

FCC SAR EVALUATION REPORT

In accordance with the requirements of
FCC 47 CFR Part 2(2.1093), ANSI/IEEE C95.1-1992 and
IEEE Std 1528-2013

Product Name : Mobile Phone

Trademark : ulefone

Model Name : GQ3090

Family Model : Armor 8, Armor 8E, Armor 8S, Armor 8P,
Armor 8X, Armor 8A, Armor 8 Pro,
Armor 8 Lite

Report No. : STR200610002009E

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TEST RESULT CERTIFICATION

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Product description

Product name.....: Mobile Phone
 Trademark: ulefone
 Model Name: GQ3090
 Family Model.....: Armor 8, Armor 8E, Armor 8S, Armor 8P, Armor 8X, Armor 8A,
 Armor 8 Pro, Armor 8 Lite
 FCC 47 CFR Part 2(2.1093)

Standards: ANSI/IEEE C95.1-1992
 IEEE Std 1528-2013
 Published RF exposure KDB procedures

This device described above has been tested by Shenzhen NTEK. In accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 and KDB 865664 D01. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992. 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.

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Date of Test

Date (s) of performance of tests: Jun. 11, 2020 ~ Jun. 28, 2020
 Date of Issue: Jul. 06, 2020
 Test Result: **Pass**

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※ ※ Revision History ※ ※

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1. General Information

1.1. RF exposure limits

(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.

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).

General Population/Uncontrolled Environments:

Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE
 HEAD AND TRUNK LIMIT
 1.6 W/kg
 APPLIED TO THIS EUT

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for GQ3090 are as follows.

RF Exposure Conditions		Equipment Class - Highest Reported SAR (W/kg)			
		PCE	DTS	NII	DSS
1-g Head		0.725	0.758	0.164	N/A
1-g Body-Worn (Separation distance of 10mm)		1.088	0.294	0.480	N/A
1-g Hotspot (Separation distance of 10mm)		1.088	0.294	0.480	N/A
Max Simultaneous Tx	Head	1.483	1.483	0.929	1.004
	Body-Worn	1.568	1.382	1.568	1.286
	Hotspot	1.568	1.382	1.568	1.286

Note: The Max Simultaneous Tx is calculated based on the same configuration and test position. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 & KDB 865664 D01.

1.3. EUT Description

Device Information	
Product Name	Mobile Phone
Trade Name	ulefone
Model Name	GQ3090
Family Model	Armor 8, Armor 8E, Armor 8S, Armor 8P, Armor 8X, Armor 8A, Armor 8 Pro, Armor 8 Lite
FCC ID	2AOWKGGQ3090
Device Phase	Identical Prototype
Exposure Category	General population / Uncontrolled environment
Antenna	PIFA Antenna
Battery Information	DC 3.8V, 5580mAh
Device Operating Configurations	
Supporting Mode(s)	GSM 850/1900, WCDMA Band 2/4/5, LTE Band 2/4/5/7/12/17, WLAN 2.4G/5.2G/5.8G, Bluetooth, NFC
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, π/4-DQPSK, 8DPSK), NFC(ASK)
Device Class	B

Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 4	1710-1755	2110-2155
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	Bluetooth	2402-2480	
NFC	13.56		
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EDGE Multislot Class(12)	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control "all 1"(WCDMA Band 2)		
	3, tested with power control "all 1"(WCDMA Band 4)		
	3, tested with power control "all 1"(WCDMA Band 5)		
	3, tested with power control all Max.(LTE Band 2)		
	3, tested with power control all Max.(LTE Band 4)		
	3, tested with power control all Max.(LTE Band 5)		
	3, tested with power control all Max.(LTE Band 7)		
	3, tested with power control all Max.(LTE Band 12)		
	3, tested with power control all Max.(LTE Band 17)		
Test Channels (low-mid-high)	128-189-251(GSM 850)		
	512-661-810(GSM 1900)		
	9262-9400-9538(WCDMA Band 2)		
	1312-1413-1513(WCDMA Band 4)		
	4132-4182-4233(WCDMA Band 5)		
	18607-18900-19193(LTE Band 2 BW=1.4MHz)		

18615-18900-19185(LTE Band 2 BW=3MHz)
18625-18900-19175(LTE Band 2 BW=5MHz)
18650-18900-19150(LTE Band 2 BW=10MHz)
18675-18900-19125(LTE Band 2 BW=15MHz)
18700-18900-19100(LTE Band 2 BW=20MHz)
19957-20175-20393(LTE Band 4 BW=1.4MHz)
19965-20175-20385(LTE Band 4 BW=3MHz)
19975-20175-20375(LTE Band 4 BW=5MHz)
20000-20175-20350(LTE Band 4 BW=10MHz)
20025-20175-20325(LTE Band 4 BW=15MHz)
20050-20175-20300(LTE Band 4 BW=20MHz)
20407-20525-20643(LTE Band 5 BW=1.4MHz)
20415-20525-20635(LTE Band 5 BW=3MHz)
20425-20525-20625(LTE Band 5 BW=5MHz)
20450-20525-20600(LTE Band 5 BW=10MHz)
20775-21100-21425(LTE Band 7 BW=5MHz)
20800-21100-21400(LTE Band 7 BW=10MHz)
20825-21100-21375(LTE Band 7 BW=15MHz)
20850-21100-21350(LTE Band 7 BW=20MHz)
23017-23095-23173 (LTE Band 12 BW=1.4MHz)
23025-23095-23165 (LTE Band 12 BW=3MHz)
23035-23095-23155 (LTE Band 12 BW=5MHz)
23060-23095-23130 (LTE Band 12 BW=10MHz)
23755-23790-23825(LTE Band 17 BW=5MHz)
23780-23790-23800(LTE Band 17 BW=10MHz)
1-6-11(WLAN 2.4G)
36-38-40-42-46-48(WLAN 5.2G)
149-151-155-157-159-165(WLAN 5.8G)

1.4. Test specification(s)

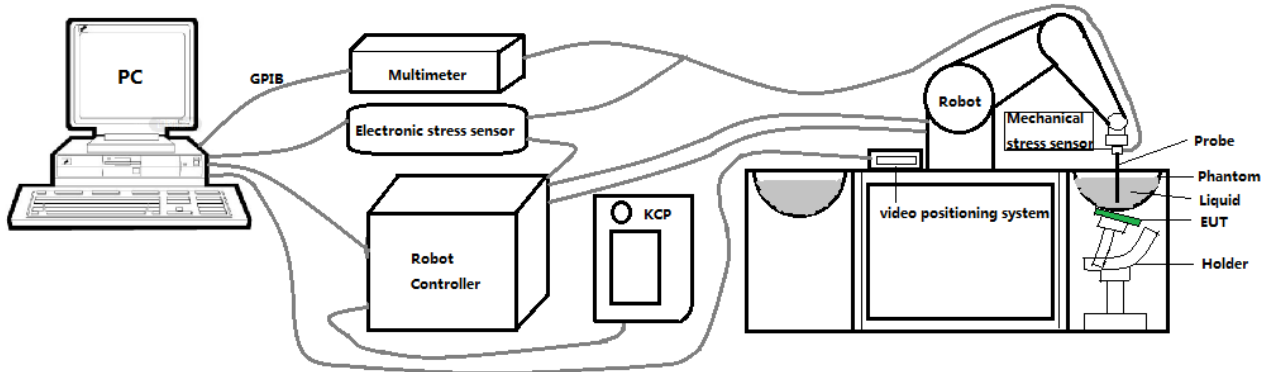
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 941225 D06 Hotspot SAR
KDB 648474 D04 Handset SAR

1.5. Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



These measurements were performed with the automated near-field scanning system OPENSAR from SATIMO. The system is based on a high precision robot (working range: 901 mm), which positions the probes with a positional repeatability of better than ± 0.03 mm. The SAR measurements were conducted with dosimetric probe (manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

The first step of the field measurement is the evaluation of the voltages induced on the probe by the device under test. Probe diode detectors are nonlinear. Below the diode compression point, the output voltage is proportional to the square of the applied E-field; above the diode compression point, it is linear to the applied E-field. The compression point depends on the diode, and a calibration procedure is necessary for each sensor of the probe.

The Keithley multimeter reads the voltage of each sensor and send these three values to the PC. The corresponding E field value is calculated using the probe calibration factors, which are stored in the working directory. This evaluation includes linearization of the diode characteristics. The field calculation is done separately for each sensor. Each component of the E field is displayed on the "Dipole Area Scan Interface" and the total E field is displayed on the "3D Interface"

2.2. Robot

The SATIMO SAR system uses the high precision robots from KUKA. For the 6-axis controller system, the robot controller version (KUKA) from KUKA is used. The KUKA robot series have many features that are important for our application:



- High precision (repeatability ± 0.03 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

2.3. E-Field Probe

This E-field detection probe is composed of three orthogonal dipoles linked to special Schottky diodes with low detection thresholds. The probe allows the measurement of electric fields in liquids such as the one defined in the IEEE and CENELEC standards.

For the measurements the Specific Dosimetric E-Field Probe SN 08/16 EPGO287 with following specifications is used



- Dynamic range: 0.01-100 W/kg
 - Tip Diameter: 2.5 mm
 - Distance between probe tip and sensor center: 1 mm
 - Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
 - Probe linearity: ± 0.08 dB
 - Axial isotropy: 0.06 dB
 - Hemispherical Isotropy: 0.08 dB
 - Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
 - Lower detection limit: 7mW/kg
- Angle between probe axis (evaluation axis) and surface normal line: less than 30° .

2.3.1. E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than $\pm 10\%$. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (Norm X, Norm Y, and Norm Z), the diode compression parameter (DCP) and the conversion factor (Conv F) of the probe are tested. The calibration data can be referred to appendix D of this report.

2.4. SAM phantoms

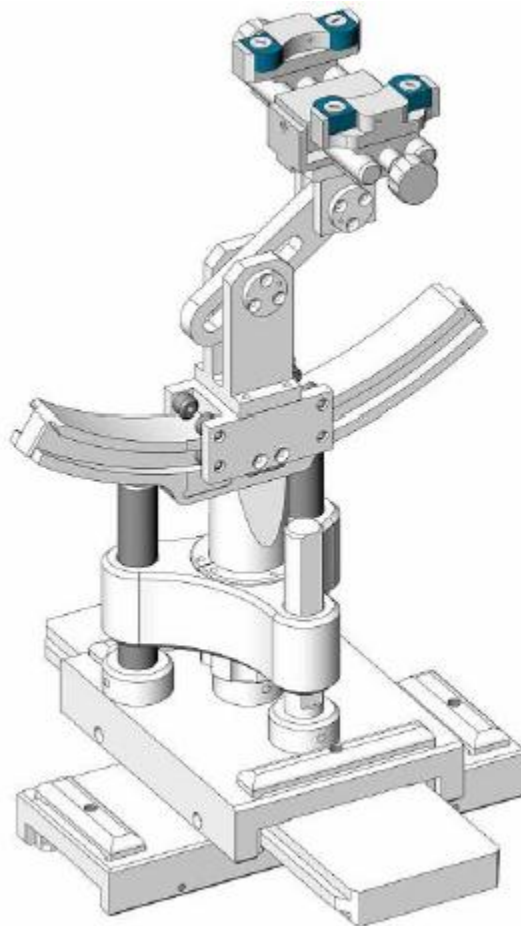
Photo of SAM phantom SN 16/15 SAM119



The SAM phantom is used to measure the SAR relative to people exposed to electro-magnetic field radiated by Mobile Phones.

2.5. Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1 degree.



Serial Number	Holder Material	Permittivity	Loss Tangent
SN 16/15 MSH100	Delrin	3.7	0.005

2.6. Test Equipment List

This table gives a complete overview of the SAR measurement equipment.

Devices used during the test described are marked

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
<input checked="" type="checkbox"/>	MVG	E FIELD PROBE	SSE2	SN 08/16 EPGO287	Dec. 27, 2019	Dec. 26, 2020
<input checked="" type="checkbox"/>	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Apr. 19, 2018	Apr. 18, 2021
<input type="checkbox"/>	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Apr. 19, 2018	Apr. 18, 2021
<input type="checkbox"/>	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Apr. 19, 2018	Apr. 18, 2021
<input checked="" type="checkbox"/>	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
<input checked="" type="checkbox"/>	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
<input checked="" type="checkbox"/>	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
<input checked="" type="checkbox"/>	R&S	Universal radio communication tester	CMU200	117858	Aug. 06, 2019	Aug. 05, 2020
<input checked="" type="checkbox"/>	R&S	Wideband radio communication tester	CMW500	103917	Aug. 28, 2019	Aug. 27, 2020
<input checked="" type="checkbox"/>	HP	Network Analyzer	8753D	3410J01136	Aug. 06, 2019	Aug. 05, 2020
<input checked="" type="checkbox"/>	Agilent	PSG Analog Signal Generator	E8257D	MY51110112	Aug. 06, 2019	Aug. 05, 2020

<input checked="" type="checkbox"/>	Agilent	Power meter	E4419B	MY45102538	Aug. 06, 2019	Aug. 05, 2020
<input checked="" type="checkbox"/>	Agilent	Power sensor	E9301A	MY41495644	Aug. 06, 2019	Aug. 05, 2020
<input checked="" type="checkbox"/>	Agilent	Power sensor	E9301A	US39212148	Aug. 06, 2019	Aug. 05, 2020
<input checked="" type="checkbox"/>	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Aug. 06, 2019	Aug. 05, 2020

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/Bluetooth power measurement, use engineering software to configure EUT WLAN/Bluetooth continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/Bluetooth output power.

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/Bluetooth continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix A demonstrates.
- (c) Set scan area, grid size and other setting on the OPENSAR software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band.
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg.

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

3.1. Power Reference

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

3.2. Area scan & Zoom scan

The area scan is a 2D scan to find the hot spot location on the DUT. The zoom scan is a 3D scan above the hot spot to calculate the 1g and 10g SAR value.

Measurement of the SAR distribution with a grid of 8 to 16 mm * 8 to 16 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.

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).

Area scan & Zoom scan scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

		≤ 3 GHz	> 3 GHz	
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	½·δ·ln(2) ± 0.5 mm	
Maximum probe angle from probe axis to phantom surface normal at the measurement location		30° ± 1°	20° ± 1°	
Maximum area scan spatial resolution: Δx _{Area} , Δy _{Area}		≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm	
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.		
Maximum zoom scan spatial resolution: Δx _{Zoom} , Δy _{Zoom}		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: Δz _{Zoom} (n)	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	Δz _{Zoom} (1): between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		Δz _{Zoom} (n>1): between subsequent points	≤ 1.5·Δz _{Zoom} (n-1)	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

3.3. Description of interpolation/extrapolation scheme

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimise measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is used to determine these highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1 mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

3.4. Volumetric Scan

The volumetric scan consists of a full 3D scan over a specific area. This 3D scan is useful for multi Tx SAR measurement. Indeed, it is possible with OpenSAR to add, point by point, several volumetric scans to calculate the SAR value of the combined measurement as it is defined in the standard IEEE1528 and IEC62209.

3.5. Power Drift

All SAR testing is under the EUT installed with a full charged battery and transmit maximum output power. In OpenSAR measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in V/m. If the power drifts more than $\pm 5\%$, the SAR will be retested.

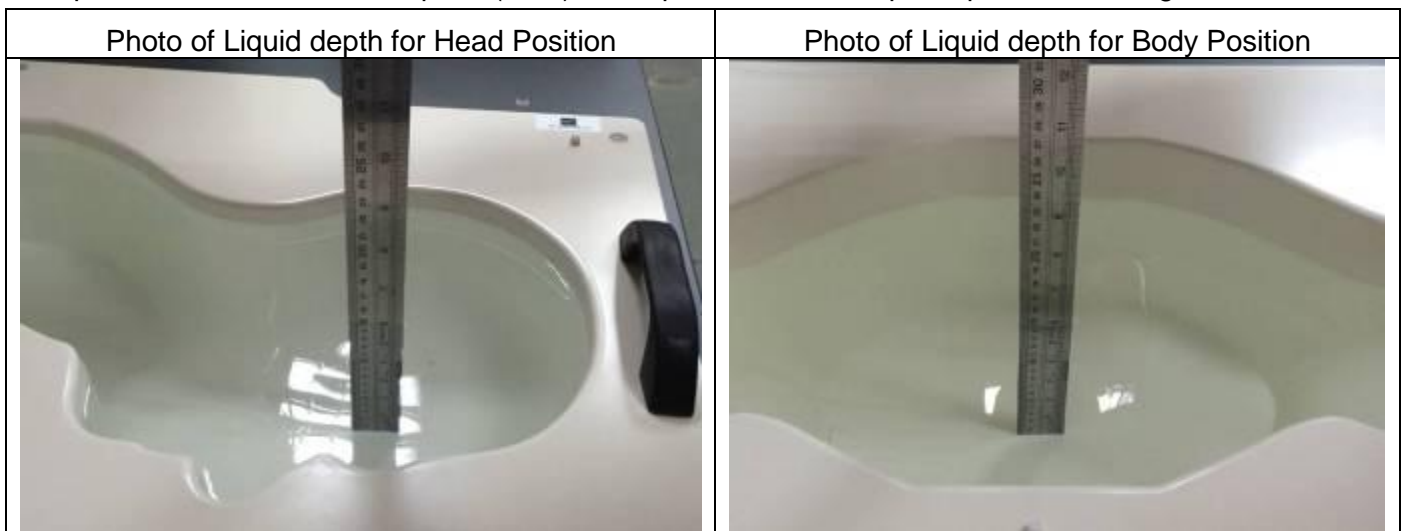
4. System Verification Procedure

4.1. Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% of weight)	Head Tissue									
	750	835	900	1800	1900	2000	2450	2600	5200	5800
Frequency Band (MHz)										
Water	34.40	34.40	34.40	55.36	55.36	57.87	57.87	57.87	65.53	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	24.24	24.24
DGBE	0.00	0.00	0.00	13.84	13.84	22.00	22.00	22.00	10.23	10.23
Ingredients (% of weight)	Body Tissue									
	750	835	900	1800	1900	2000	2450	2600	5200	5800
Frequency Band (MHz)										
Water	50.30	50.30	50.30	69.91	69.91	71.88	71.88	71.88	79.54	79.54
NaCl	0.60	0.60	0.60	0.13	0.13	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	49.10	49.10	49.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	9.99	9.99	19.97	19.97	19.97	11.24	11.24
DGBE	0.00	0.00	0.00	19.97	19.97	7.99	7.99	7.99	9.22	9.22

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 15 cm. For head SAR testing, the liquid depth from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm.



4.1.1. Tissue Dielectric Parameter Check Results

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

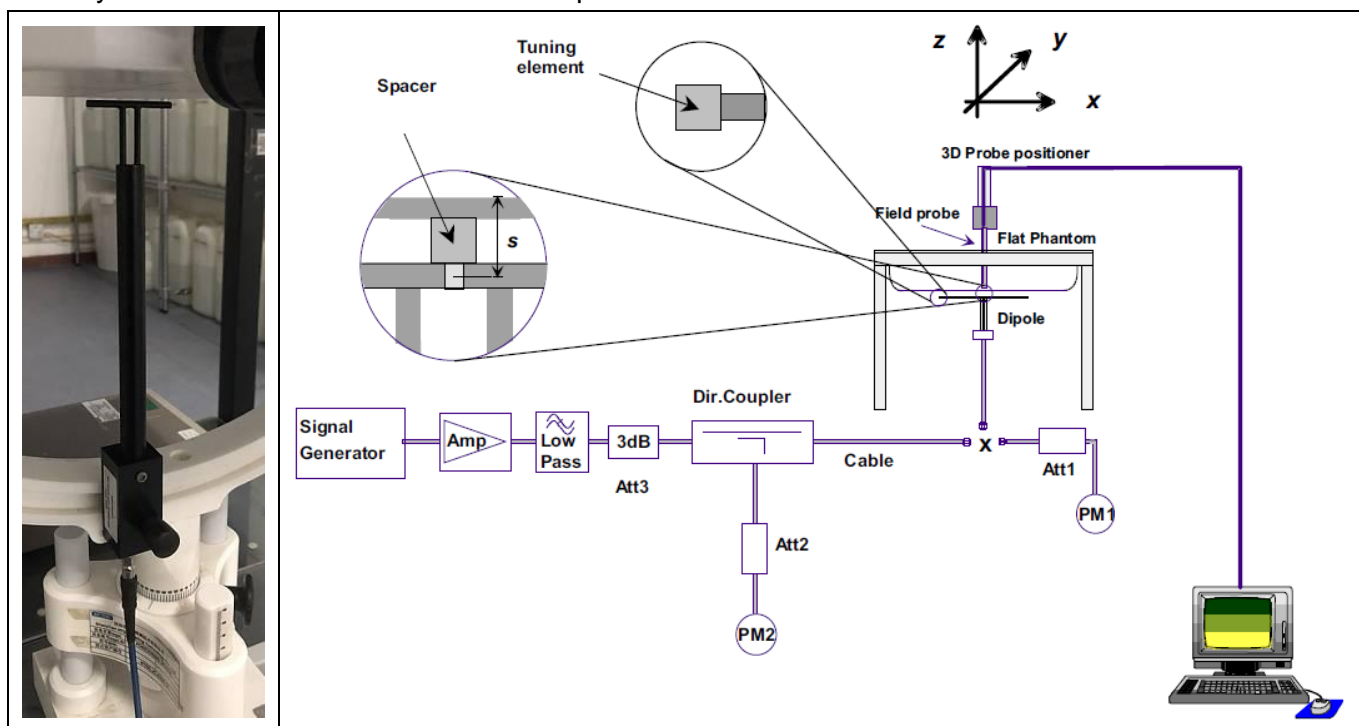
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		ϵ_r ($\pm 5\%$)	σ (S/m) ($\pm 5\%$)	ϵ_r	σ (S/m)		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	41.55	0.92	21.5 °C	Jun. 28, 2020
Body 750	750	55.55 (52.77~58.33)	0.96 (0.91~1.01)	55.47	0.96	21.5 °C	Jun. 20, 2020
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	40.74	0.93	21.5 °C	Jun. 20, 2020
Body 850	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.47	0.98	21.5 °C	Jun. 20, 2020
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.52	1.39	21.3 °C	Jun. 13, 2020
Body 1800	1800	53.30 (50.64~55.97)	1.52 (1.44~1.60)	54.04	1.51	21.5 °C	Jun. 21, 2020
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.58	1.44	21.5 °C	Jun. 21, 2020
Body 1900	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	54.21	1.53	21.5 °C	Jun. 21, 2020
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.47	1.85	21.2 °C	Jun. 23, 2020
Body 2450	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	51.47	1.89	21.5 °C	Jun. 22, 2020
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	38.06	2.03	21.4 °C	Jun. 23, 2020
Body 2600	2600	52.51 (49.88~55.14)	2.16 (2.05~2.27)	52.80	2.22	21.2 °C	Jun. 22, 2020
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	35.58	4.65	21.5 °C	Jun. 11, 2020
Body 5200	5200	49.00 (46.55~51.45)	5.30 (5.04~5.57)	49.64	5.26	21.5 °C	Jun. 24, 2020

NOTE: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

4.2. System Verification Procedure

The system verification is performed for verifying the accuracy of the complete measurement system and performance of the software. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100mW (below 5GHz) or 100mW (above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system verification to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system verification to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

The system verification is shown as below picture:



4.2.1. System Verification Results

Comparing to the original SAR value provided by SATIMO, the verification data should be within its specification of $\pm 10\%$. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance verification can meet the variation criterion and the plots can be referred to Appendix B of this report.

System Verification	Target SAR (1W) ($\pm 10\%$)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
750MHz Head	8.56 (7.70~9.42)	5.55 (5.00~6.11)	8.93	5.60	21.5 °C	Jun. 28, 2020
750MHz Body	8.85 (7.97~9.74)	5.91 (5.32~6.50)	8.45	6.06	21.5 °C	Jun. 20, 2020
835MHz Head	9.55 (8.60~10.51)	6.10 (5.49~6.71)	9.04	6.37	21.5 °C	Jun. 20, 2020
835MHz Body	9.83 (8.85~10.81)	6.45 (5.81~7.10)	10.28	6.28	21.5 °C	Jun. 20, 2020
1800MHz Head	38.11 (34.30~41.92)	20.05 (18.05~22.06)	37.69	19.43	21.3 °C	Jun. 13, 2020
1800MHz Body	38.13 (34.32~41.94)	20.65 (18.59~22.72)	37.41	20.19	21.5 °C	Jun. 21, 2020
1900MHz Head	38.92 (35.03~42.81)	20.09 (18.08~22.10)	39.15	19.73	21.5 °C	Jun. 21, 2020
1900MHz Body	39.02 (35.12~42.92)	20.57 (18.51~22.63)	37.12	21.69	21.5 °C	Jun. 21, 2020
2450MHz Head	53.76 (48.38~59.14)	24.12 (21.71~26.53)	53.74	24.10	21.2 °C	Jun. 23, 2020
2450MHz Body	52.90 (47.61~58.19)	24.09 (21.68~26.50)	53.14	25.14	21.5 °C	Jun. 22, 2020
2600MHz Head	55.60 (50.04~61.16)	24.60 (22.14~27.06)	55.52	24.51	21.4 °C	Jun. 23, 2020
2600MHz Body	52.49 (47.24~57.74)	23.74 (21.37~26.11)	53.09	22.56	21.2 °C	Jun. 22, 2020
5200MHz Head	160.94 (144.85~177.03)	55.97 (50.37~61.57)	162.86	55.62	21.5 °C	Jun. 11, 2020
5200MHz Body	156.85 (141.17~172.54)	55.20 (49.68~60.72)	158.86	56.33	21.5 °C	Jun. 24, 2020

5. SAR Measurement variability and uncertainty

5.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 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 ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

5.2. SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6. RF Exposure Positions

6.1. Ear and handset reference point

Figure 6.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE”.



Fig 6.1.1 Front, back, and side views of SAM phantom

6.2. Definition of the cheek position

1. Define two imaginary lines on the handset, the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset: the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 6.2.1 and Figure 6.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 6.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 6.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
2. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
3. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP
4. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
5. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.

6. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 6.2.3. The actual rotation angles should be documented in the test report.

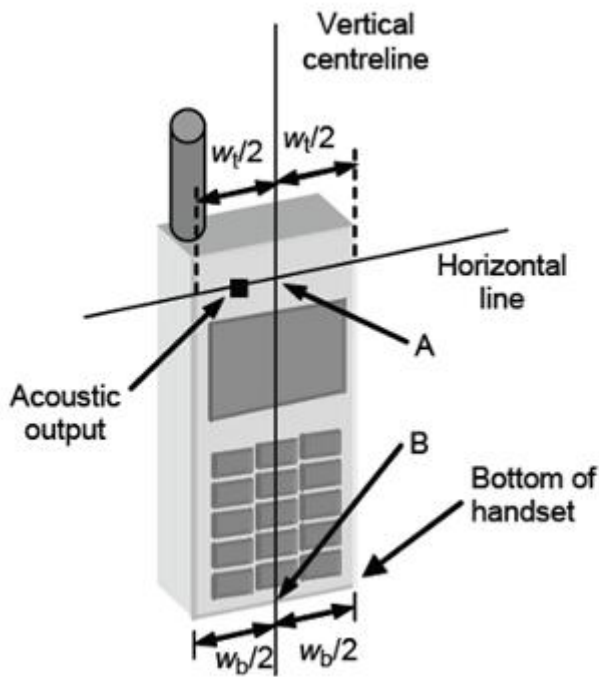


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case"

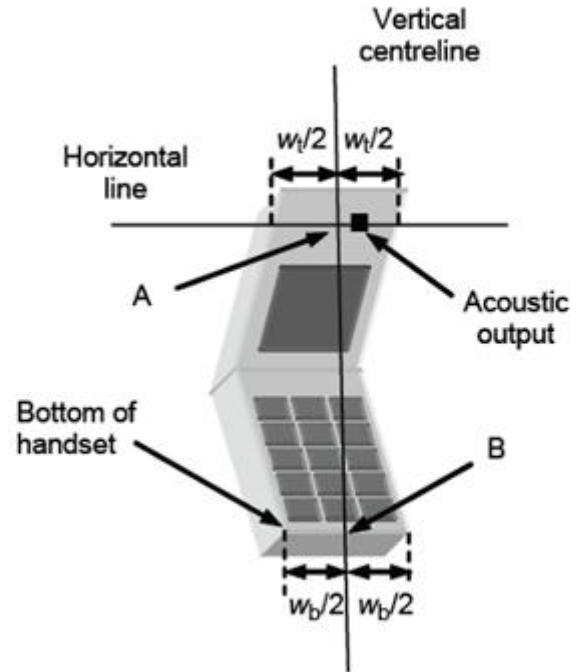


Fig 6.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

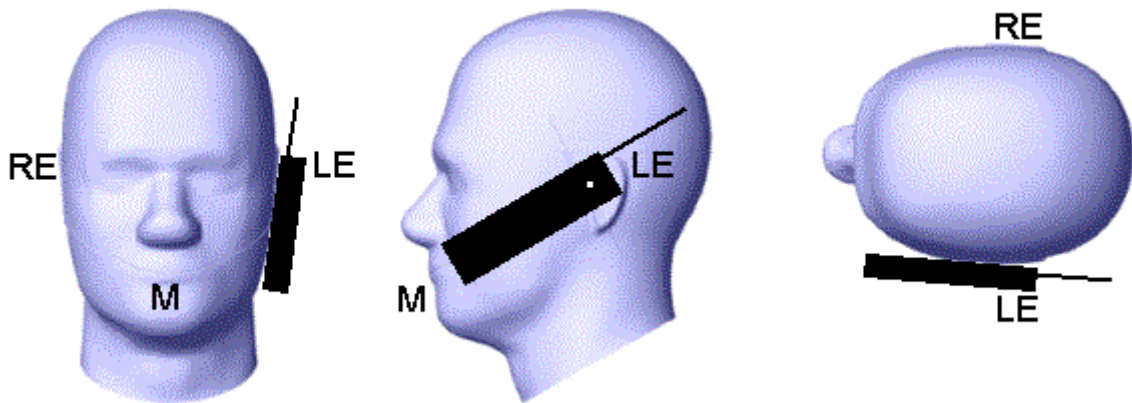


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

6.3. Definition of the tilt position

1. While maintaining the orientation of the handset, retract the handset parallel to the reference plane far enough away from the phantom to enable a rotation of the device by 15 degree.
2. Rotate the Handset around the horizontal line by 15 degree (see Figure 6.3.1).
3. While maintaining the orientation of the handset, move the handset towards the phantom on a line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna, e.g., the antenna with the back of the phantom head, the angle of the handset shall be reduced. In this case, the tilt position is obtained if any part of the handset is in contact with the pinna as well as a second part of the handset is in contact with the phantom, e.g., the antenna with the back of the head.

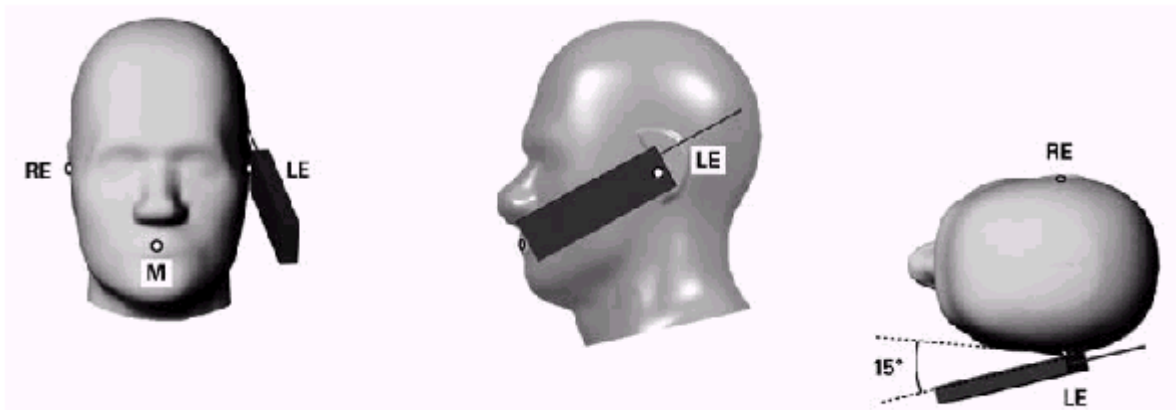


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

6.4. Body Worn Accessory

1. Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6.4.1). Per KDB 648474 D04, 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 FCC KDB 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is $< 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.
2. Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest

spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

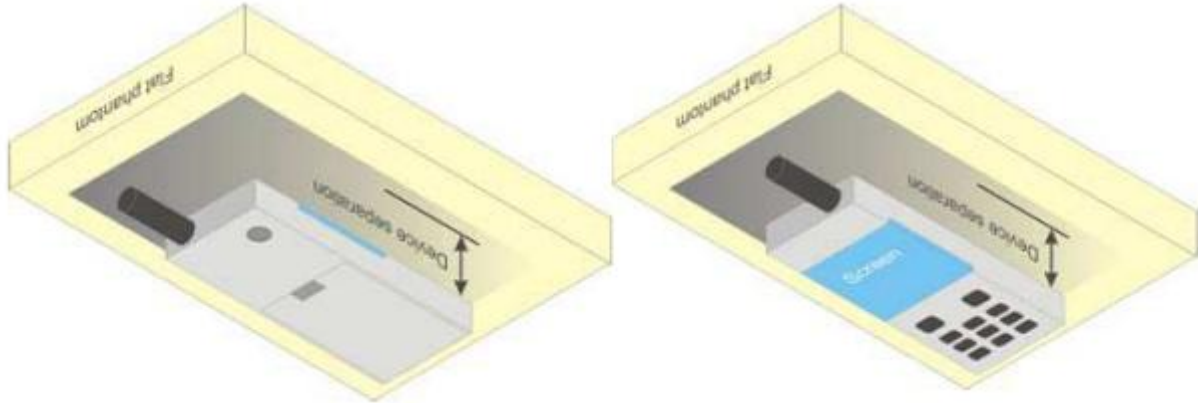


Figure 6.4.1 – Test positions for body-worn devices

6.5. Wireless Router Devices

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WLAN simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WLAN transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WLAN transmitter according to FCC KDB Publication 447498 D01 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850		Burst-Averaged output Power (dBm)			Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	128	189	251	Tune-up (dBm)	128	189	251
Frequency (MHz)		824.2	836.4	848.8		824.2	836.4	848.8
GSM (GMSK)	33.00	32.88	32.95	32.71	23.97	23.85	23.92	23.68
GPRS(GMSK, 1 TS)	33.00	32.87	32.91	32.72	23.97	23.84	23.88	23.69
GPRS(GMSK, 2 TS)	33.00	32.14	32.12	31.92	26.98	26.12	26.10	25.90
GPRS(GMSK, 3 TS)	31.00	30.34	30.31	30.12	26.74	26.08	26.05	25.86
GPRS(GMSK, 4 TS)	30.00	29.18	29.13	28.97	26.99	26.17	26.12	25.96
EDGE(8PSK, 1 TS)	28.00	27.59	27.73	27.97	18.97	18.56	18.70	18.94
EDGE(8PSK, 2 TS)	27.00	26.66	26.61	26.36	20.98	20.64	20.59	20.34
EDGE(8PSK, 3 TS)	25.00	24.60	24.18	24.36	20.74	20.34	19.92	20.10
EDGE(8PSK, 4 TS)	24.00	23.24	22.82	22.97	20.99	20.23	19.81	19.96
Band GSM1900		Burst-Averaged output Power (dBm)			Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	512	661	810	Tune-up (dBm)	512	661	810
Frequency (MHz)		1850.2	1880.0	1909.8		1850.2	1880.0	1909.8
GSM (GMSK)	31.00	30.00	30.31	30.61	21.97	20.97	21.28	21.58
GPRS(GMSK, 1 TS)	31.00	29.99	30.30	30.59	21.97	20.96	21.27	21.56
GPRS(GMSK, 2 TS)	30.00	29.24	29.54	29.84	23.98	23.22	23.52	23.82
GPRS(GMSK, 3 TS)	29.00	27.46	27.76	28.11	24.74	23.20	23.50	23.85
GPRS(GMSK, 4 TS)	28.00	26.29	26.64	27.01	24.99	23.28	23.63	24.00
EDGE(8PSK, 1 TS)	27.00	26.44	26.52	26.99	17.97	17.41	17.49	17.96
EDGE(8PSK, 2 TS)	26.00	25.64	25.76	25.91	19.98	19.62	19.74	19.89
EDGE(8PSK, 3 TS)	24.00	23.50	23.60	23.81	19.74	19.24	19.34	19.55
EDGE(8PSK, 4 TS)	23.00	22.39	22.47	22.73	19.99	19.38	19.46	19.72

Note: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 TS) - 9.03 dB

Frame-averaged power = Maximum burst averaged power (2 TS) - 6.02 dB

Frame-averaged power = Maximum burst averaged power (3 TS) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 TS) - 3.01 dB

7.2. WCDMA Conducted Power

Band		WCDMA Band 2		
Tx Channel	Tune-up	9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
RMC 12.2Kbps	24.00	23.49	23.76	23.85
HSDPA Subtest-1	23.00	22.73	22.82	22.88
HSDPA Subtest-2	23.00	22.02	22.28	22.03
HSDPA Subtest-3	22.00	21.12	21.43	20.97
HSDPA Subtest-4	22.00	21.35	21.47	21.49
HSUPA Subtest-1	23.00	22.28	22.36	22.44
HSUPA Subtest-2	23.00	22.69	22.73	22.81
HSUPA Subtest-3	22.00	21.49	21.42	21.62
HSUPA Subtest-4	23.00	22.70	22.80	22.87
HSUPA Subtest-5	23.00	22.17	22.10	22.06
Band		WCDMA Band 4		
Tx Channel	Tune-up	1312	1413	1513
Frequency (MHz)		1712.4	1732.6	1752.6
RMC 12.2Kbps	24.00	23.20	23.03	23.38
HSDPA Subtest-1	23.00	22.23	22.00	21.86
HSDPA Subtest-2	22.00	21.81	21.37	21.68
HSDPA Subtest-3	21.00	20.67	20.22	20.62
HSDPA Subtest-4	21.00	20.67	20.57	20.53
HSUPA Subtest-1	23.00	21.93	21.43	22.04
HSUPA Subtest-2	22.00	21.88	21.81	21.96
HSUPA Subtest-3	21.00	20.93	20.69	20.97
HSUPA Subtest-4	23.00	22.13	21.98	22.31
HSUPA Subtest-5	22.00	21.49	20.98	21.22
Band		WCDMA Band 5		
Tx Channel	Tune-up	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6
RMC 12.2Kbps	24.00	23.25	23.28	23.13
HSDPA Subtest-1	23.00	22.32	22.37	22.26
HSDPA Subtest-2	22.00	21.66	21.75	21.48
HSDPA Subtest-3	21.00	20.57	20.86	20.45
HSDPA Subtest-4	21.00	20.89	20.81	20.87
HSUPA Subtest-1	23.00	22.09	22.15	21.65
HSUPA Subtest-2	23.00	22.20	22.27	22.16
HSUPA Subtest-3	22.00	20.87	21.06	20.81
HSUPA Subtest-4	23.00	22.30	22.37	22.23

HSUPA Subtest-5	22.00	21.29	21.61	21.14
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7.3. LTE Conducted Power

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	24.00	23.53	23.14	23.07
			1	2	24.00	23.69	23.32	23.23
			1	5	24.00	23.42	23.14	23.07
			3	0	24.00	23.11	23.18	23.14
			3	1	24.00	23.09	23.21	23.16
			3	2	24.00	23.07	23.17	23.14
		16QAM	6	0	23.00	22.14	22.16	22.14
			1	0	23.00	21.83	22.21	22.18
			1	2	23.00	22.00	22.30	22.35
			1	5	23.00	21.83	22.20	22.22
			3	0	23.00	22.17	22.28	22.28
			3	1	23.00	22.16	22.28	22.30
			3	2	23.00	22.19	22.26	22.29
			6	0	22.00	21.27	21.33	21.27
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5
LTE Band 2	3MHz	QPSK	1	0	24.00	23.04	23.09	23.05
			1	7	24.00	23.19	23.47	23.41
			1	14	24.00	23.07	23.05	23.07
			8	0	23.00	22.02	22.08	22.12
			8	4	23.00	22.07	22.10	22.15
			8	7	23.00	22.00	22.08	22.07
			15	0	23.00	21.98	22.06	22.04
		16QAM	1	0	23.00	21.88	22.45	22.19
			1	7	23.00	22.10	22.92	22.44
			1	14	23.00	21.83	22.44	22.16
			8	0	22.00	21.01	21.10	21.06
			8	4	22.00	21.01	21.13	21.07
			8	7	22.00	20.99	21.09	21.04
			15	0	22.00	21.02	21.08	20.99

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5
LTE Band 2	5MHz	QPSK	1	0	24.00	22.91	23.03	22.99
			1	12	24.00	23.41	23.44	23.47
			1	24	24.00	22.92	23.01	23.04
			12	0	23.00	21.98	22.08	22.10
			12	6	23.00	22.06	22.12	22.11
			12	11	23.00	22.00	22.06	22.05
			25	0	23.00	22.00	22.09	22.06
		16QAM	1	0	23.00	22.16	22.47	22.24
			1	12	23.00	22.53	22.81	22.54
			1	24	23.00	22.19	22.47	22.24
			12	0	22.00	20.99	21.10	21.02
			12	6	22.00	21.08	21.13	21.04
			12	11	22.00	21.02	21.04	20.92
			25	0	22.00	20.97	21.05	21.09
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18650/1855	18900/1880	19150/1905
LTE Band 2	10MHz	QPSK	1	0	24.00	23.02	23.13	23.09
			1	24	24.00	23.14	23.21	23.25
			1	49	24.00	22.96	23.08	23.12
			25	0	23.00	21.97	22.23	22.26
			25	12	23.00	21.99	22.09	22.07
			25	24	23.00	22.05	22.09	22.00
			50	0	23.00	21.99	22.16	22.15
		16QAM	1	0	23.00	22.35	22.18	21.84
			1	24	23.00	22.51	22.34	21.98
			1	49	23.00	22.32	22.19	21.89
			25	0	22.00	21.00	21.19	21.26
			25	12	22.00	21.06	21.11	21.05
			25	24	22.00	21.08	21.10	20.98
			50	0	22.00	21.05	21.17	21.06
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5

