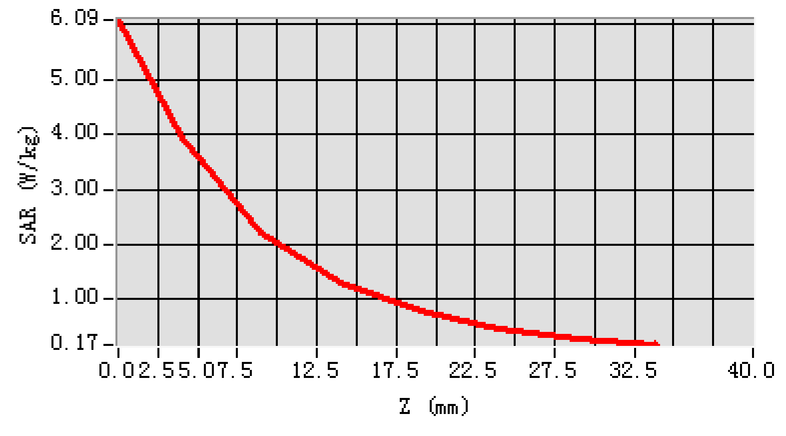
Phantom	Validation plane
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900MHz
Relative permittivity	39.11
Conductivity (S/m)	1.42
Power drift (%)	1.18
Probe	SN 41/18 EPGO334
ConvF:	1.84
Crest factor:	1:1

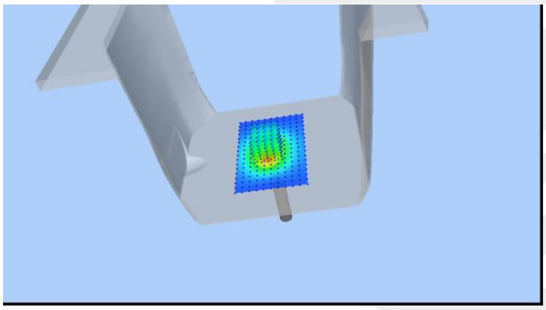
SURFACE SAR	VOLUME SAR
	

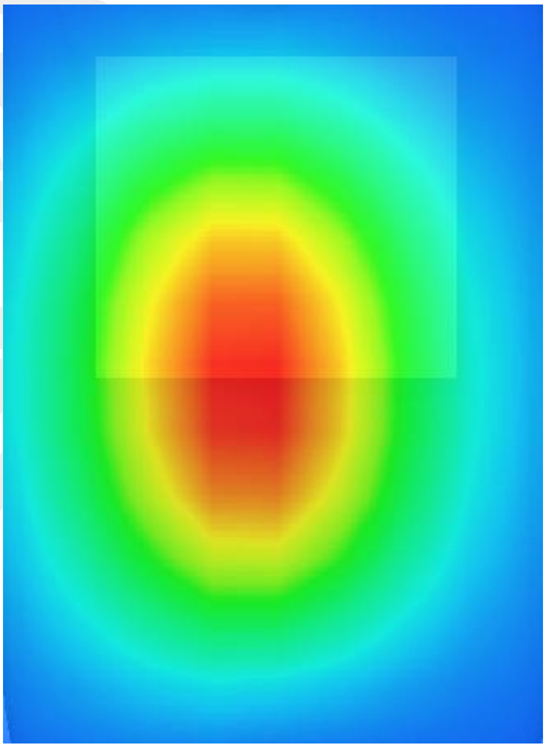
Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.178512
SAR 1g (W/Kg)	3.984319

Z Axis Scan


6.09
5.00
4.00
3.00
2.00
1.00
0.17
SAR (W/kg)
0.0
2.5
5.0
7.5
12.5
17.5
22.5
27.5
32.5
40.0
Z (mm)



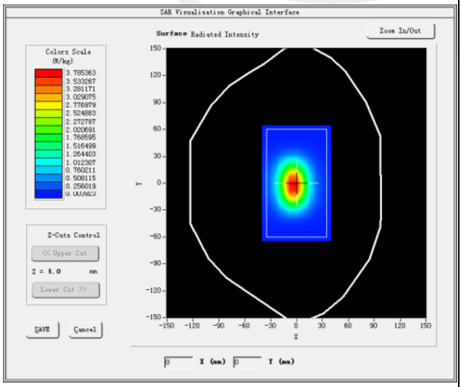
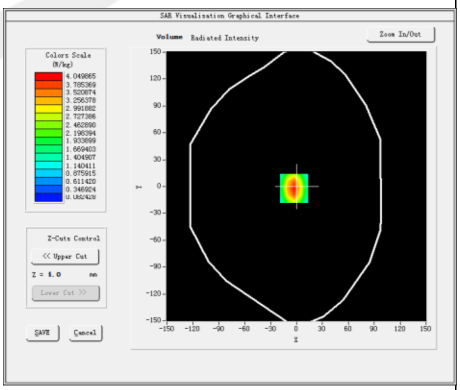


System Performance Check Data (1900MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-15

Experimental conditions.

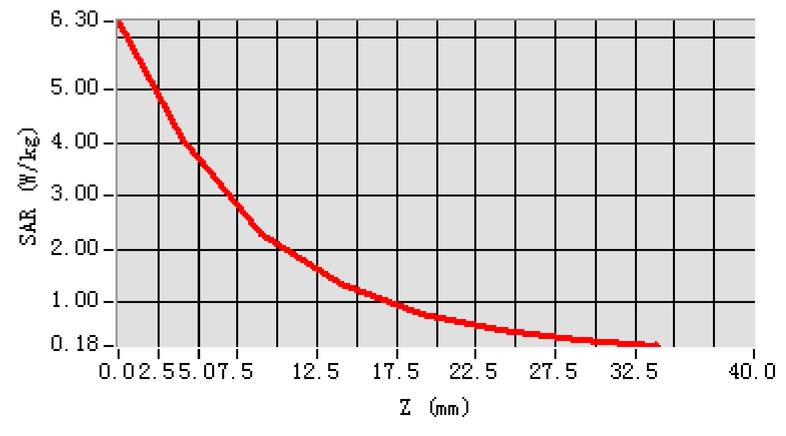
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900
Relative permittivity	53.39
Conductivity (S/m)	1.54
Power drift (%)	-2.31
Probe	SN 41/18 EPGO334
ConvF	1.88
Crest factor	1:1

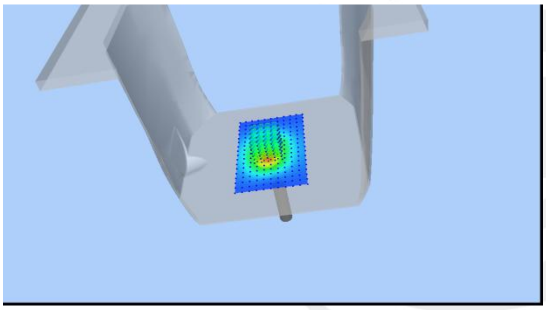
SURFACE SAR	VOLUME SAR
	

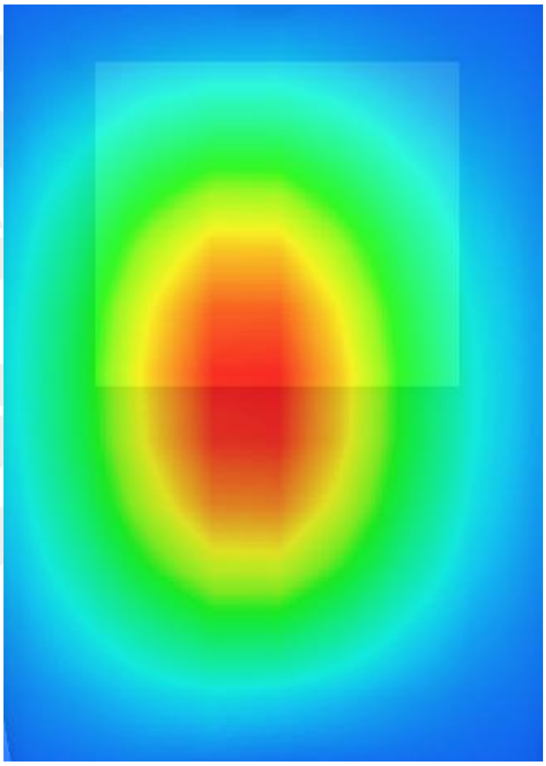
Maximum location: X=-3.00, Y=-2.00

SAR 10g (W/Kg)	2.137814
SAR 1g (W/Kg)	4.174325

Z Axis Scan


6.30
5.00
4.00
3.00
2.00
1.00
0.18
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)



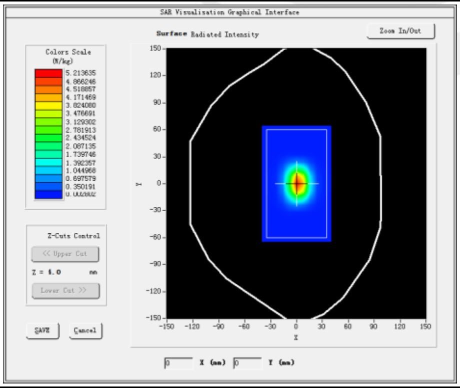
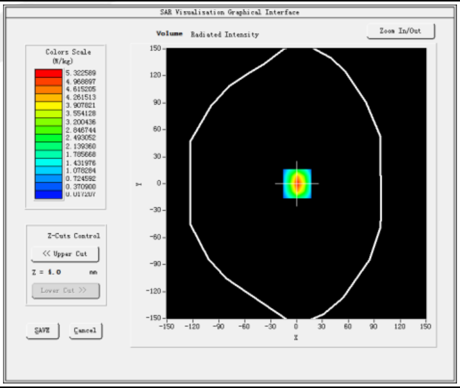


System Performance Check Data (2450MHz Head)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-16

Experimental conditions.

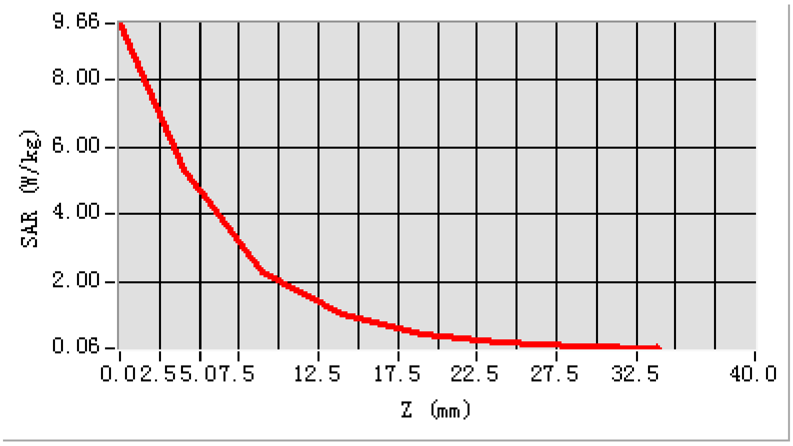
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	38.92
Conductivity (S/m)	1.78
Power drift (%)	0.96
Probe	SN 41/18 EPGO334
ConvF	1.97
Crest factor	1:1