LTE Band 2	15MHz	QPSK	1	0	24.00	22.99	23.01	23.01
			1	37	24.00	23.26	23.32	23.18
			1	74	24.00	22.91	22.97	23.01
			36	0	23.00	22.05	22.29	22.23
			36	18	23.00	22.08	22.20	22.16
			36	37	23.00	22.08	22.17	22.03
			75	0	23.00	22.10	22.20	22.12
		16QAM	1	0	23.00	22.14	22.08	22.27
			1	37	23.00	22.34	22.35	22.45
			1	74	23.00	21.97	22.07	22.29
			36	0	22.00	21.08	21.19	21.12
			36	18	22.00	21.14	21.10	21.07
			36	37	22.00	21.09	21.07	20.97
			75	0	22.00	21.03	21.19	21.04
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		18700/1860	18900/1880	19100/1900
LTE Band 2	20MHz	QPSK	1	0	24.00	22.95	22.98	23.07
			1	49	24.00	23.10	23.21	23.22
			1	99	24.00	22.88	22.94	22.99
			50	0	23.00	21.90	22.22	21.93
			50	24	23.00	21.94	22.09	22.01
			50	49	23.00	21.88	22.03	21.67
			100	0	23.00	21.86	22.15	21.83
		16QAM	1	0	23.00	22.21	22.12	22.16
			1	49	23.00	22.33	22.38	22.26
			1	99	23.00	22.12	22.13	22.12
			50	0	22.00	20.95	21.22	20.98
			50	24	22.00	20.99	21.08	20.96
			50	49	22.00	20.96	21.01	20.72
			100	0	22.00	20.87	21.15	20.81

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19957/1710.7	20175/1732.5	20393/1754.3
LTE Band 4	1.4MHz	QPSK	1	0	24.00	23.03	23.02	22.92
			1	2	24.00	23.17	23.16	23.03
			1	5	24.00	23.04	23.01	22.88

			3	0	24.00	23.06	23.08	23.02
			3	1	24.00	23.06	23.07	23.03
			3	2	24.00	23.03	23.07	23.00
			6	0	23.00	22.11	21.97	21.96
		16QAM	1	0	23.00	21.78	22.12	22.06
			1	2	23.00	21.96	22.23	22.15
			1	5	23.00	21.79	22.10	22.06
			3	0	23.00	22.13	22.19	22.18
			3	1	23.00	22.15	22.18	22.18
			3	2	23.00	22.16	22.15	22.15
6	0	22.00	21.23	21.18	21.10			
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19965/1711.5	20175/1732.5	20385/1753.5
LTE Band 4	3MHz	QPSK	1	0	24.00	23.05	23.06	23.02
			1	7	24.00	23.24	23.46	23.35
			1	14	24.00	23.07	23.04	22.96
			8	0	23.00	22.03	22.00	21.97
			8	4	23.00	22.09	22.04	22.02
			8	7	23.00	22.06	21.98	21.97
			15	0	23.00	22.01	21.97	21.94
		16QAM	1	0	23.00	22.17	21.83	22.34
			1	7	23.00	22.42	22.15	22.55
			1	14	23.00	22.17	21.83	22.28
			8	0	22.00	21.07	21.04	21.01
			8	4	22.00	21.08	21.06	21.04
			8	7	22.00	21.06	21.05	21.00
			15	0	22.00	20.95	21.06	20.98
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		19975/1712.5	20175/1732.5	20375/1752.5
LTE Band 4	5MHz	QPSK	1	0	24.00	22.99	22.96	22.93
			1	12	24.00	23.43	23.34	23.31
			1	24	24.00	23.05	22.93	22.88
			12	0	23.00	22.03	22.03	21.98
			12	6	23.00	22.09	22.04	22.03
			12	11	23.00	22.02	21.99	21.91
			25	0	23.00	22.04	21.99	21.97

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20000/1715	20175/1732.5	20350/1750
LTE Band 4	10MHz	16QAM	1	0	23.00	22.39	22.20	22.23
			1	12	23.00	22.76	22.48	22.47
			1	24	23.00	22.42	22.23	22.16
			12	0	22.00	21.04	20.95	20.99
			12	6	22.00	21.10	21.02	21.05
			12	11	22.00	21.01	20.94	20.97
			25	0	22.00	21.05	21.06	20.97
LTE Band 4	10MHz	QPSK	1	0	24.00	23.04	22.99	22.98
			1	24	24.00	23.16	23.10	23.13
			1	49	24.00	23.03	23.00	22.97
			25	0	23.00	22.07	22.06	22.03
			25	12	23.00	22.05	22.04	21.98
			25	24	23.00	22.14	22.03	22.01
			50	0	23.00	22.09	22.05	22.02
		16QAM	1	0	23.00	22.39	22.14	21.78
			1	24	23.00	22.49	22.27	21.95
			1	49	23.00	22.39	22.13	21.77
			25	0	22.00	21.12	21.10	21.05
			25	12	22.00	21.09	21.07	21.03
			25	24	22.00	21.20	21.08	21.03
			50	0	22.00	21.13	21.13	21.01
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717.5	20175/1732.5	20325/1747.5
LTE Band 4	15MHz	QPSK	1	0	24.00	23.00	22.96	22.96
			1	37	24.00	23.37	23.14	23.28
			1	74	24.00	22.91	22.86	22.84
			36	0	23.00	22.17	22.14	22.11
			36	18	23.00	22.18	22.10	22.10
			36	37	23.00	22.16	22.08	22.06
			75	0	23.00	22.14	22.11	22.04
		16QAM	1	0	23.00	22.08	22.06	22.36
			1	37	23.00	22.39	22.29	22.58
			1	74	23.00	22.05	21.99	22.24
36	0		22.00	21.19	21.07	21.10		

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20050/1720	20175/1732.5	20300/1745
			36	18		22.00	21.19	21.01
36	37	22.00	21.15	21.01	21.06			
75	0	22.00	21.12	21.11	21.05			
LTE Band 4	20MHz	QPSK	1	0	24.00	22.95	22.92	22.90
			1	49	24.00	23.24	23.15	23.17
			1	99	24.00	22.90	22.93	22.90
			50	0	23.00	22.04	22.10	22.02
			50	24	23.00	22.09	22.02	22.05
			50	49	23.00	21.96	21.98	21.97
			100	0	23.00	21.99	22.04	22.01
		16QAM	1	0	23.00	22.16	22.15	22.12
			1	49	23.00	22.44	22.37	22.31
			1	99	23.00	22.15	22.17	22.04
			50	0	22.00	21.09	21.14	21.04
			50	24	22.00	21.15	21.04	21.14
			50	49	22.00	21.05	20.99	21.04
			100	0	22.00	21.04	21.04	21.03

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20407/824.7	20525/836.5	20643/848.3
LTE Band 5	1.4MHz	QPSK	1	0	24.00	23.06	23.19	22.97
			1	2	24.00	23.18	23.34	23.06
			1	5	24.00	23.13	23.16	22.88
			3	0	24.00	23.08	23.27	23.06
			3	1	24.00	23.11	23.26	23.05
			3	2	24.00	23.09	23.25	23.06
			6	0	23.00	22.13	22.19	21.97
		16QAM	1	0	23.00	21.86	22.31	22.12
			1	2	23.00	22.04	22.39	22.22
			1	5	23.00	21.92	22.30	22.12
			3	0	23.00	22.15	22.38	22.21
			3	1	23.00	22.20	22.38	22.25
			3	2	23.00	22.20	22.36	22.20
			6	0	22.00	21.29	21.40	21.21

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE Band 5	3MHz	QPSK	1	0	24.00	23.06	23.12	23.06
			1	7	24.00	23.36	23.44	23.51
			1	14	24.00	23.08	23.17	22.98
			8	0	23.00	22.05	22.17	22.03
			8	4	23.00	22.11	22.18	22.05
			8	7	23.00	22.11	22.18	22.01
			15	0	23.00	22.08	22.17	22.00
		16QAM	1	0	23.00	22.41	22.34	21.93
			1	7	23.00	22.73	22.74	22.18
			1	14	23.00	22.48	22.32	21.81
			8	0	22.00	21.13	21.21	21.10
			8	4	22.00	21.17	21.19	21.06
			8	7	22.00	21.17	21.19	21.01
			15	0	22.00	21.16	21.18	21.11
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20425/826.5	20525/836.5	20625/846.5
LTE Band 5	5MHz	QPSK	1	0	24.00	22.98	23.13	23.01
			1	12	24.00	23.46	23.46	23.35
			1	24	24.00	23.09	23.09	22.86
			12	0	23.00	22.09	22.23	22.16
			12	6	23.00	22.16	22.23	22.09
			12	11	23.00	22.12	22.11	21.96
			25	0	23.00	22.12	22.16	22.07
		16QAM	1	0	23.00	22.47	22.45	22.30
			1	12	23.00	22.91	22.78	22.56
			1	24	23.00	22.54	22.38	22.14
			12	0	22.00	21.11	21.19	21.18
			12	6	22.00	21.19	21.21	21.14
			12	11	22.00	21.15	21.11	20.99
			25	0	22.00	21.15	21.23	21.07
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20450/829	20525/836.5	20600/844

LTE Band 5	10MHz	QPSK	1	0	24.00	23.05	23.20	23.13
			1	24	24.00	23.27	23.29	23.22
			1	49	24.00	23.13	23.13	22.96
			25	0	23.00	22.21	22.25	22.15
			25	12	23.00	22.13	22.19	22.14
			25	24	23.00	22.18	22.16	21.94
			50	0	23.00	22.17	22.19	22.08
		16QAM	1	0	23.00	22.19	21.99	22.51
			1	24	23.00	22.40	22.17	22.57
			1	49	23.00	22.31	21.96	22.34
			25	0	22.00	21.26	21.31	21.20
			25	12	22.00	21.23	21.24	21.19
			25	24	22.00	21.22	21.23	21.02
			50	0	22.00	21.24	21.21	21.10

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20775/2502.5	21100/2535	21425/2567.5
LTE Band 7	5MHz	QPSK	1	0	24.00	23.73	23.48	23.67
			1	12	24.00	23.62	23.24	23.28
			1	24	24.00	23.64	23.03	22.85
			12	0	24.00	23.39	23.21	23.07
			12	6	24.00	23.45	23.18	23.09
			12	11	24.00	23.35	23.14	23.01
			25	0	24.00	23.41	23.13	23.00
		16QAM	1	0	24.00	23.51	23.26	23.30
			1	12	24.00	23.79	23.45	23.46
			1	24	24.00	23.55	23.21	23.02
			12	0	23.00	22.41	22.22	22.00
			12	6	23.00	22.42	22.24	22.02
			12	11	23.00	22.36	22.17	21.94
			25	0	23.00	22.44	22.17	21.98
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
RB Size	RB Offset	20800/2505	21100/2535	21400/2565				
LTE Band 7	10MHz	QPSK	1	0	25.00	24.23	23.77	24.09
			1	24	25.00	23.93	23.28	23.56
			1	49	25.00	24.25	23.03	23.02

		16QAM	25	0	24.00	23.48	23.23	23.11
			25	12	24.00	23.43	23.19	23.11
			25	24	24.00	23.47	23.09	23.02
			50	0	24.00	23.49	23.26	23.08
			1	0	24.00	23.48	22.91	23.36
			1	24	24.00	23.57	23.03	23.38
			1	49	24.00	23.46	22.68	23.08
			25	0	23.00	22.51	22.27	22.18
			25	12	23.00	22.50	22.21	22.14
			25	24	23.00	22.53	22.20	22.04
50	0	23.00	22.57	22.20	22.09			
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5
LTE Band 7	15MHz	QPSK	1	0	25.00	24.23	23.95	23.82
			1	37	25.00	23.92	23.17	23.77
			1	74	25.00	24.16	23.05	23.02
			36	0	24.00	23.58	23.44	23.21
			36	18	24.00	23.58	23.17	23.27
			36	37	24.00	23.51	22.87	23.28
			75	0	24.00	23.60	23.17	23.26
		16QAM	1	0	24.00	23.43	23.44	23.14
			1	37	24.00	23.75	23.46	23.45
			1	74	24.00	23.31	22.98	22.87
			36	0	23.00	22.46	22.37	22.23
			36	18	23.00	22.47	22.32	22.26
			36	37	23.00	22.41	22.23	22.20
			75	0	23.00	22.57	22.34	22.19
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		20850/2510	21100/2535	21350/2560
LTE Band 7	20MHz	QPSK	1	0	25.00	24.16	24.04	23.19
			1	49	25.00	24.09	23.21	23.90
			1	99	25.00	24.19	24.04	23.85
			50	0	24.00	23.35	23.25	22.99
			50	24	24.00	23.42	23.20	23.10
			50	49	24.00	23.40	22.69	22.96
			100	0	24.00	23.42	23.12	22.95

16QAM	1	0	24.00	23.49	23.30	23.19
	1	49	24.00	23.74	23.29	23.33
	1	99	24.00	23.48	22.67	22.80
	50	0	23.00	22.45	22.26	22.12
	50	24	23.00	22.50	22.20	22.18
	50	49	23.00	22.53	22.10	22.06
	100	0	23.00	22.47	22.20	22.01

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23017/699.7	23095/707.5	23173/715.3
LTE Band 12	1.4MHz	QPSK	1	0	23.00	22.66	22.85	22.67
			1	2	23.00	22.84	22.97	22.81
			1	5	23.00	22.78	22.81	22.64
			3	0	23.00	22.78	22.92	22.81
			3	1	23.00	22.79	22.93	22.80
			3	2	23.00	22.89	22.90	22.79
		16QAM	6	0	22.00	21.77	21.76	21.72
			1	0	23.00	21.56	21.98	21.89
			1	2	23.00	21.73	22.12	22.03
			1	5	23.00	21.69	22.00	21.92
			3	0	23.00	21.91	22.05	22.05
			3	1	23.00	21.96	22.06	22.03
			3	2	23.00	22.06	22.09	22.04
			6	0	22.00	20.94	21.02	20.89
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23025/700.5	23095/707.5	23165/714.5
LTE Band 12	3MHz	QPSK	1	0	24.00	22.70	22.90	22.77
			1	7	24.00	23.22	23.12	23.01
			1	14	24.00	22.96	22.79	22.73
			8	0	22.00	21.77	21.83	21.79
			8	4	22.00	21.88	21.83	21.83
			8	7	22.00	21.87	21.82	21.79
		16QAM	15	0	22.00	21.86	21.83	21.83
			1	0	23.00	21.60	22.28	22.06
			1	7	23.00	22.05	22.57	22.28
			1	14	23.00	21.80	22.20	21.95

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5
			8	0	21.00	20.76	20.88	20.84
			8	4	21.00	20.88	20.89	20.87
			8	7	21.00	20.86	20.85	20.81
			15	0	21.00	20.90	20.86	20.77
LTE Band 12	5MHz	QPSK	1	0	24.00	22.65	22.81	22.69
			1	12	24.00	23.22	23.17	23.20
			1	24	24.00	22.80	22.76	22.65
			12	0	22.00	21.82	21.93	21.81
			12	6	22.00	21.96	21.91	21.88
			12	11	22.00	21.90	21.82	21.83
			25	0	22.00	21.88	21.86	21.86
		16QAM	1	0	23.00	21.99	22.34	22.10
			1	12	23.00	22.52	22.74	22.46
			1	24	23.00	22.14	22.31	22.04
			12	0	22.00	20.89	20.89	20.84
			12	6	22.00	21.02	20.92	20.81
			12	11	22.00	20.92	20.86	20.82
			25	0	21.00	20.86	20.86	20.88
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23060/704	23095/707.5	23130/711
LTE Band 12	10MHz	QPSK	1	0	23.00	22.65	22.87	22.83
			1	24	23.00	22.97	22.95	22.88
			1	49	23.00	22.78	22.78	22.69
			25	0	22.00	21.87	21.89	21.97
			25	12	22.00	21.87	21.86	21.89
			25	24	22.00	21.91	21.81	21.84
			50	0	22.00	21.91	21.87	21.94
		16QAM	1	0	23.00	21.94	21.77	22.27
			1	24	23.00	22.18	21.87	22.31
			1	49	23.00	22.02	21.72	22.20
			25	0	21.00	20.89	20.95	20.99
			25	12	21.00	20.89	20.87	20.90
			25	24	21.00	20.94	20.84	20.92
			50	0	21.00	20.95	20.86	20.94

Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23755/706.5	23790/710	23825/713.5
LTE Band 17	5MHz	QPSK	1	0	23.00	22.79	22.80	22.80
			1	12	23.00	22.97	23.00	23.00
			1	24	23.00	22.75	22.78	22.70
			12	0	22.00	21.84	21.88	21.94
			12	6	22.00	21.91	21.89	21.90
			12	11	22.00	21.86	21.80	21.85
			25	0	22.00	21.88	21.86	21.89
		16QAM	1	0	23.00	22.15	22.31	22.11
			1	12	23.00	22.44	22.70	22.50
			1	24	23.00	22.07	22.30	22.00
			12	0	21.00	20.88	20.87	20.83
			12	6	21.00	20.93	20.87	20.84
			12	11	21.00	20.91	20.81	20.84
			25	0	21.00	20.81	20.78	20.93
Band	Band Width	Modulation	RB Configuration		Tune-up	Channel/Frequency(MHz)		
			RB Size	RB Offset		23780/709	23790/710	23800/711
LTE Band 17	10MHz	QPSK	1	0	23.00	22.84	22.86	22.86
			1	24	23.00	22.93	22.91	22.88
			1	49	23.00	22.78	22.74	22.69
			25	0	22.00	21.92	21.95	21.89
			25	12	22.00	21.83	21.85	21.91
			25	24	22.00	21.80	21.80	21.87
			50	0	22.00	21.82	21.88	21.91
		16QAM	1	0	23.00	22.08	21.72	22.23
			1	24	23.00	22.11	21.81	22.34
			1	49	23.00	21.97	21.68	22.19
			25	0	21.00	20.92	20.95	20.97
			25	12	21.00	20.84	20.85	20.85
			25	24	21.00	20.81	20.83	20.90
			50	0	21.00	20.85	20.87	20.92

7.4. WLAN & Bluetooth Output Power

7.4.1. Output Power Results Of WLAN

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11b	1	2412	13.00	12.44
	6	2437	13.00	12.66
	11	2462	13.00	12.96
802.11g	1	2412	13.00	11.61
	6	2437	13.00	12.10
	11	2462	13.00	12.16
802.11n HT20	1	2412	13.00	11.58
	6	2437	13.00	12.35
	11	2462	13.00	12.57

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	36	5180	10.00	9.70
	40	5200	10.00	9.29
	48	5240	10.00	9.57
802.11n HT20	36	5180	10.00	9.60
	40	5200	10.00	9.12
	48	5240	10.00	9.42
802.11n HT40	38	5190	8.00	6.66
	46	5230	8.00	7.16
802.11ac VHT20	36	5180	10.00	9.64
	40	5200	10.00	9.16
	48	5240	10.00	9.52
802.11ac VHT40	38	5190	9.00	7.45
	46	5230	9.00	8.20
802.11ac VHT80	42	5210	8.00	7.02

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	149	5745	5.00	4.63
	157	5785	5.00	4.64
	165	5825	5.00	4.07
802.11n HT20	149	5745	5.00	4.73
	157	5785	5.00	4.73
	165	5825	5.00	4.16

802.11n HT40	151	5755	5.00	4.40
	159	5795	5.00	4.61
802.11ac VHT20	149	5745	5.00	4.70
	157	5785	5.00	4.72
	165	5825	5.00	4.07
802.11ac VHT40	151	5755	5.00	4.54
	159	5795	5.00	4.62
802.11ac VHT80	155	5775	5.00	4.53

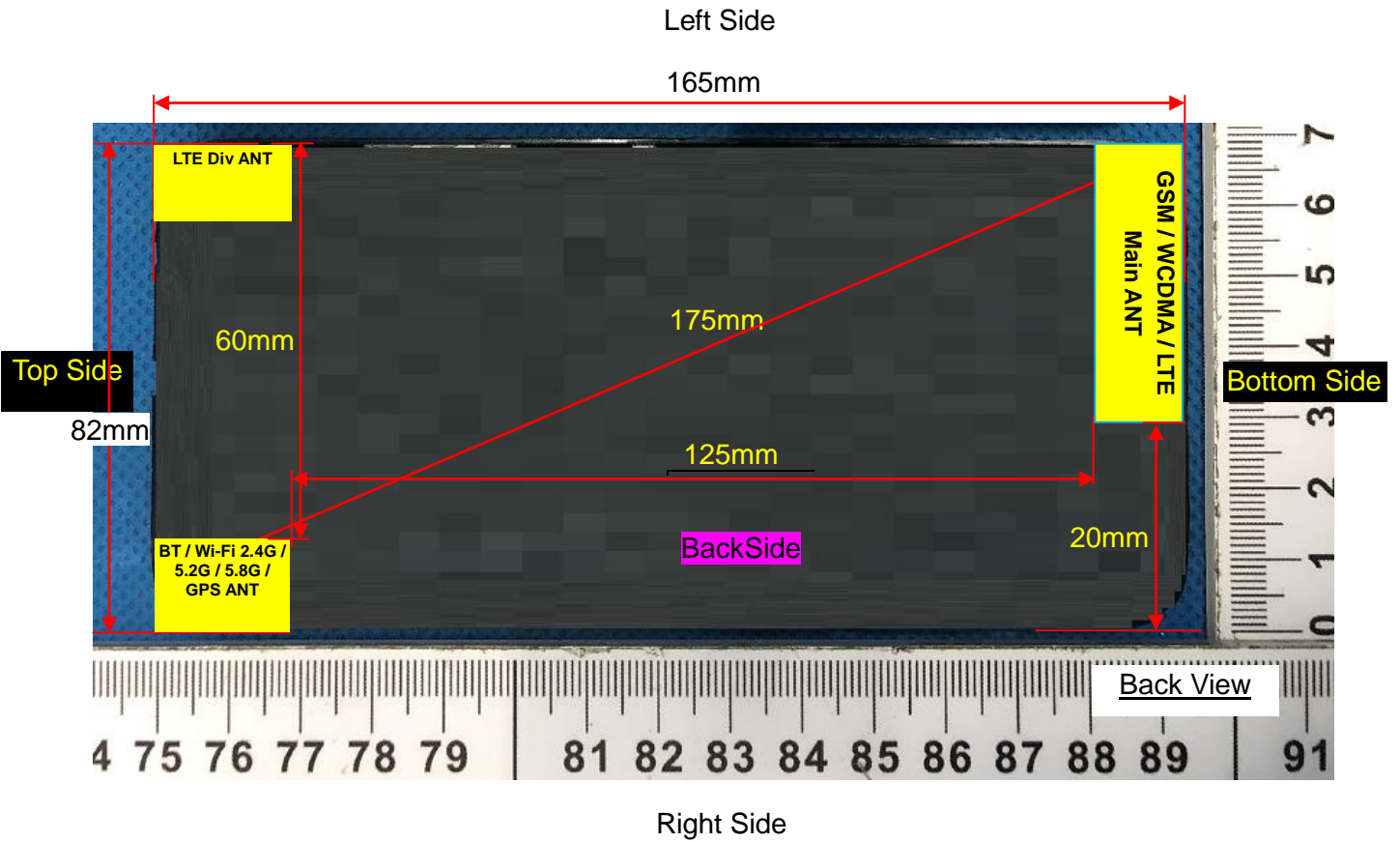
NOTE: Power measurement results of WLAN 5.8G.

7.4.2. Output Power Results Of Bluetooth

BR+EDR	Output Power (dBm)				
	Channel	Tune-up	Data Rates		
			1M	2M	3M
	0CH	6.000	4.280	4.143	4.154
	39CH	6.000	4.846	4.640	4.615
	78CH	6.000	5.994	5.653	5.858

BLE	Channel	Tune-up	Output Power (dBm)
	0CH	2.00	0.02
	19CH	2.00	0.11
	39CH	2.00	1.09

8. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WWAN Main	≤ 25mm	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm
WLAN & Bluetooth	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	>25mm
Positions for SAR tests						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WWAN Main	Yes	Yes	Yes	Yes	NO	Yes
WLAN & Bluetooth	Yes	Yes	NO	Yes	Yes	NO

9. Stand-alone SAR test exclusion

Refer to 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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- $f_{(\text{GHz})}$ 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.

Mode	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
Bluetooth	6.00	3.98	5	2.480	1.25	3.0	Yes
WLAN 5.8G	5.00	3.16	5	5.825	1.53	3.0	Yes

NOTE: Standalone SAR test exclusion for Bluetooth

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}} / x] \text{ W/kg}$ for test separation distances $\leq 50\text{mm}$, where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

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

Mode	Position	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	x	Estimated SAR (W/Kg)
Bluetooth	Head	6.0	3.98	5	2.480	7.5	0.167
Bluetooth	Body	6.0	3.98	10	2.480	7.5	0.084
Bluetooth	Hotspot	6.0	3.98	10	2.480	7.5	0.084
WLAN 5.8G	Head	5.0	3.16	5	5.825	7.5	0.204
WLAN 5.8G	Body	5.0	3.16	10	5.825	7.5	0.102
WLAN 5.8G	Hotspot	5.0	3.16	10	5.825	7.5	0.102

NOTE: Estimated SAR calculation for Bluetooth

10. SAR Results

10.1. SAR measurement results

10.1.1. SAR measurement Result of GSM850

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	189/836.4	GPRS(GMSK 4TS)	0.120	0.095	0.99	29.13	30.00	0.147
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.066	0.053	-3.20	29.13	30.00	0.081
Right Cheek	189/836.4	GPRS(GMSK 4TS)	0.105	0.087	-3.30	29.13	30.00	0.128
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.051	0.045	-4.97	29.13	30.00	0.062

NOTE: Head SAR test results of GSM850.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	189/836.4	GPRS(GMSK 4TS)	0.215	0.168	0.72	29.13	30.00	0.263
Back Side	189/836.4	GPRS(GMSK 4TS)	0.280	0.213	-1.50	29.13	30.00	0.342

NOTE: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	189/836.4	GPRS(GMSK 4TS)	0.215	0.168	0.72	29.13	30.00	0.263
Back Side	189/836.4	GPRS(GMSK 4TS)	0.280	0.213	-1.50	29.13	30.00	0.342
Left Side	189/836.4	GPRS(GMSK 4TS)	0.212	0.163	-2.33	29.13	30.00	0.259
Right Side	189/836.4	GPRS(GMSK 4TS)	0.123	0.095	-3.31	29.13	30.00	0.150
Bottom Side	189/836.4	GPRS(GMSK 4TS)	0.108	0.083	2.25	29.13	30.00	0.132

NOTE: Hotspot SAR test results of GSM850

10.1.2. SAR measurement Result of GSM1900

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	661/1880	GPRS(GMSK 4TS)	0.186	0.111	-1.35	26.64	28.00	0.254

Left Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.096	0.059	0.36	26.64	28.00	0.131
Right Cheek	661/1880	GPRS(GMSK 4TS)	0.176	0.102	-0.72	26.64	28.00	0.241
Right Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.088	0.053	-0.98	26.64	28.00	0.120

NOTE: Head SAR test results of GSM1900

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	661/1880	GPRS(GMSK 4TS)	0.409	0.223	-1.58	26.64	28.00	0.559
Back Side	661/1880	GPRS(GMSK 4TS)	0.536	0.297	0.13	26.64	28.00	0.733

NOTE: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	661/1880	GPRS(GMSK 4TS)	0.409	0.223	-1.58	26.64	28.00	0.559
Back Side	661/1880	GPRS(GMSK 4TS)	0.536	0.297	0.13	26.64	28.00	0.733
Left Side	661/1880	GPRS(GMSK 4TS)	0.421	0.231	-0.25	26.64	28.00	0.576
Right Side	661/1880	GPRS(GMSK 4TS)	0.244	0.132	4.19	26.64	28.00	0.334
Bottom Side	661/1880	GPRS(GMSK 4TS)	0.204	0.112	3.15	26.64	28.00	0.279

NOTE: Hotspot SAR test results of GSM1900

10.1.3. SAR measurement Result of WCDMA Band 2

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	9400/1880	RMC12.2K	0.184	0.113	2.08	23.76	24.00	0.194
Left Tilt 15 Degree	9400/1880	RMC12.2K	0.093	0.056	-0.30	23.76	24.00	0.098
Right Cheek	9400/1880	RMC12.2K	0.159	0.097	-2.69	23.76	24.00	0.168
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.085	0.051	-0.93	23.76	24.00	0.090

NOTE: Head SAR test results of WCDMA Band 2

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	9400/1880	RMC12.2K	0.411	0.229	-4.38	23.76	24.00	0.434

Back Side	9400/1880	RMC12.2K	0.547	0.303	-0.07	23.76	24.00	0.578
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NOTE: Body-Worn SAR test results of WCDMA Band 2

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	9400/1880	RMC12.2K	0.411	0.229	-4.38	23.76	24.00	0.434
Back Side	9400/1880	RMC12.2K	0.547	0.303	-0.07	23.76	24.00	0.578
Left Side	9400/1880	RMC12.2K	0.398	0.220	-0.91	23.76	24.00	0.421
Right Side	9400/1880	RMC12.2K	0.256	0.142	-2.71	23.76	24.00	0.271
Bottom Side	9400/1880	RMC12.2K	0.209	0.117	4.87	23.76	24.00	0.221

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA Band 4

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	1413/1732.6	RMC12.2K	0.580	0.363	-1.64	23.03	24.00	0.725
Left Tilt 15 Degree	1413/1732.6	RMC12.2K	0.305	0.187	-0.60	23.03	24.00	0.381
Right Cheek	1413/1732.6	RMC12.2K	0.530	0.335	4.09	23.03	24.00	0.663
Right Tilt 15 Degree	1413/1732.6	RMC12.2K	0.260	0.158	3.81	23.03	24.00	0.325

NOTE: Head SAR test results of WCDMA Band 4

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	1413/1732.6	RMC12.2K	0.275	0.176	4.88	23.03	24.00	0.344
Back Side	1413/1732.6	RMC12.2K	0.360	0.233	0.51	23.03	24.00	0.450

NOTE: Body-Worn SAR test results of WCDMA Band 4

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	1413/1732.6	RMC12.2K	0.275	0.176	4.88	23.03	24.00	0.344
Back Side	1413/1732.6	RMC12.2K	0.360	0.233	0.51	23.03	24.00	0.450
Left Side	1413/1732.6	RMC12.2K	0.285	0.188	0.41	23.03	24.00	0.356
Right Side	1413/1732.6	RMC12.2K	0.177	0.117	3.05	23.03	24.00	0.221
Bottom Side	1413/1732.6	RMC12.2K	0.134	0.083	-2.90	23.03	24.00	0.168

NOTE: Hotspot SAR test results of WCDMA Band 4

10.1.5. SAR measurement Result of WCDMA Band 5

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	4182/836.4	RMC12.2K	0.065	0.053	2.91	23.28	24.00	0.077
Left Tilt 15 Degree	4182/836.4	RMC12.2K	0.038	0.035	1.14	23.28	24.00	0.045
Right Cheek	4182/836.4	RMC12.2K	0.057	0.051	-1.15	23.28	24.00	0.067
Right Tilt 15 Degree	4182/836.4	RMC12.2K	0.026	0.021	-0.67	23.28	24.00	0.031

NOTE: Head SAR test results of WCDMA Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	4182/836.4	RMC12.2K	0.100	0.082	3.36	23.28	24.00	0.118
Back Side	4182/836.4	RMC12.2K	0.131	0.101	1.16	23.28	24.00	0.155

NOTE: Body-Worn SAR test results of WCDMA Band 5

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	4182/836.4	RMC12.2K	0.100	0.082	3.36	23.28	24.00	0.118
Back Side	4182/836.4	RMC12.2K	0.131	0.101	1.16	23.28	24.00	0.155
Left Side	4182/836.4	RMC12.2K	0.102	0.075	-2.79	23.28	24.00	0.120
Right Side	4182/836.4	RMC12.2K	0.058	0.046	0.34	23.28	24.00	0.068
Bottom Side	4182/836.4	RMC12.2K	0.050	0.037	1.14	23.28	24.00	0.059

NOTE: Hotspot SAR test results of WCDMA Band 5

10.1.6. SAR measurement Result of LTE Band 2

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Left Cheek	18900/1880	20M QPSK(1,49)	0.203	0.122	-0.59	23.21	24.00	0.243
Left Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.111	0.071	-3.56	23.21	24.00	0.133
Right Cheek	18900/1880	20M QPSK(1,49)	0.193	0.121	-3.72	23.21	24.00	0.232

Right Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.089	0.058	4.43	23.21	24.00	0.107
50%RB								
Left Cheek	18900/1880	1.4M QPSK(3,1)	0.179	0.106	-1.86	23.21	24.00	0.215
Left Tilt 15 Degree	18900/1880	1.4M QPSK(3,1)	0.102	0.067	2.73	23.21	24.00	0.122
Right Cheek	18900/1880	1.4M QPSK(3,1)	0.176	0.112	-0.57	23.21	24.00	0.211
Right Tilt 15 Degree	18900/1880	1.4M QPSK(3,1)	0.083	0.054	1.29	23.21	24.00	0.100

NOTE: Head SAR test results of LTE Band 2

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	18900/1880	20M QPSK(1,49)	0.546	0.291	-4.92	23.21	24.00	0.655
Back Side	18900/1880	20M QPSK(1,49)	0.665	0.358	-1.65	23.21	24.00	0.798
50%RB								
Front Side	18900/1880	1.4M QPSK(3,1)	0.489	0.254	2.39	23.21	24.00	0.587
Back Side	18900/1880	1.4M QPSK(3,1)	0.573	0.317	-1.90	23.21	24.00	0.687

NOTE: Body-Worn SAR test results of LTE Band 2

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	18900/1880	20M QPSK(1,49)	0.546	0.291	-4.92	23.21	24.00	0.655
Back Side	18900/1880	20M QPSK(1,49)	0.665	0.358	-1.65	23.21	24.00	0.798
Left Side	18900/1880	20M QPSK(1,49)	0.494	0.263	3.57	23.21	24.00	0.593
Right Side	18900/1880	20M QPSK(1,49)	0.290	0.155	2.59	23.21	24.00	0.348
Bottom Side	18900/1880	20M QPSK(1,49)	0.227	0.127	-3.99	23.21	24.00	0.272
50%RB								
Front Side	18900/1880	1.4M QPSK(3,1)	0.489	0.254	2.39	23.21	24.00	0.587
Back Side	18900/1880	1.4M QPSK(3,1)	0.573	0.317	-1.90	23.21	24.00	0.687

Left Side	18900/1880	1.4M QPSK(3,1)	0.453	0.231	-3.92	23.21	24.00	0.543
Right Side	18900/1880	1.4M QPSK(3,1)	0.252	0.144	4.55	23.21	24.00	0.302
Bottom Side	18900/1880	1.4M QPSK(3,1)	0.210	0.111	0.92	23.21	24.00	0.252

NOTE: Hotspot SAR test results of LTE Band 2

10.1.7. SAR measurement Result of LTE Band 4

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Left Cheek	20175/1732.5	20M QPSK(1,49)	0.161	0.102	0.28	23.15	24.00	0.196
Left Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.087	0.051	2.90	23.15	24.00	0.106
Right Cheek	20175/1732.5	20M QPSK(1,49)	0.151	0.097	3.21	23.15	24.00	0.184
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.078	0.047	1.82	23.15	24.00	0.095
50%RB								
Left Cheek	20175/1732.5	1.4M QPSK(3,0)	0.137	0.096	-2.71	23.08	24.00	0.169
Left Tilt 15 Degree	20175/1732.5	1.4M QPSK(3,0)	0.077	0.045	-2.50	23.08	24.00	0.095
Right Cheek	20175/1732.5	1.4M QPSK(3,0)	0.132	0.091	2.08	23.08	24.00	0.163
Right Tilt 15 Degree	20175/1732.5	1.4M QPSK(3,0)	0.071	0.044	-4.42	23.08	24.00	0.088

NOTE: Head SAR test results of LTE Band 4

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								

Front Side	20175/1732. 5	20M QPSK(1,49)	0.452	0.252	3.60	23.15	24.00	0.550
Back Side	20175/1732. 5	20M QPSK(1,49)	0.543	0.303	-1.77	23.15	24.00	0.660
50%RB								
Front Side	20175/1732. 5	1.4M QPSK(3,0)	0.414	0.225	3.55	23.08	24.00	0.512
Back Side	20175/1732. 5	1.4M QPSK(3,0)	0.503	0.262	-4.78	23.08	24.00	0.622

NOTE: Body-Worn SAR test results of LTE Band 4

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	20175/1732. 5	20M QPSK(1,49)	0.452	0.252	3.60	23.15	24.00	0.550
Back Side	20175/1732. 5	20M QPSK(1,49)	0.543	0.303	-1.77	23.15	24.00	0.660
Left Side	20175/1732. 5	20M QPSK(1,49)	0.390	0.216	0.01	23.15	24.00	0.474
Right Side	20175/1732. 5	20M QPSK(1,49)	0.240	0.139	2.53	23.15	24.00	0.292
Bottom Side	20175/1732. 5	20M QPSK(1,49)	0.187	0.103	-4.50	23.15	24.00	0.227
50%RB								
Front Side	20175/1732. 5	1.4M QPSK(3,0)	0.414	0.225	3.55	23.08	24.00	0.512
Back Side	20175/1732. 5	1.4M QPSK(3,0)	0.503	0.262	-4.78	23.08	24.00	0.622
Left Side	20175/1732. 5	1.4M QPSK(3,0)	0.361	0.186	-2.79	23.08	24.00	0.446
Right Side	20175/1732. 5	1.4M QPSK(3,0)	0.217	0.131	1.06	23.08	24.00	0.268
Bottom Side	20175/1732. 5	1.4M QPSK(3,0)	0.175	0.096	-1.51	23.08	24.00	0.216

NOTE: Hotspot SAR test results of LTE Band 4

10.1.8. SAR measurement Result of LTE Band 5

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Left Cheek	20525/836.5	10M QPSK(1,24)	0.065	0.054	4.08	23.29	24.00	0.077
Left Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.036	0.034	-3.63	23.29	24.00	0.042
Right Cheek	20525/836.5	10M QPSK(1,24)	0.056	0.043	0.32	23.29	24.00	0.066
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.028	0.022	4.53	23.29	24.00	0.033
50%RB								
Left Cheek	20525/836.5	1.4M QPSK(3,0)	0.057	0.049	3.34	23.27	24.00	0.067
Left Tilt 15 Degree	20525/836.5	1.4M QPSK(3,0)	0.034	0.029	0.66	23.27	24.00	0.040
Right Cheek	20525/836.5	1.4M QPSK(3,0)	0.048	0.040	2.16	23.27	24.00	0.057
Right Tilt 15 Degree	20525/836.5	1.4M QPSK(3,0)	0.025	0.019	4.73	23.27	24.00	0.030

NOTE: Head SAR test results of LTE Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	20525/836.5	10M QPSK(1,24)	0.149	0.092	4.33	23.29	24.00	0.175
Back Side	20525/836.5	10M QPSK(1,24)	0.186	0.110	1.03	23.29	24.00	0.219
50%RB								
Front Side	20525/836.5	1.4M QPSK(3,0)	0.140	0.083	-2.46	23.27	24.00	0.166
Back Side	20525/836.5	1.4M QPSK(3,0)	0.168	0.104	2.28	23.27	24.00	0.199

NOTE: Body-Worn SAR test results of LTE Band 5

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	20525/836.5	10M QPSK(1,24)	0.149	0.092	4.33	23.29	24.00	0.175
Back Side	20525/836.5	10M QPSK(1,24)	0.186	0.110	1.03	23.29	24.00	0.219
Left Side	20525/836.5	10M QPSK(1,24)	0.139	0.078	-3.21	23.29	24.00	0.164
Right Side	20525/836.5	10M QPSK(1,24)	0.082	0.050	4.88	23.29	24.00	0.097
Bottom Side	20525/836.5	10M QPSK(1,24)	0.064	0.040	0.16	23.29	24.00	0.075
50%RB								
Front Side	20525/836.5	1.4M QPSK(3,0)	0.140	0.083	-2.46	23.27	24.00	0.166
Back Side	20525/836.5	1.4M QPSK(3,0)	0.168	0.104	2.28	23.27	24.00	0.199
Left Side	20525/836.5	1.4M QPSK(3,0)	0.131	0.069	2.91	23.27	24.00	0.155
Right Side	20525/836.5	1.4M QPSK(3,0)	0.076	0.043	2.61	23.27	24.00	0.090
Bottom Side	20525/836.5	1.4M QPSK(3,0)	0.059	0.037	2.62	23.27	24.00	0.070

NOTE: Hotspot SAR test results of LTE Band 5

10.1.9. SAR measurement Result of LTE Band 7

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Left Cheek	21100/2535	20M QPSK(1,99)	0.086	0.053	4.05	24.04	25.00	0.107
Left Tilt 15 Degree	21100/2535	20M QPSK(1,99)	0.045	0.025	1.46	24.04	25.00	0.056

Right Cheek	21100/2535	20M QPSK(1,99)	0.080	0.050	-4.08	24.04	25.00	0.100
Right Tilt 15 Degree	21100/2535	20M QPSK(1,99)	0.040	0.022	-3.99	24.04	25.00	0.050
50%RB								
Left Cheek	21100/2535	20M QPSK(50,24)	0.075	0.049	-0.68	23.20	24.00	0.090
Left Tilt 15 Degree	21100/2535	20M QPSK(50,24)	0.040	0.023	-2.70	23.20	24.00	0.048
Right Cheek	21100/2535	20M QPSK(50,24)	0.074	0.045	0.80	23.20	24.00	0.089
Right Tilt 15 Degree	21100/2535	20M QPSK(50,24)	0.035	0.021	-2.72	23.20	24.00	0.042

NOTE: Head SAR test results of LTE Band 7

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	21100/2535	20M QPSK(1,99)	0.585	0.247	-2.06	24.04	25.00	0.730
Back Side	21100/2535	20M QPSK(1,99)	0.872	0.437	-0.76	24.04	25.00	1.088
Back Side Repeated	21100/2535	20M QPSK(1,99)	0.870	0.434	0.33	24.04	25.00	1.085
Back Side	20850/2510	20M QPSK(1,99)	0.689	0.356	0.55	24.19	25.00	0.830
Back Side	21350/2560	20M QPSK(1,99)	0.657	0.348	0.77	23.85	25.00	0.856
50%RB								
Front Side	21100/2535	20M QPSK(50,24)	0.642	0.312	-4.99	23.20	24.00	0.772
Back Side	21100/2535	20M QPSK(50,24)	0.660	0.411	-1.63	23.20	24.00	0.793
100%RB								
Back Side	21100/2535	20M QPSK(100,0)	0.548	0.257	1.21	23.12	24.00	0.671