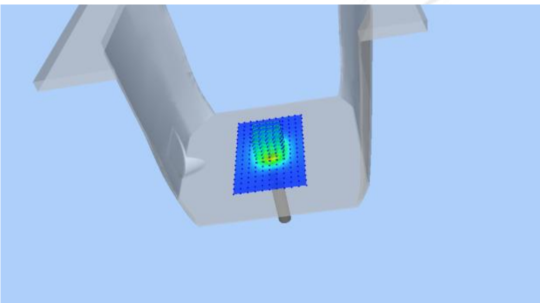
SURFACE SAR	VOLUME SAR
	

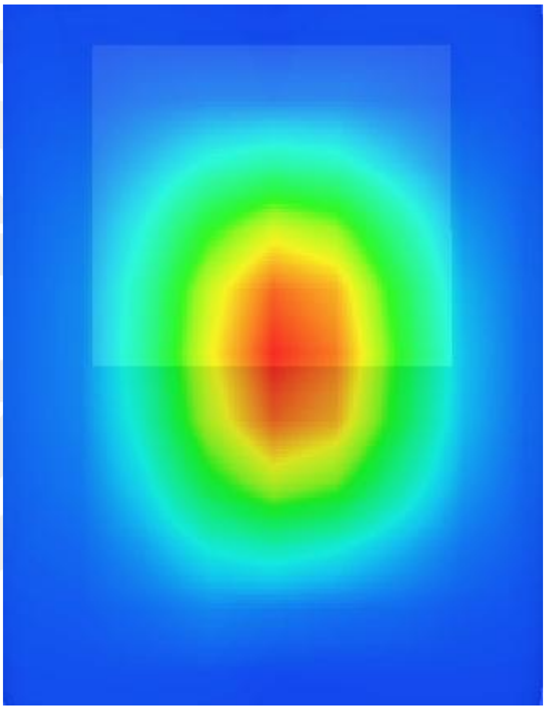
Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	2.431896
SAR 1g (W/Kg)	5.311894

Z Axis Scan


9.66
8.00
6.00
4.00
2.00
0.06
SAR (W/kg)
0.0 2.5 5.0 7.5
12.5
17.5
22.5
27.5
32.5
40.0
Z (mm)



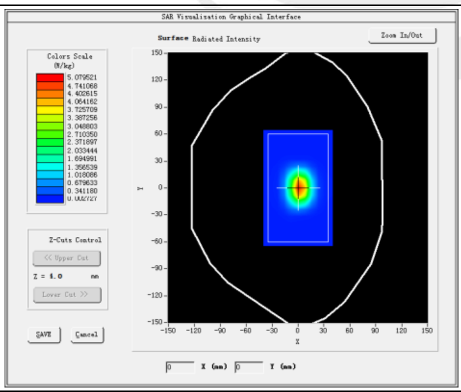
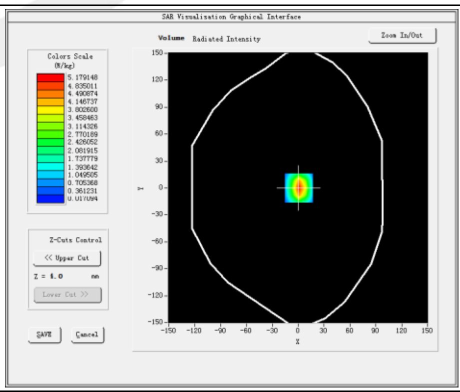


System Performance Check Data (2450MHz Body)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm, dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-07-16

Experimental conditions.

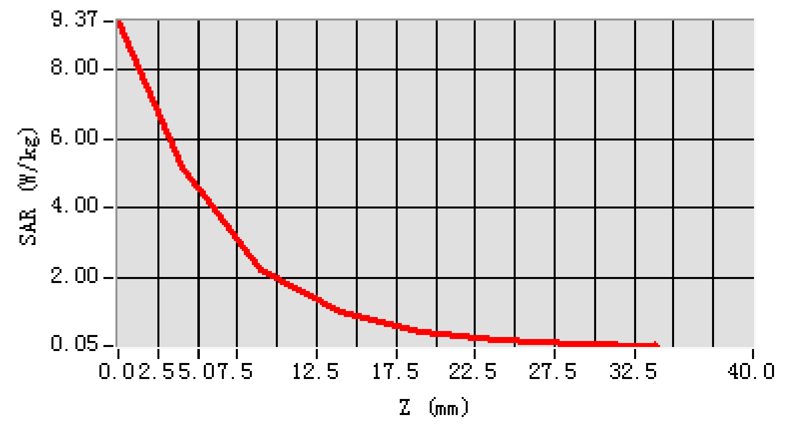
Device Position	Validation plane
Band	2450 MHz
Channels	-
Signal	CW
Frequency (MHz)	2450
Relative permittivity	53.01
Conductivity (S/m)	1.93
Power drift (%)	-0.15
Probe	SN 41/18 EPGO334
ConvF	2.02
Crest factor:	1:1