NOTE: Body-Worn SAR test results of LTE Band 7

Test	Test channel	Test Mode	SAR Value	Power	Conduc	Tune-u	Scaled
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1RB								
Left Cheek	23095/707.5	5M QPSK(1,12)	0.026	0.022	-2.07	23.17	24.00	0.031
Left Tilt 15 Degree	23095/707.5	5M QPSK(1,12)	0.015	0.015	0.10	23.17	24.00	0.018
Right Cheek	23095/707.5	5M QPSK(1,12)	0.022	0.020	1.75	23.17	24.00	0.027
Right Tilt 15 Degree	23095/707.5	5M QPSK(1,12)	0.011	0.007	-4.51	23.17	24.00	0.013
50%RB								
Left Cheek	23095/707.5	1.4M QPSK(3,1)	0.024	0.020	2.61	22.93	23.00	0.024
Left Tilt 15 Degree	23095/707.5	1.4M QPSK(3,1)	0.014	0.013	-3.90	22.93	23.00	0.014
Right Cheek	23095/707.5	1.4M QPSK(3,1)	0.019	0.019	0.50	22.93	23.00	0.019
Right Tilt 15 Degree	23095/707.5	1.4M QPSK(3,1)	0.010	0.006	2.87	22.93	23.00	0.010

NOTE: Head SAR test results of LTE Band 12

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	23095/707.5	5M QPSK(1,12)	0.036	0.034	-2.33	23.17	24.00	0.044
Back Side	23095/707.5	5M QPSK(1,12)	0.048	0.041	-0.78	23.17	24.00	0.058
50%RB								
Front Side	23095/707.5	1.4M QPSK(3,1)	0.033	0.030	-1.36	22.93	23.00	0.034
Back Side	23095/707.5	1.4M QPSK(3,1)	0.045	0.036	4.97	22.93	23.00	0.046

NOTE: Body-Worn SAR test results of LTE Band 12

Test Position of Hotspot with	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				

10mm								
1RB								
Front Side	23095/707.5	5M QPSK(1,12)	0.036	0.034	-2.33	23.17	24.00	0.044
Back Side	23095/707.5	5M QPSK(1,12)	0.048	0.041	-0.78	23.17	24.00	0.058
Left Side	23095/707.5	5M QPSK(1,12)	0.036	0.026	1.14	23.17	24.00	0.044
Right Side	23095/707.5	5M QPSK(1,12)	0.022	0.022	-3.89	23.17	24.00	0.027
Bottom Side	23095/707.5	5M QPSK(1,12)	0.017	0.016	-1.16	23.17	24.00	0.021
50%RB								
Front Side	23095/707.5	1.4M QPSK(3,1)	0.033	0.030	-1.36	22.93	23.00	0.034
Back Side	23095/707.5	1.4M QPSK(3,1)	0.045	0.036	4.97	22.93	23.00	0.046
Left Side	23095/707.5	1.4M QPSK(3,1)	0.033	0.024	3.80	22.93	23.00	0.034
Right Side	23095/707.5	1.4M QPSK(3,1)	0.020	0.017	-1.26	22.93	23.00	0.020
Bottom Side	23095/707.5	1.4M QPSK(3,1)	0.015	0.014	-3.38	22.93	23.00	0.015

NOTE: Hotspot SAR test results of LTE Band 12

10.1.11. SAR measurement Result of LTE Band 17

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Left Cheek	23790/710	10M QPSK(1,24)	0.030	0.025	1.74	22.91	23.00	0.031
Left Tilt 15 Degree	23790/710	10M QPSK(1,24)	0.017	0.011	3.55	22.91	23.00	0.017
Right Cheek	23790/710	10M QPSK(1,24)	0.026	0.021	0.44	22.91	23.00	0.027
Right Tilt 15 Degree	23790/710	10M QPSK(1,24)	0.014	0.007	4.23	22.91	23.00	0.014
50%RB								

Left Cheek	23790/710	10M QPSK(25,0)	0.026	0.022	0.50	21.95	22.00	0.026
Left Tilt 15 Degree	23790/710	10M QPSK(25,0)	0.016	0.010	-4.58	21.95	22.00	0.016
Right Cheek	23790/710	10M QPSK(25,0)	0.022	0.019	-1.22	21.95	22.00	0.022
Right Tilt 15 Degree	23790/710	10M QPSK(25,0)	0.013	0.006	0.53	21.95	22.00	0.013

NOTE: Head SAR test results of LTE Band 17

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	23790/710	10M QPSK(1,24)	0.044	0.037	1.65	22.91	23.00	0.045
Back Side	23790/710	10M QPSK(1,24)	0.056	0.047	1.16	22.91	23.00	0.057
50%RB								
Front Side	23790/710	10M QPSK(25,0)	0.041	0.034	3.26	21.95	22.00	0.041
Back Side	23790/710	10M QPSK(25,0)	0.052	0.040	2.39	21.95	22.00	0.053

NOTE: Body-Worn SAR test results of LTE Band 17

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
1RB								
Front Side	23790/710	10M QPSK(1,24)	0.044	0.037	1.65	22.91	23.00	0.045
Back Side	23790/710	10M QPSK(1,24)	0.056	0.047	1.16	22.91	23.00	0.057
Left Side	23790/710	10M QPSK(1,24)	0.042	0.035	-0.58	22.91	23.00	0.043
Right Side	23790/710	10M QPSK(1,24)	0.027	0.025	-3.64	22.91	23.00	0.028
Bottom Side	23790/710	10M QPSK(1,24)	0.020	0.019	1.88	22.91	23.00	0.020
50%RB								
Front	23790/710	10M QPSK(25,0)	0.041	0.034	3.26	21.95	22.00	0.041

Side								
Back Side	23790/710	10M QPSK(25,0)	0.052	0.040	2.39	21.95	22.00	0.053
Left Side	23790/710	10M QPSK(25,0)	0.038	0.032	3.13	21.95	22.00	0.038
Right Side	23790/710	10M QPSK(25,0)	0.026	0.023	-2.35	21.95	22.00	0.026
Bottom Side	23790/710	10M QPSK(25,0)	0.019	0.018	2.64	21.95	22.00	0.019

NOTE: Hotspot SAR test results of LTE Band 17

10.1.12. SAR measurement Result of WLAN 2.4G

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	6/2437	802.11 b	0.701	0.334	-2.75	12.66	13.00	0.758
Left Tilt 15 Degree	6/2437	802.11 b	0.406	0.194	-1.71	12.66	13.00	0.439
Right Cheek	6/2437	802.11 b	0.635	0.299	4.73	12.66	13.00	0.687
Right Tilt 15 Degree	6/2437	802.11 b	0.295	0.144	-0.28	12.66	13.00	0.319

NOTE: Head SAR test results of WLAN 2.4G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	6/2437	802.11 b	0.165	0.094	1.52	12.66	13.00	0.178
Back Side	6/2437	802.11 b	0.272	0.147	0.22	12.66	13.00	0.294

NOTE: Body-Worn SAR test results of WLAN 2.4G

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	6/2437	802.11 b	0.165	0.094	1.52	12.66	13.00	0.178
Back Side	6/2437	802.11 b	0.272	0.147	0.22	12.66	13.00	0.294
Right Side	6/2437	802.11 b	0.066	0.037	-2.94	12.66	13.00	0.071
Top Side	6/2437	802.11 b	0.085	0.046	-2.54	12.66	13.00	0.092

NOTE: Hotspot SAR test results of WLAN 2.4G

10.1.13. SAR measurement Result of WLAN 5.2G

Test Position of Head	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Left Cheek	40/5200	802.11a	0.139	0.080	-1.64	9.29	10.00	0.164
Left Tilt 15 Degree	40/5200	802.11a	0.075	0.042	-3.37	9.29	10.00	0.088
Right Cheek	40/5200	802.11a	0.120	0.072	0.59	9.29	10.00	0.141
Right Tilt 15 Degree	40/5200	802.11a	0.057	0.029	2.36	9.29	10.00	0.067

NOTE: Head SAR test results of WLAN 5.2G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	40/5200	802.11a	0.321	0.151	-4.79	9.29	10.00	0.378
Back Side	40/5200	802.11a	0.408	0.236	-0.69	9.29	10.00	0.480

NOTE: Body-Worn SAR test results of WLAN 5.2G

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)
			1g	10g				
Front Side	40/5200	802.11a	0.321	0.151	-4.79	9.29	10.00	0.378
Back Side	40/5200	802.11a	0.408	0.236	-0.69	9.29	10.00	0.480
Right Side	40/5200	802.11a	0.106	0.054	-0.49	9.29	10.00	0.125
Top Side	40/5200	802.11a	0.162	0.074	-4.24	9.29	10.00	0.191

NOTE: Hotspot SAR test results of WLAN 5.2G

10.2. SAR Summation Scenario

Per KDB 447498 D01, simultaneous transmission SAR is compliant if,

- 1) Scalar SAR summation < 1.6W/kg.
- 2) $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan. If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

Test Position	Scaled SAR _{MAX}	∑ 1-g SAR	SPLSR	Remark
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		GSM 850	WLAN 2.4G	(W/Kg)		
Head	Left Cheek	0.147	0.758	0.905	N/A	N/A
	Left Tilt 15 Degree	0.081	0.439	0.520	N/A	N/A
	Right Cheek	0.128	0.687	0.815	N/A	N/A
	Right Tilt 15 Degree	0.062	0.319	0.381	N/A	N/A
Body-Worn	Front Side	0.263	0.178	0.441	N/A	N/A
	Back Side	0.342	0.294	0.636	N/A	N/A
Hotspot	Front Side	0.263	0.178	0.441	N/A	N/A
	Back Side	0.342	0.294	0.636	N/A	N/A
	Left Side	0.259	N/A	0.259	N/A	N/A
	Right Side	0.150	0.071	0.221	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.132	N/A	0.132	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM850 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 1900	WLAN 2.4G			
Head	Left Cheek	0.254	0.758	1.012	N/A	N/A
	Left Tilt 15 Degree	0.131	0.439	0.570	N/A	N/A
	Right Cheek	0.241	0.687	0.928	N/A	N/A
	Right Tilt 15 Degree	0.120	0.319	0.439	N/A	N/A
Body-Worn	Front Side	0.559	0.178	0.737	N/A	N/A
	Back Side	0.733	0.294	1.027	N/A	N/A
Hotspot	Front Side	0.559	0.178	0.737	N/A	N/A
	Back Side	0.733	0.294	1.027	N/A	N/A
	Left Side	0.576	N/A	0.576	N/A	N/A
	Right Side	0.334	0.071	0.405	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.279	N/A	0.279	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM1900 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 2	WLAN 2.4G			
Head	Left Cheek	0.194	0.758	0.952	N/A	N/A
	Left Tilt 15 Degree	0.098	0.439	0.537	N/A	N/A
	Right Cheek	0.168	0.687	0.855	N/A	N/A
	Right Tilt 15 Degree	0.090	0.319	0.409	N/A	N/A
Body-Worn	Front Side	0.434	0.178	0.612	N/A	N/A

	Back Side	0.578	0.294	0.872	N/A	N/A
Hotspot	Front Side	0.434	0.178	0.612	N/A	N/A
	Back Side	0.578	0.294	0.872	N/A	N/A
	Left Side	0.421	N/A	0.421	N/A	N/A
	Right Side	0.271	0.071	0.342	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.221	N/A	0.221	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 2 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 4	WLAN 2.4G			
Head	Left Cheek	0.725	0.758	1.483	N/A	N/A
	Left Tilt 15 Degree	0.381	0.439	0.820	N/A	N/A
	Right Cheek	0.663	0.687	1.350	N/A	N/A
	Right Tilt 15 Degree	0.325	0.319	0.644	N/A	N/A
Body-Worn	Front Side	0.344	0.178	0.522	N/A	N/A
	Back Side	0.450	0.294	0.744	N/A	N/A
Hotspot	Front Side	0.344	0.178	0.522	N/A	N/A
	Back Side	0.450	0.294	0.744	N/A	N/A
	Left Side	0.356	N/A	0.356	N/A	N/A
	Right Side	0.221	0.071	0.292	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.168	N/A	0.168	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 4 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 5	WLAN 2.4G			
Head	Left Cheek	0.077	0.758	0.835	N/A	N/A
	Left Tilt 15 Degree	0.045	0.439	0.484	N/A	N/A
	Right Cheek	0.067	0.687	0.754	N/A	N/A
	Right Tilt 15 Degree	0.031	0.319	0.350	N/A	N/A
Body-Worn	Front Side	0.118	0.178	0.296	N/A	N/A
	Back Side	0.155	0.294	0.449	N/A	N/A
Hotspot	Front Side	0.118	0.178	0.296	N/A	N/A
	Back Side	0.155	0.294	0.449	N/A	N/A
	Left Side	0.120	N/A	0.120	N/A	N/A
	Right Side	0.068	0.071	0.139	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A

	Bottom Side	0.059	N/A	0.059	N/A	N/A
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NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 5 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 2	WLAN 2.4G			
Head	Left Cheek	0.243	0.758	1.001	N/A	N/A
	Left Tilt 15 Degree	0.133	0.439	0.572	N/A	N/A
	Right Cheek	0.232	0.687	0.919	N/A	N/A
	Right Tilt 15 Degree	0.107	0.319	0.426	N/A	N/A
Body-Worn	Front Side	0.655	0.178	0.833	N/A	N/A
	Back Side	0.798	0.294	1.092	N/A	N/A
Hotspot	Front Side	0.655	0.178	0.833	N/A	N/A
	Back Side	0.798	0.294	1.092	N/A	N/A
	Left Side	0.593	N/A	0.593	N/A	N/A
	Right Side	0.348	0.071	0.419	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.272	N/A	0.272	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 2 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 4	WLAN 2.4G			
Head	Left Cheek	0.196	0.758	0.954	N/A	N/A
	Left Tilt 15 Degree	0.106	0.439	0.545	N/A	N/A
	Right Cheek	0.184	0.687	0.871	N/A	N/A
	Right Tilt 15 Degree	0.095	0.319	0.414	N/A	N/A
Body-Worn	Front Side	0.550	0.178	0.728	N/A	N/A
	Back Side	0.660	0.294	0.954	N/A	N/A
Hotspot	Front Side	0.550	0.178	0.728	N/A	N/A
	Back Side	0.660	0.294	0.954	N/A	N/A
	Left Side	0.474	N/A	0.474	N/A	N/A
	Right Side	0.292	0.071	0.363	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.227	N/A	0.227	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 4 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 5	WLAN 2.4G			
Head	Left Cheek	0.077	0.758	0.835	N/A	N/A
	Left Tilt 15 Degree	0.042	0.439	0.481	N/A	N/A

	Right Cheek	0.066	0.687	0.753	N/A	N/A
	Right Tilt 15 Degree	0.033	0.319	0.352	N/A	N/A
Body-Worn	Front Side	0.175	0.178	0.353	N/A	N/A
	Back Side	0.219	0.294	0.513	N/A	N/A
Hotspot	Front Side	0.175	0.178	0.353	N/A	N/A
	Back Side	0.219	0.294	0.513	N/A	N/A
	Left Side	0.164	N/A	0.164	N/A	N/A
	Right Side	0.097	0.071	0.168	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.075	N/A	0.075	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 5 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 7	WLAN 2.4G			
Head	Left Cheek	0.107	0.758	0.865	N/A	N/A
	Left Tilt 15 Degree	0.056	0.439	0.495	N/A	N/A
	Right Cheek	0.100	0.687	0.787	N/A	N/A
	Right Tilt 15 Degree	0.050	0.319	0.369	N/A	N/A
Body-Worn	Front Side	0.772	0.178	0.950	N/A	N/A
	Back Side	1.088	0.294	1.382	N/A	N/A
Hotspot	Front Side	0.772	0.178	0.950	N/A	N/A
	Back Side	1.088	0.294	1.382	N/A	N/A
	Left Side	0.738	N/A	0.738	N/A	N/A
	Right Side	0.518	0.071	0.589	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.422	N/A	0.422	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 7 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 12	WLAN 2.4G			
Head	Left Cheek	0.031	0.758	0.789	N/A	N/A
	Left Tilt 15 Degree	0.018	0.439	0.457	N/A	N/A
	Right Cheek	0.027	0.687	0.714	N/A	N/A
	Right Tilt 15 Degree	0.013	0.319	0.332	N/A	N/A
Body-Worn	Front Side	0.044	0.178	0.222	N/A	N/A
	Back Side	0.058	0.294	0.352	N/A	N/A
Hotspot	Front Side	0.044	0.178	0.222	N/A	N/A
	Back Side	0.058	0.294	0.352	N/A	N/A

	Left Side	0.044	N/A	0.044	N/A	N/A
	Right Side	0.027	0.071	0.098	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.021	N/A	0.021	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 12 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 17	WLAN 2.4G			
Head	Left Cheek	0.031	0.758	0.789	N/A	N/A
	Left Tilt 15 Degree	0.017	0.439	0.456	N/A	N/A
	Right Cheek	0.027	0.687	0.714	N/A	N/A
	Right Tilt 15 Degree	0.014	0.319	0.333	N/A	N/A
Body-Worn	Front Side	0.045	0.178	0.223	N/A	N/A
	Back Side	0.057	0.294	0.351	N/A	N/A
Hotspot	Front Side	0.045	0.178	0.223	N/A	N/A
	Back Side	0.057	0.294	0.351	N/A	N/A
	Left Side	0.043	N/A	0.043	N/A	N/A
	Right Side	0.028	0.071	0.099	N/A	N/A
	Top Side	N/A	0.092	0.092	N/A	N/A
	Bottom Side	0.020	N/A	0.020	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 17 and WLAN 2.4G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 850	WLAN 5.2G			
Head	Left Cheek	0.147	0.164	0.311	N/A	N/A
	Left Tilt 15 Degree	0.081	0.088	0.169	N/A	N/A
	Right Cheek	0.128	0.141	0.269	N/A	N/A
	Right Tilt 15 Degree	0.062	0.067	0.129	N/A	N/A
Body-Worn	Front Side	0.263	0.378	0.641	N/A	N/A
	Back Side	0.342	0.480	0.822	N/A	N/A
Hotspot	Front Side	0.263	0.378	0.641	N/A	N/A
	Back Side	0.342	0.480	0.822	N/A	N/A
	Left Side	0.259	N/A	0.259	N/A	N/A
	Right Side	0.150	0.125	0.275	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.132	N/A	0.132	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM850 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 1900	WLAN 5.2G			
Head	Left Cheek	0.254	0.164	0.418	N/A	N/A
	Left Tilt 15 Degree	0.131	0.088	0.219	N/A	N/A
	Right Cheek	0.241	0.141	0.382	N/A	N/A
	Right Tilt 15 Degree	0.120	0.067	0.187	N/A	N/A
Body-Worn	Front Side	0.559	0.378	0.937	N/A	N/A
	Back Side	0.733	0.480	1.213	N/A	N/A
Hotspot	Front Side	0.559	0.378	0.937	N/A	N/A
	Back Side	0.733	0.480	1.213	N/A	N/A
	Left Side	0.576	N/A	0.576	N/A	N/A
	Right Side	0.334	0.125	0.459	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.279	N/A	0.279	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM1900 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 2	WLAN 5.2G			
Head	Left Cheek	0.194	0.164	0.358	N/A	N/A
	Left Tilt 15 Degree	0.098	0.088	0.186	N/A	N/A
	Right Cheek	0.168	0.141	0.309	N/A	N/A
	Right Tilt 15 Degree	0.090	0.067	0.157	N/A	N/A
Body-Worn	Front Side	0.434	0.378	0.812	N/A	N/A
	Back Side	0.578	0.480	1.058	N/A	N/A
Hotspot	Front Side	0.434	0.378	0.812	N/A	N/A
	Back Side	0.578	0.480	1.058	N/A	N/A
	Left Side	0.421	N/A	0.421	N/A	N/A
	Right Side	0.271	0.125	0.396	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.221	N/A	0.221	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 2 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 4	WLAN 5.2G			
Head	Left Cheek	0.725	0.164	0.889	N/A	N/A
	Left Tilt 15 Degree	0.381	0.088	0.469	N/A	N/A
	Right Cheek	0.663	0.141	0.804	N/A	N/A

	Right Tilt 15 Degree	0.325	0.067	0.392	N/A	N/A
Body-Worn	Front Side	0.344	0.378	0.722	N/A	N/A
	Back Side	0.450	0.480	0.930	N/A	N/A
Hotspot	Front Side	0.344	0.378	0.722	N/A	N/A
	Back Side	0.450	0.480	0.930	N/A	N/A
	Left Side	0.356	N/A	0.356	N/A	N/A
	Right Side	0.221	0.125	0.346	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.168	N/A	0.168	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 4 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 5	WLAN 5.2G			
Head	Left Cheek	0.077	0.164	0.241	N/A	N/A
	Left Tilt 15 Degree	0.045	0.088	0.133	N/A	N/A
	Right Cheek	0.067	0.141	0.208	N/A	N/A
	Right Tilt 15 Degree	0.031	0.067	0.098	N/A	N/A
Body-Worn	Front Side	0.118	0.378	0.496	N/A	N/A
	Back Side	0.155	0.480	0.635	N/A	N/A
Hotspot	Front Side	0.118	0.378	0.496	N/A	N/A
	Back Side	0.155	0.480	0.635	N/A	N/A
	Left Side	0.120	N/A	0.120	N/A	N/A
	Right Side	0.068	0.125	0.193	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.059	N/A	0.059	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 5 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 2	WLAN 5.2G			
Head	Left Cheek	0.243	0.164	0.407	N/A	N/A
	Left Tilt 15 Degree	0.133	0.088	0.221	N/A	N/A
	Right Cheek	0.232	0.141	0.373	N/A	N/A
	Right Tilt 15 Degree	0.107	0.067	0.174	N/A	N/A
Body-Worn	Front Side	0.655	0.378	1.033	N/A	N/A
	Back Side	0.798	0.480	1.278	N/A	N/A
Hotspot	Front Side	0.655	0.378	1.033	N/A	N/A
	Back Side	0.798	0.480	1.278	N/A	N/A
	Left Side	0.593	N/A	0.593	N/A	N/A

	Right Side	0.348	0.125	0.473	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.272	N/A	0.272	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 2 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 4	WLAN 5.2G			
Head	Left Cheek	0.196	0.164	0.360	N/A	N/A
	Left Tilt 15 Degree	0.106	0.088	0.194	N/A	N/A
	Right Cheek	0.184	0.141	0.325	N/A	N/A
	Right Tilt 15 Degree	0.095	0.067	0.162	N/A	N/A
Body-Worn	Front Side	0.550	0.378	0.928	N/A	N/A
	Back Side	0.660	0.480	1.140	N/A	N/A
Hotspot	Front Side	0.550	0.378	0.928	N/A	N/A
	Back Side	0.660	0.480	1.140	N/A	N/A
	Left Side	0.474	N/A	0.474	N/A	N/A
	Right Side	0.292	0.125	0.417	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.227	N/A	0.227	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 4 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 5	WLAN 5.2G			
Head	Left Cheek	0.077	0.164	0.241	N/A	N/A
	Left Tilt 15 Degree	0.042	0.088	0.130	N/A	N/A
	Right Cheek	0.066	0.141	0.207	N/A	N/A
	Right Tilt 15 Degree	0.033	0.067	0.100	N/A	N/A
Body-Worn	Front Side	0.175	0.378	0.553	N/A	N/A
	Back Side	0.219	0.480	0.699	N/A	N/A
Hotspot	Front Side	0.175	0.378	0.553	N/A	N/A
	Back Side	0.219	0.480	0.699	N/A	N/A
	Left Side	0.164	N/A	0.164	N/A	N/A
	Right Side	0.097	0.125	0.222	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.075	N/A	0.075	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 5 and WLAN 5.2G.

Test Position	Scaled SAR _{MAX}		Σ 1-g SAR	SPLSR	Remark
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		LTE Band 7	WLAN 5.2G	(W/Kg)		
Head	Left Cheek	0.107	0.164	0.271	N/A	N/A
	Left Tilt 15 Degree	0.056	0.088	0.144	N/A	N/A
	Right Cheek	0.100	0.141	0.241	N/A	N/A
	Right Tilt 15 Degree	0.050	0.067	0.117	N/A	N/A
Body-Worn	Front Side	0.772	0.378	1.150	N/A	N/A
	Back Side	1.088	0.480	1.568	N/A	N/A
Hotspot	Front Side	0.772	0.378	1.150	N/A	N/A
	Back Side	1.088	0.480	1.568	N/A	N/A
	Left Side	0.738	N/A	0.738	N/A	N/A
	Right Side	0.518	0.125	0.643	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.422	N/A	0.422	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 7 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 12	WLAN 5.2G			
Head	Left Cheek	0.031	0.164	0.195	N/A	N/A
	Left Tilt 15 Degree	0.018	0.088	0.106	N/A	N/A
	Right Cheek	0.027	0.141	0.168	N/A	N/A
	Right Tilt 15 Degree	0.013	0.067	0.080	N/A	N/A
Body-Worn	Front Side	0.044	0.378	0.422	N/A	N/A
	Back Side	0.058	0.480	0.538	N/A	N/A
Hotspot	Front Side	0.044	0.378	0.422	N/A	N/A
	Back Side	0.058	0.480	0.538	N/A	N/A
	Left Side	0.044	N/A	0.044	N/A	N/A
	Right Side	0.027	0.125	0.152	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.021	N/A	0.021	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 12 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 17	WLAN 5.2G			
Head	Left Cheek	0.031	0.164	0.195	N/A	N/A
	Left Tilt 15 Degree	0.017	0.088	0.105	N/A	N/A
	Right Cheek	0.027	0.141	0.168	N/A	N/A
	Right Tilt 15	0.014	0.067	0.081	N/A	N/A

	Degree					
Body-Worn	Front Side	0.045	0.378	0.423	N/A	N/A
	Back Side	0.057	0.480	0.537	N/A	N/A
Hotspot	Front Side	0.045	0.378	0.423	N/A	N/A
	Back Side	0.057	0.480	0.537	N/A	N/A
	Left Side	0.043	N/A	0.043	N/A	N/A
	Right Side	0.028	0.125	0.153	N/A	N/A
	Top Side	N/A	0.191	0.191	N/A	N/A
	Bottom Side	0.020	N/A	0.020	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 17 and WLAN 5.2G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 850	WLAN 5.8G			
Head	Left Cheek	0.147	0.204	0.351	N/A	N/A
	Left Tilt 15 Degree	0.081	0.204	0.285	N/A	N/A
	Right Cheek	0.128	0.204	0.332	N/A	N/A
	Right Tilt 15 Degree	0.062	0.204	0.266	N/A	N/A
Body-Worn	Front Side	0.263	0.102	0.365	N/A	N/A
	Back Side	0.342	0.102	0.444	N/A	N/A
Hotspot	Front Side	0.263	0.102	0.365	N/A	N/A
	Back Side	0.342	0.102	0.444	N/A	N/A
	Left Side	0.259	N/A	0.259	N/A	N/A
	Right Side	0.150	0.102	0.252	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.132	N/A	0.132	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM850 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 1900	WLAN 5.8G			
Head	Left Cheek	0.254	0.204	0.458	N/A	N/A
	Left Tilt 15 Degree	0.131	0.204	0.335	N/A	N/A
	Right Cheek	0.241	0.204	0.445	N/A	N/A
	Right Tilt 15 Degree	0.120	0.204	0.324	N/A	N/A
Body-Worn	Front Side	0.559	0.102	0.661	N/A	N/A
	Back Side	0.733	0.102	0.835	N/A	N/A
Hotspot	Front Side	0.559	0.102	0.661	N/A	N/A
	Back Side	0.733	0.102	0.835	N/A	N/A
	Left Side	0.576	N/A	0.576	N/A	N/A
	Right Side	0.334	0.102	0.436	N/A	N/A

	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.279	N/A	0.279	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM1900 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 2	WLAN 5.8G			
Head	Left Cheek	0.194	0.204	0.398	N/A	N/A
	Left Tilt 15 Degree	0.098	0.204	0.302	N/A	N/A
	Right Cheek	0.168	0.204	0.372	N/A	N/A
	Right Tilt 15 Degree	0.090	0.204	0.294	N/A	N/A
Body-Worn	Front Side	0.434	0.102	0.536	N/A	N/A
	Back Side	0.578	0.102	0.680	N/A	N/A
Hotspot	Front Side	0.434	0.102	0.536	N/A	N/A
	Back Side	0.578	0.102	0.680	N/A	N/A
	Left Side	0.421	N/A	0.421	N/A	N/A
	Right Side	0.271	0.102	0.373	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.221	N/A	0.221	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 2 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 4	WLAN 5.8G			
Head	Left Cheek	0.725	0.204	0.929	N/A	N/A
	Left Tilt 15 Degree	0.381	0.204	0.585	N/A	N/A
	Right Cheek	0.663	0.204	0.867	N/A	N/A
	Right Tilt 15 Degree	0.325	0.204	0.529	N/A	N/A
Body-Worn	Front Side	0.344	0.102	0.446	N/A	N/A
	Back Side	0.450	0.102	0.552	N/A	N/A
Hotspot	Front Side	0.344	0.102	0.446	N/A	N/A
	Back Side	0.450	0.102	0.552	N/A	N/A
	Left Side	0.356	N/A	0.356	N/A	N/A
	Right Side	0.221	0.102	0.323	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.168	N/A	0.168	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 4 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA	WLAN 5.8G			

		Band 5				
Head	Left Cheek	0.077	0.204	0.281	N/A	N/A
	Left Tilt 15 Degree	0.045	0.204	0.249	N/A	N/A
	Right Cheek	0.067	0.204	0.271	N/A	N/A
	Right Tilt 15 Degree	0.031	0.204	0.235	N/A	N/A
Body-Worn	Front Side	0.118	0.102	0.220	N/A	N/A
	Back Side	0.155	0.102	0.257	N/A	N/A
Hotspot	Front Side	0.118	0.102	0.220	N/A	N/A
	Back Side	0.155	0.102	0.257	N/A	N/A
	Left Side	0.120	N/A	0.120	N/A	N/A
	Right Side	0.068	0.102	0.170	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.059	N/A	0.059	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 5 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 2	WLAN 5.8G			
Head	Left Cheek	0.243	0.204	0.447	N/A	N/A
	Left Tilt 15 Degree	0.133	0.204	0.337	N/A	N/A
	Right Cheek	0.232	0.204	0.436	N/A	N/A
	Right Tilt 15 Degree	0.107	0.204	0.311	N/A	N/A
Body-Worn	Front Side	0.655	0.102	0.757	N/A	N/A
	Back Side	0.798	0.102	0.900	N/A	N/A
Hotspot	Front Side	0.655	0.102	0.757	N/A	N/A
	Back Side	0.798	0.102	0.900	N/A	N/A
	Left Side	0.593	N/A	0.593	N/A	N/A
	Right Side	0.348	0.102	0.450	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.272	N/A	0.272	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 2 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 4	WLAN 5.8G			
Head	Left Cheek	0.196	0.204	0.400	N/A	N/A
	Left Tilt 15 Degree	0.106	0.204	0.310	N/A	N/A
	Right Cheek	0.184	0.204	0.388	N/A	N/A
	Right Tilt 15 Degree	0.095	0.204	0.299	N/A	N/A

Body-Worn	Front Side	0.550	0.102	0.652	N/A	N/A
	Back Side	0.660	0.102	0.762	N/A	N/A
Hotspot	Front Side	0.550	0.102	0.652	N/A	N/A
	Back Side	0.660	0.102	0.762	N/A	N/A
	Left Side	0.474	N/A	0.474	N/A	N/A
	Right Side	0.292	0.102	0.394	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.227	N/A	0.227	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 4 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 5	WLAN 5.8G			
Head	Left Cheek	0.077	0.204	0.281	N/A	N/A
	Left Tilt 15 Degree	0.042	0.204	0.246	N/A	N/A
	Right Cheek	0.066	0.204	0.270	N/A	N/A
	Right Tilt 15 Degree	0.033	0.204	0.237	N/A	N/A
Body-Worn	Front Side	0.175	0.102	0.277	N/A	N/A
	Back Side	0.219	0.102	0.321	N/A	N/A
Hotspot	Front Side	0.175	0.102	0.277	N/A	N/A
	Back Side	0.219	0.102	0.321	N/A	N/A
	Left Side	0.164	N/A	0.164	N/A	N/A
	Right Side	0.097	0.102	0.199	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.075	N/A	0.075	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 5 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 7	WLAN 5.8G			
Head	Left Cheek	0.107	0.204	0.311	N/A	N/A
	Left Tilt 15 Degree	0.056	0.204	0.260	N/A	N/A
	Right Cheek	0.100	0.204	0.304	N/A	N/A
	Right Tilt 15 Degree	0.050	0.204	0.254	N/A	N/A
Body-Worn	Front Side	0.772	0.102	0.874	N/A	N/A
	Back Side	1.088	0.102	1.190	N/A	N/A
Hotspot	Front Side	0.772	0.102	0.874	N/A	N/A
	Back Side	1.088	0.102	1.190	N/A	N/A
	Left Side	0.738	N/A	0.738	N/A	N/A
	Right Side	0.518	0.102	0.620	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A

	Bottom Side	0.422	N/A	0.422	N/A	N/A
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NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 7 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 12	WLAN 5.8G			
Head	Left Cheek	0.031	0.204	0.235	N/A	N/A
	Left Tilt 15 Degree	0.018	0.204	0.222	N/A	N/A
	Right Cheek	0.027	0.204	0.231	N/A	N/A
	Right Tilt 15 Degree	0.013	0.204	0.217	N/A	N/A
Body-Worn	Front Side	0.044	0.102	0.146	N/A	N/A
	Back Side	0.058	0.102	0.160	N/A	N/A
Hotspot	Front Side	0.044	0.102	0.146	N/A	N/A
	Back Side	0.058	0.102	0.160	N/A	N/A
	Left Side	0.044	N/A	0.044	N/A	N/A
	Right Side	0.027	0.102	0.129	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.021	N/A	0.021	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 12 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 17	WLAN 5.8G			
Head	Left Cheek	0.031	0.204	0.235	N/A	N/A
	Left Tilt 15 Degree	0.017	0.204	0.221	N/A	N/A
	Right Cheek	0.027	0.204	0.231	N/A	N/A
	Right Tilt 15 Degree	0.014	0.204	0.218	N/A	N/A
Body-Worn	Front Side	0.045	0.102	0.147	N/A	N/A
	Back Side	0.057	0.102	0.159	N/A	N/A
Hotspot	Front Side	0.045	0.102	0.147	N/A	N/A
	Back Side	0.057	0.102	0.159	N/A	N/A
	Left Side	0.043	N/A	0.043	N/A	N/A
	Right Side	0.028	0.102	0.130	N/A	N/A
	Top Side	N/A	0.102	0.102	N/A	N/A
	Bottom Side	0.020	N/A	0.020	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 17 and WLAN 5.8G.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 850	Bluetooth			

Head	Left Cheek	0.147	0.167	0.314	N/A	N/A
	Left Tilt 15 Degree	0.081	0.167	0.248	N/A	N/A
	Right Cheek	0.128	0.167	0.295	N/A	N/A
	Right Tilt 15 Degree	0.062	0.167	0.229	N/A	N/A
Body-Worn	Front Side	0.263	0.084	0.347	N/A	N/A
	Back Side	0.342	0.084	0.426	N/A	N/A
Hotspot	Front Side	0.263	0.084	0.347	N/A	N/A
	Back Side	0.342	0.084	0.426	N/A	N/A
	Left Side	0.259	N/A	0.259	N/A	N/A
	Right Side	0.150	0.084	0.234	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.132	N/A	0.132	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM850 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		GSM 1900	Bluetooth			
Head	Left Cheek	0.254	0.167	0.421	N/A	N/A
	Left Tilt 15 Degree	0.131	0.167	0.298	N/A	N/A
	Right Cheek	0.241	0.167	0.408	N/A	N/A
	Right Tilt 15 Degree	0.120	0.167	0.287	N/A	N/A
Body-Worn	Front Side	0.559	0.084	0.643	N/A	N/A
	Back Side	0.733	0.084	0.817	N/A	N/A
Hotspot	Front Side	0.559	0.084	0.643	N/A	N/A
	Back Side	0.733	0.084	0.817	N/A	N/A
	Left Side	0.576	N/A	0.576	N/A	N/A
	Right Side	0.334	0.084	0.418	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.279	N/A	0.279	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of GSM1900 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 2	Bluetooth			
Head	Left Cheek	0.194	0.167	0.361	N/A	N/A
	Left Tilt 15 Degree	0.098	0.167	0.265	N/A	N/A
	Right Cheek	0.168	0.167	0.335	N/A	N/A
	Right Tilt 15 Degree	0.090	0.167	0.257	N/A	N/A
Body-Worn	Front Side	0.434	0.084	0.518	N/A	N/A

	Back Side	0.578	0.084	0.662	N/A	N/A
Hotspot	Front Side	0.434	0.084	0.518	N/A	N/A
	Back Side	0.578	0.084	0.662	N/A	N/A
	Left Side	0.421	N/A	0.421	N/A	N/A
	Right Side	0.271	0.084	0.355	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.221	N/A	0.221	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 2 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 4	Bluetooth			
Head	Left Cheek	0.725	0.167	0.892	N/A	N/A
	Left Tilt 15 Degree	0.381	0.167	0.548	N/A	N/A
	Right Cheek	0.663	0.167	0.830	N/A	N/A
	Right Tilt 15 Degree	0.325	0.167	0.492	N/A	N/A
Body-Worn	Front Side	0.344	0.084	0.428	N/A	N/A
	Back Side	0.450	0.084	0.534	N/A	N/A
Hotspot	Front Side	0.344	0.084	0.428	N/A	N/A
	Back Side	0.450	0.084	0.534	N/A	N/A
	Left Side	0.356	N/A	0.356	N/A	N/A
	Right Side	0.221	0.084	0.305	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.168	N/A	0.168	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 4 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WCDMA Band 5	Bluetooth			
Head	Left Cheek	0.077	0.167	0.244	N/A	N/A
	Left Tilt 15 Degree	0.045	0.167	0.212	N/A	N/A
	Right Cheek	0.067	0.167	0.234	N/A	N/A
	Right Tilt 15 Degree	0.031	0.167	0.198	N/A	N/A
Body-Worn	Front Side	0.118	0.084	0.202	N/A	N/A
	Back Side	0.155	0.084	0.239	N/A	N/A
Hotspot	Front Side	0.118	0.084	0.202	N/A	N/A
	Back Side	0.155	0.084	0.239	N/A	N/A
	Left Side	0.120	N/A	0.120	N/A	N/A
	Right Side	0.068	0.084	0.152	N/A	N/A

	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.059	N/A	0.059	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of WCDMA Band 5 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 2	Bluetooth			
Head	Left Cheek	0.243	0.167	0.410	N/A	N/A
	Left Tilt 15 Degree	0.133	0.167	0.300	N/A	N/A
	Right Cheek	0.232	0.167	0.399	N/A	N/A
	Right Tilt 15 Degree	0.107	0.167	0.274	N/A	N/A
Body-Worn	Front Side	0.655	0.084	0.739	N/A	N/A
	Back Side	0.798	0.084	0.882	N/A	N/A
Hotspot	Front Side	0.655	0.084	0.739	N/A	N/A
	Back Side	0.798	0.084	0.882	N/A	N/A
	Left Side	0.593	N/A	0.593	N/A	N/A
	Right Side	0.348	0.084	0.432	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.272	N/A	0.272	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 2 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 4	Bluetooth			
Head	Left Cheek	0.196	0.167	0.363	N/A	N/A
	Left Tilt 15 Degree	0.106	0.167	0.273	N/A	N/A
	Right Cheek	0.184	0.167	0.351	N/A	N/A
	Right Tilt 15 Degree	0.095	0.167	0.262	N/A	N/A
Body-Worn	Front Side	0.550	0.084	0.634	N/A	N/A
	Back Side	0.660	0.084	0.744	N/A	N/A
Hotspot	Front Side	0.550	0.084	0.634	N/A	N/A
	Back Side	0.660	0.084	0.744	N/A	N/A
	Left Side	0.474	N/A	0.474	N/A	N/A
	Right Side	0.292	0.084	0.376	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.227	N/A	0.227	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 4 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 5	Bluetooth			
Head	Left Cheek	0.077	0.167	0.244	N/A	N/A

	Left Tilt 15 Degree	0.042	0.167	0.209	N/A	N/A
	Right Cheek	0.066	0.167	0.233	N/A	N/A
	Right Tilt 15 Degree	0.033	0.167	0.200	N/A	N/A
Body-Worn	Front Side	0.175	0.084	0.259	N/A	N/A
	Back Side	0.219	0.084	0.303	N/A	N/A
Hotspot	Front Side	0.175	0.084	0.259	N/A	N/A
	Back Side	0.219	0.084	0.303	N/A	N/A
	Left Side	0.164	N/A	0.164	N/A	N/A
	Right Side	0.097	0.084	0.181	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.075	N/A	0.075	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 5 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 7	Bluetooth			
Head	Left Cheek	0.107	0.167	0.274	N/A	N/A
	Left Tilt 15 Degree	0.056	0.167	0.223	N/A	N/A
	Right Cheek	0.100	0.167	0.267	N/A	N/A
	Right Tilt 15 Degree	0.050	0.167	0.217	N/A	N/A
Body-Worn	Front Side	0.772	0.084	0.856	N/A	N/A
	Back Side	1.088	0.084	1.172	N/A	N/A
Hotspot	Front Side	0.772	0.084	0.856	N/A	N/A
	Back Side	1.088	0.084	1.172	N/A	N/A
	Left Side	0.738	N/A	0.738	N/A	N/A
	Right Side	0.518	0.084	0.602	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.422	N/A	0.422	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 7 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 12	Bluetooth			
Head	Left Cheek	0.031	0.167	0.198	N/A	N/A
	Left Tilt 15 Degree	0.018	0.167	0.185	N/A	N/A
	Right Cheek	0.027	0.167	0.194	N/A	N/A
	Right Tilt 15 Degree	0.013	0.167	0.180	N/A	N/A
Body-Worn	Front Side	0.044	0.084	0.128	N/A	N/A
	Back Side	0.058	0.084	0.142	N/A	N/A

Hotspot	Front Side	0.044	0.084	0.128	N/A	N/A
	Back Side	0.058	0.084	0.142	N/A	N/A
	Left Side	0.044	N/A	0.044	N/A	N/A
	Right Side	0.027	0.084	0.111	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.021	N/A	0.021	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 12 and Bluetooth.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		LTE Band 17	Bluetooth			
Head	Left Cheek	0.031	0.167	0.198	N/A	N/A
	Left Tilt 15 Degree	0.017	0.167	0.184	N/A	N/A
	Right Cheek	0.027	0.167	0.194	N/A	N/A
	Right Tilt 15 Degree	0.014	0.167	0.181	N/A	N/A
Body-Worn	Front Side	0.045	0.084	0.129	N/A	N/A
	Back Side	0.057	0.084	0.141	N/A	N/A
Hotspot	Front Side	0.045	0.084	0.129	N/A	N/A
	Back Side	0.057	0.084	0.141	N/A	N/A
	Left Side	0.043	N/A	0.043	N/A	N/A
	Right Side	0.028	0.084	0.112	N/A	N/A
	Top Side	N/A	0.084	0.084	N/A	N/A
	Bottom Side	0.020	N/A	0.020	N/A	N/A

NOTE: 1-g SAR Simultaneous Tx Combination of LTE Band 17 and Bluetooth.