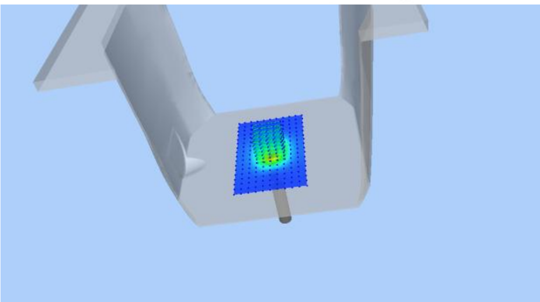
SURFACE SAR	VOLUME SAR
	

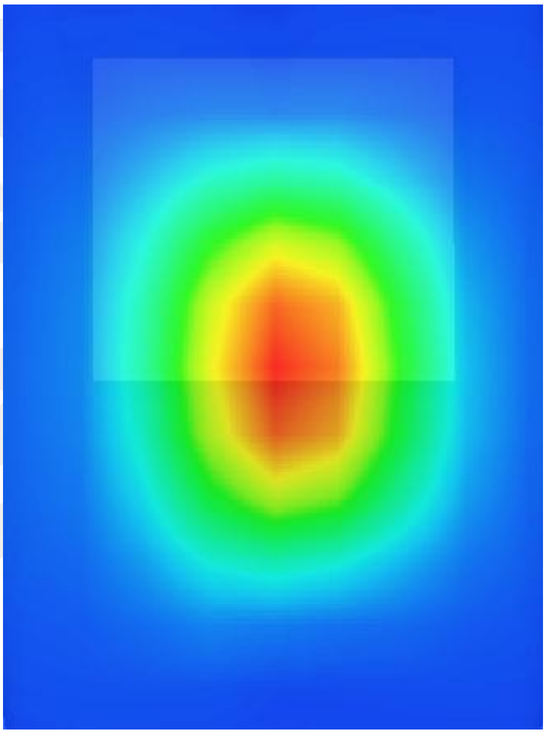
Maximum location: X=1.00, Y=0.00

SAR 10g (W/Kg)	2.421864
SAR 1g (W/Kg)	5.266359

Z Axis Scan


9.37
8.00
6.00
4.00
2.00
0.05
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)





Appendix B. SAR Test Plots

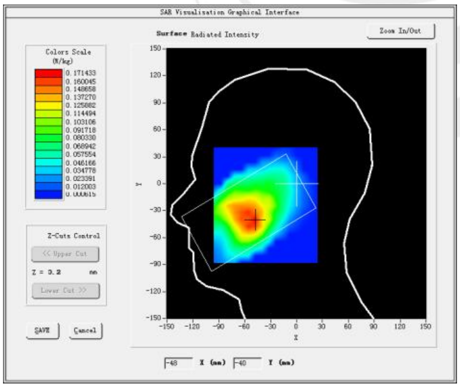
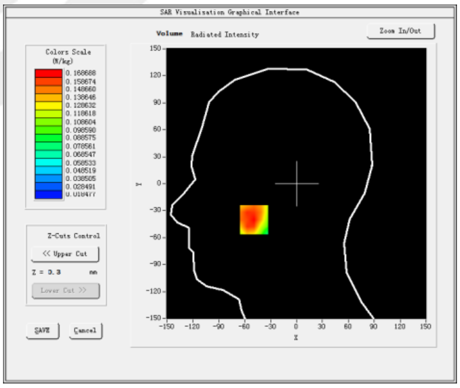
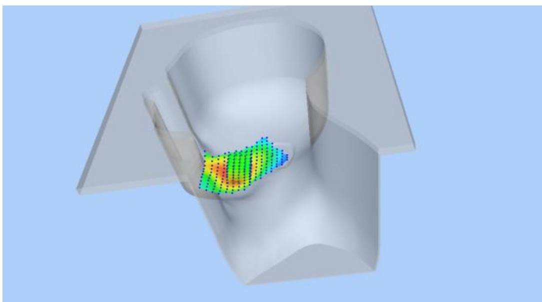
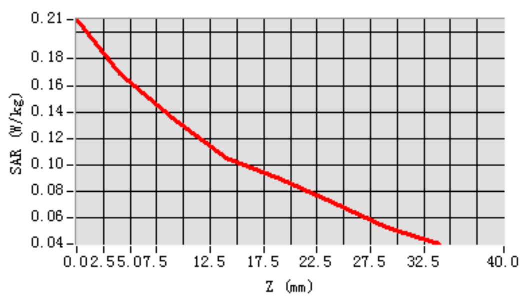
Plot 1: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-14
Probe	SN 41/18 EPGO334
ConvF	1.48
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GSM850
Channels	High
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	41.35
Conductivity (S/m)	0.90
Variation (%)	-3.14

Maximum location: X=-49.00, Y=-40.00

SAR Peak: 0.22W/kg

SAR 10g (W/Kg)	0.121310
SAR 1g (W/Kg)	0.164713

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

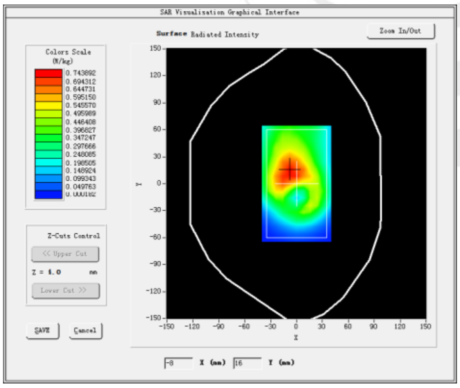
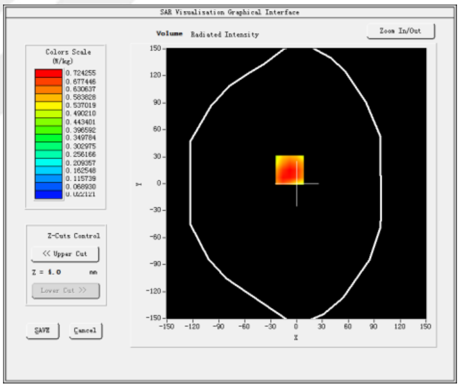
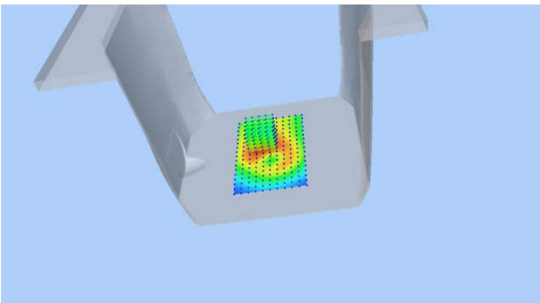
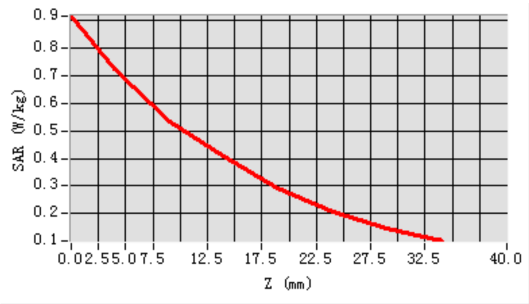
Plot 2: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-14
Probe	SN 41/18 EPGO334
ConvF	1.53
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back side
Band	GPRS 850
Channels	High
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	848.8
Relative permittivity (real part)	54.33
Conductivity (S/m)	0.98
Variation (%)	2.75