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

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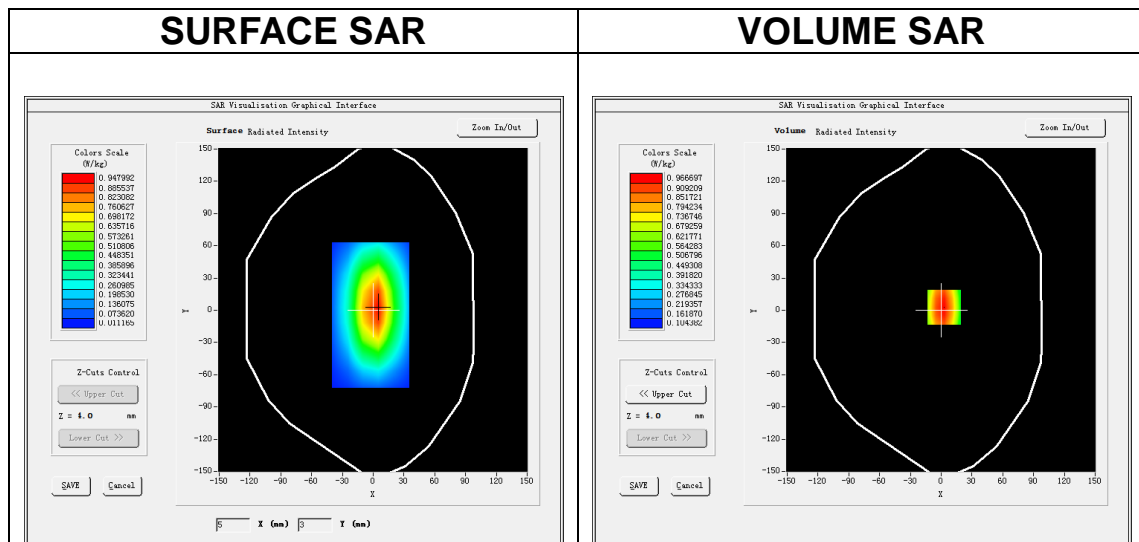
MEASUREMENT 1

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW750</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative permittivity (real part)	41.553162
Relative permittivity (imaginary part)	22.301263
Conductivity (S/m)	0.922262
Variation (%)	-1.810000

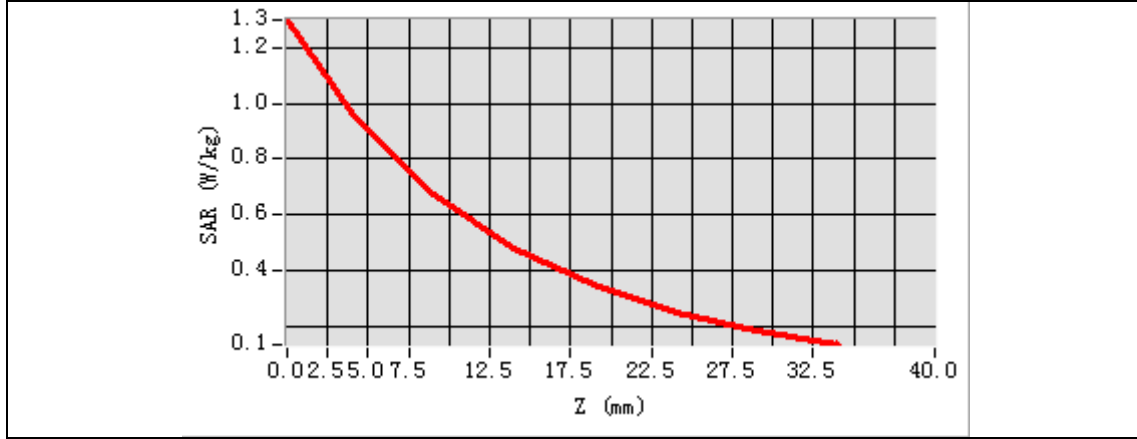


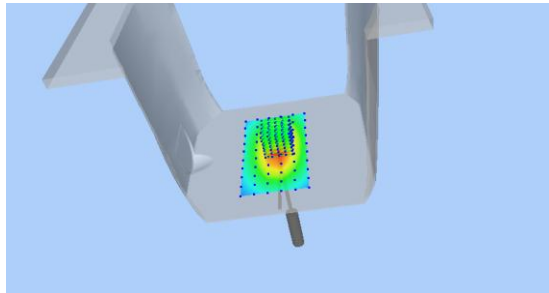
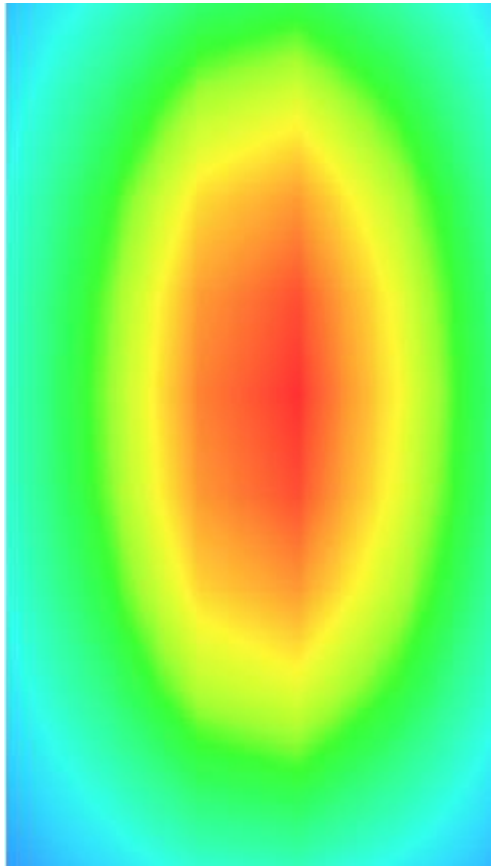
Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.560218
SAR 1g (W/Kg)	0.893362

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2913	0.9633	0.6716	0.4837	0.3478	0.2536	0.1837



3D screen shot	Hot spot position
	

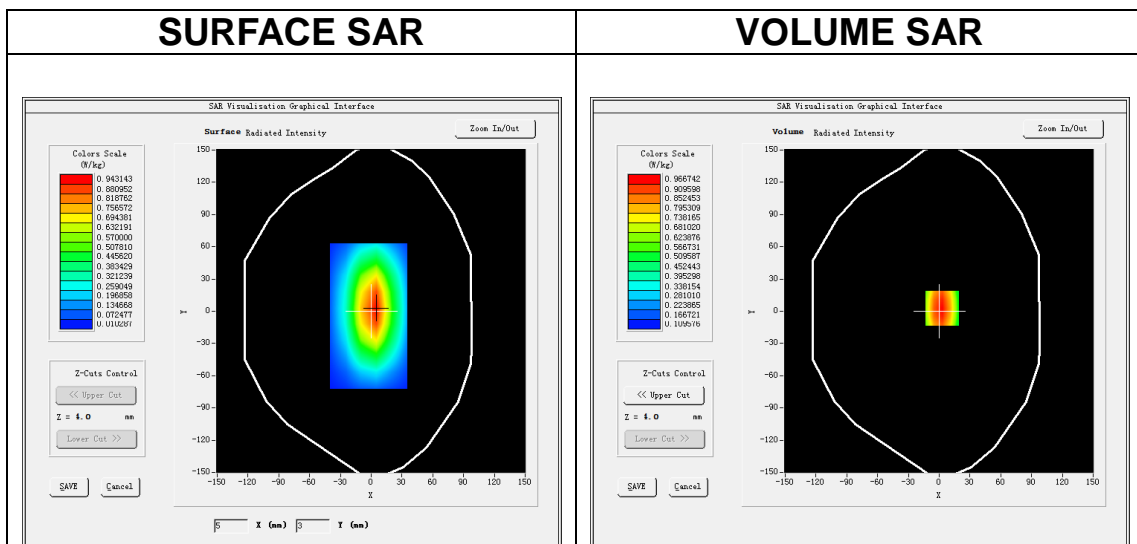
MEASUREMENT 2

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW750</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

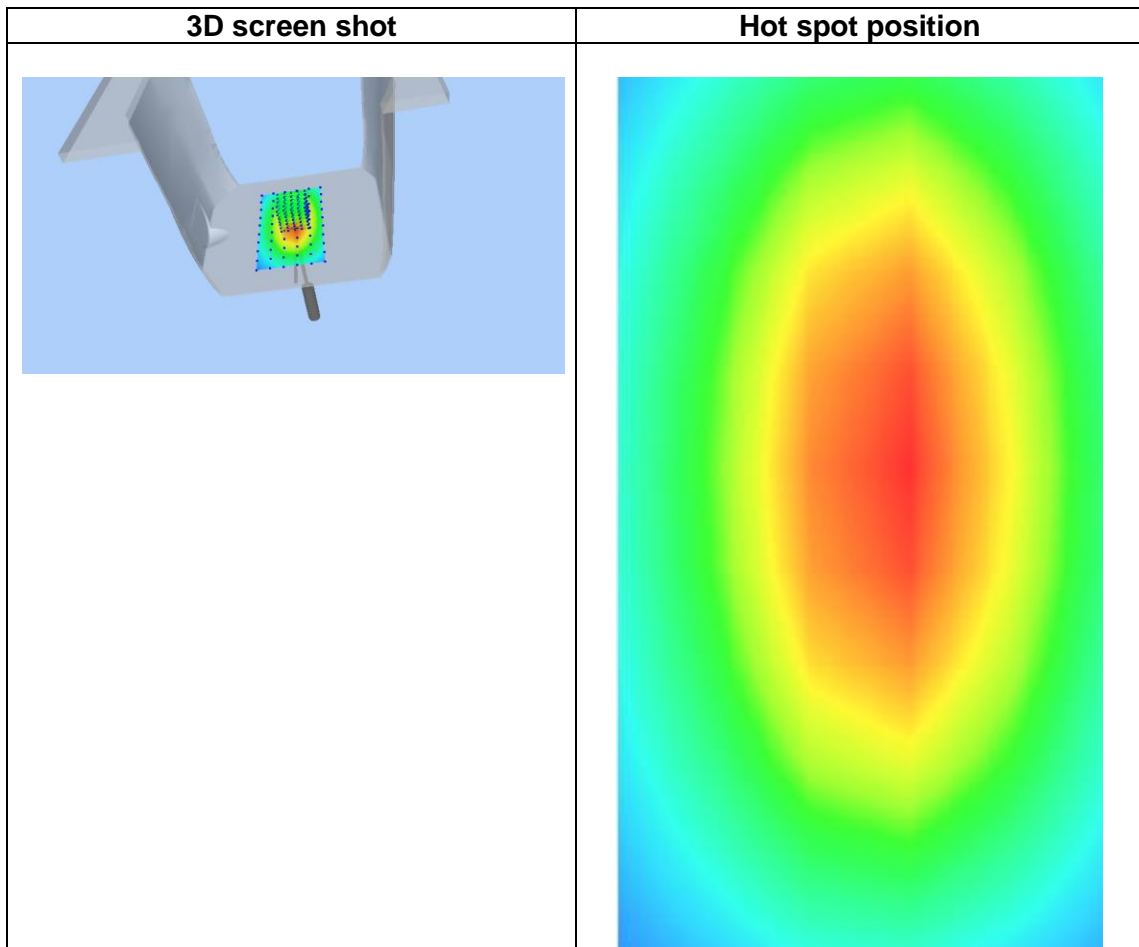
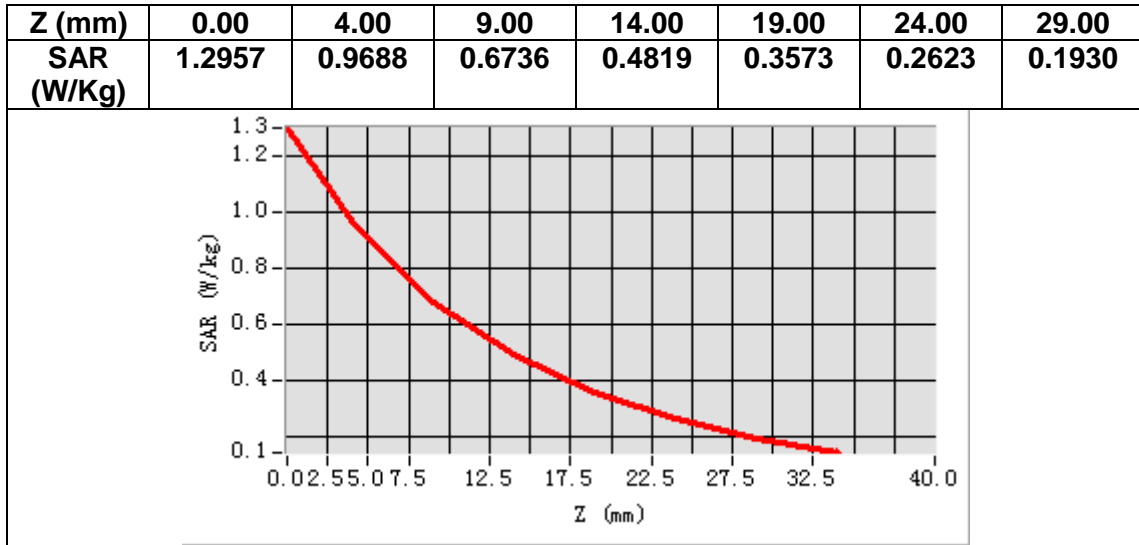
Frequency (MHz)	750.000000
Relative permittivity (real part)	55.470248
Relative permittivity (imaginary part)	23.163842
Conductivity (S/m)	0.960318
Variation (%)	-0.490000



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.606281
SAR 1g (W/Kg)	0.845263



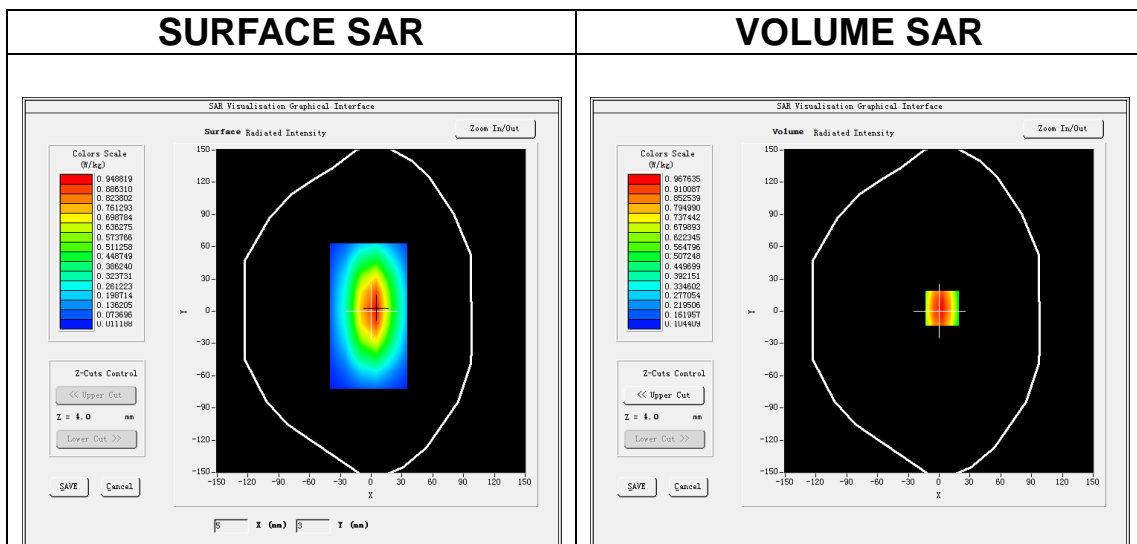
MEASUREMENT 3

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW835</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

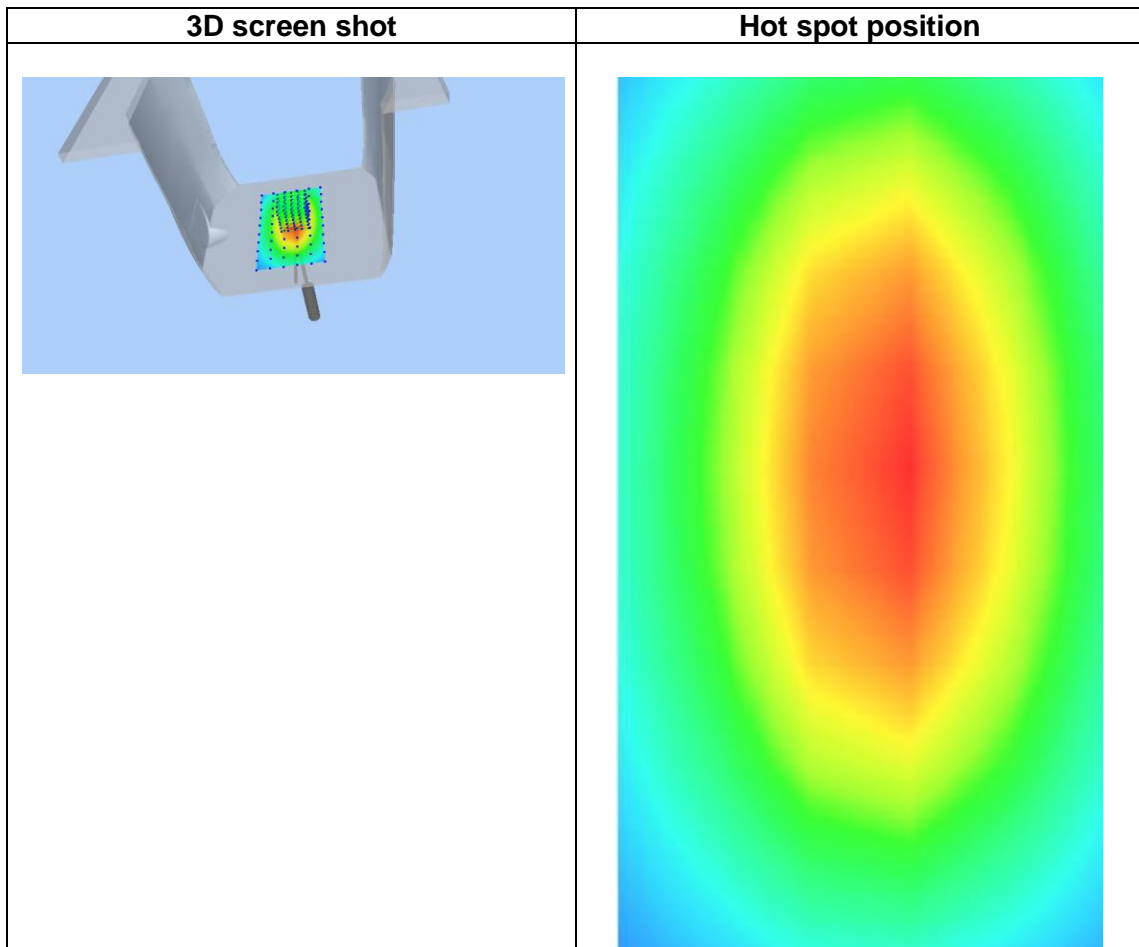
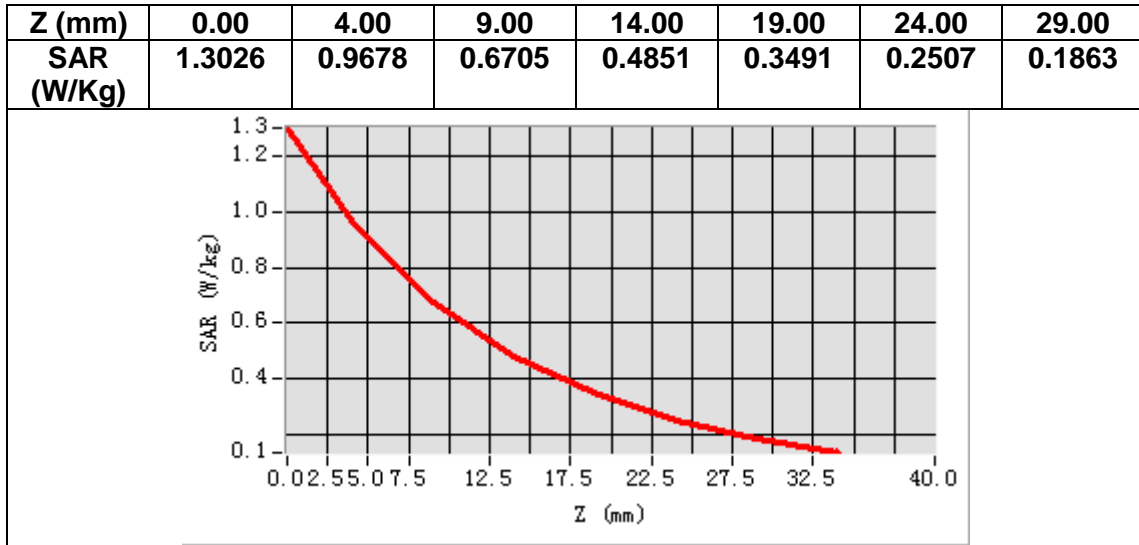
Frequency (MHz)	835.000000
Relative permittivity (real part)	40.743541
Relative permittivity (imaginary part)	19.971613
Conductivity (S/m)	0.930542
Variation (%)	1.870000



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.637466
SAR 1g (W/Kg)	0.904035



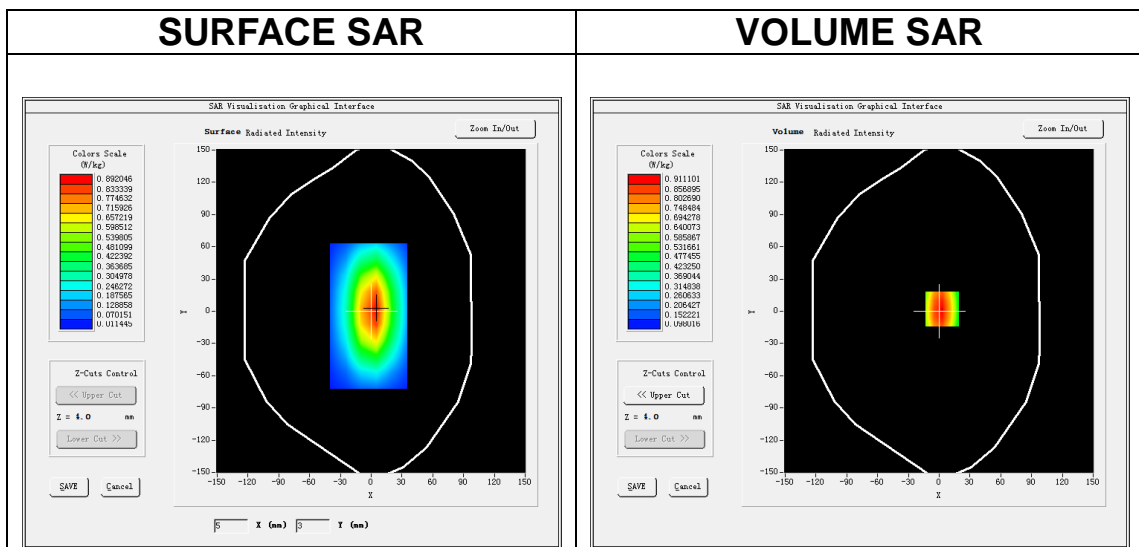
MEASUREMENT 4

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW835</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative permittivity (real part)	54.471101
Relative permittivity (imaginary part)	21.213359
Conductivity (S/m)	0.981236
Variation (%)	-1.210000

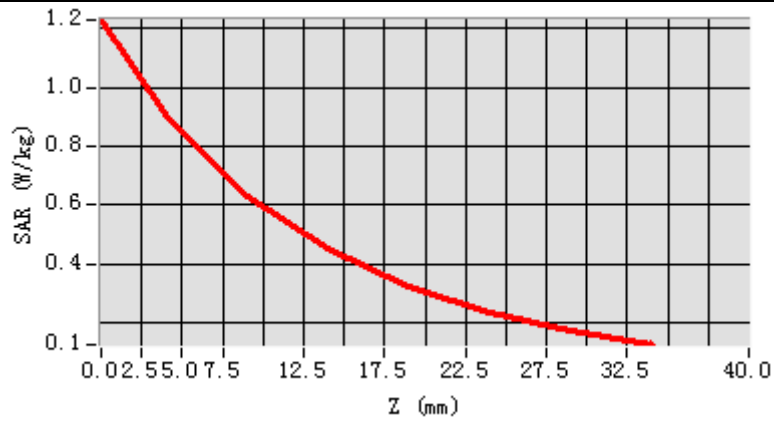


Maximum location: X=3.00, Y=2.00

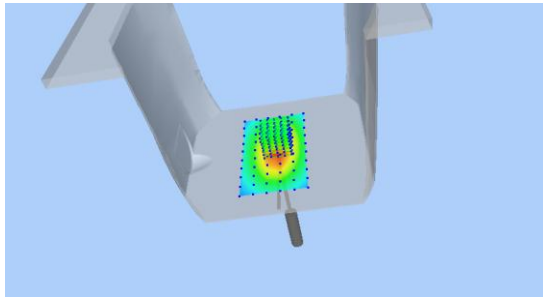
SAR Peak: 1.23 W/kg

SAR 10g (W/Kg)	0.628123
SAR 1g (W/Kg)	1.028356

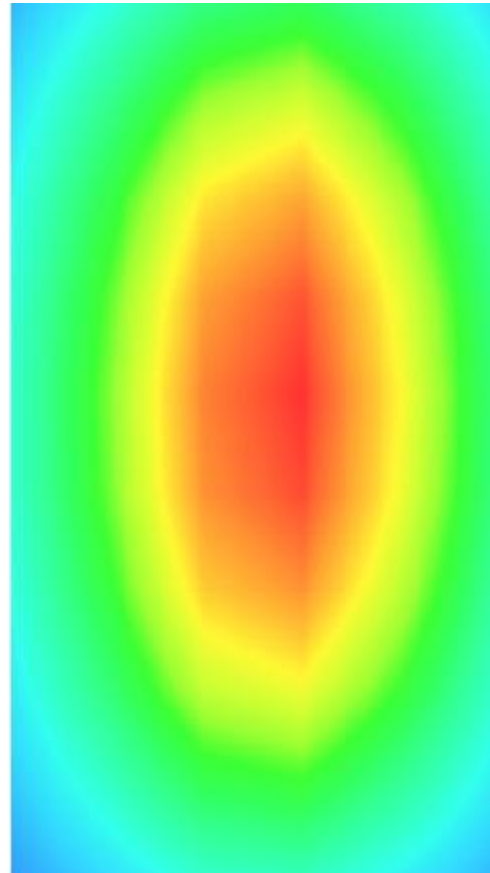
Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2214	0.9178	0.6330	0.4575	0.3252	0.2301	0.1735



3D screen shot



Hot spot position



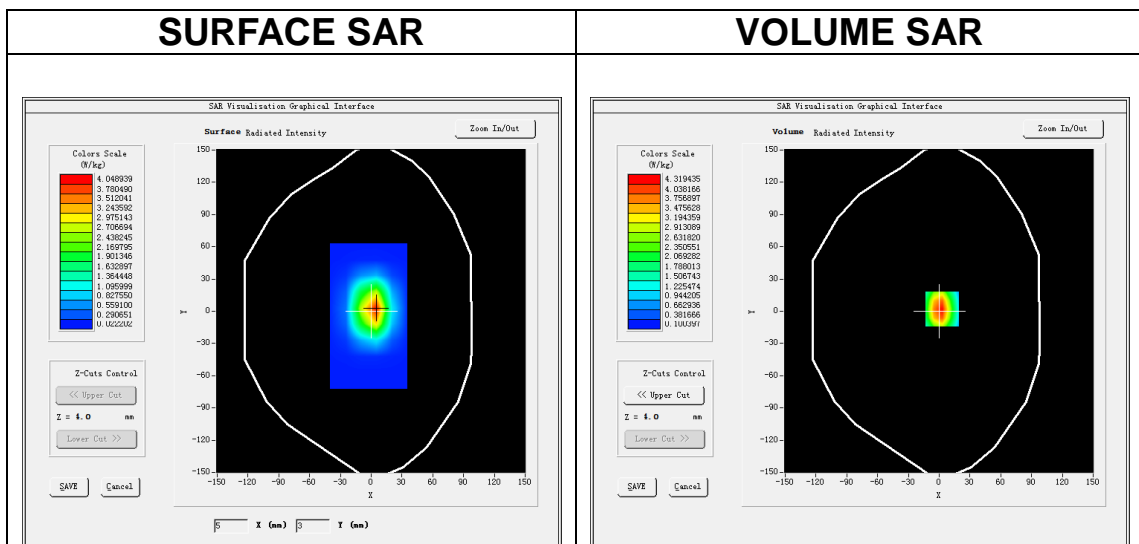
MEASUREMENT 5

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1800</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	38.521237
Relative permittivity (imaginary part)	13.863229
Conductivity (S/m)	1.391367
Variation (%)	-2.113000

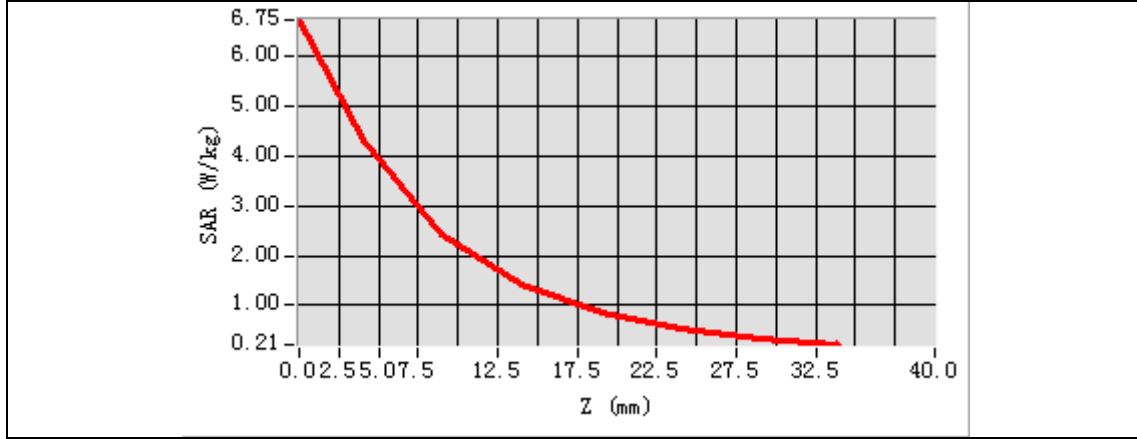


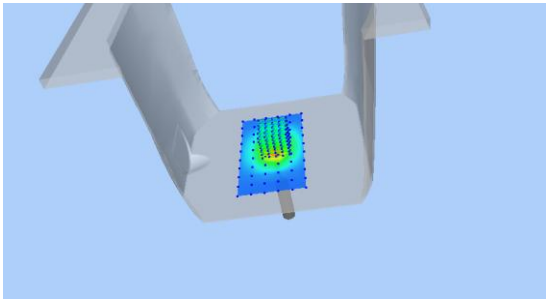
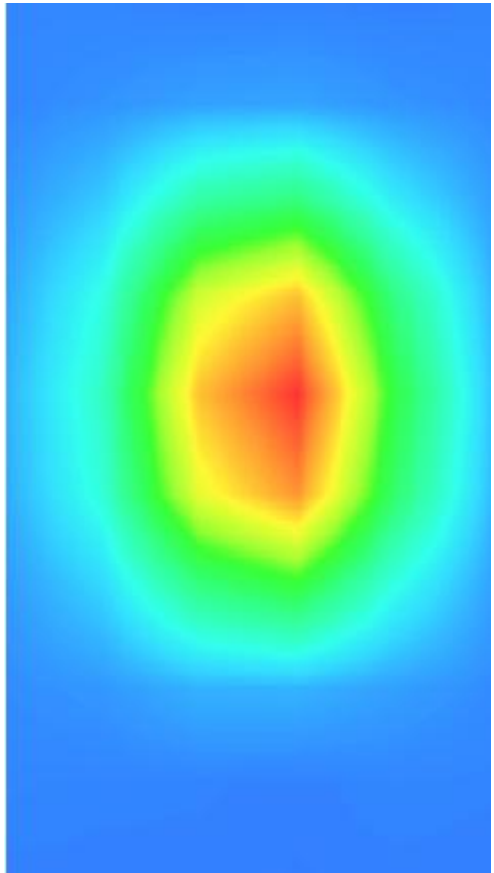
Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	1.943397
SAR 1g (W/Kg)	3.769451

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.7434	4.3126	2.4318	1.4277	0.8554	0.5237	0.3279



3D screen shot	Hot spot position
	

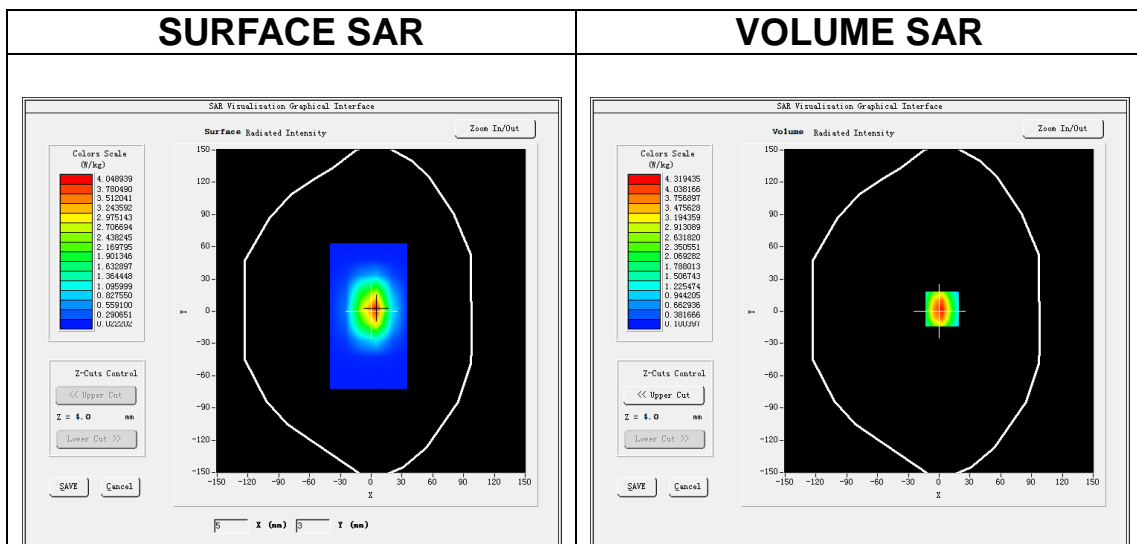
MEASUREMENT 6

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1800</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	54.043510
Relative permittivity (imaginary part)	15.144016
Conductivity (S/m)	1.513096
Variation (%)	2.020000

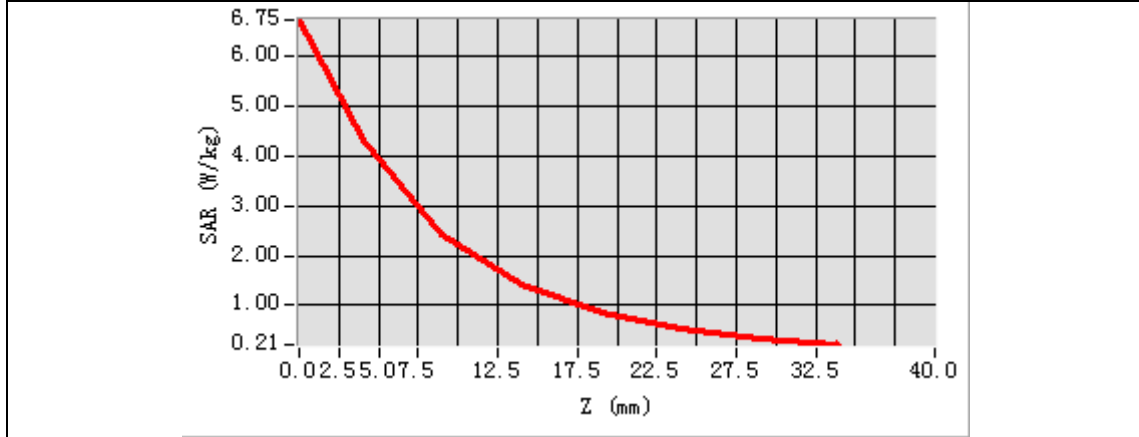


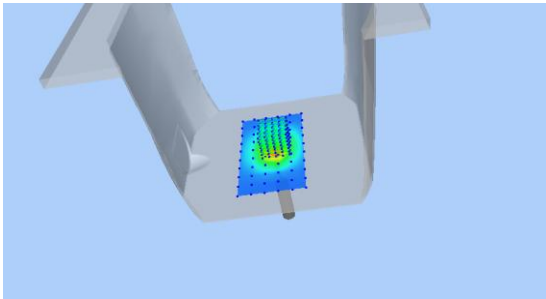
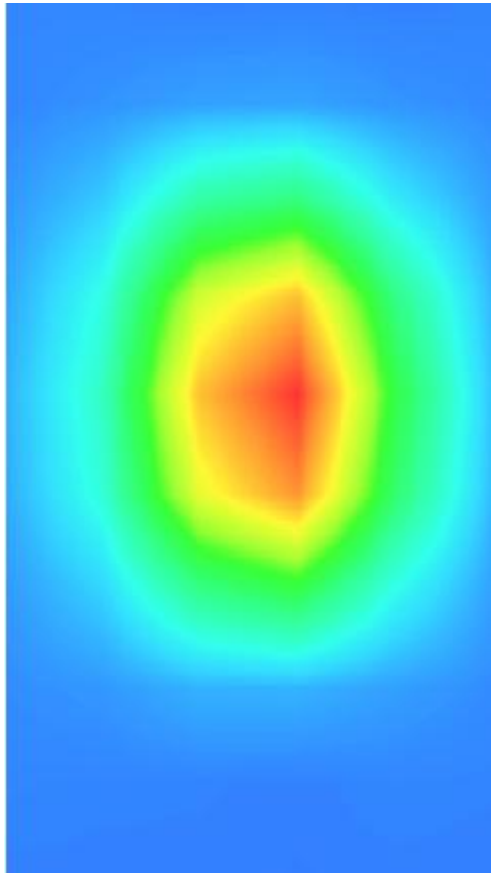
Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	2.019379
SAR 1g (W/Kg)	3.741268

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.7434	4.3133	2.4332	1.4247	0.8577	0.5244	0.3266



3D screen shot	Hot spot position
	

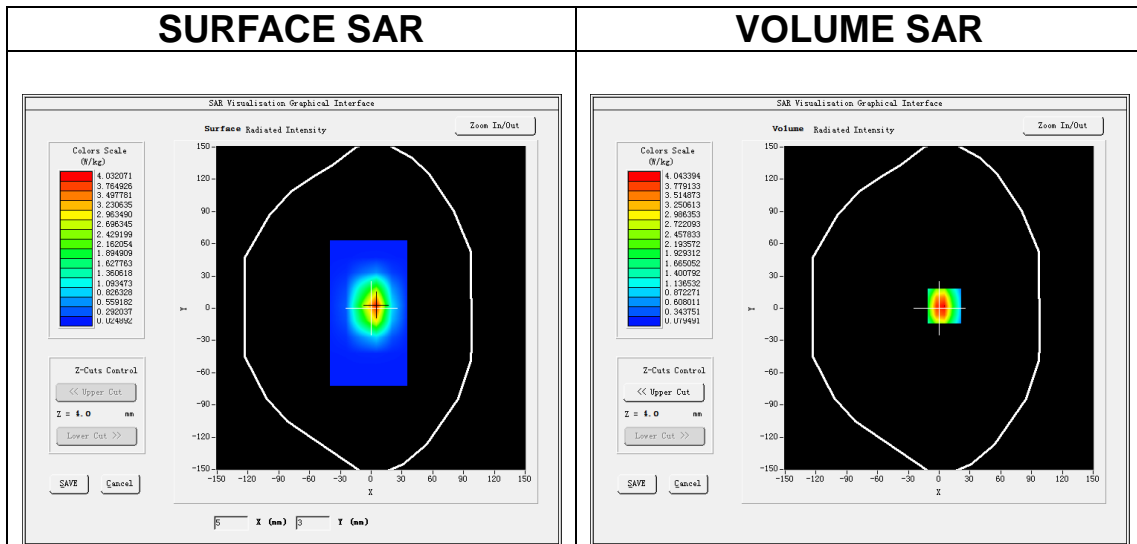
MEASUREMENT 7

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1900</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.581287
Relative permittivity (imaginary part)	13.633008
Conductivity (S/m)	1.440336
Variation (%)	-1.430000