Maximum location: X=-8.00, Y=15.00

SAR Peak: 1.00W/kg

SAR 10g (W/Kg)	0.491768
SAR 1g (W/Kg)	0.708911

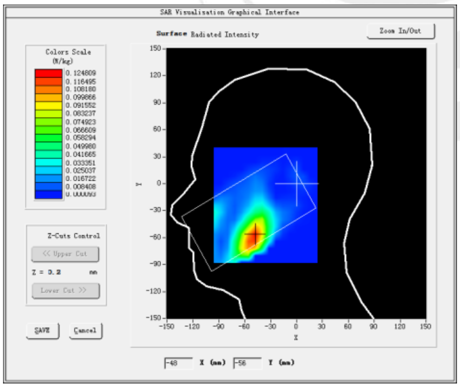
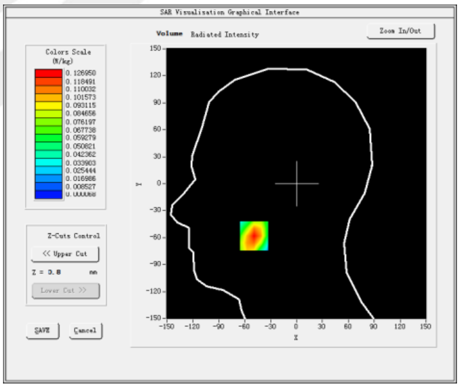
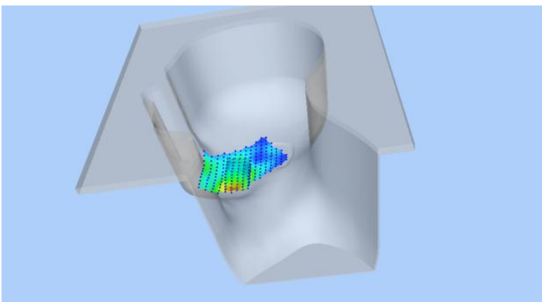
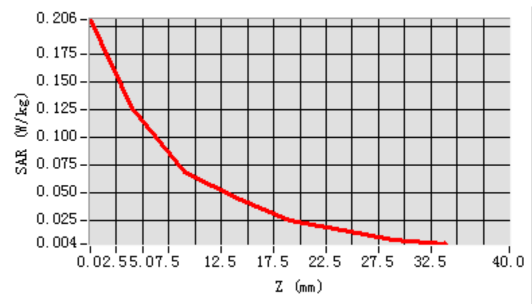
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 3: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-15
Probe	SN 41/18 EPGO334
ConvF	1.84
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	GSM1900
Channels	Mid
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1880.0
Relative permittivity (real part)	39.11
Conductivity (S/m)	1.42
Variation (%)	0.18

Maximum location: X=-49.00, Y=-58.00
SAR Peak: 0.21W/kg

SAR 10g (W/Kg)	0.064731
SAR 1g (W/Kg)	0.120906

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

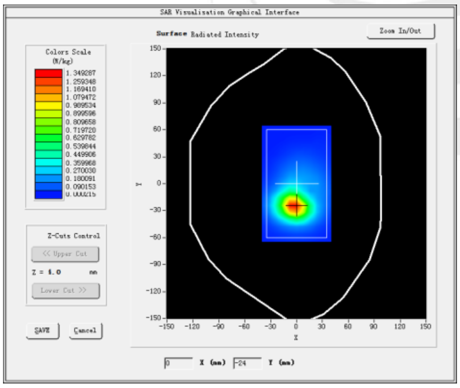
Plot 4: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-15
Probe	SN 41/18 EPGO334
ConvF	1.88
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back side
Band	GPRS 1900
Channels	Mid
Signal	Duty Cycle: 2.00 (Crest factor: 2.0)
Frequency (MHz)	1880.0
Relative permittivity (real part)	53.39
Conductivity (S/m)	1.54
Variation (%)	0.45

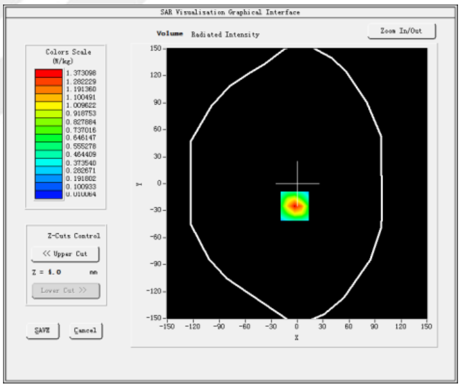
Maximum location: X=-3.00, Y=-25.00
SAR Peak:2.12W/kg

SAR 10g (W/Kg)	0.635650
SAR 1g (W/Kg)	1.261685

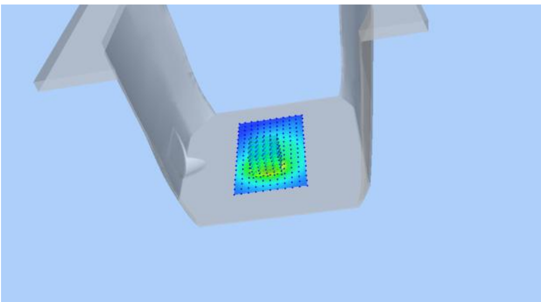
SURFACE SAR



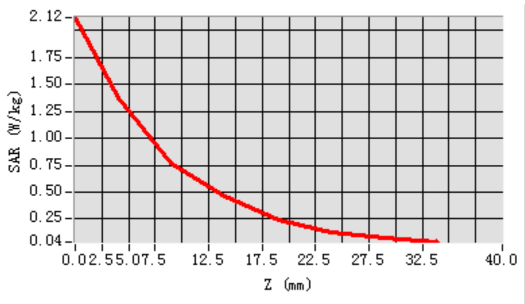
VOLUME SAR



3D screen shot



Z Axis Scan



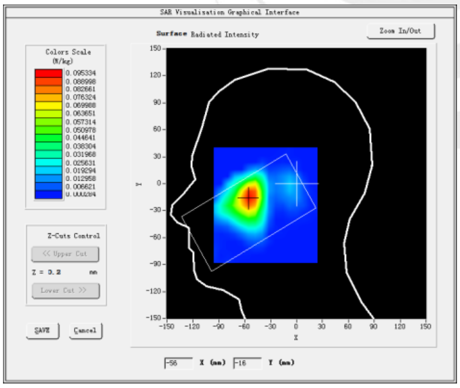
Plot 5: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-15
Probe	SN 41/18 EPGO334
ConvF	1.84
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	WCDMA II
Channels	High
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1907.6
Relative permittivity (real part)	39.11
Conductivity (S/m)	1.42
Variation (%)	0.24

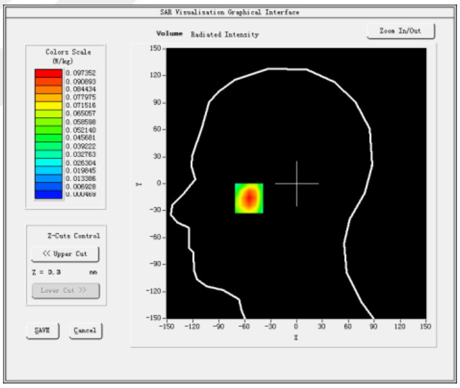
Maximum location: X=-55.00, Y=-15.00
SAR Peak: 0.14W/kg

SAR 10g (W/Kg)	0.051551
SAR 1g (W/Kg)	0.092734

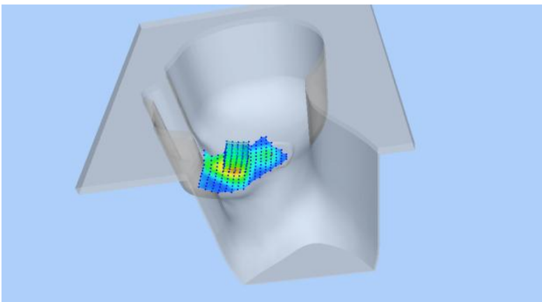
SURFACE SAR



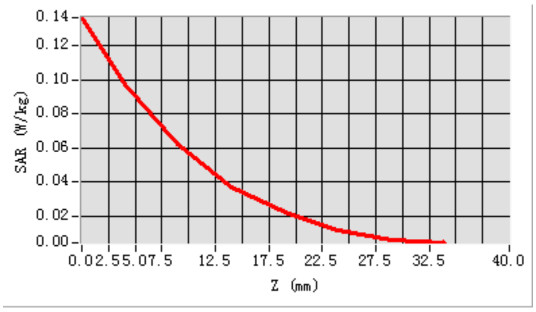
VOLUME SAR



3D screen shot



Z Axis Scan



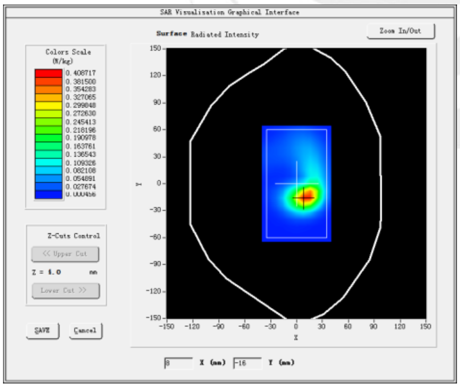
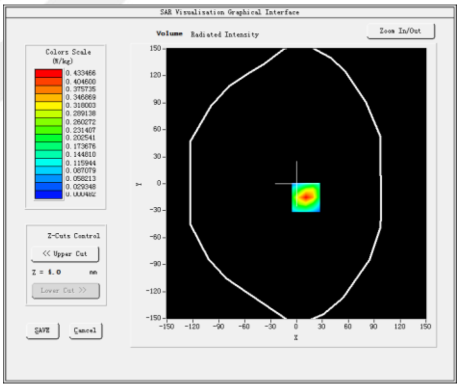
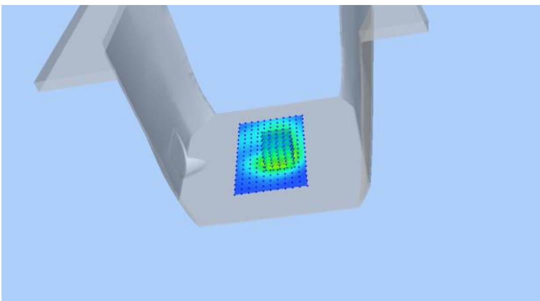
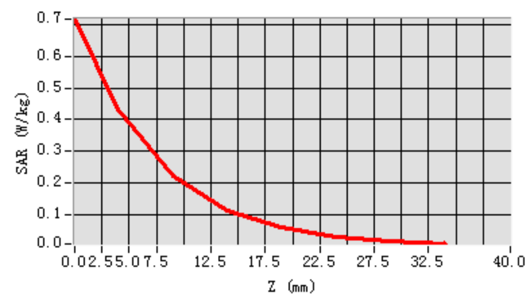
Plot 6: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-15
Probe	SN 41/18 EPGO334
ConvF	1.88
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back side
Band	WCDMA II
Channels	High
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	1907.6
Relative permittivity (real part)	53.30
Conductivity (S/m)	1.52
Variation (%)	-4.00