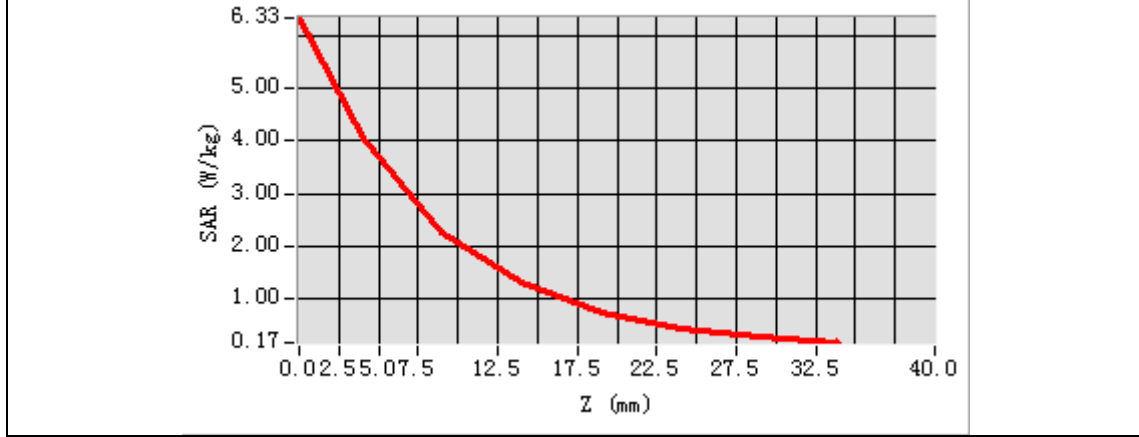


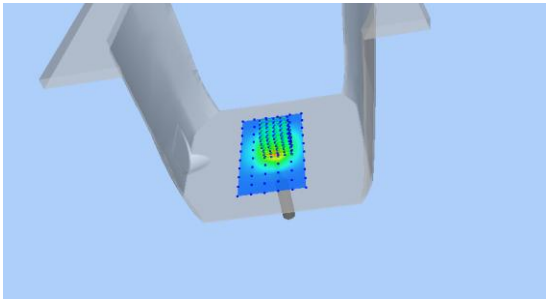
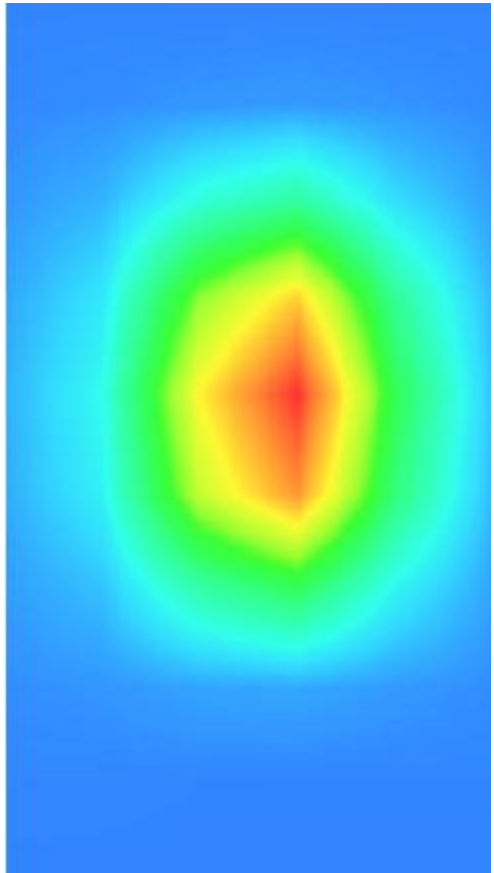
Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	1.973456
SAR 1g (W/Kg)	3.915365

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.3211	4.0432	2.2653	1.3077	0.7635	0.4533	0.2735



3D screen shot	Hot spot position
	

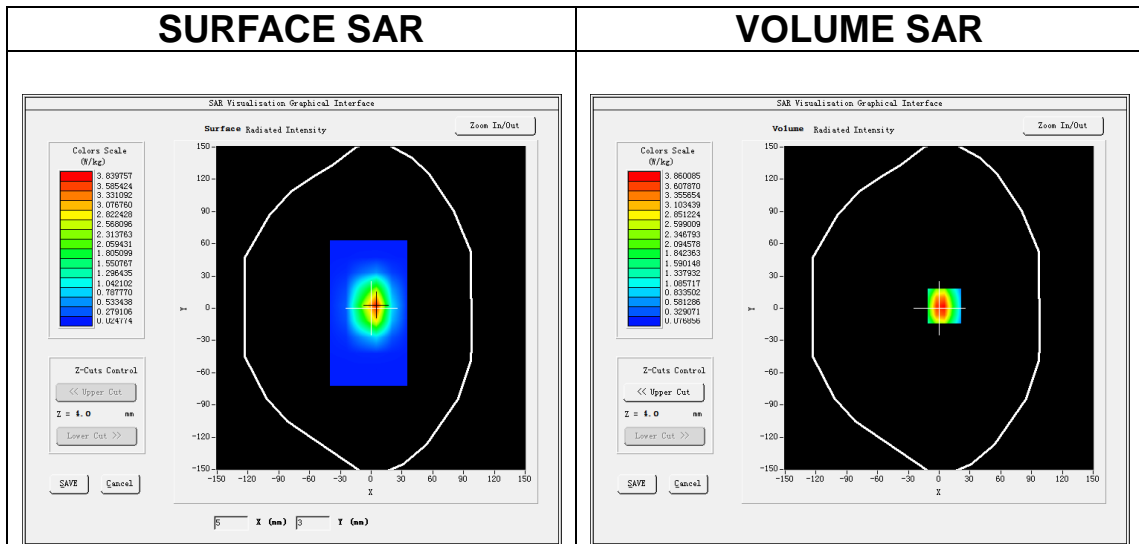
MEASUREMENT 8

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1900</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	54.213335
Relative permittivity (imaginary part)	14.513503
Conductivity (S/m)	1.533566
Variation (%)	0.120000

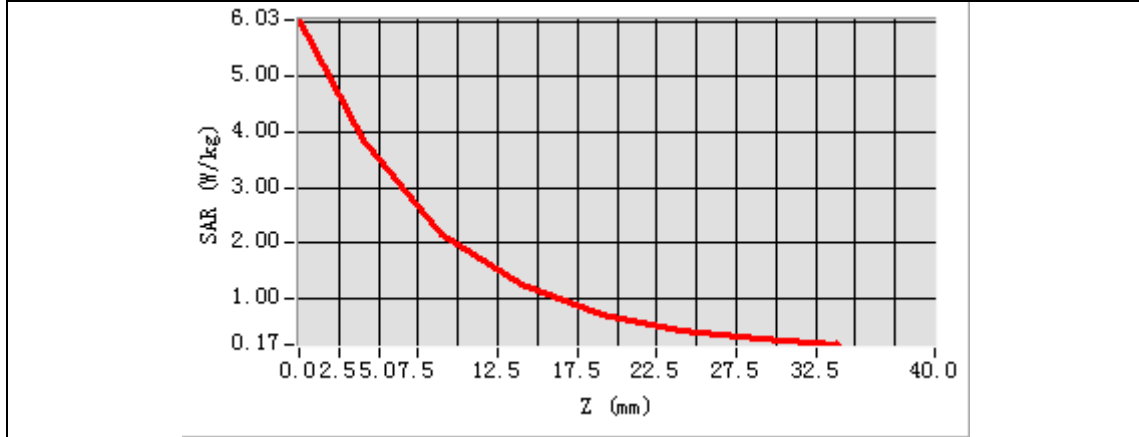


Maximum location: X=5.00, Y=2.00

SAR Peak: 6.39 W/kg

SAR 10g (W/Kg)	2.169329
SAR 1g (W/Kg)	3.712402

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.0345	3.8665	2.1619	1.2445	0.7255	0.4326	0.2634



3D screen shot	Hot spot position
<p>A 3D perspective view of a grey, L-shaped device. A grid of small blue dots is overlaid on the flat surface of the device. A small black probe or needle is positioned at one of the dots in the center of the grid.</p>	<p>A 2D heatmap corresponding to the device's surface. The background is blue, representing low SAR. A central region is colored with a gradient from yellow to red, indicating the highest SAR values (the hot spot). This hot spot is centered on the same area as the probe in the 3D view.</p>

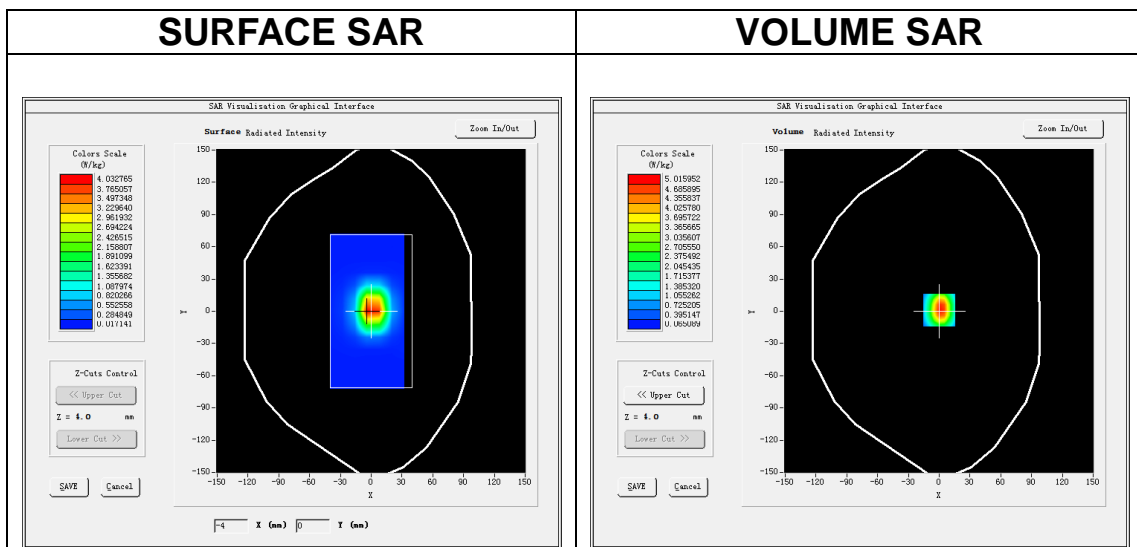
MEASUREMENT 9

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW2450</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	38.471421
Relative permittivity (imaginary part)	13.592631
Conductivity (S/m)	1.850663
Variation (%)	-3.350000

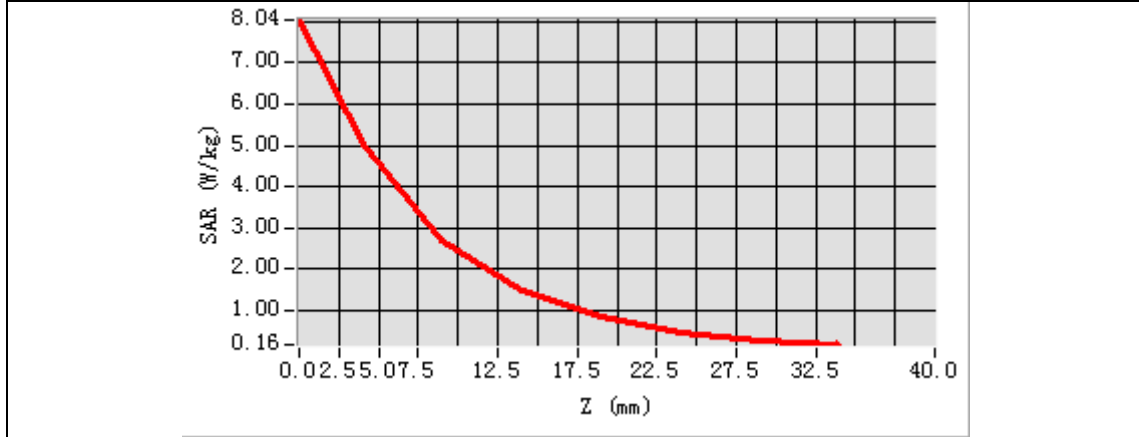


Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

SAR 10g (W/Kg)	2.410375
SAR 1g (W/Kg)	5.374435

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	8.0302	5.0113	2.6947	1.4868	0.8390	0.4693	0.2643



3D screen shot	Hot spot position

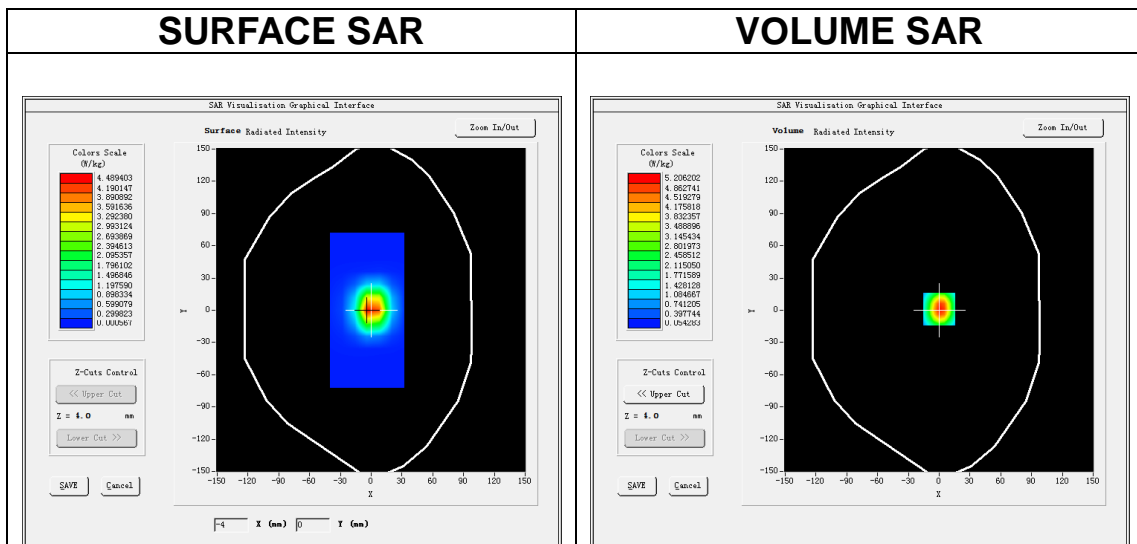
MEASUREMENT 10

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7, dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2450</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	51.471497
Relative permittivity (imaginary part)	13.863566
Conductivity (S/m)	1.892816
Variation (%)	0.420000

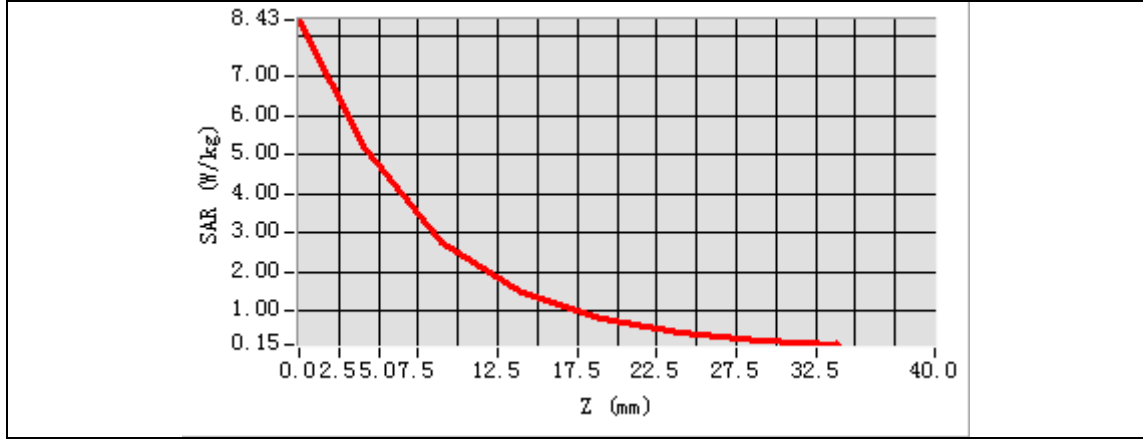


Maximum location: X=0.00, Y=1.00

SAR Peak: 8.46 W/kg

SAR 10g (W/Kg)	2.514285
SAR 1g (W/Kg)	5.314270

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	8.4312	5.2217	2.7528	1.4235	0.8268	0.4398	0.2567



3D screen shot	Hot spot position

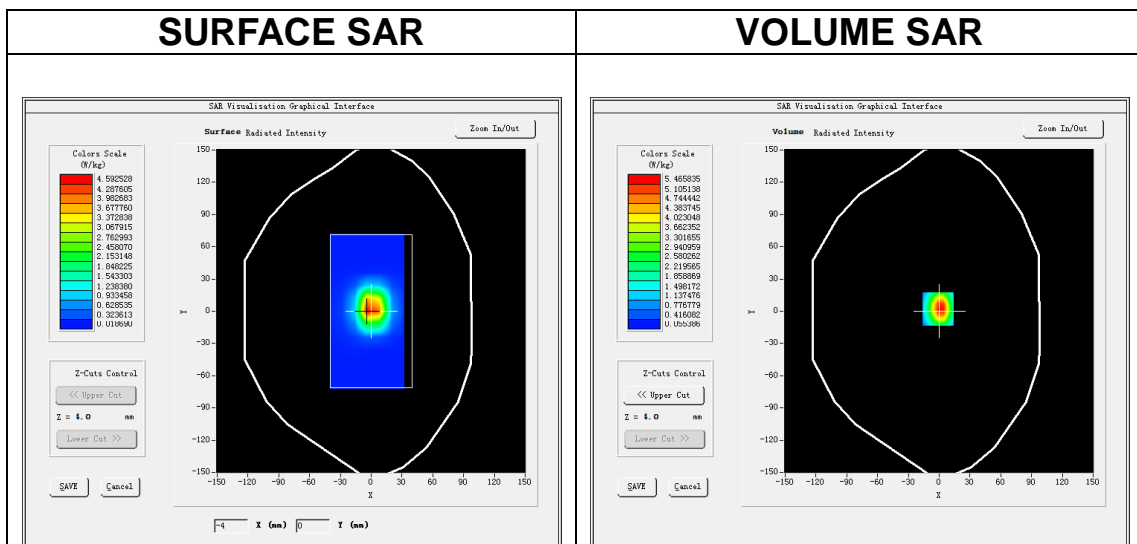
MEASUREMENT 11

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW2600</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

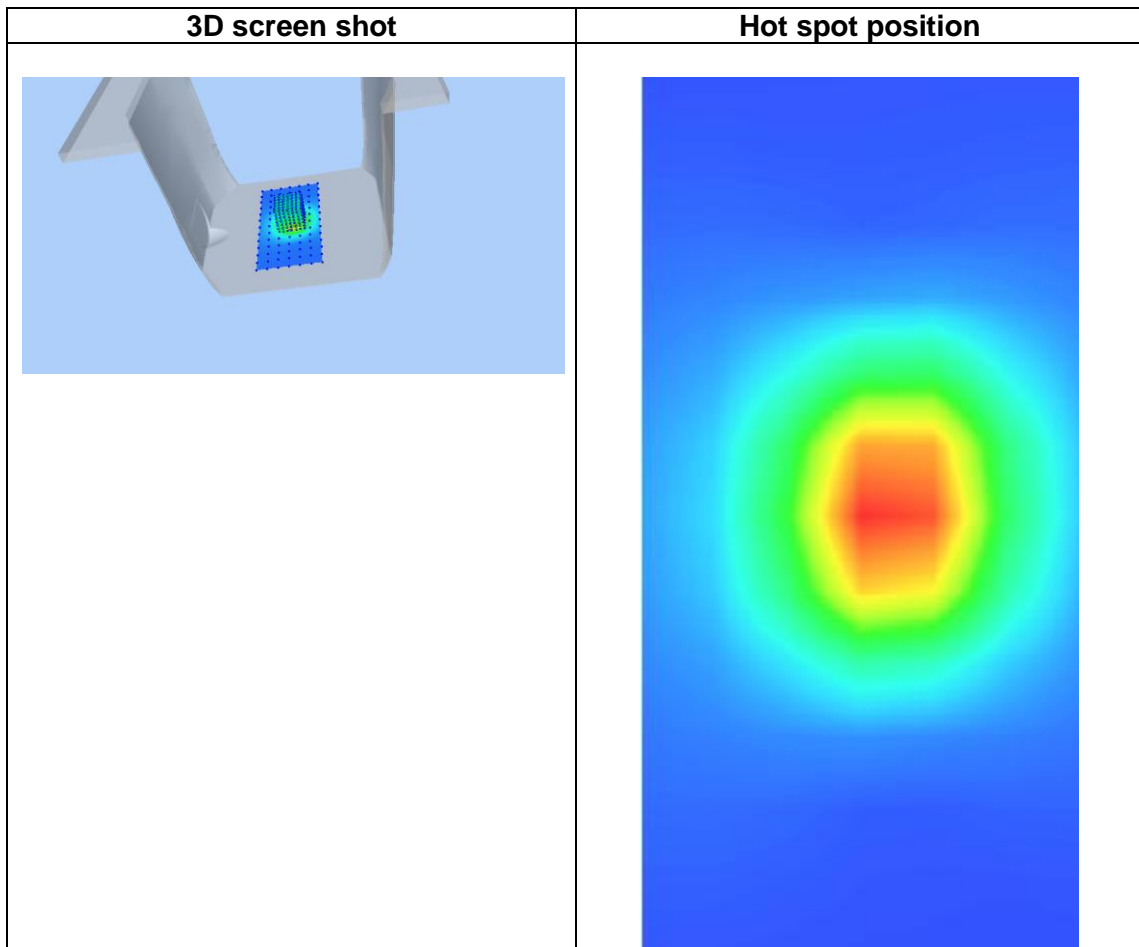
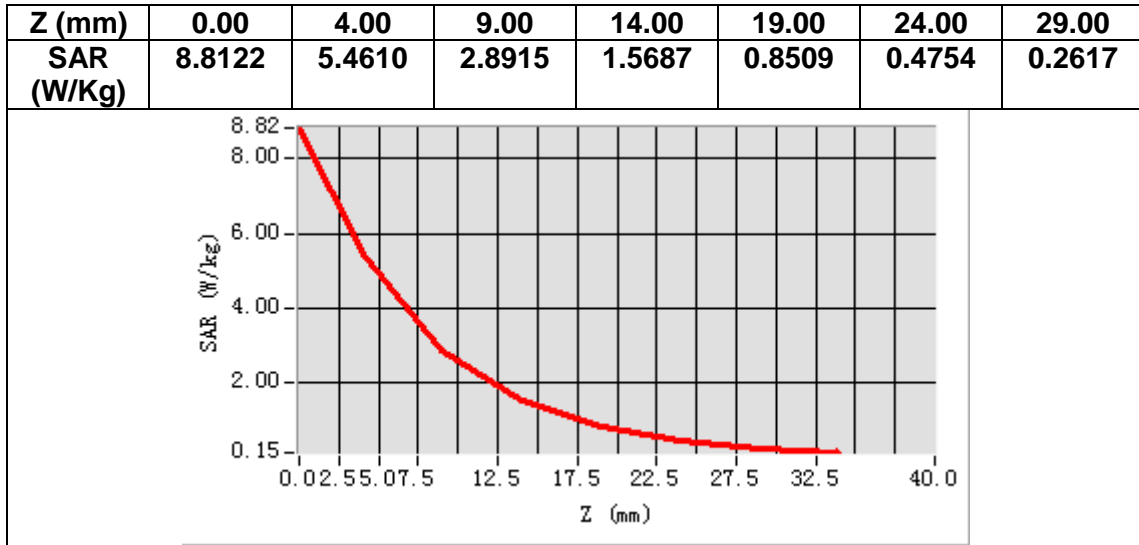
Frequency (MHz)	2600.000000
Relative permittivity (real part)	38.062638
Relative permittivity (imaginary part)	14.033997
Conductivity (S/m)	2.033631
Variation (%)	-0.040000



Maximum location: X=-1.00, Y=2.00

SAR Peak: 9.07 W/kg

SAR 10g (W/Kg)	2.451205
SAR 1g (W/Kg)	5.552267



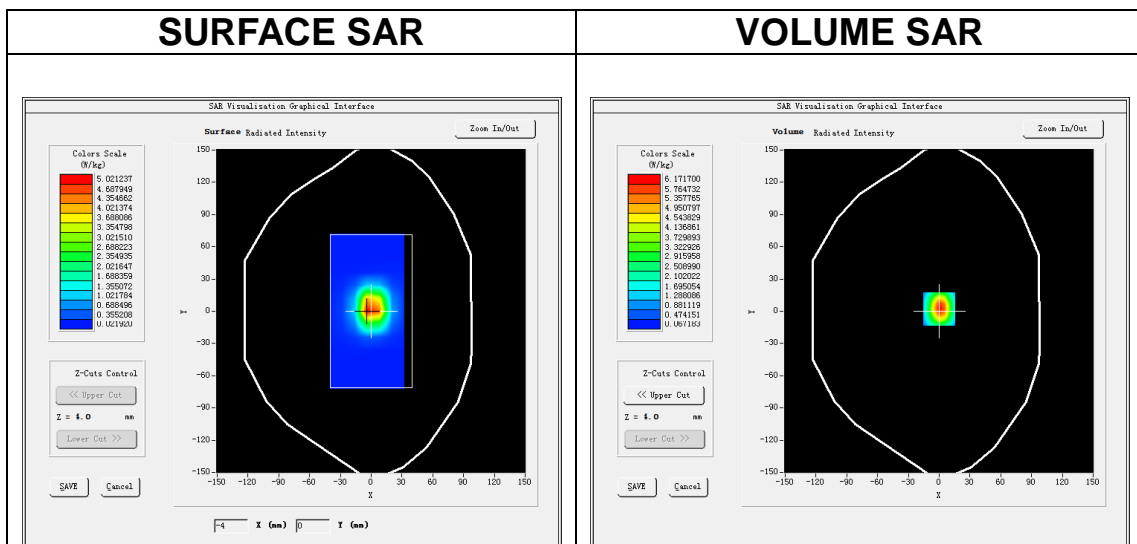
MEASUREMENT 12

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW2600</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	2600.000000
Relative permittivity (real part)	52.802866
Relative permittivity (imaginary part)	15.360101
Conductivity (S/m)	2.223465
Variation (%)	-1.220000

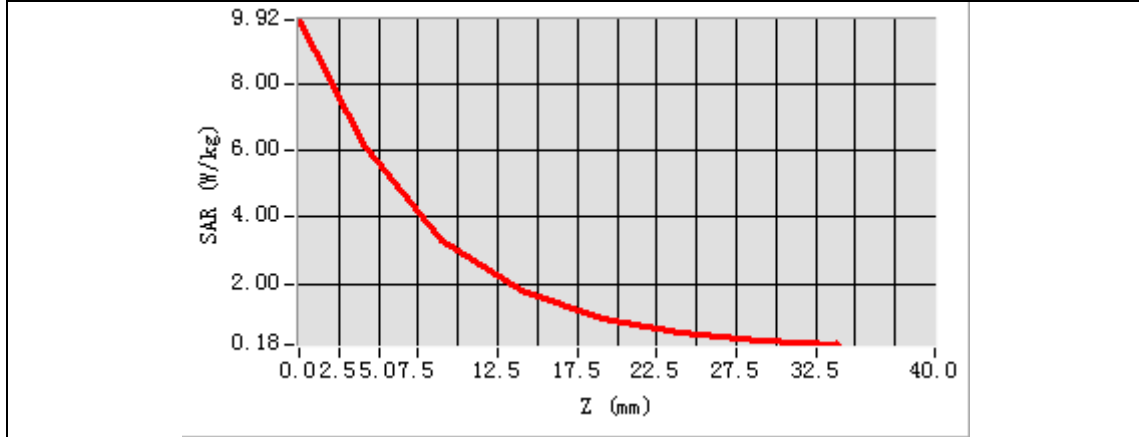


Maximum location: X=0.00, Y=2.00

SAR Peak: 9.99 W/kg

SAR 10g (W/Kg)	2.256324
SAR 1g (W/Kg)	5.309188

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	9.9118	6.1777	3.2952	1.7819	0.9818	0.5452	0.3128



3D screen shot	Hot spot position

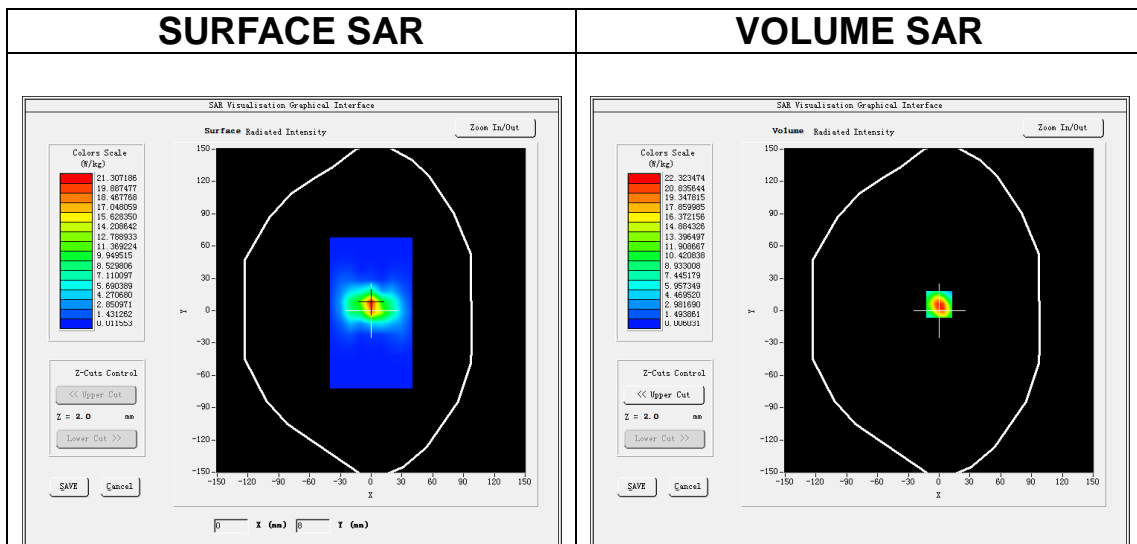
MEASUREMENT 13

A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW5200</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.579980
Relative permittivity (imaginary part)	16.111619
Conductivity (S/m)	4.653246
Variation (%)	1.660000

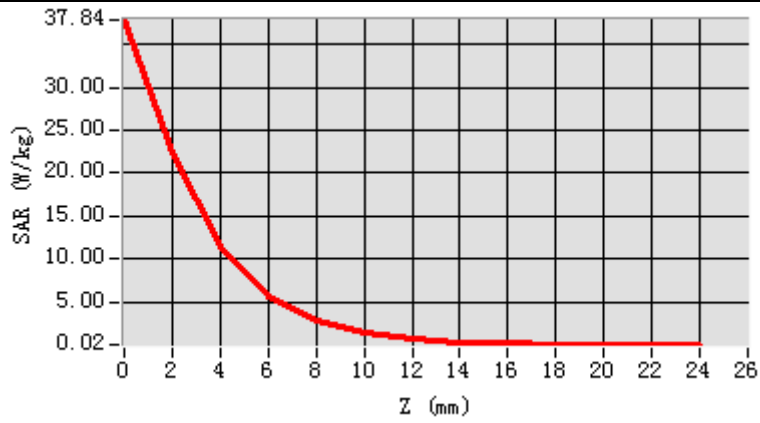


Maximum location: X=0.00, Y=6.00

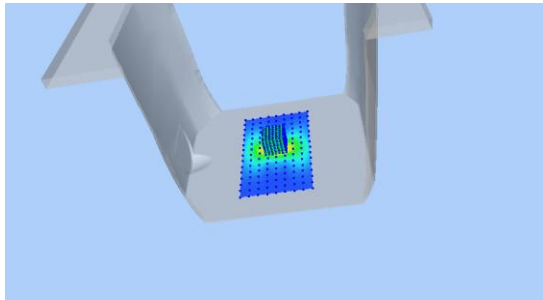
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.562495
SAR 1g (W/Kg)	16.286221

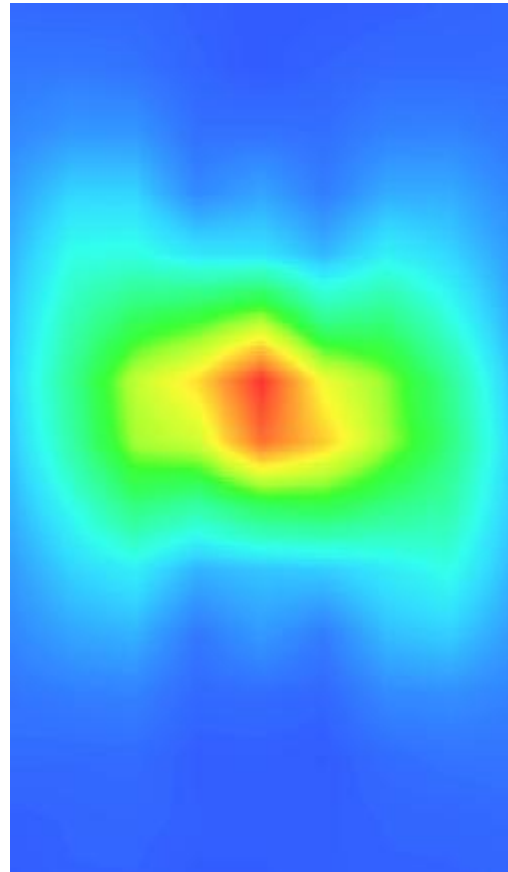
Z (m)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	37.8356	22.3278	11.3730	5.6618	2.8255	1.4093	0.7124	0.3660	0.1808	0.1012	0.0513	0.0323



3D screen shot



Hot spot position



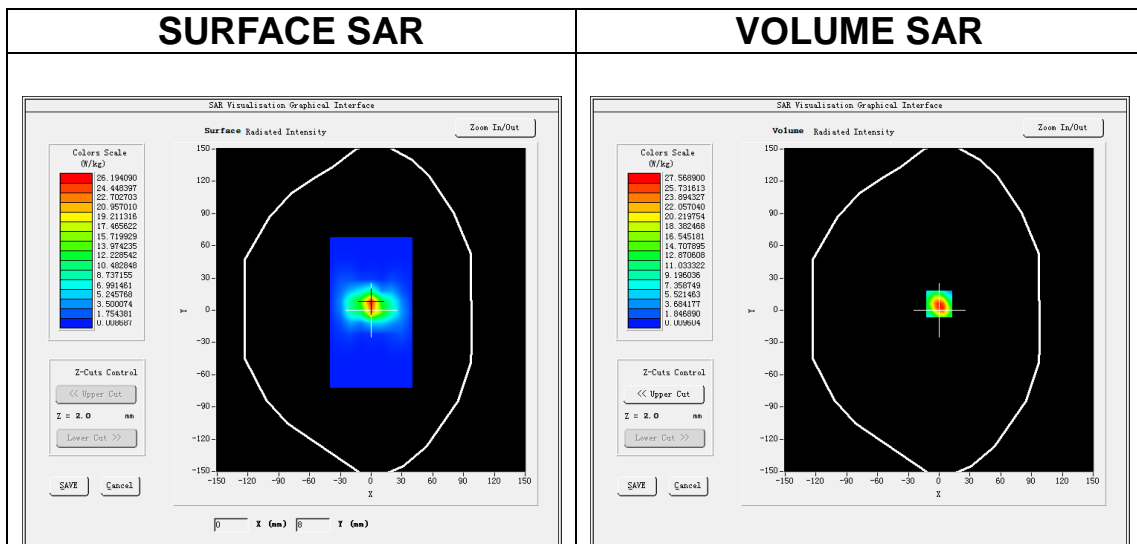
MEASUREMENT 14

A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW5200</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	49.639539
Relative permittivity (imaginary part)	18.214510
Conductivity (S/m)	5.264258
Variation (%)	4.490000

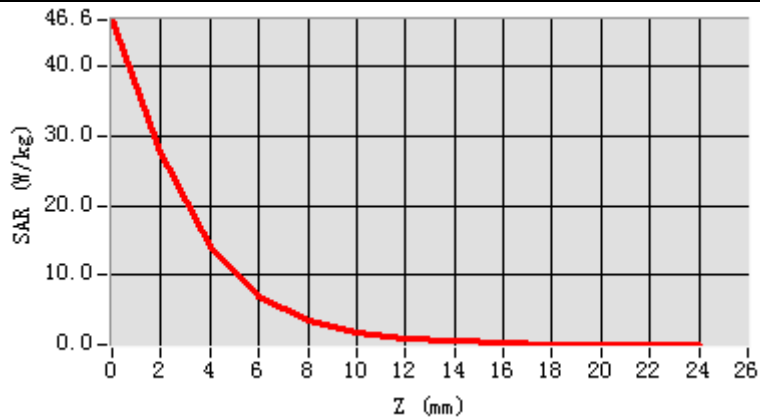


Maximum location: X=0.00, Y=6.00

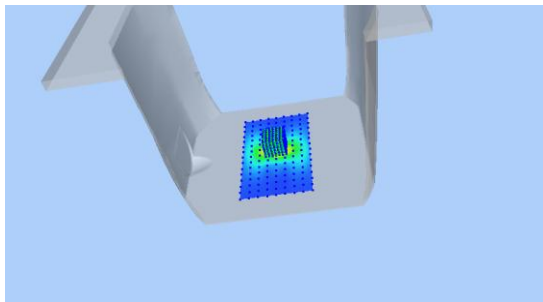
SAR Peak: 49.61 W/kg

SAR 10g (W/Kg)	5.633184
SAR 1g (W/Kg)	15.886246

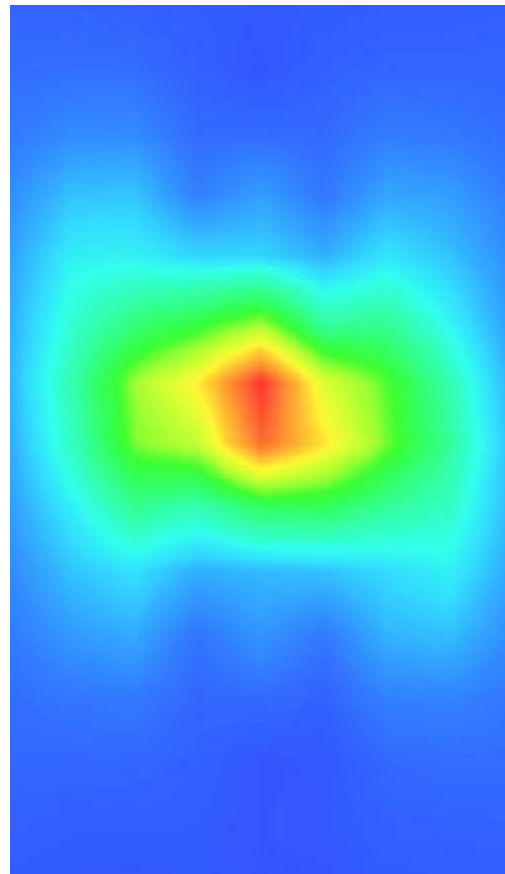
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0
SAR (W/ Kg)	46.6	27.5	14.0	7.05	3.59	1.78	0.89	0.46	0.24	0.13	0.06	0.04
	150	644	668	91	28	02	38	70	75	53	50	000



3D screen shot



Hot spot position



13. Appendix C. Plots of High SAR Measurement

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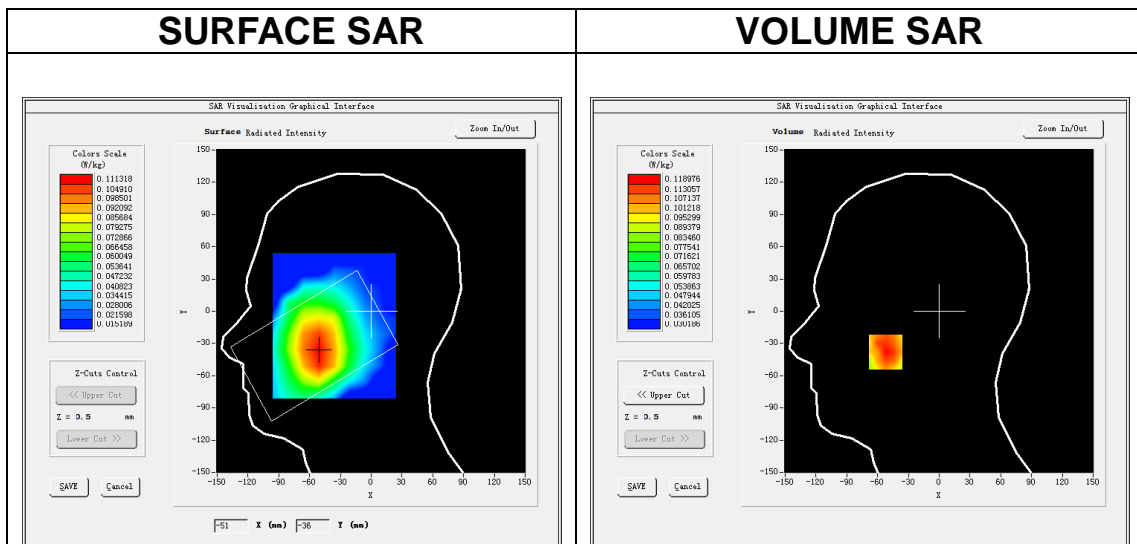
MEASUREMENT 1

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>GSM850</u>
Channels	<u>Middle</u>
Signal	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

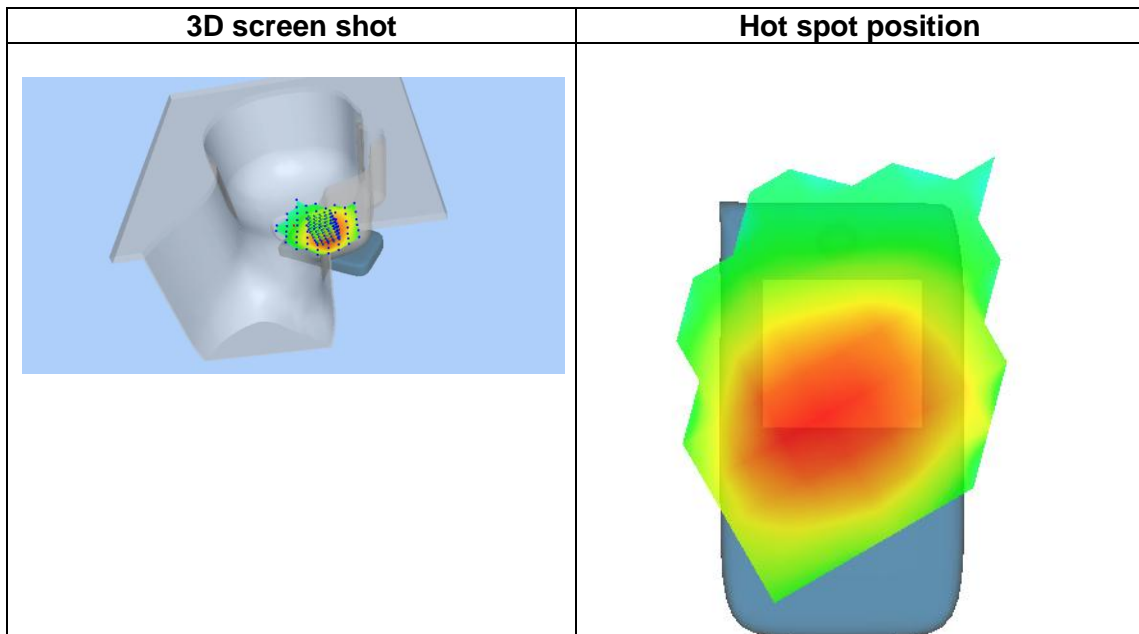
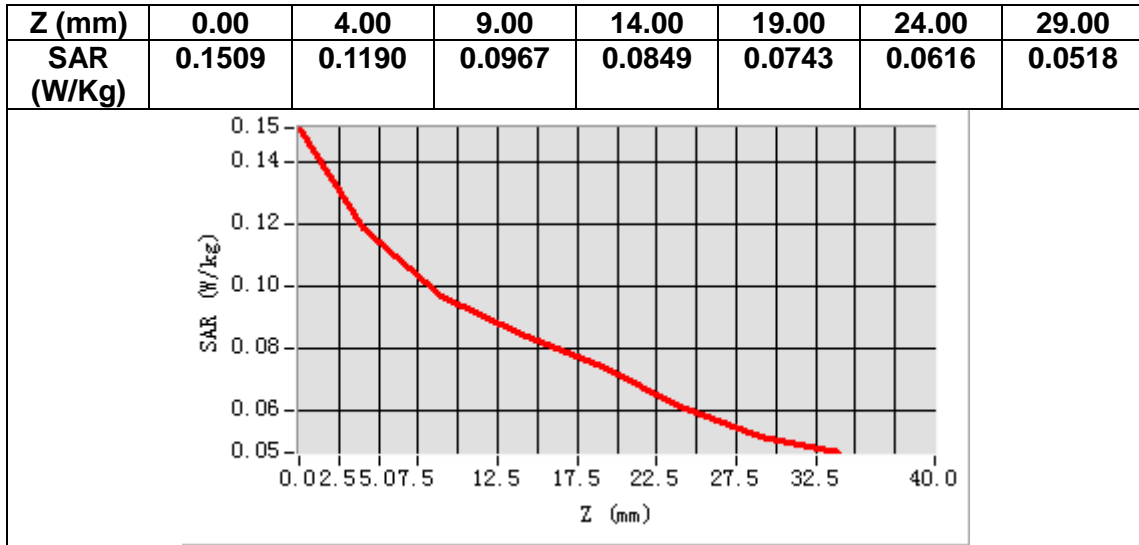
Frequency (MHz)	836.400000
Relative permittivity (real part)	40.650959
Relative permittivity (imaginary part)	19.991541
Conductivity (S/m)	0.928940
Variation (%)	0.990000



Maximum location: X=-52.00, Y=-38.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.094524
SAR 1g (W/Kg)	0.119555



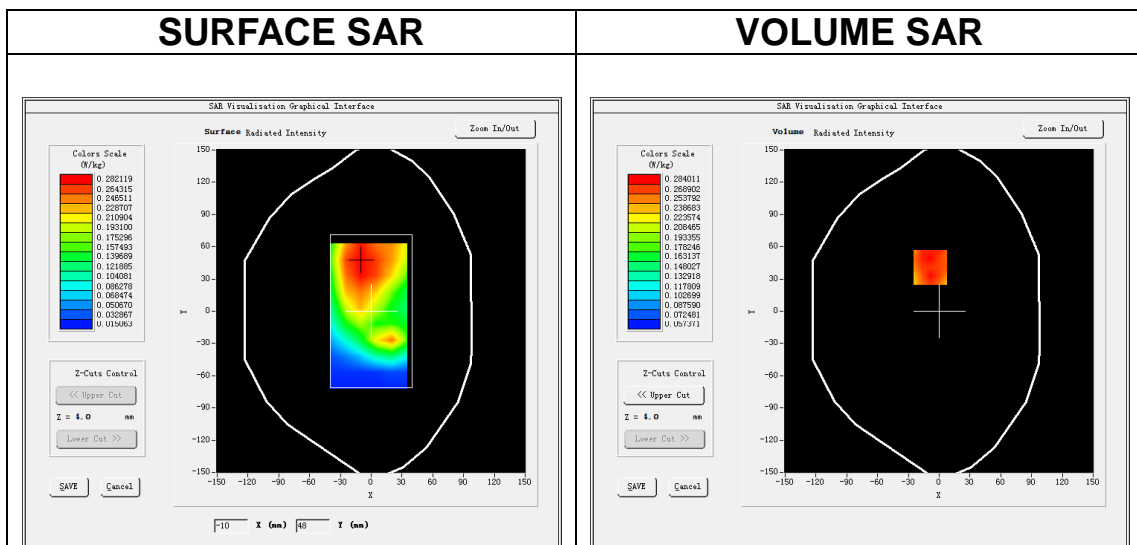
MEASUREMENT 2

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>GSM850</u>
Channels	<u>Middle</u>
Signal	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	54.479580
Relative permittivity (imaginary part)	21.192739
Conductivity (S/m)	0.984756
Variation (%)	-1.500000

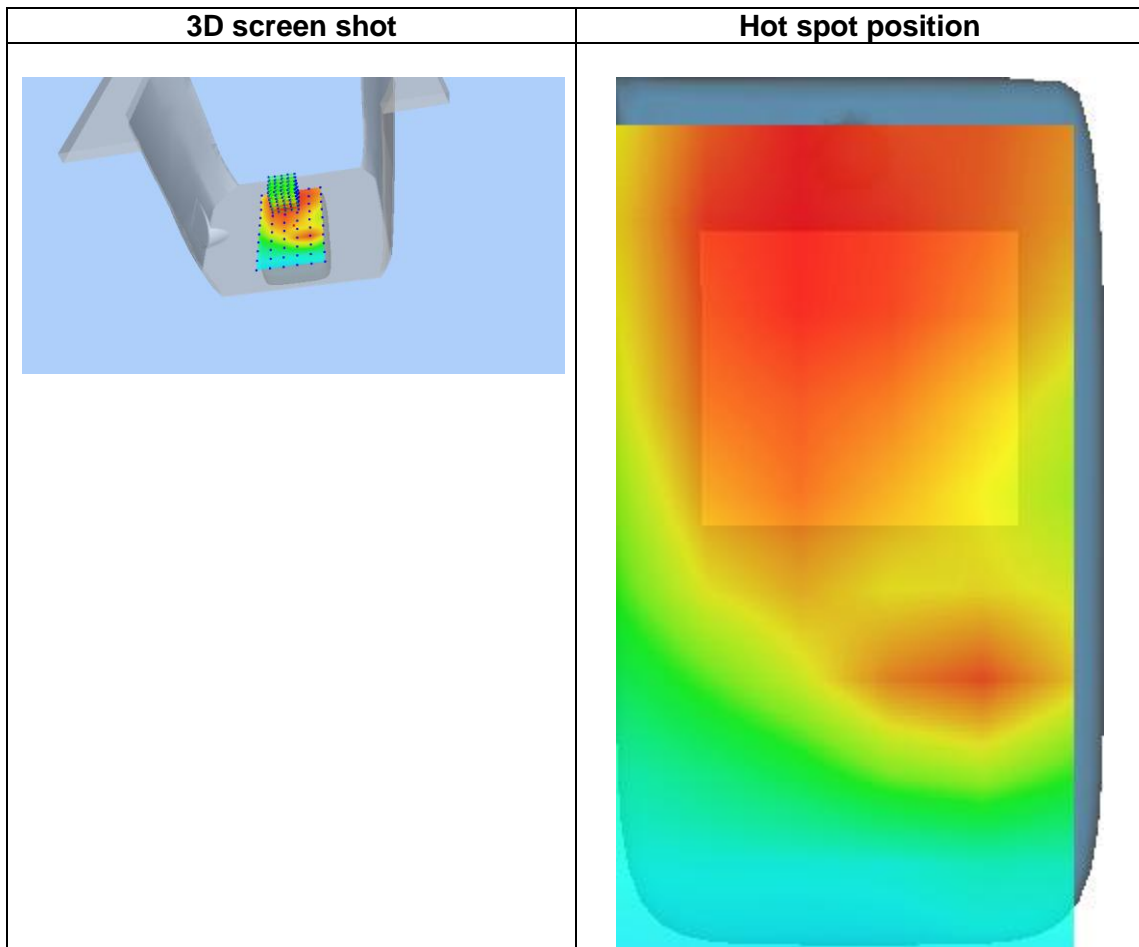
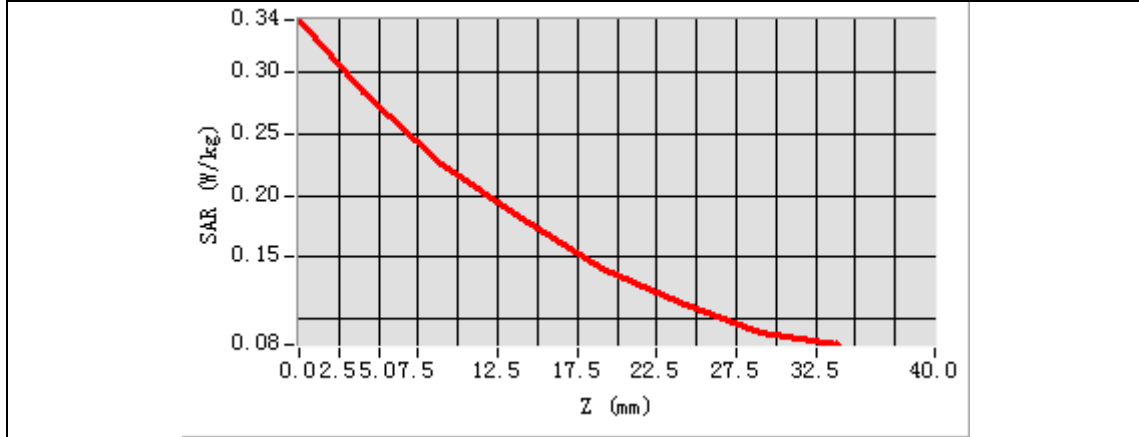


Maximum location: X=-9.00, Y=41.00

SAR Peak: 0.36 W/kg

SAR 10g (W/Kg)	0.213377
SAR 1g (W/Kg)	0.279715

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.3430	0.2840	0.2250	0.1823	0.1411	0.1125	0.0894



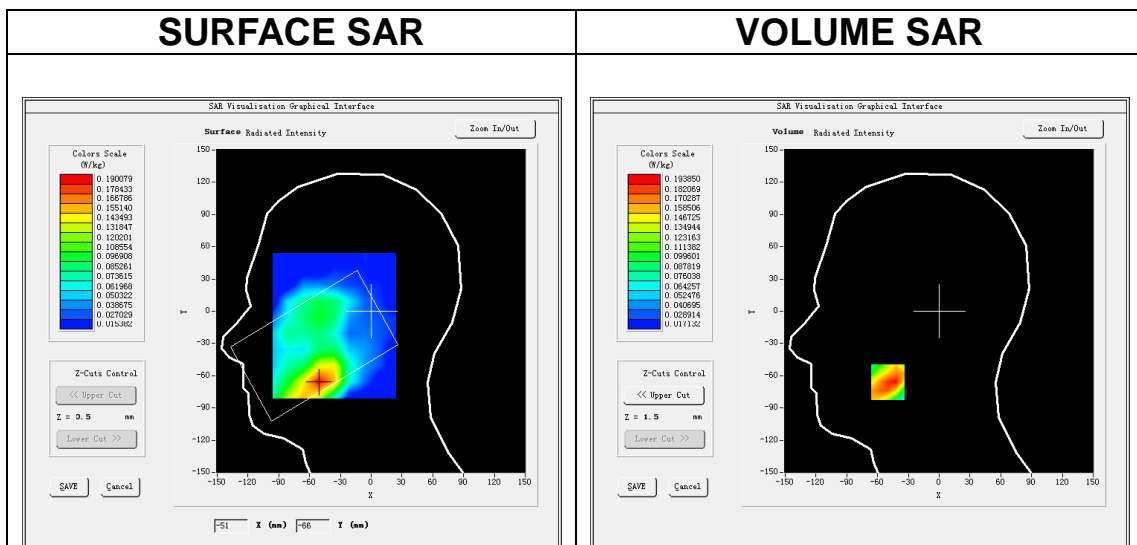
MEASUREMENT 3

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>GSM1900</u>
Channels	<u>Middle</u>
Signal	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

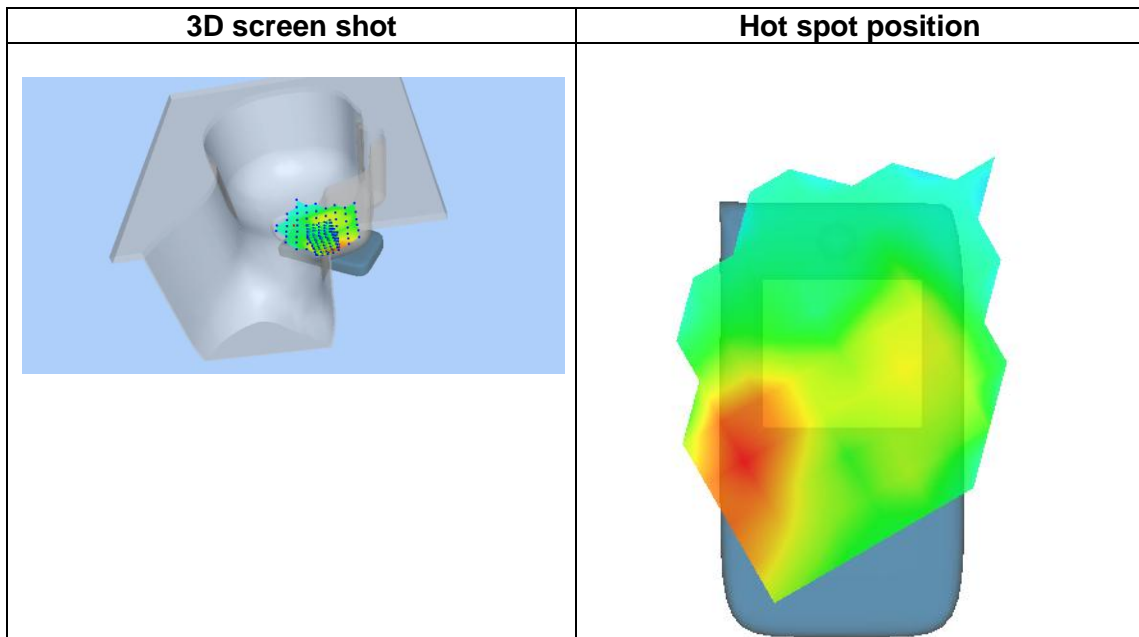
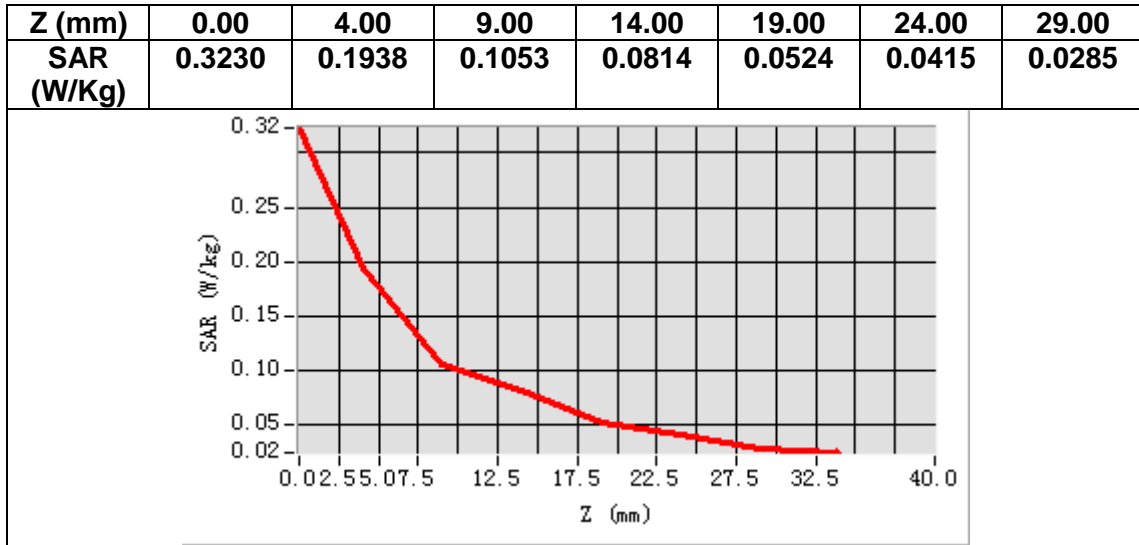
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.957001
Relative permittivity (imaginary part)	13.290200
Conductivity (S/m)	1.388088
Variation (%)	-1.350000



Maximum location: X=-50.00, Y=-66.00

SAR Peak: 0.30 W/kg

SAR 10g (W/Kg)	0.110846
SAR 1g (W/Kg)	0.186241



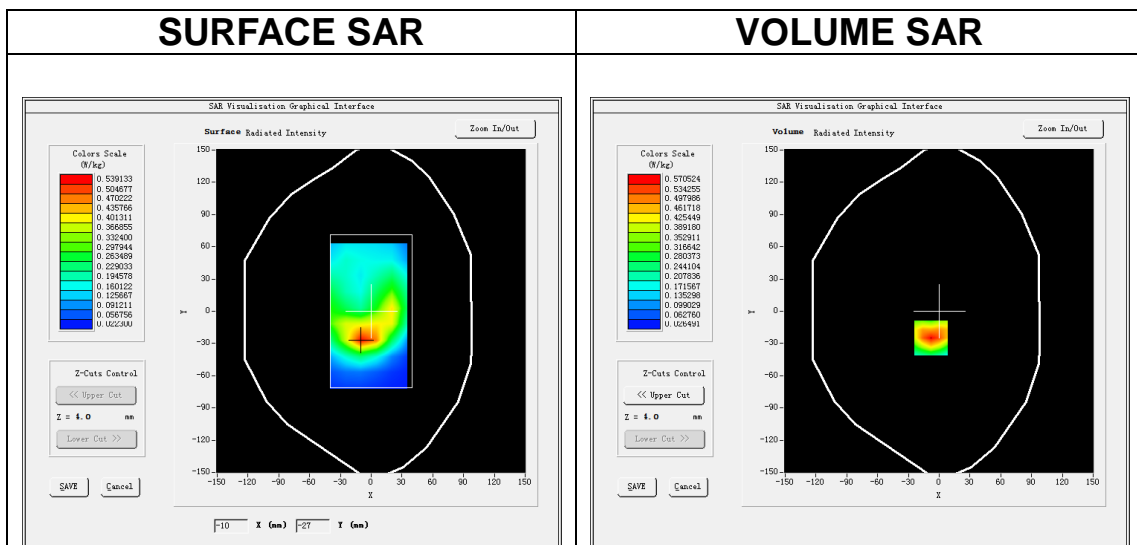
MEASUREMENT 4

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>GSM1900</u>
Channels	<u>Middle</u>
Signal	<u>TDMA (Crest factor: 2.0)</u>

B. SAR Measurement Results

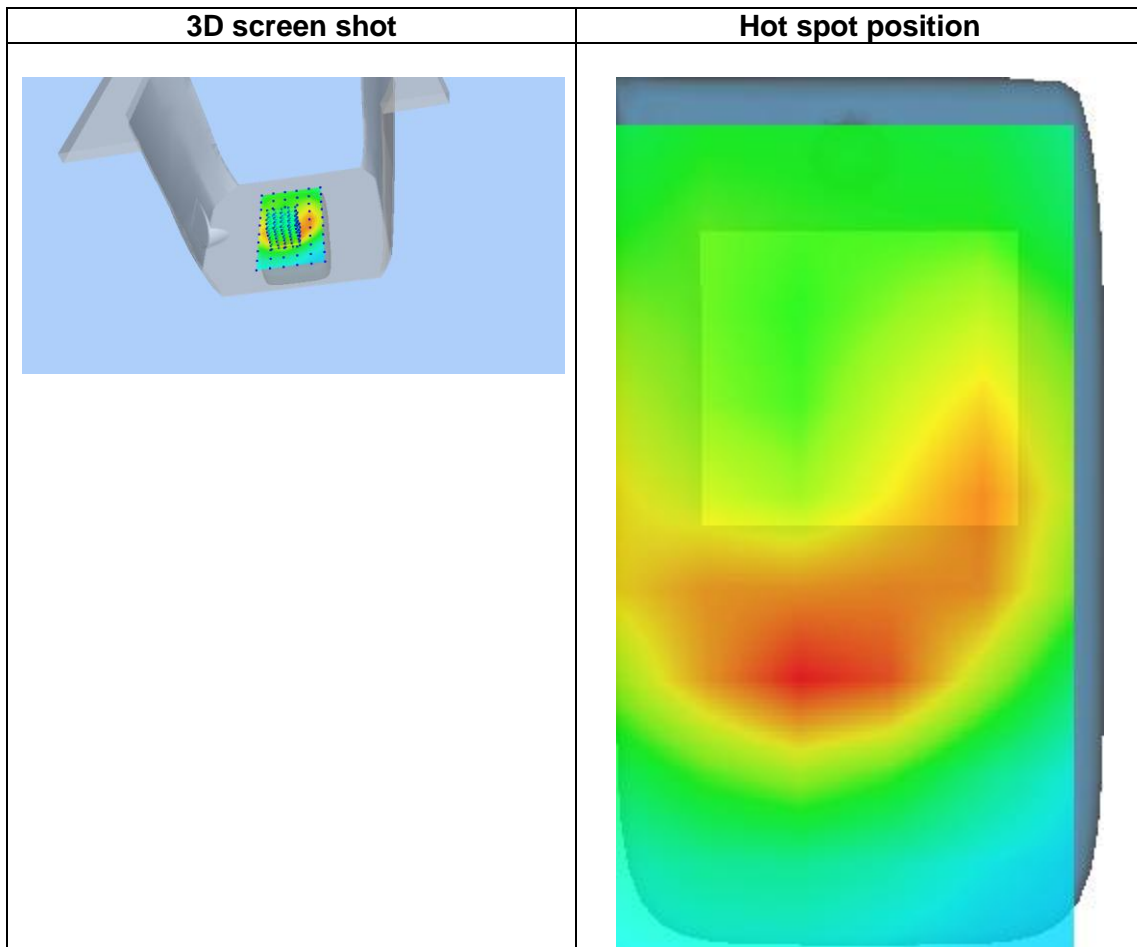
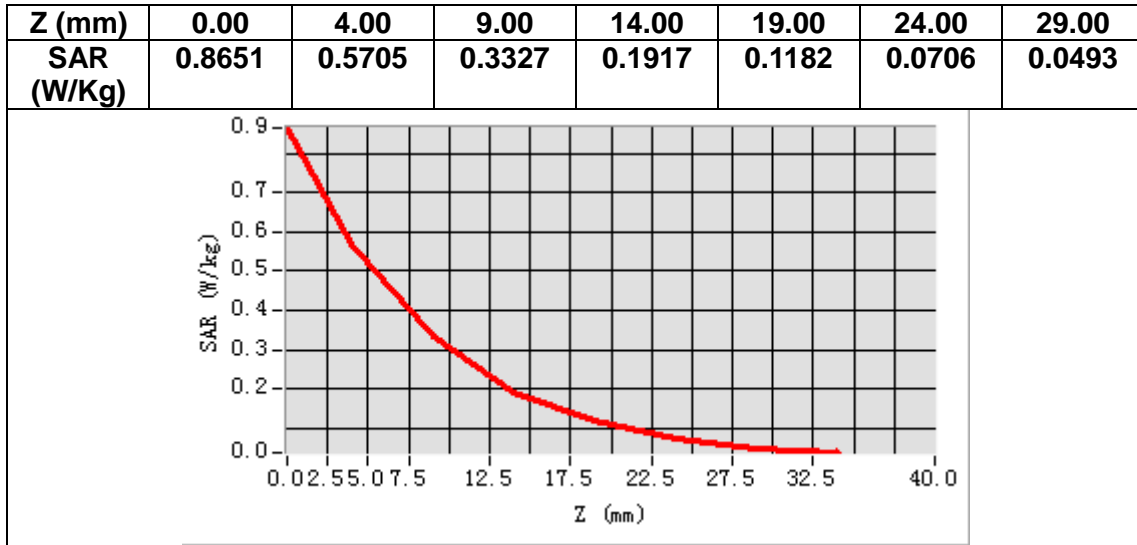
Frequency (MHz)	1880.000000
Relative permittivity (real part)	54.283901
Relative permittivity (imaginary part)	14.597700
Conductivity (S/m)	1.524649
Variation (%)	0.130000



Maximum location: X=-8.00, Y=-25.00

SAR Peak: 0.86 W/kg

SAR 10g (W/Kg)	0.297364
SAR 1g (W/Kg)	0.535665



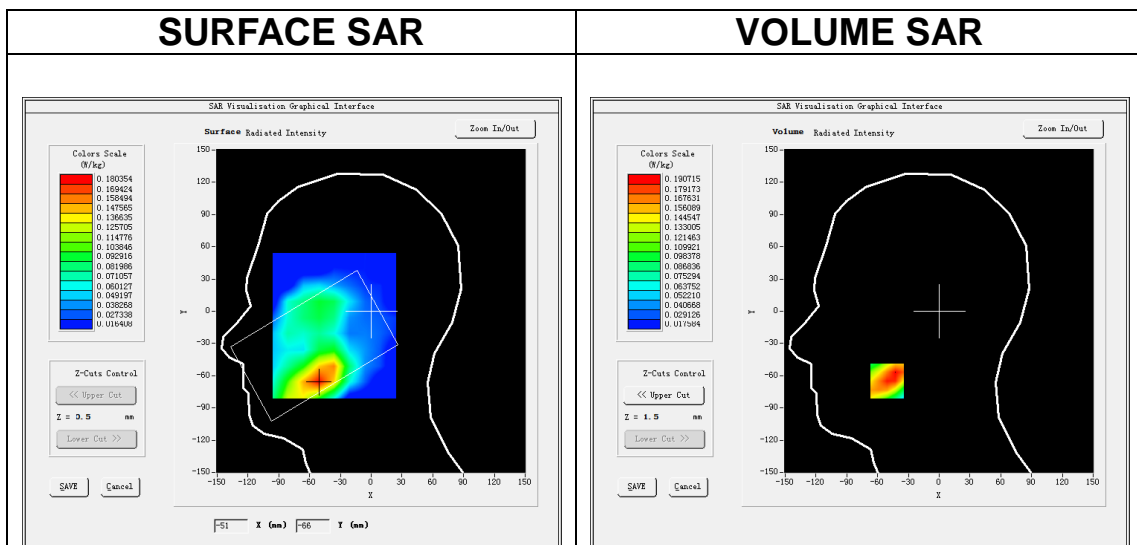
MEASUREMENT 5

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>Band2 WCDMA1900</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

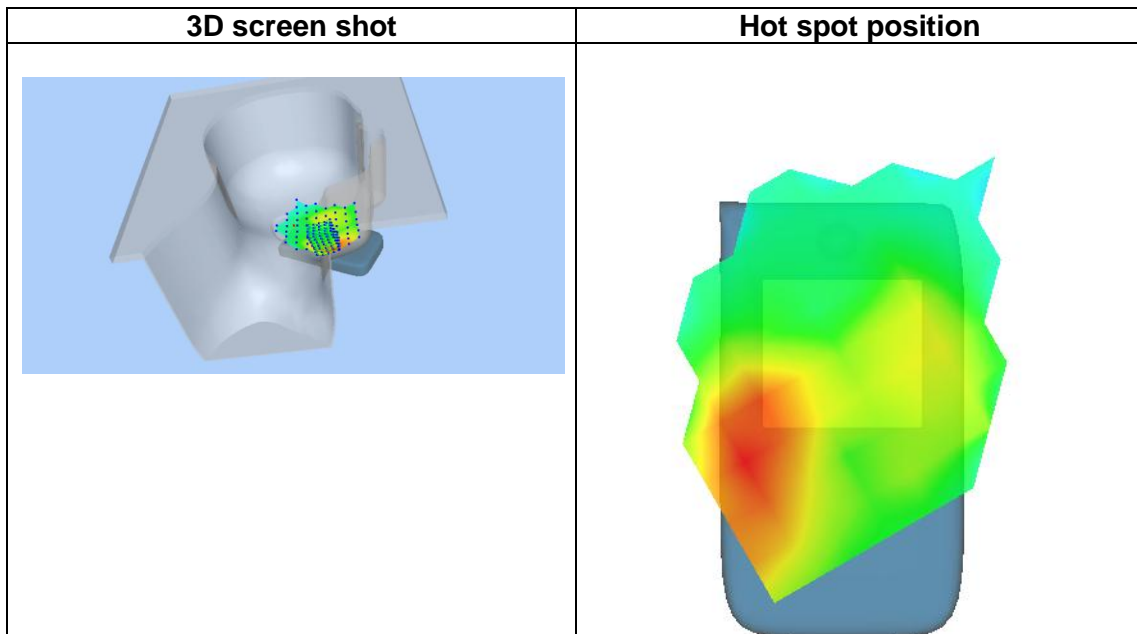
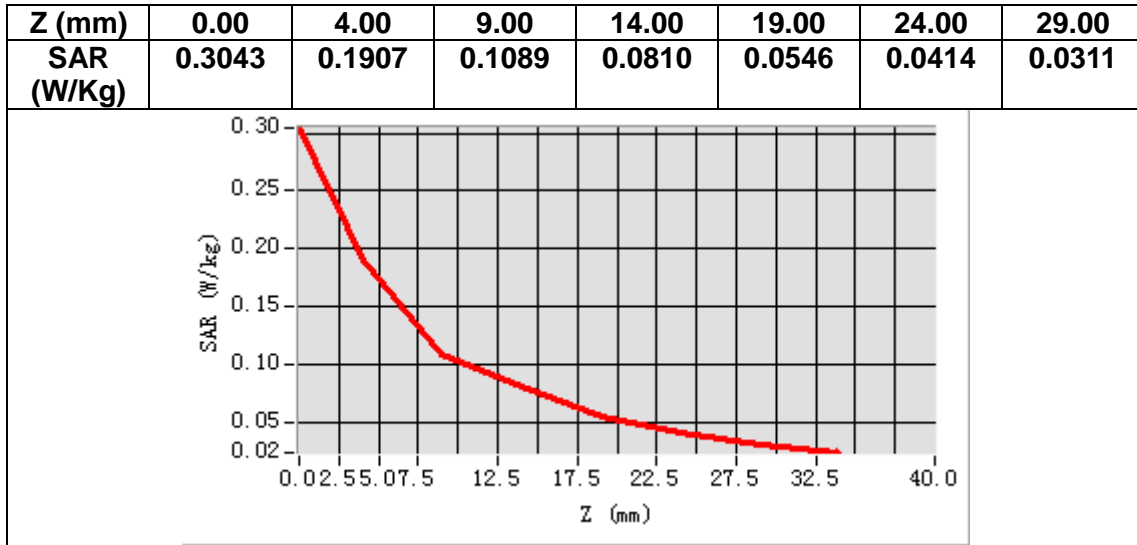
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.957001
Relative permittivity (imaginary part)	13.290200
Conductivity (S/m)	1.388088
Variation (%)	2.080000



Maximum location: X=-51.00, Y=-65.00

SAR Peak: 0.28 W/kg

SAR 10g (W/Kg)	0.112757
SAR 1g (W/Kg)	0.183672



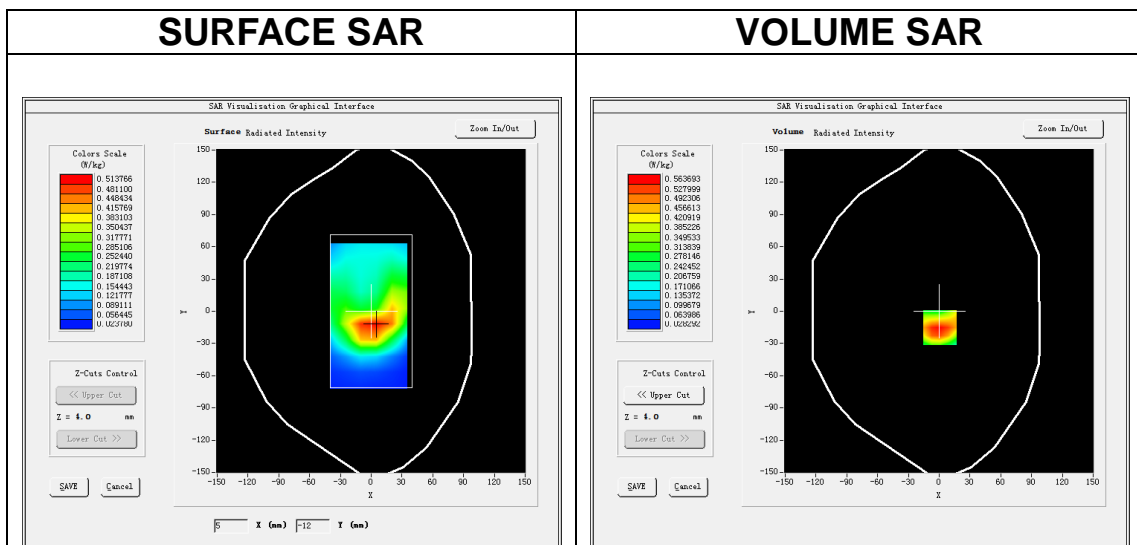
MEASUREMENT 6

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band2 WCDMA1900</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

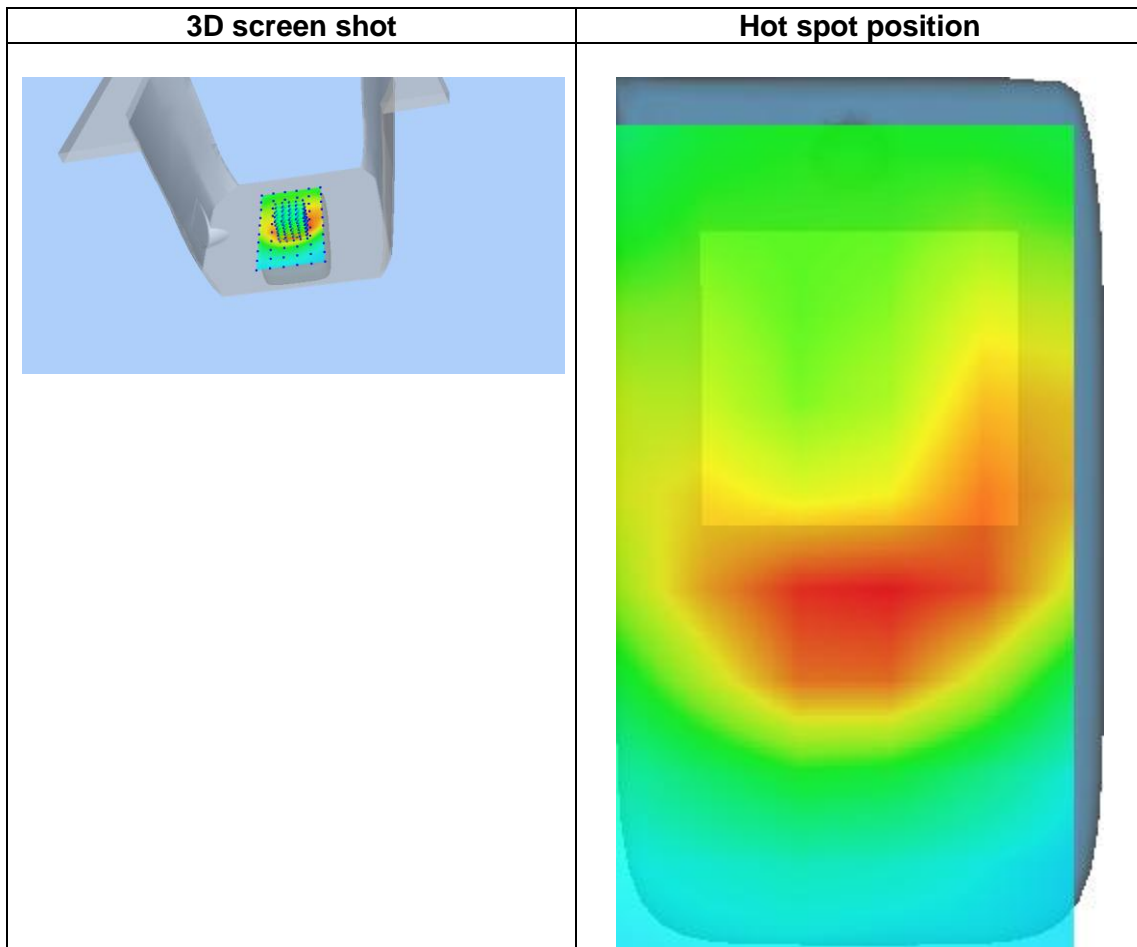
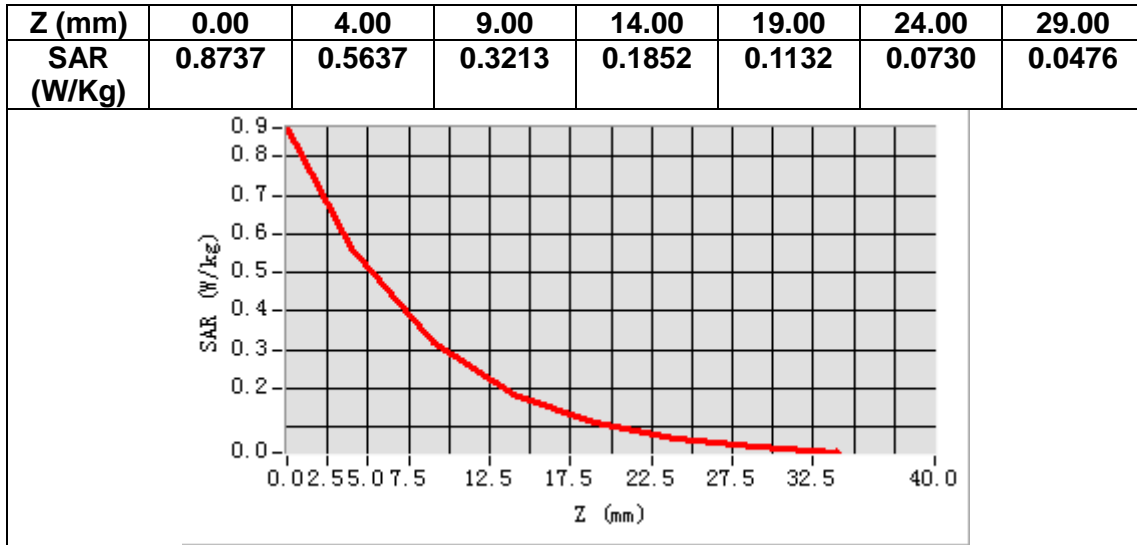
Frequency (MHz)	1880.000000
Relative permittivity (real part)	54.283901
Relative permittivity (imaginary part)	14.597700
Conductivity (S/m)	1.524649
Variation (%)	-0.070000