Maximum location: X=11.00, Y=-15.00

SAR Peak: 0.72W/kg

SAR 10g (W/Kg)	0.183653
SAR 1g (W/Kg)	0.403243

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

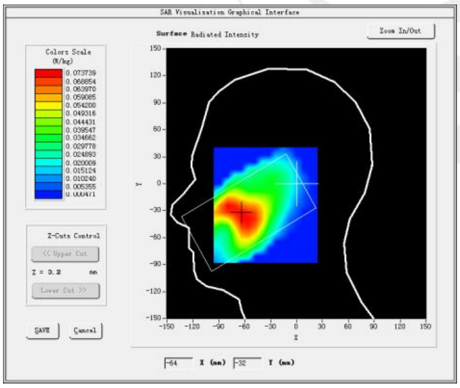
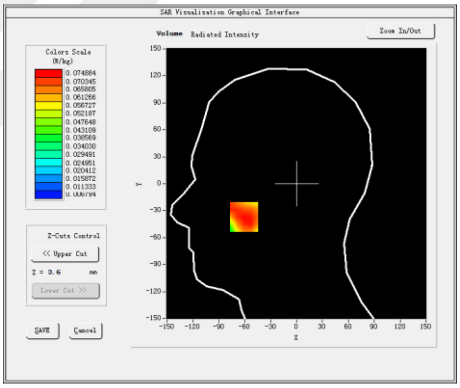
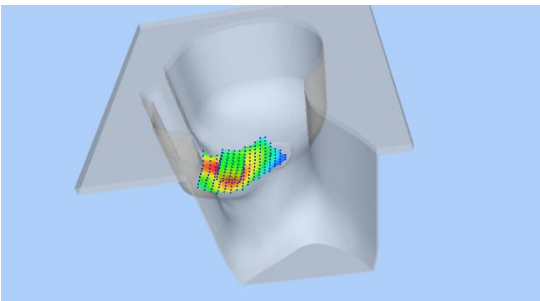
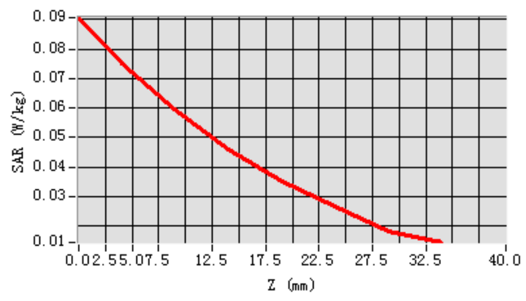
Plot 7: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-14
Probe	SN 41/18 EPGO334
ConvF	1.48
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	WCDMA V
Channels	High
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	846.6
Relative permittivity (real part)	41.50
Conductivity (S/m)	0.90
Variation (%)	0.15

Maximum location: X=-61.00, Y=-37.00

SAR Peak: 0.10W/kg

SAR 10g (W/Kg)	0.054078
SAR 1g (W/Kg)	0.074285

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

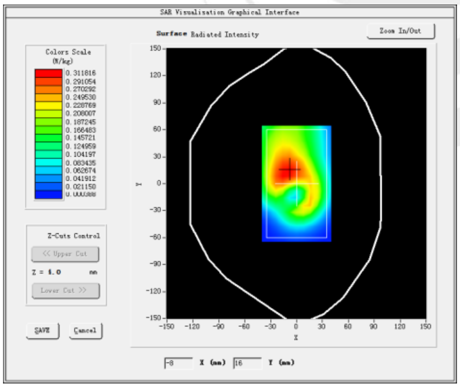
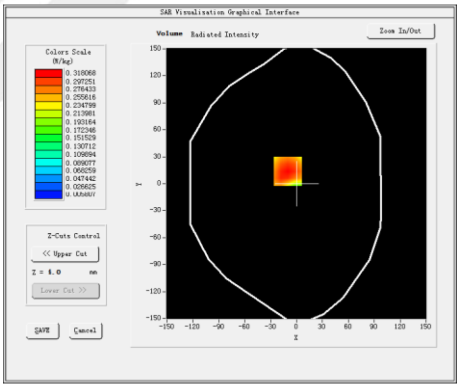
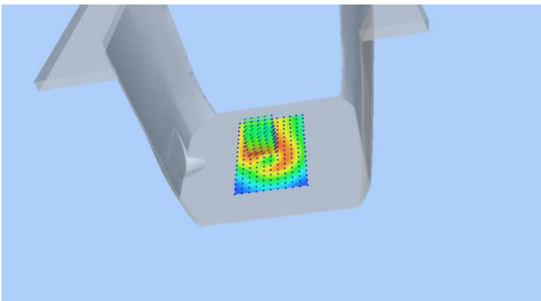
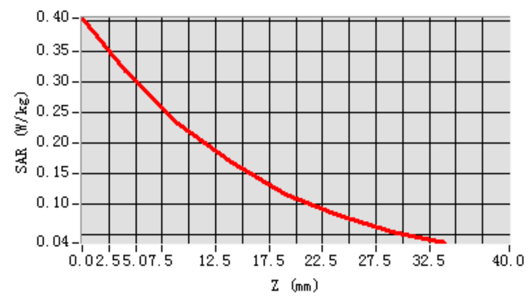
Plot 8: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-14
Probe	SN 41/18 EPGO334
ConvF	1.53
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body back side
Band	WCDMA V
Channels	High
Signal	WCDMA (Crest factor: 1.0)
Frequency (MHz)	846.6
Relative permittivity (real part)	55.20
Conductivity (S/m)	0.97
Variation (%)	-3.77