Maximum location: X=1.00, Y=-15.00

SAR Peak: 0.88 W/kg

SAR 10g (W/Kg)	0.303146
SAR 1g (W/Kg)	0.546564



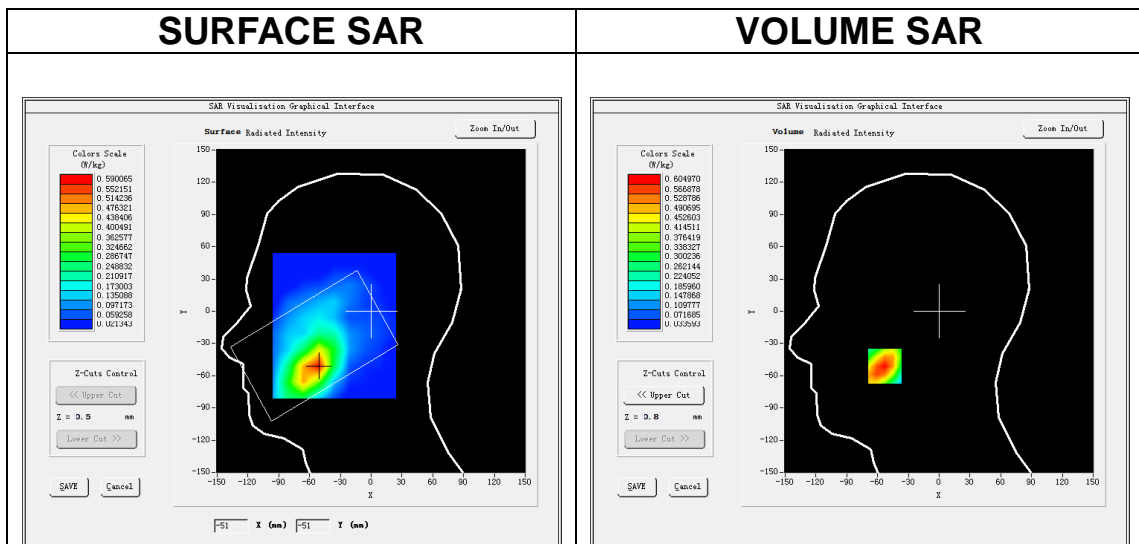
MEASUREMENT 7

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

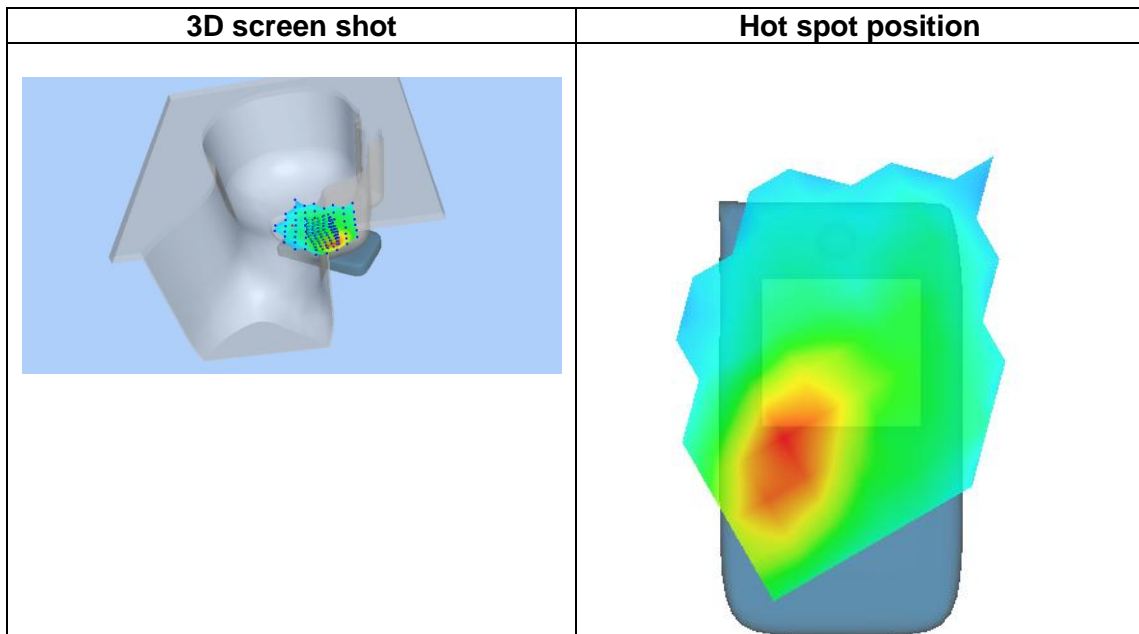
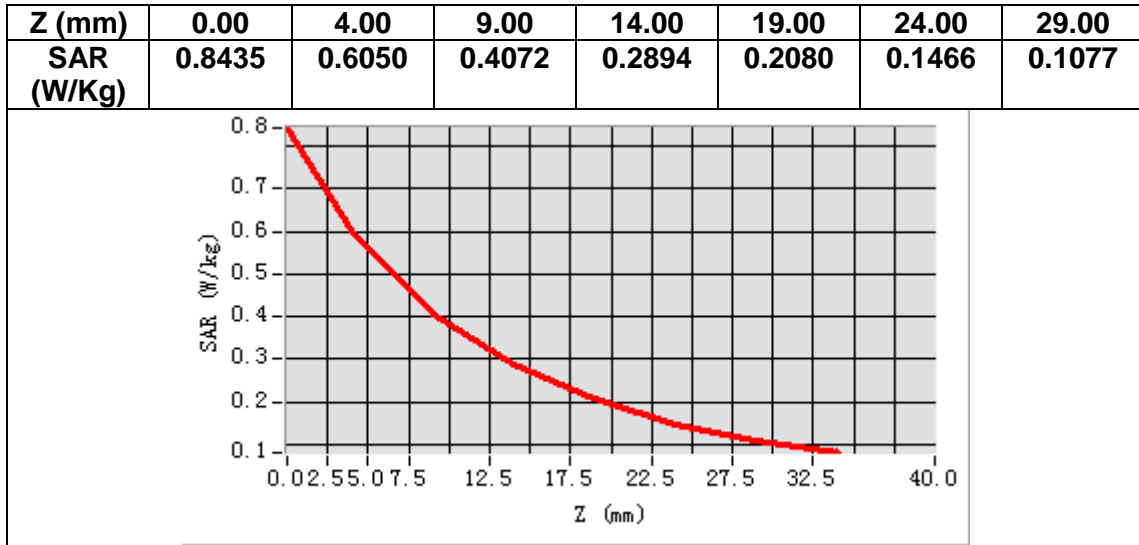
Frequency (MHz)	1732.600000
Relative permittivity (real part)	38.985291
Relative permittivity (imaginary part)	13.800592
Conductivity (S/m)	1.328307
Variation (%)	-1.640000



Maximum location: X=-53.00, Y=-51.00

SAR Peak: 0.84 W/kg

SAR 10g (W/Kg)	0.362523
SAR 1g (W/Kg)	0.579524



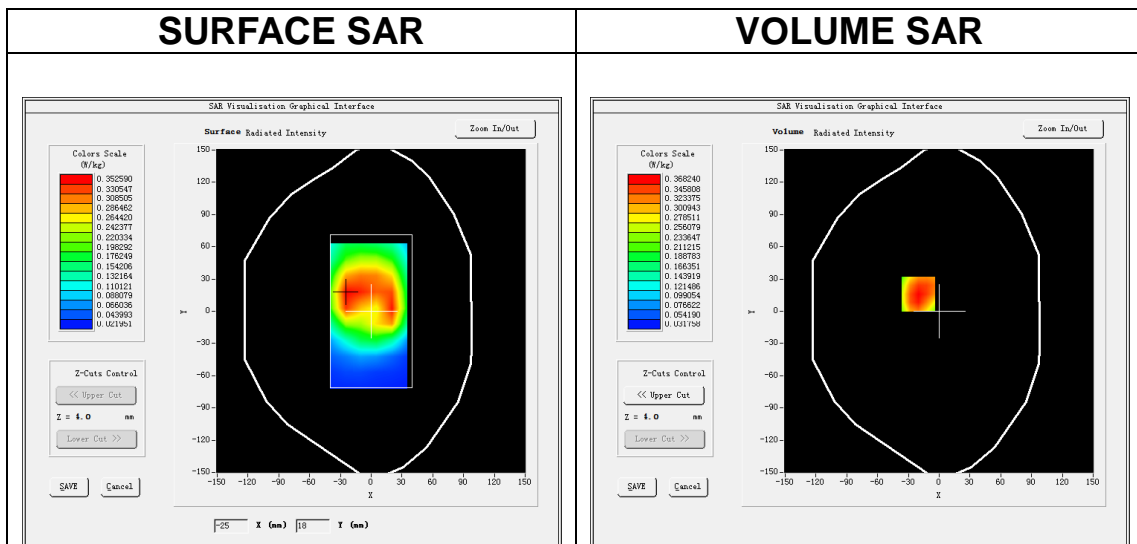
MEASUREMENT 8

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band4 WCDMA1700</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>

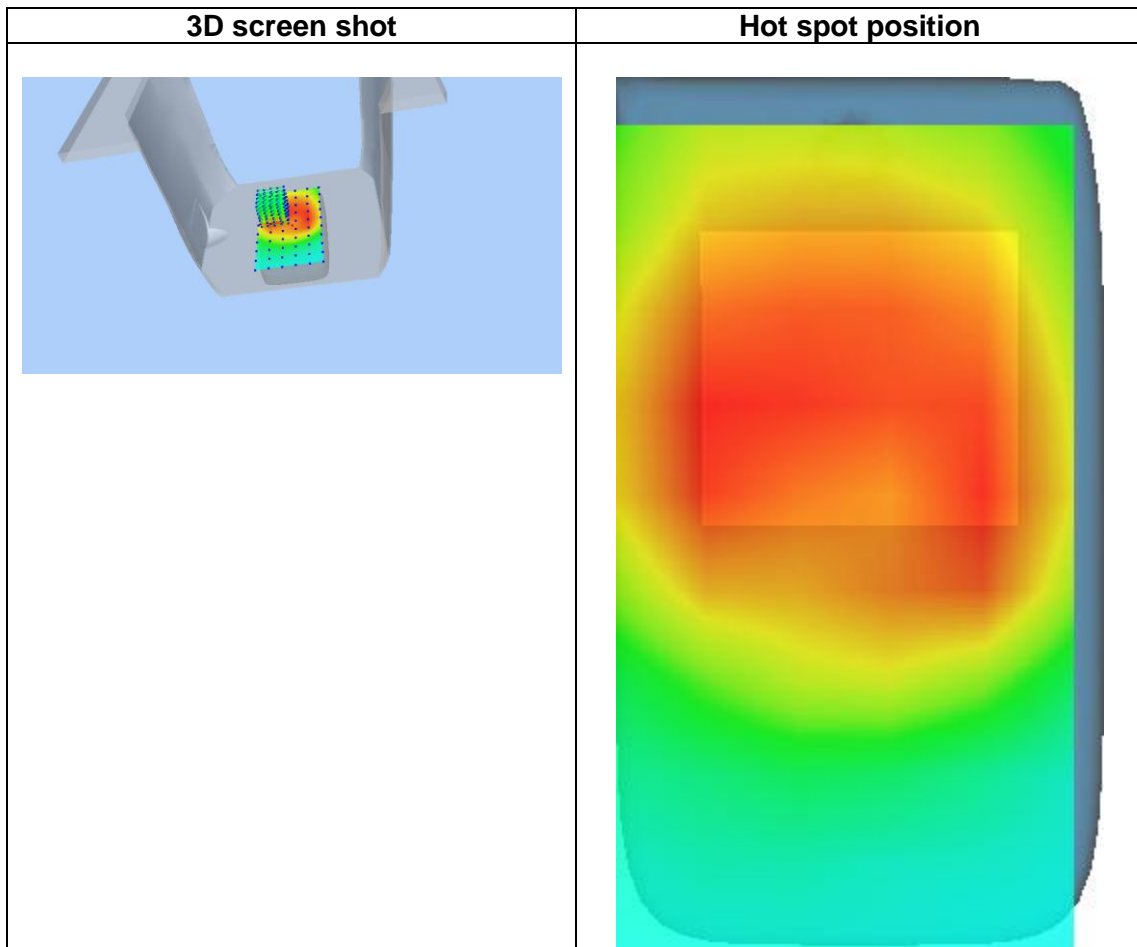
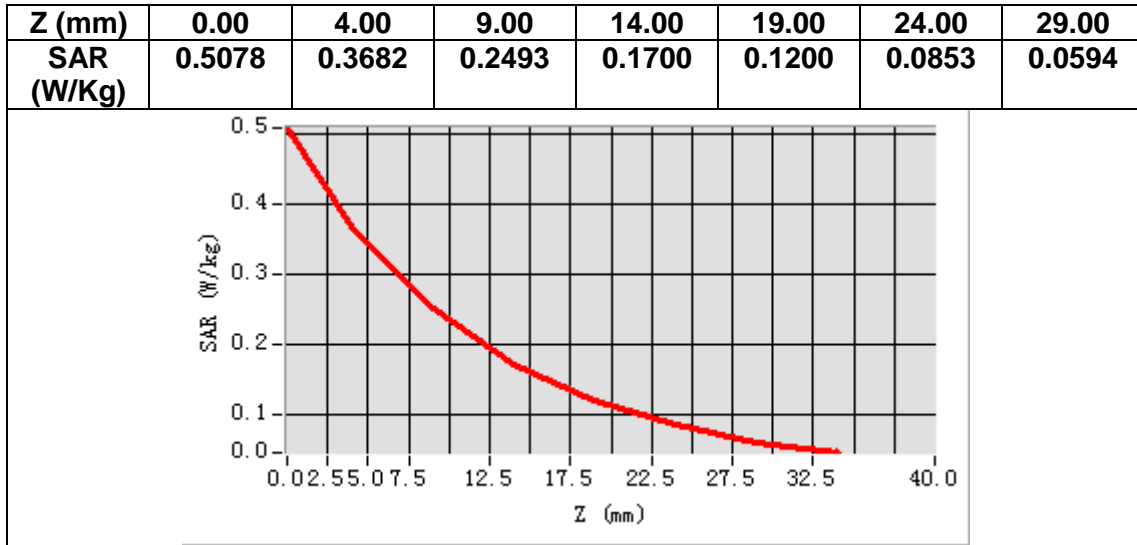
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	54.428368
Relative permittivity (imaginary part)	15.168220
Conductivity (S/m)	1.459941
Variation (%)	0.510000



Maximum location: X=-20.00, Y=16.00
SAR Peak: 0.51 W/kg

SAR 10g (W/Kg)	0.233051
SAR 1g (W/Kg)	0.360076



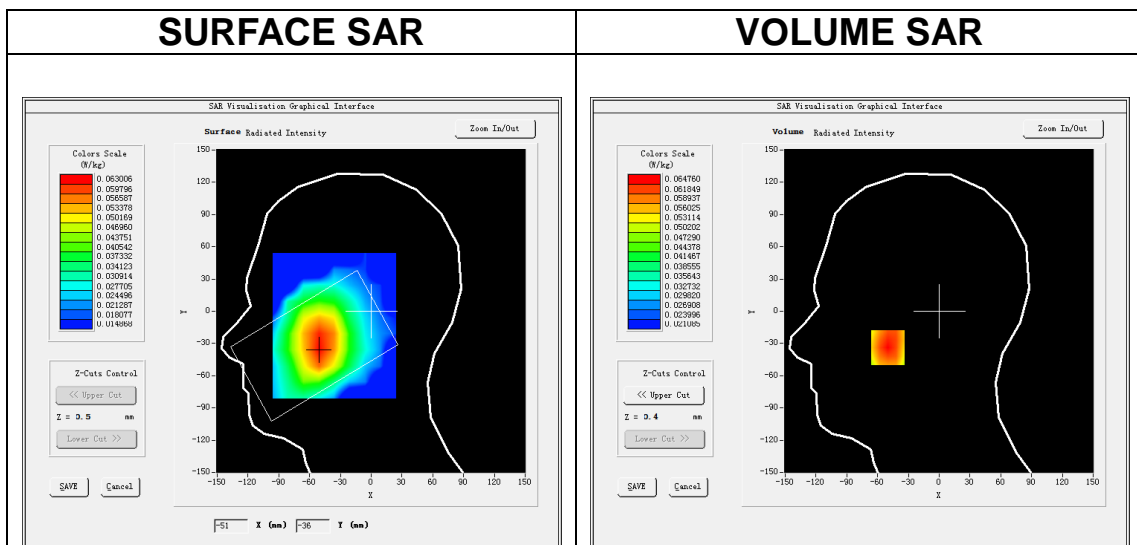
MEASUREMENT 9

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>Band5_WCDMA850</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

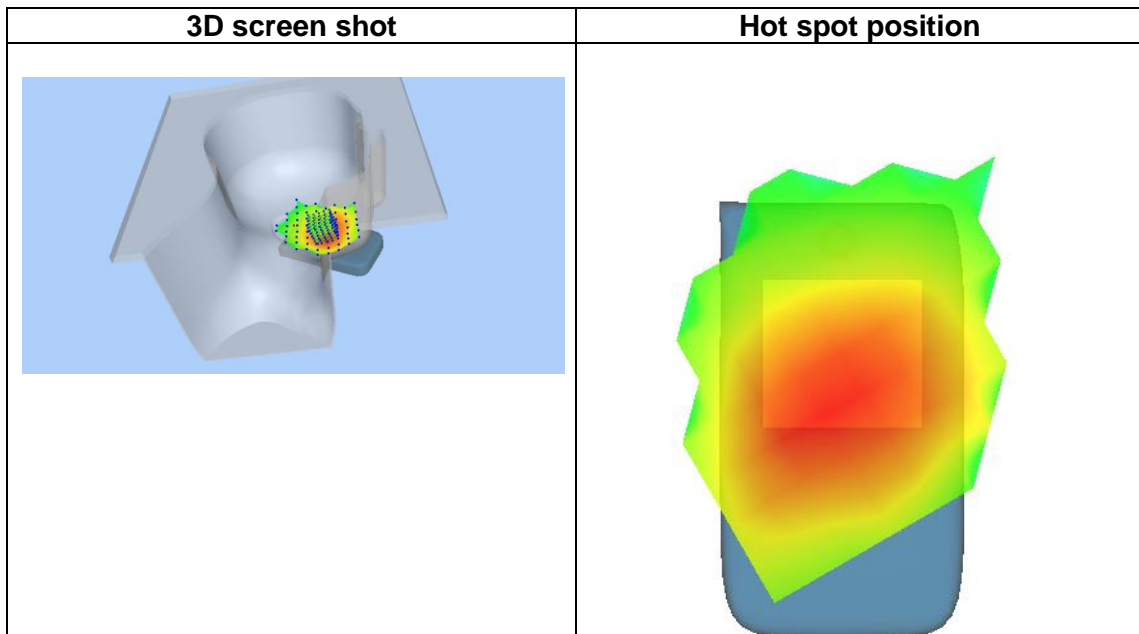
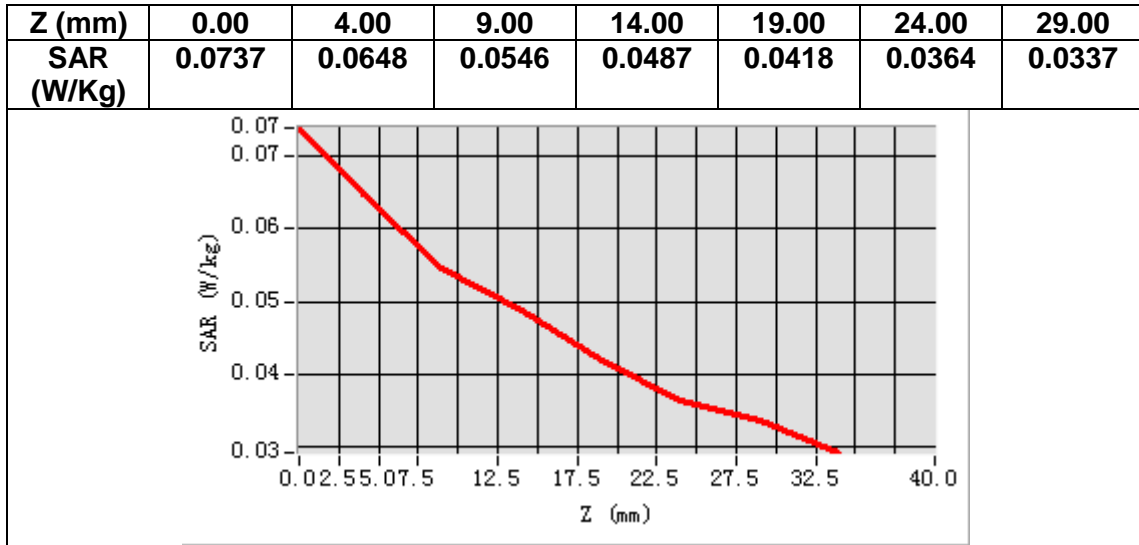
Frequency (MHz)	836.400000
Relative permittivity (real part)	40.650959
Relative permittivity (imaginary part)	19.991541
Conductivity (S/m)	0.928940
Variation (%)	2.910000



Maximum location: X=-50.00, Y=-34.00

SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.053171
SAR 1g (W/Kg)	0.064848



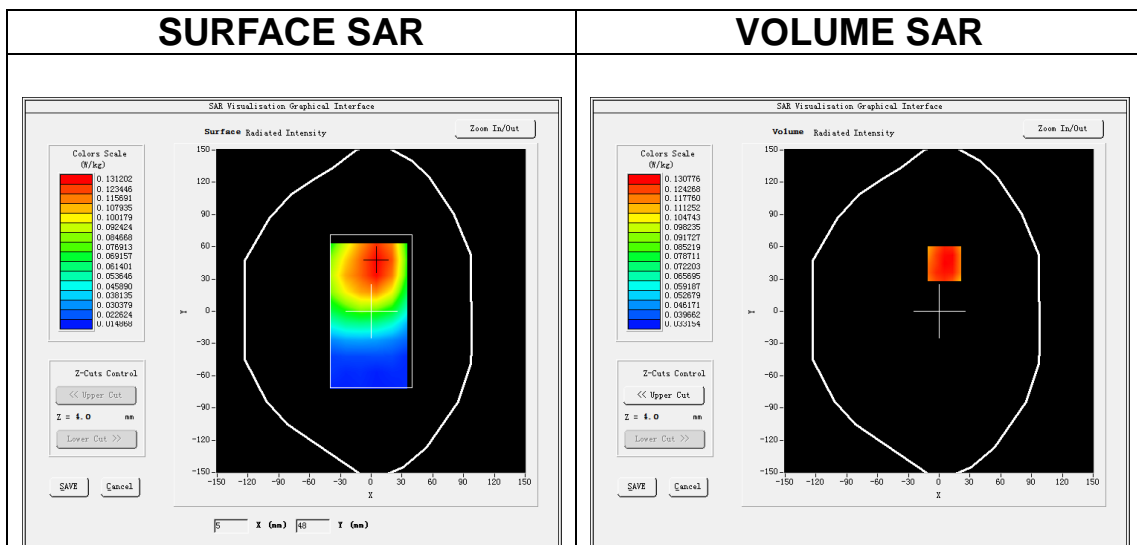
MEASUREMENT 10

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>Band5_WCDMA850</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>

B. SAR Measurement Results

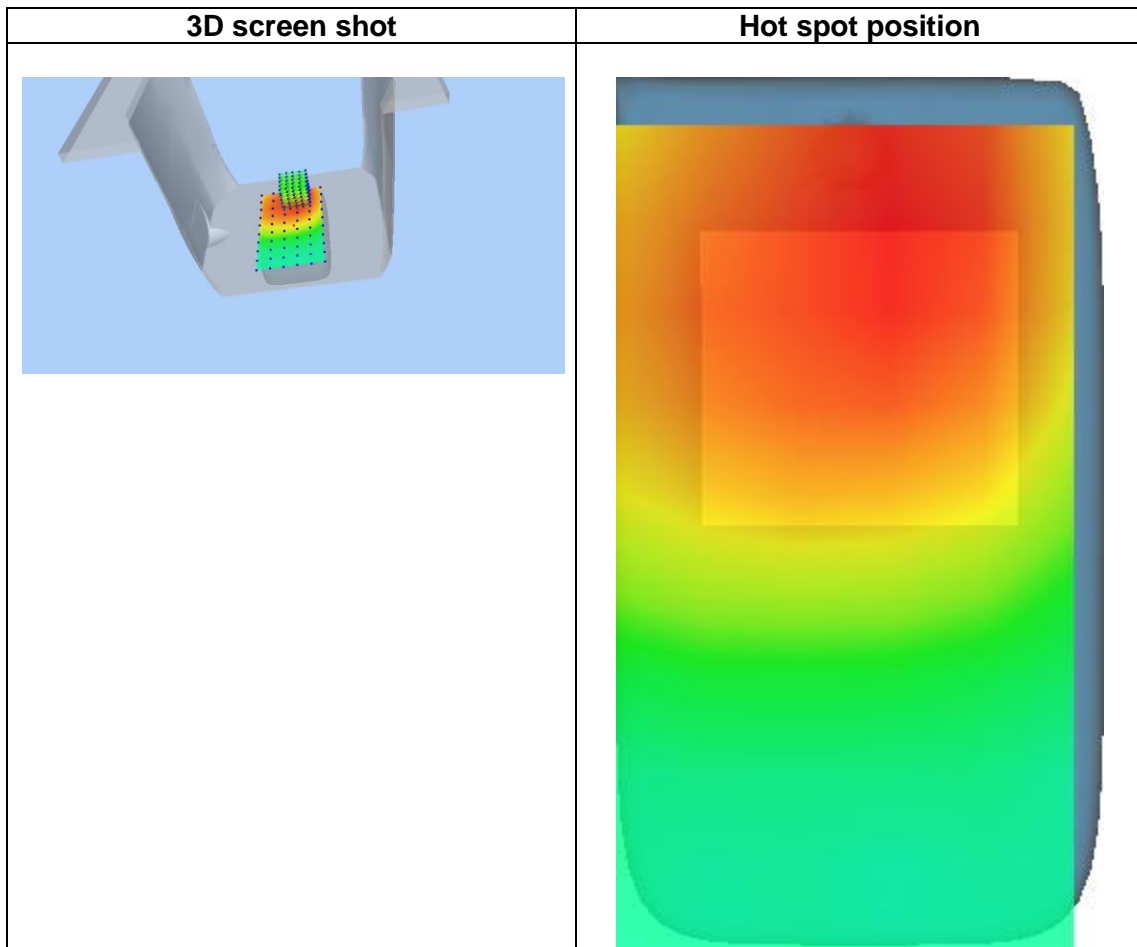
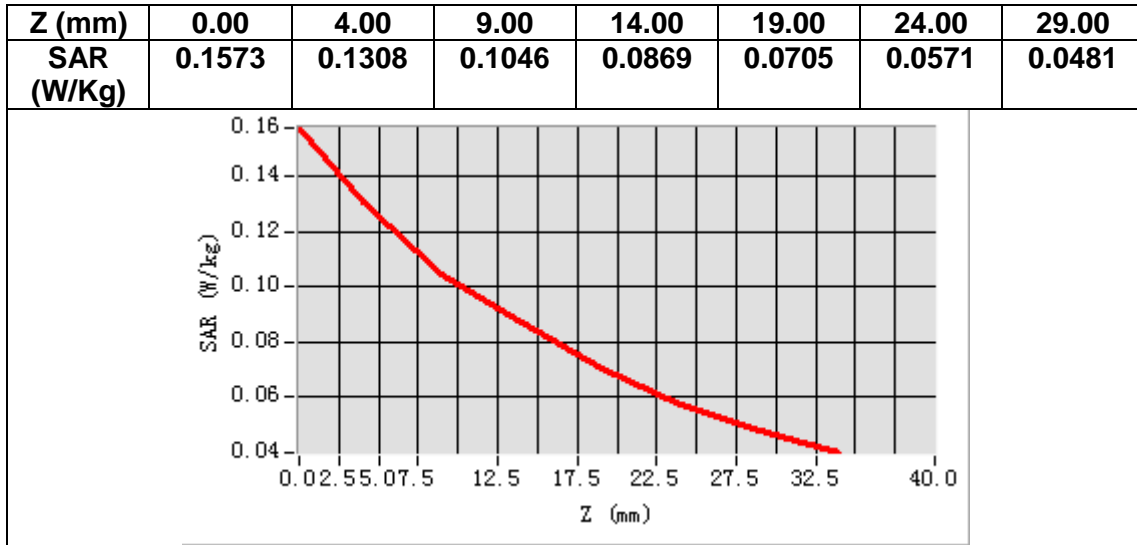
Frequency (MHz)	836.400000
Relative permittivity (real part)	54.479580
Relative permittivity (imaginary part)	21.192739
Conductivity (S/m)	0.984756
Variation (%)	1.160000



Maximum location: X=5.00, Y=44.00

SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.101120
SAR 1g (W/Kg)	0.130528



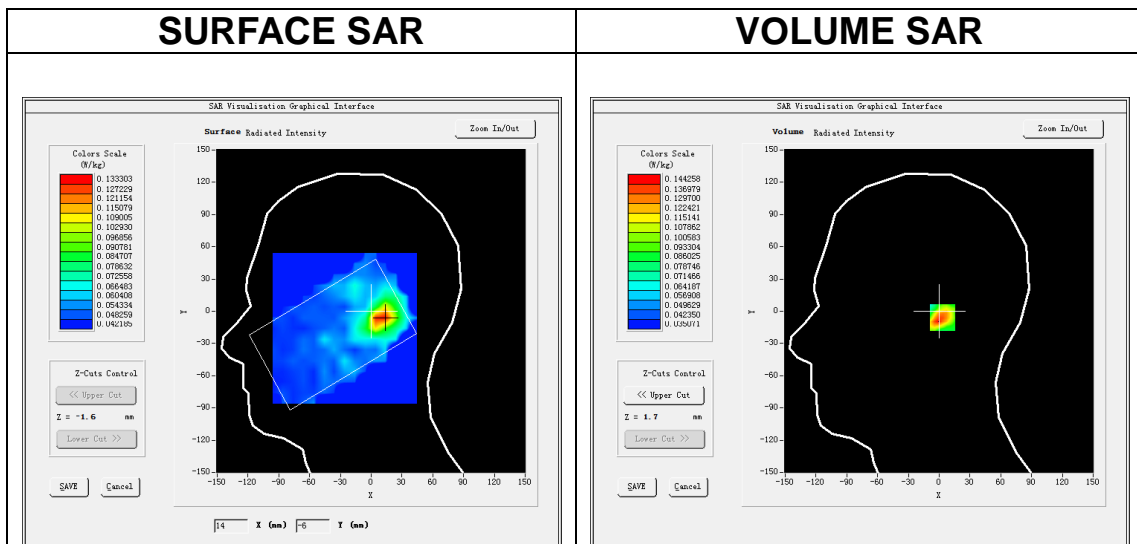
MEASUREMENT 11

A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.579980
Relative permittivity (imaginary part)	16.111619
Conductivity (S/m)	4.653246
Variation (%)	-1.640000

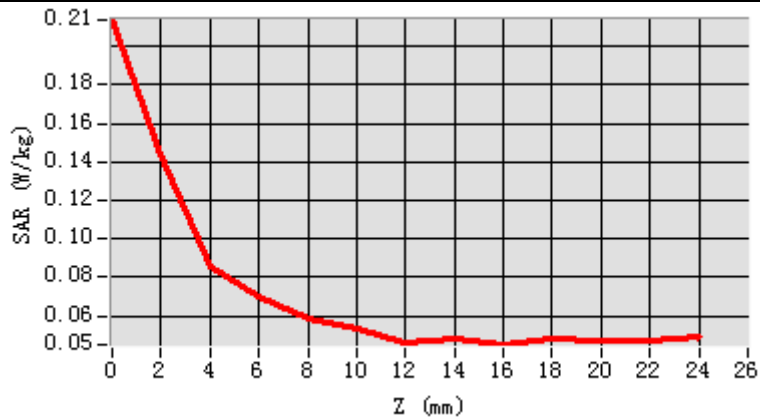


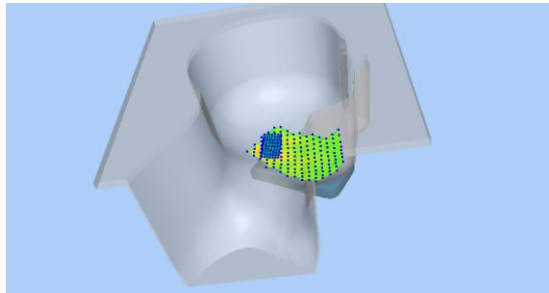
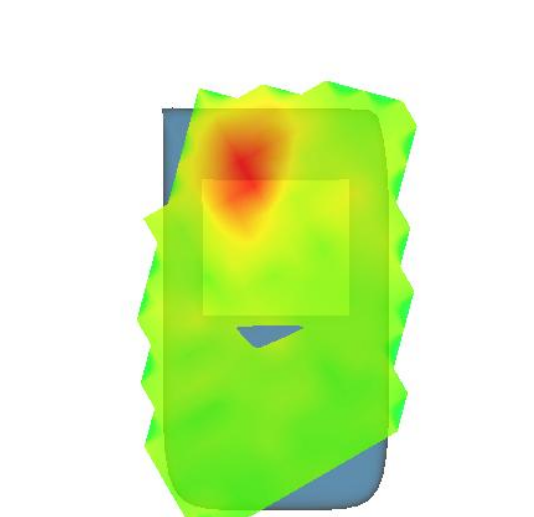
Maximum location: X=11.00, Y=-6.00

SAR Peak: 0.32 W/kg

SAR 10g (W/Kg)	0.080032
SAR 1g (W/Kg)	0.139447

Z (m)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	0.2136	0.1443	0.0858	0.0701	0.0588	0.0531	0.0461	0.0478	0.0451	0.0480	0.0469	0.0471



3D screen shot	Hot spot position
	

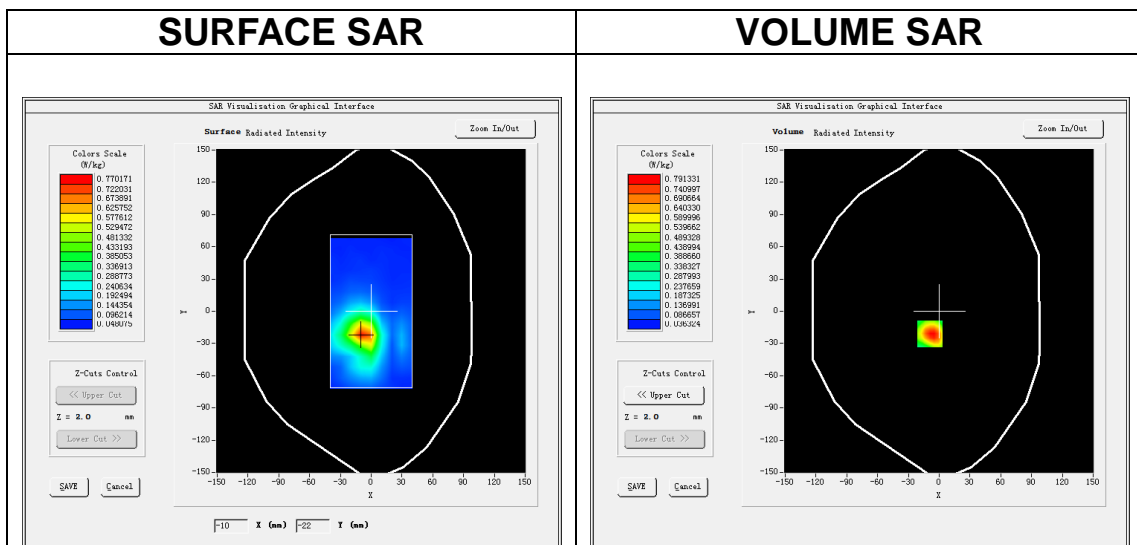
MEASUREMENT 12

A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>IEEE 802.11a U-NII</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11a (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	49.639539
Relative permittivity (imaginary part)	18.214510
Conductivity (S/m)	5.264258
Variation (%)	-0.690000

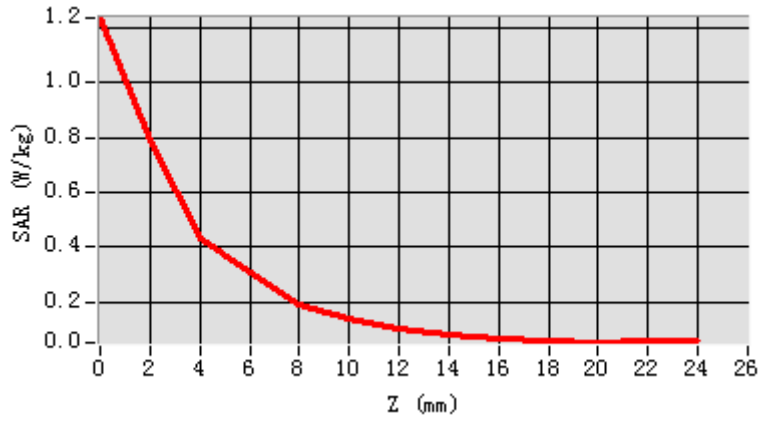


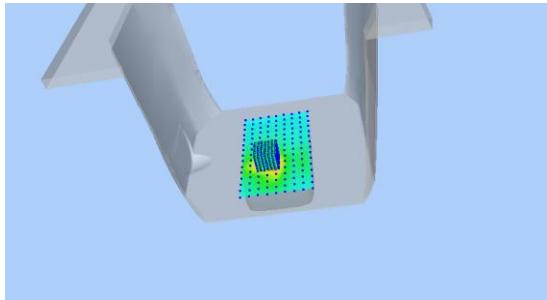
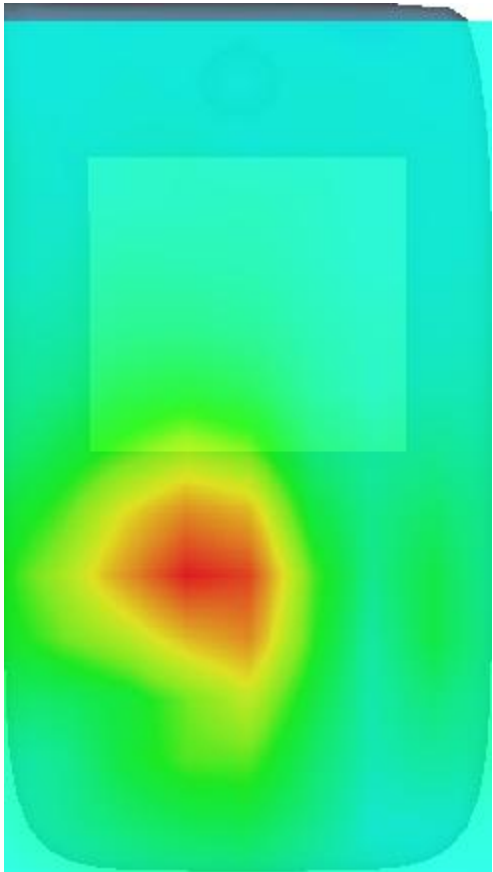
Maximum location: X=-9.00, Y=-21.00

SAR Peak: 1.26 W/kg

SAR 10g (W/Kg)	0.235535
SAR 1g (W/Kg)	0.408100

Z (m m)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	1.2376	0.7913	0.4341	0.3069	0.1867	0.1378	0.0999	0.0827	0.0681	0.0594	0.0498	0.0554



3D screen shot	Hot spot position
	

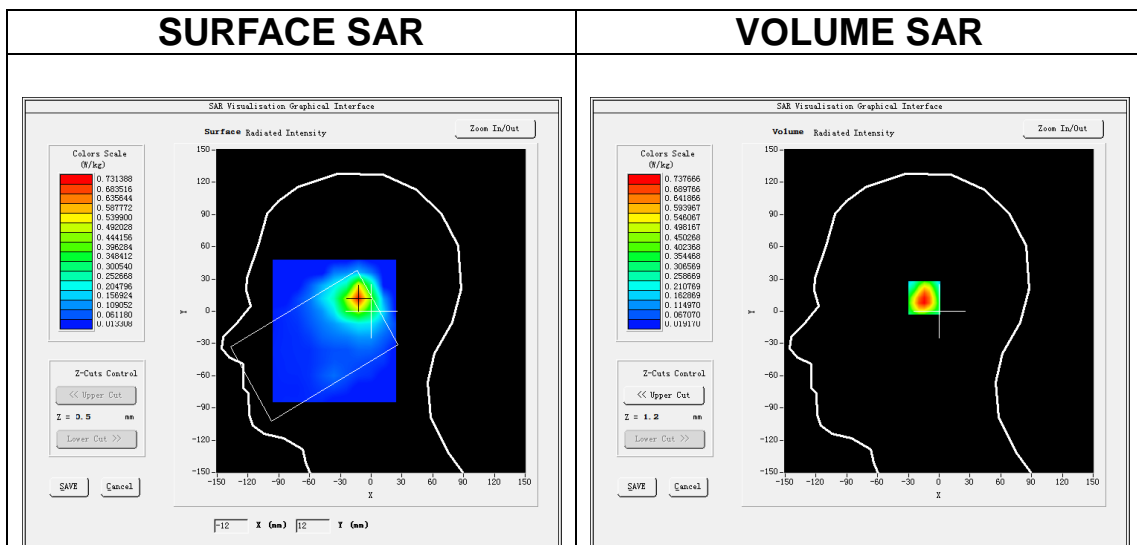
MEASUREMENT 13

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11b (Crest factor: 1.0)</u>

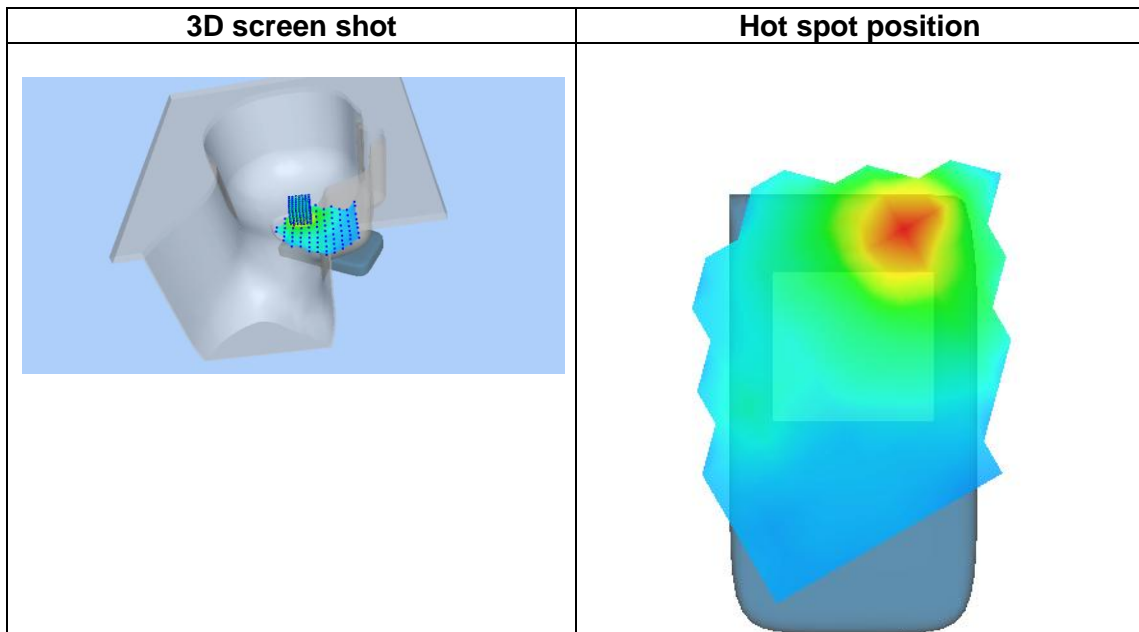
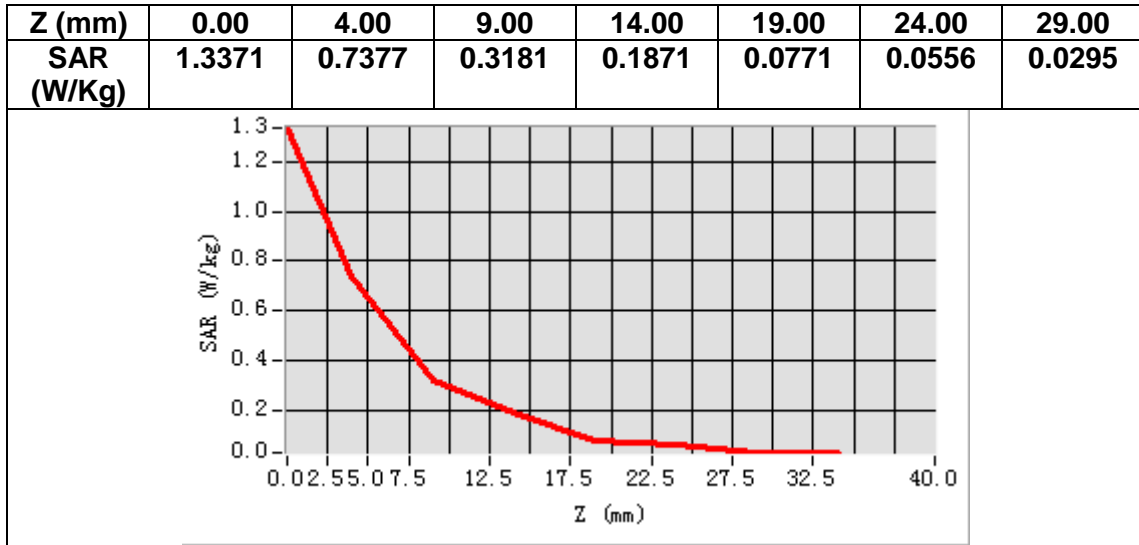
B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	38.518002
Relative permittivity (imaginary part)	13.510300
Conductivity (S/m)	1.829145
Variation (%)	-2.750000