Maximum location: X=-10.00, Y=14.00

SAR Peak: 0.42W/kg

SAR 10g (W/Kg)	0.216389
SAR 1g (W/Kg)	0.310185

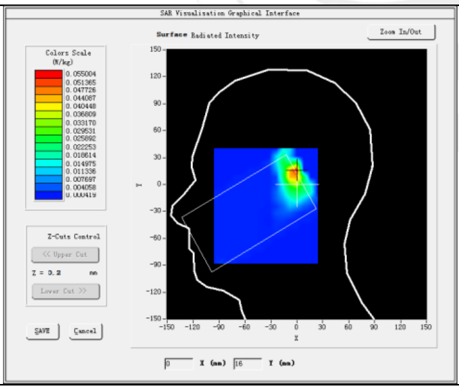
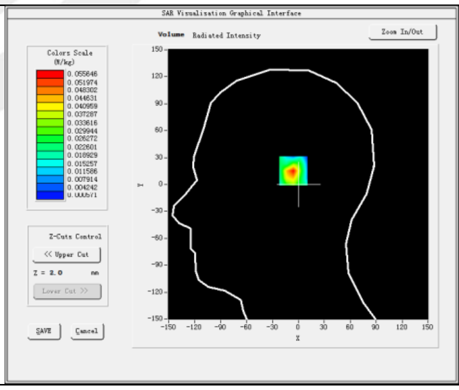
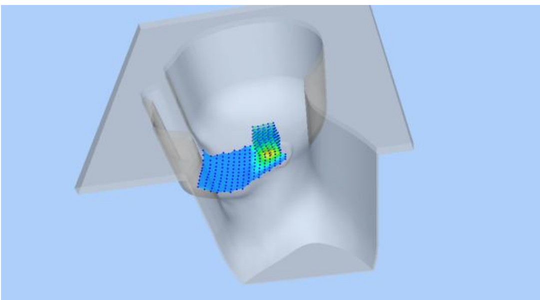
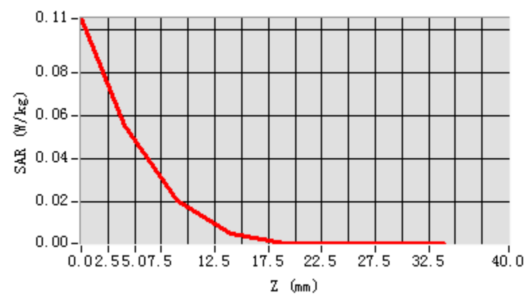
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 9: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-16
Probe	SN 41/18 EPGO334
ConvF	1.97
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right head
Device Position	Cheek
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	39.20
Conductivity (S/m)	1.80
Variation (%)	-2.09

Maximum location: X=-1.00, Y=15.00
SAR Peak: 0.11W/kg

SAR 10g (W/Kg)	0.020195
SAR 1g (W/Kg)	0.050770

SURFACE SAR	VOLUME SAR
	
3D	**Z Axis Scan**
	

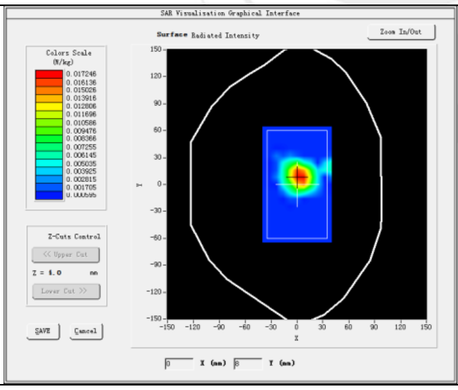
Plot 10: DUT: Mobile phone; EUT Model: Q5 Pro

Test Date	2020-07-16
Probe	SN 41/18 EPGO334
ConvF	2.02
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Body Back side
Band	IEEE 802.11b ISM
Channels	Low
Signal	IEEE802.b (Crest factor: 1.0)
Frequency (MHz)	2412
Relative permittivity (real part)	52.70
Conductivity (S/m)	1.95
Variation (%)	-3.77

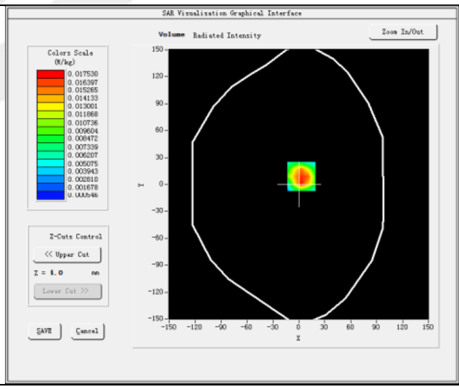
Maximum location: X=3.00, Y=9.00
SAR Peak: 0.04W/kg

SAR 10g (W/Kg)	0.006883
SAR 1g (W/Kg)	0.017279

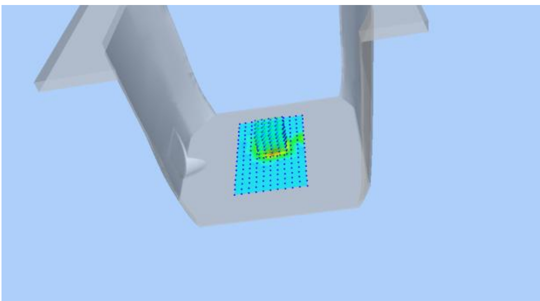
SURFACE SAR



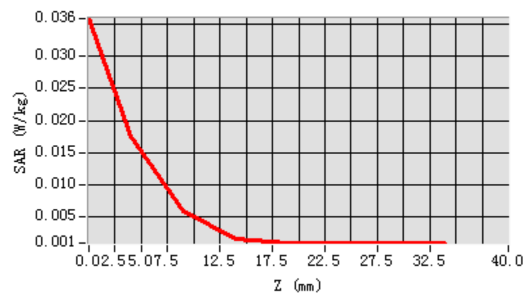
VOLUME SAR



3D



Z Axis Scan



Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※

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