Maximum location: X=-12.00, Y=13.00
SAR Peak: 1.24 W/kg

SAR 10g (W/Kg)	0.333941
SAR 1g (W/Kg)	0.701084



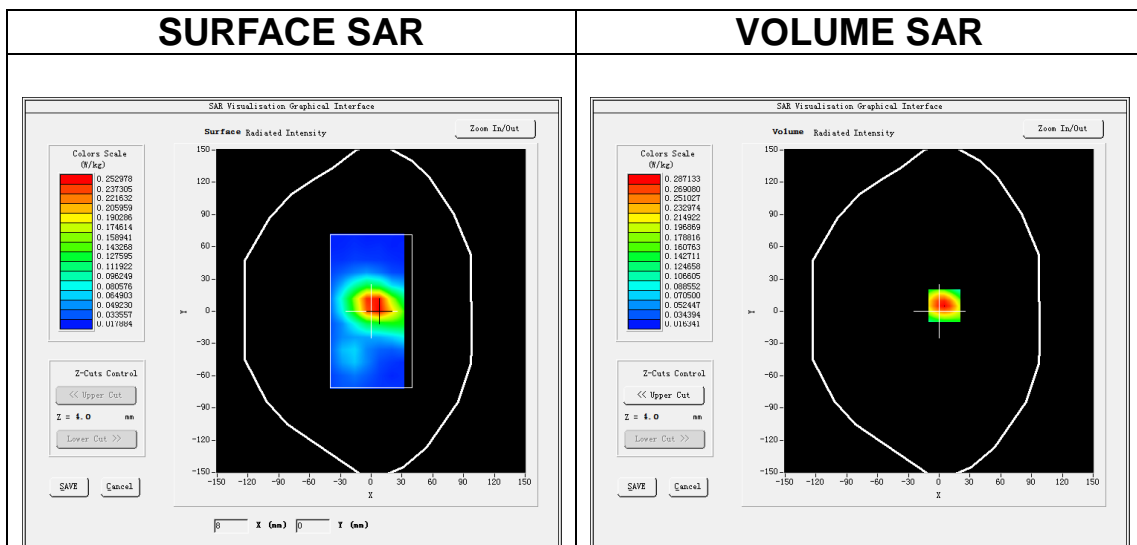
MEASUREMENT 14

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Middle</u>
Signal	<u>IEEE802.11b (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	51.603699
Relative permittivity (imaginary part)	13.934400
Conductivity (S/m)	1.886563
Variation (%)	0.220000

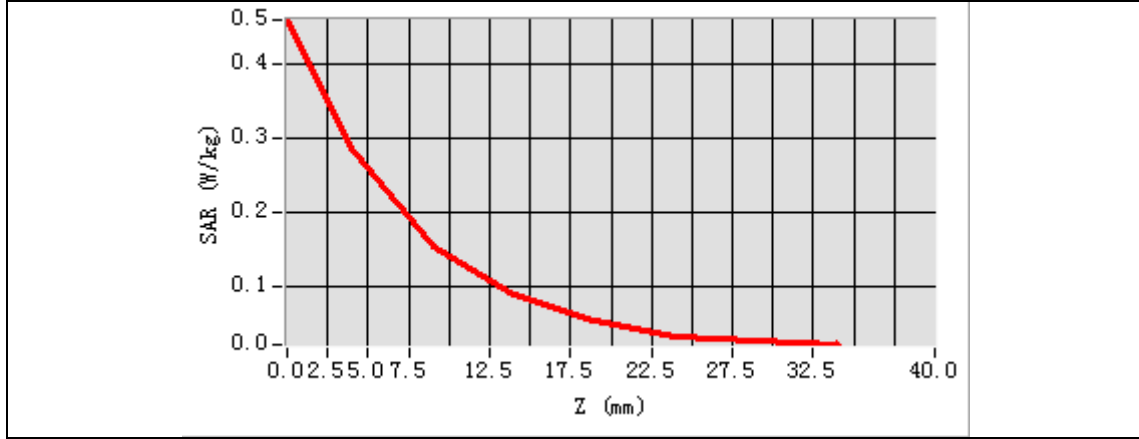


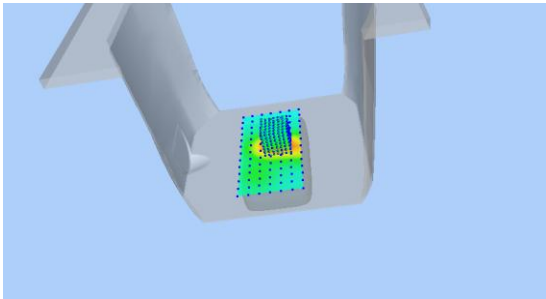
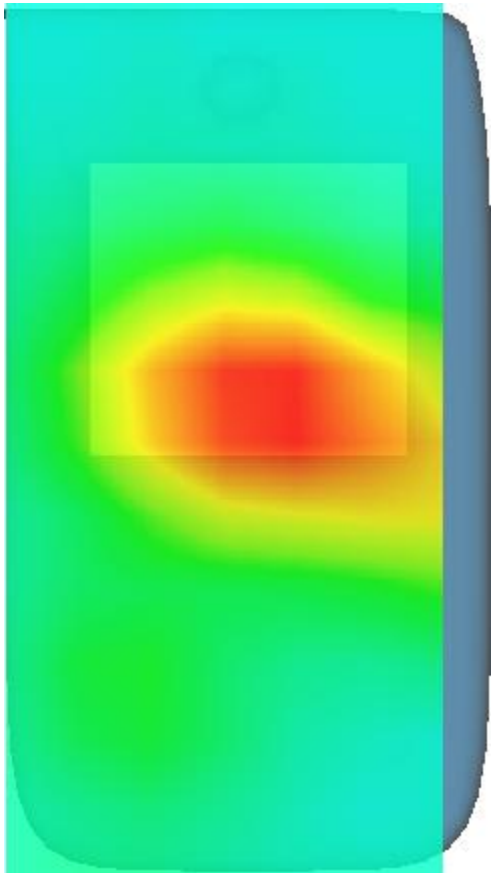
Maximum location: X=5.00, Y=5.00

SAR Peak: 0.46 W/kg

SAR 10g (W/Kg)	0.146884
SAR 1g (W/Kg)	0.271767

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.4592	0.2871	0.1553	0.0888	0.0548	0.0332	0.0276



3D screen shot	Hot spot position
	

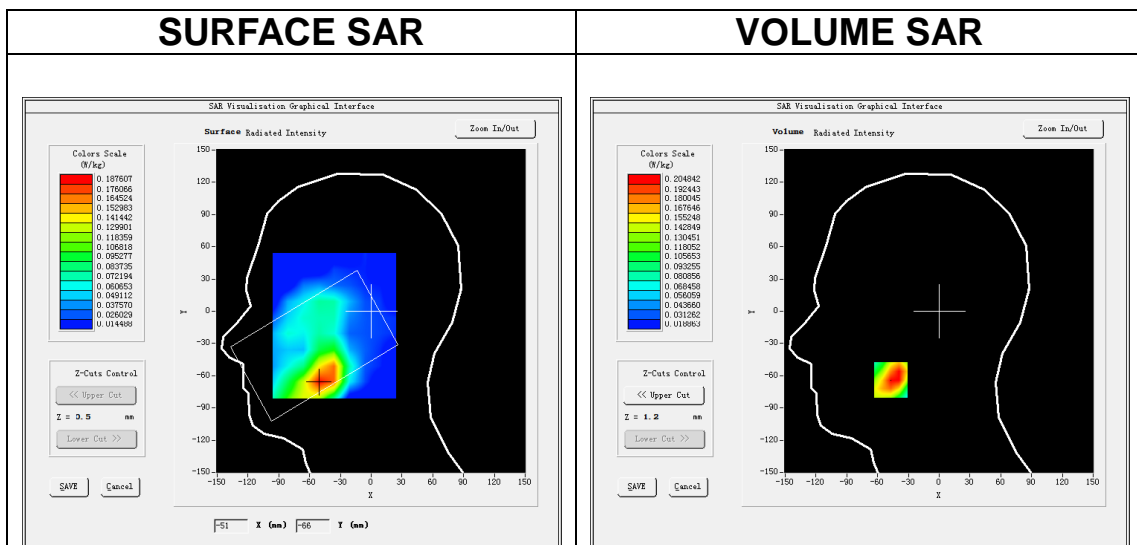
MEASUREMENT 15

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 2</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.957001
Relative permittivity (imaginary part)	13.290200
Conductivity (S/m)	1.388088
Variation (%)	-0.590000

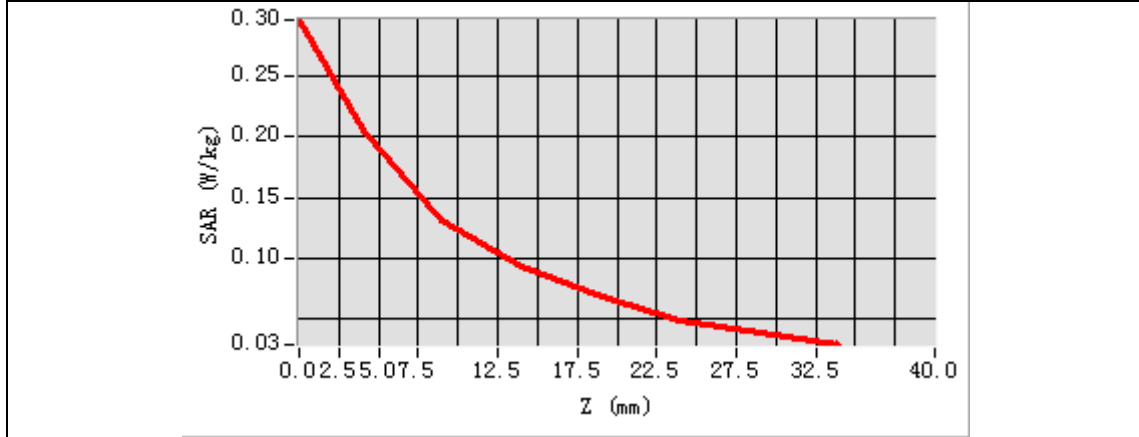


Maximum location: X=-47.00, Y=-64.00

SAR Peak: 0.32 W/kg

SAR 10g (W/Kg)	0.121830
SAR 1g (W/Kg)	0.203096

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.2969	0.2048	0.1312	0.0931	0.0671	0.0488	0.0386



3D screen shot	Hot spot position
<p>A 3D rendering of a human head model. A grid of small colored dots is overlaid on the head, representing the spatial distribution of SAR. The colors range from blue (low SAR) to red (high SAR), with the highest values concentrated in the frontal region.</p>	<p>A 3D visualization of the hot spot position. The head model is shown with a semi-transparent surface. The area of highest SAR is highlighted in red and yellow, indicating the location of maximum energy absorption.</p>

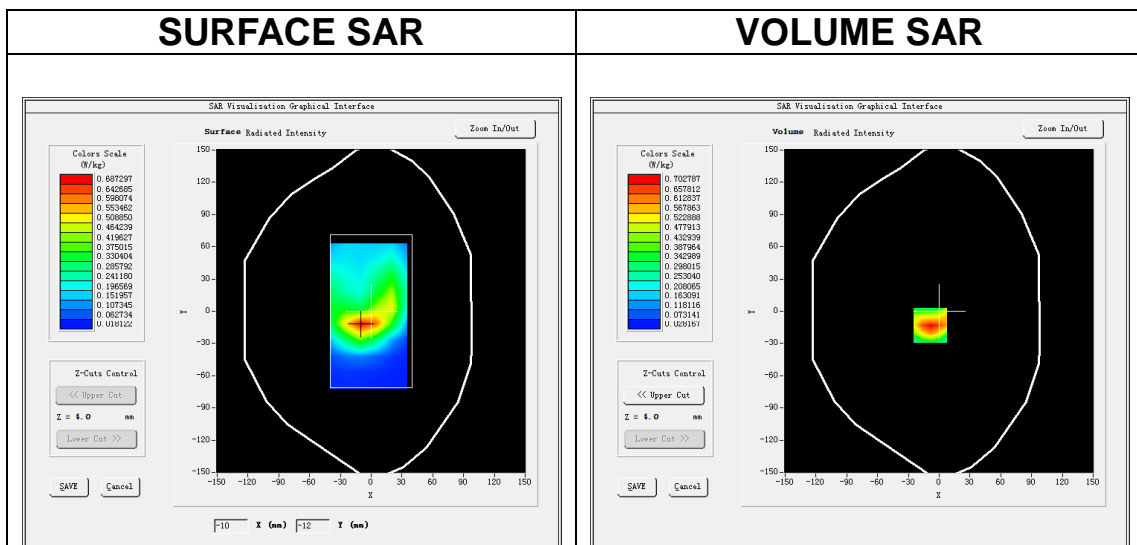
MEASUREMENT 16

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 2</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	54.290951
Relative permittivity (imaginary part)	14.606150
Conductivity (S/m)	1.525125
Variation (%)	-1.650000

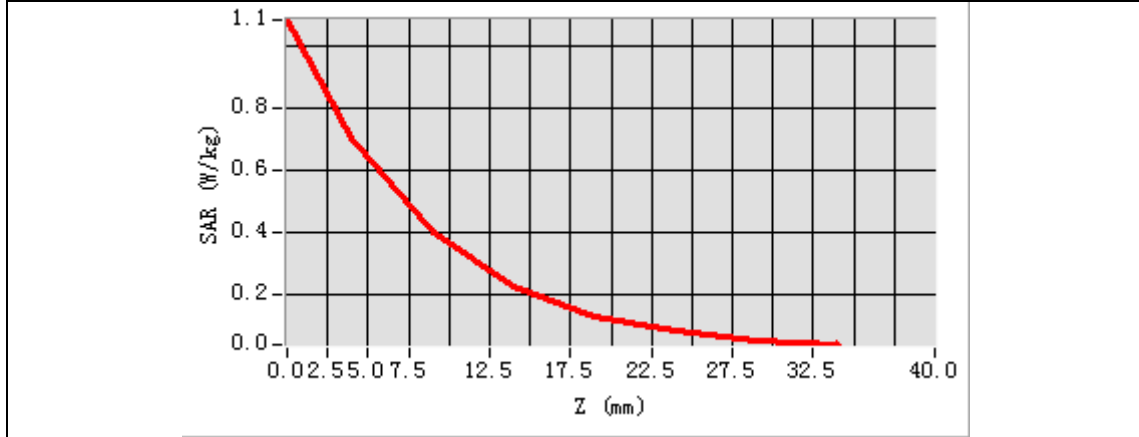


Maximum location: X=-9.00, Y=-13.00

SAR Peak: 1.10 W/kg

SAR 10g (W/Kg)	0.357812
SAR 1g (W/Kg)	0.664571

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.0854	0.7028	0.3977	0.2234	0.1315	0.0807	0.0534



3D screen shot	Hot spot position

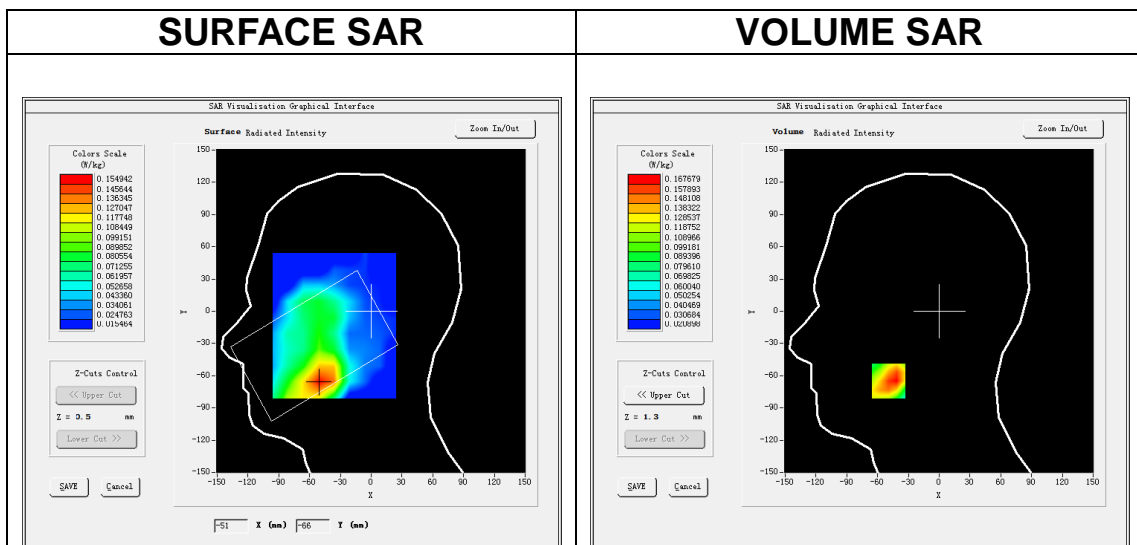
MEASUREMENT 17

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 4</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

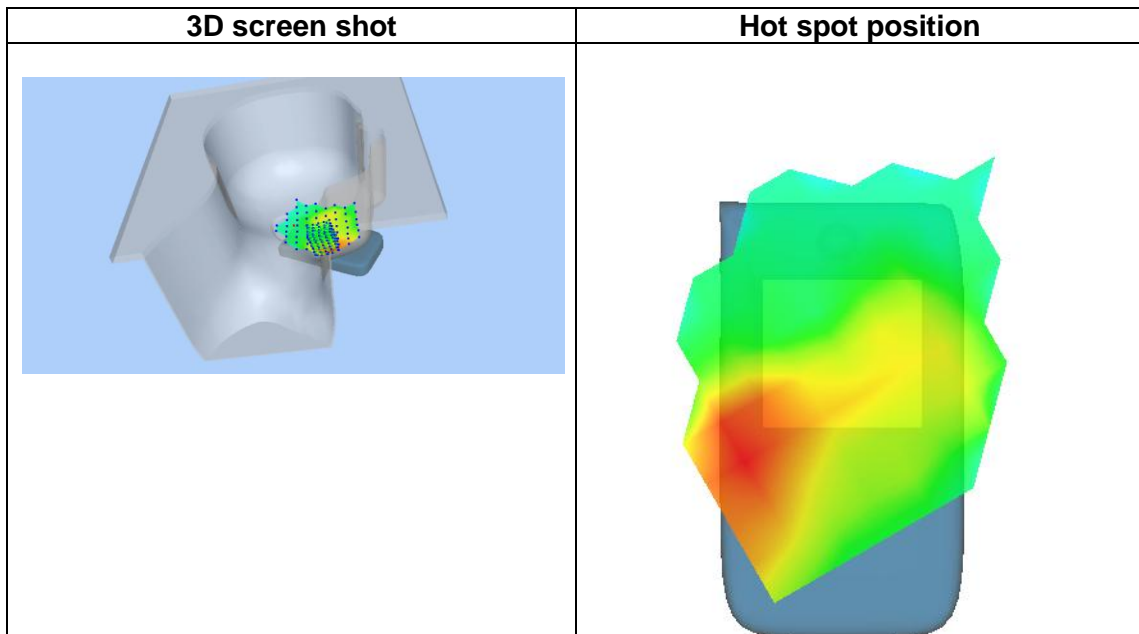
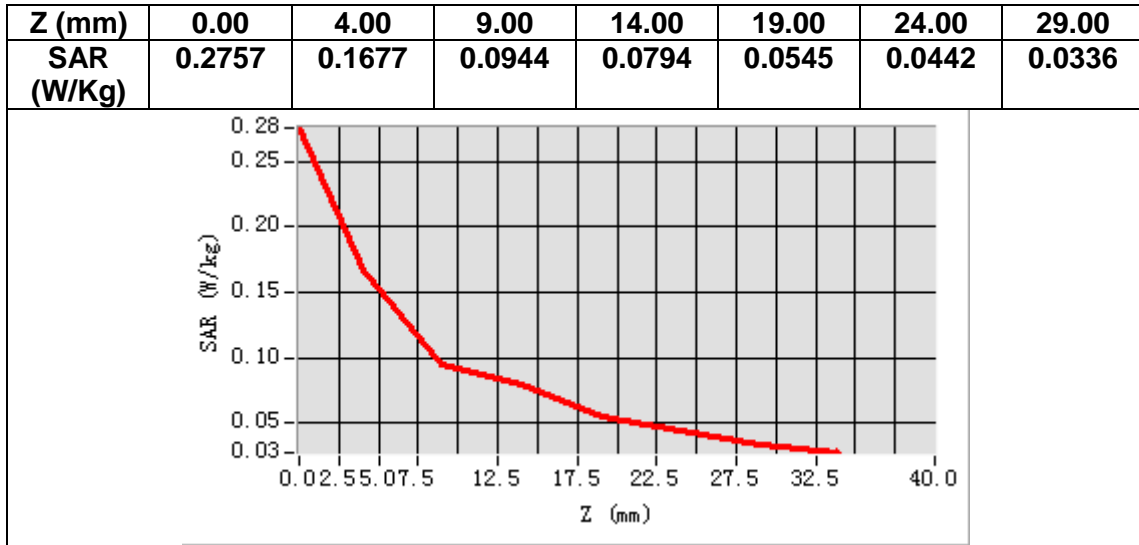
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	38.985291
Relative permittivity (imaginary part)	13.800592
Conductivity (S/m)	1.328307
Variation (%)	0.280000



Maximum location: X=-49.00, Y=-65.00
SAR Peak: 0.24 W/kg

SAR 10g (W/Kg)	0.101830
SAR 1g (W/Kg)	0.160986



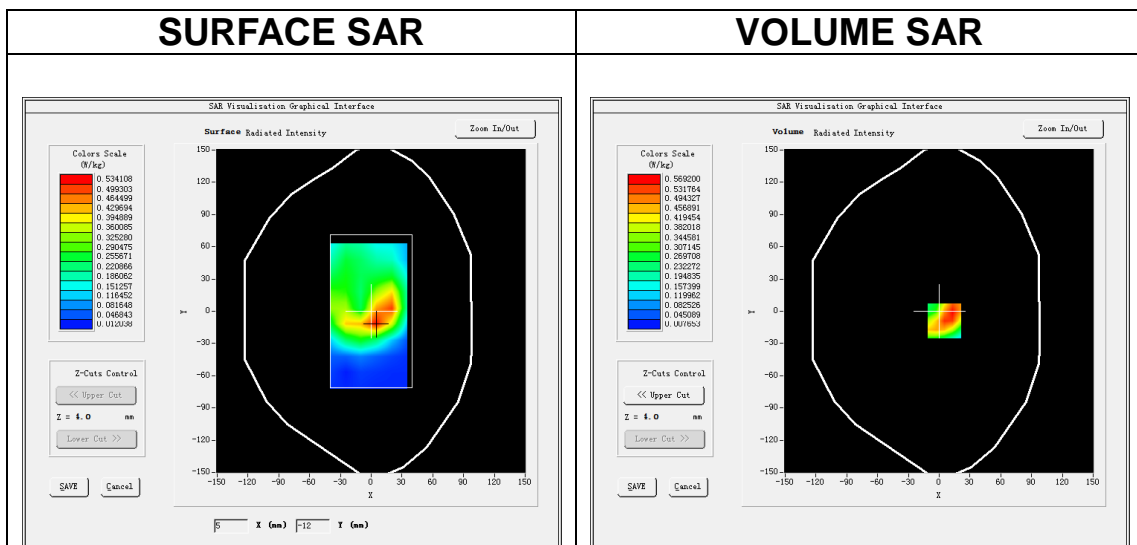
MEASUREMENT 18

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 4</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

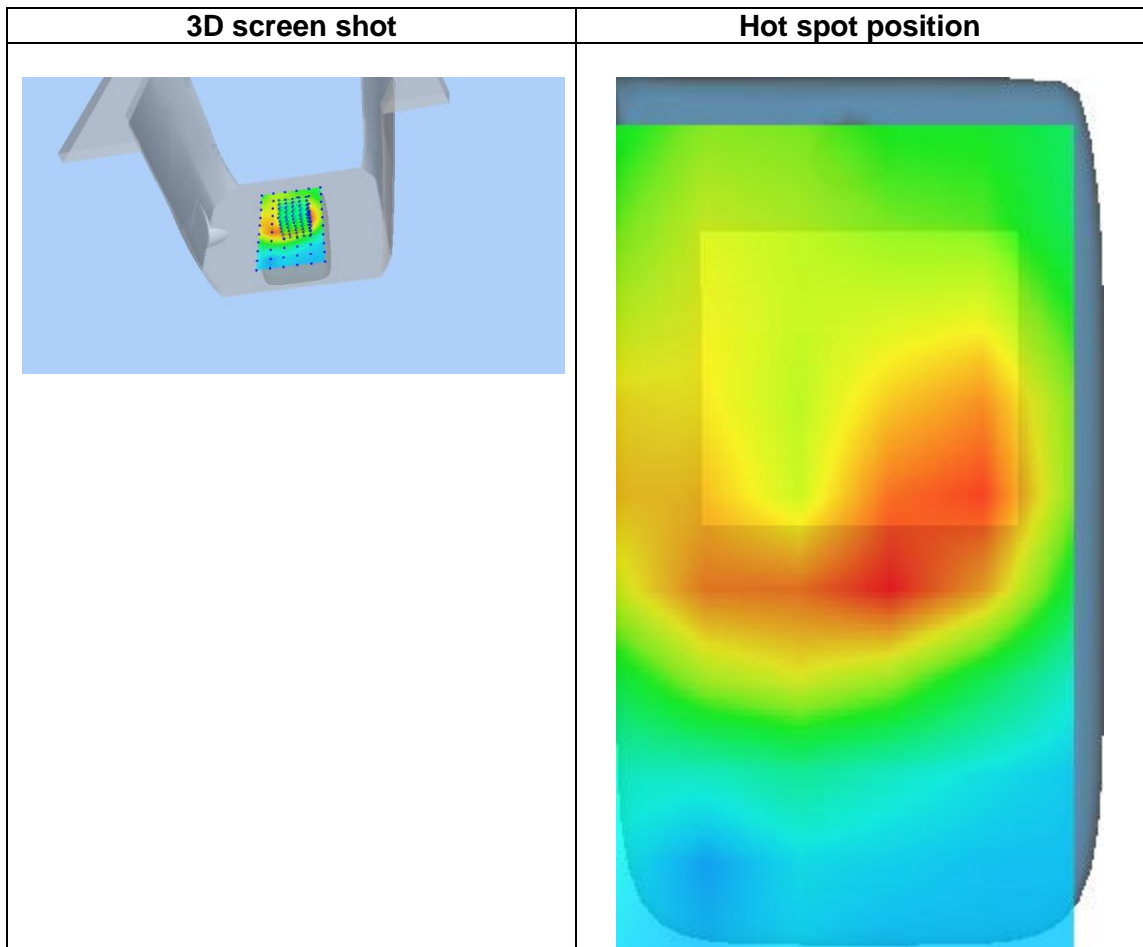
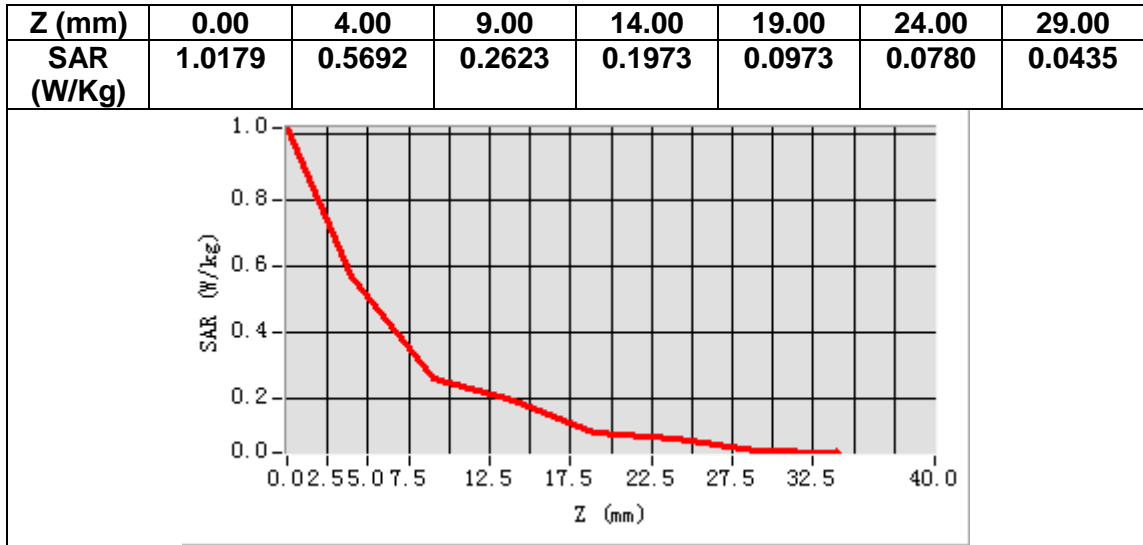
Frequency (MHz)	1732.500000
Relative permittivity (real part)	54.428368
Relative permittivity (imaginary part)	15.168220
Conductivity (S/m)	1.459941
Variation (%)	-1.770000



Maximum location: X=5.00, Y=-9.00

SAR Peak: 0.91 W/kg

SAR 10g (W/Kg)	0.302561
SAR 1g (W/Kg)	0.542569



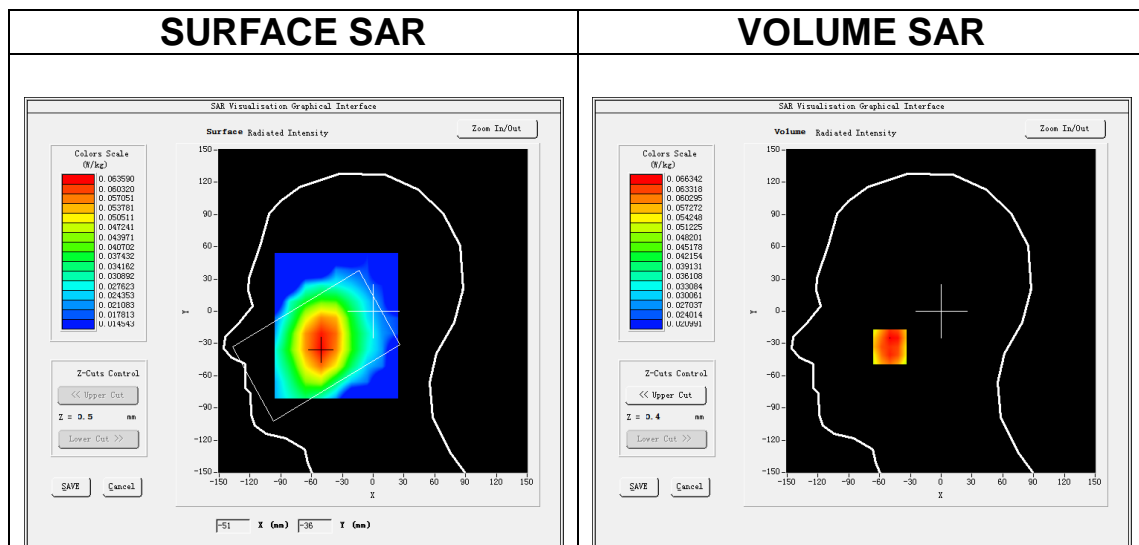
MEASUREMENT 19

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 5</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

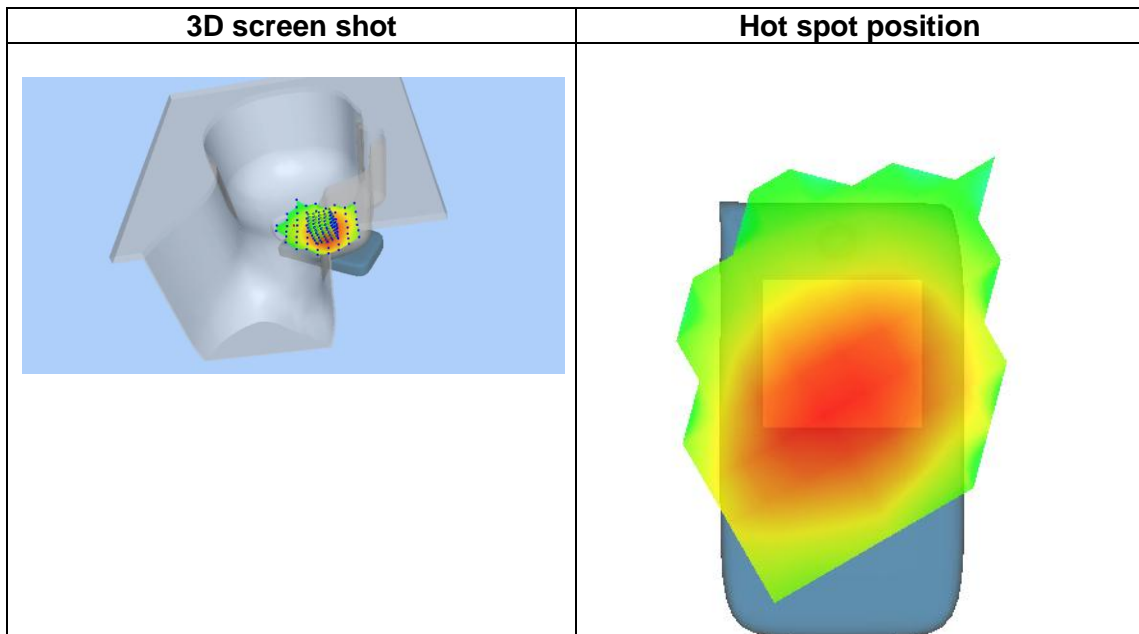
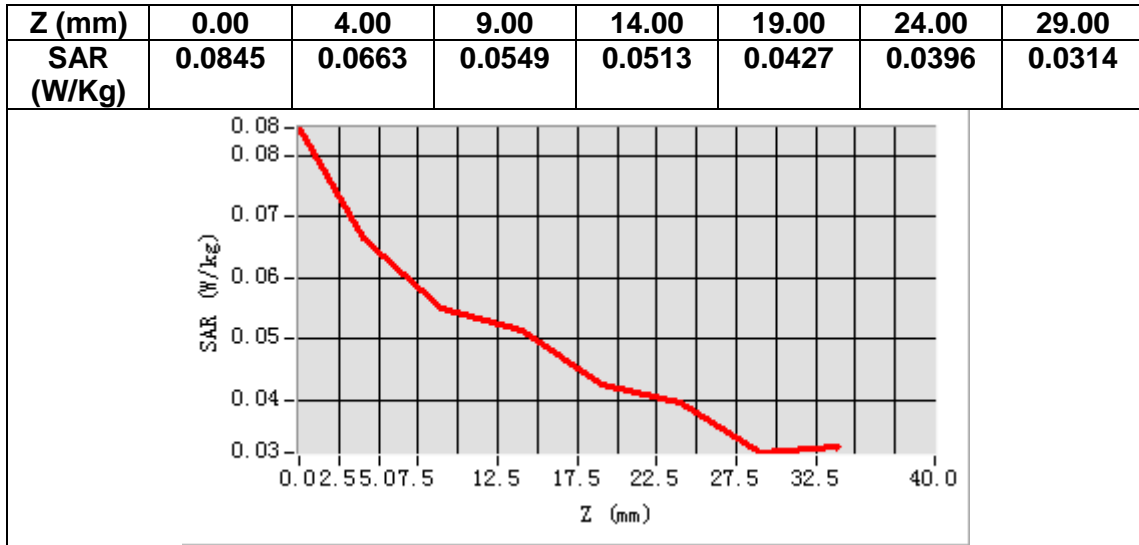
Frequency (MHz)	836.500000
Relative permittivity (real part)	40.878601
Relative permittivity (imaginary part)	19.081850
Conductivity (S/m)	0.886776
Variation (%)	4.080000



Maximum location: X=-50.00, Y=-33.00

SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.053736
SAR 1g (W/Kg)	0.064953



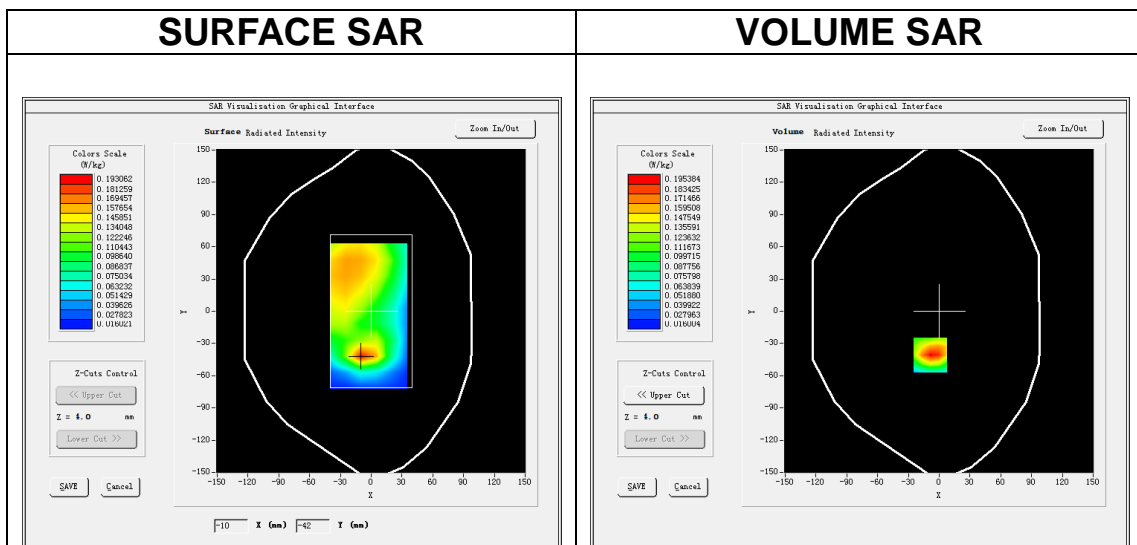
MEASUREMENT 20

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 5</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

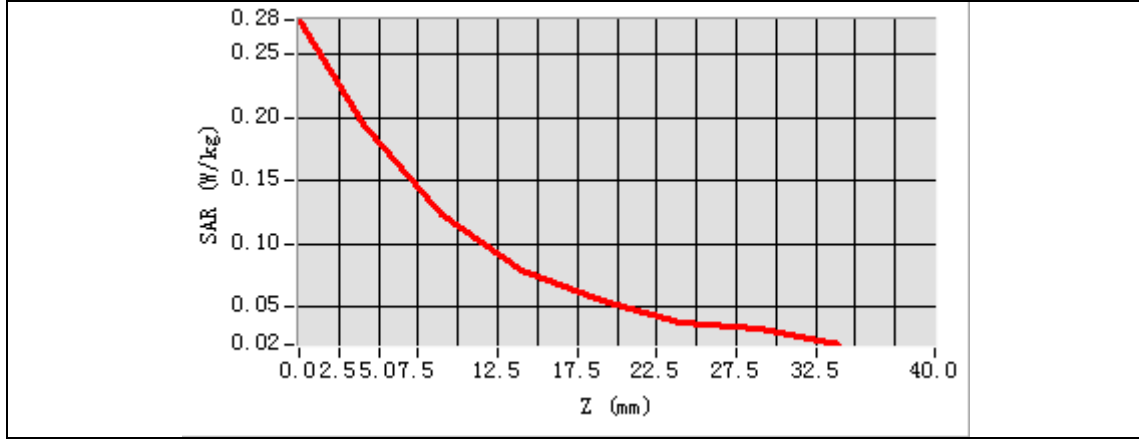
Frequency (MHz)	836.500000
Relative permittivity (real part)	54.483501
Relative permittivity (imaginary part)	21.187000
Conductivity (S/m)	0.984607
Variation (%)	1.030000



Maximum location: X=-9.00, Y=-41.00
SAR Peak: 0.29 W/kg

SAR 10g (W/Kg)	0.110045
SAR 1g (W/Kg)	0.185935

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.2772	0.1954	0.1226	0.0791	0.0550	0.0380	0.0336



3D screen shot	Hot spot position

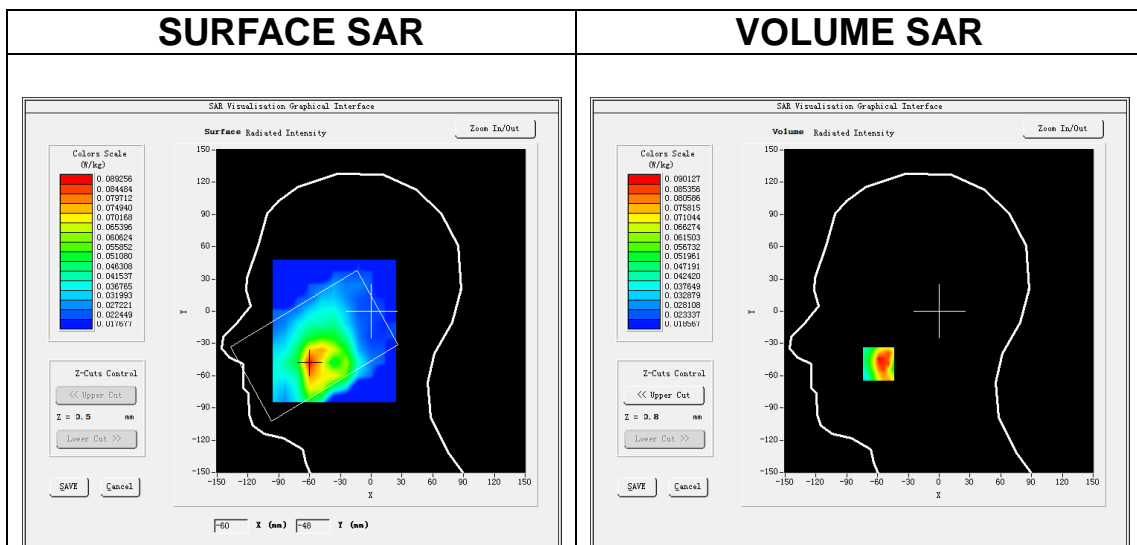
MEASUREMENT 21

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 7</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.392487
Relative permittivity (imaginary part)	13.901160
Conductivity (S/m)	1.957747
Variation (%)	4.050000

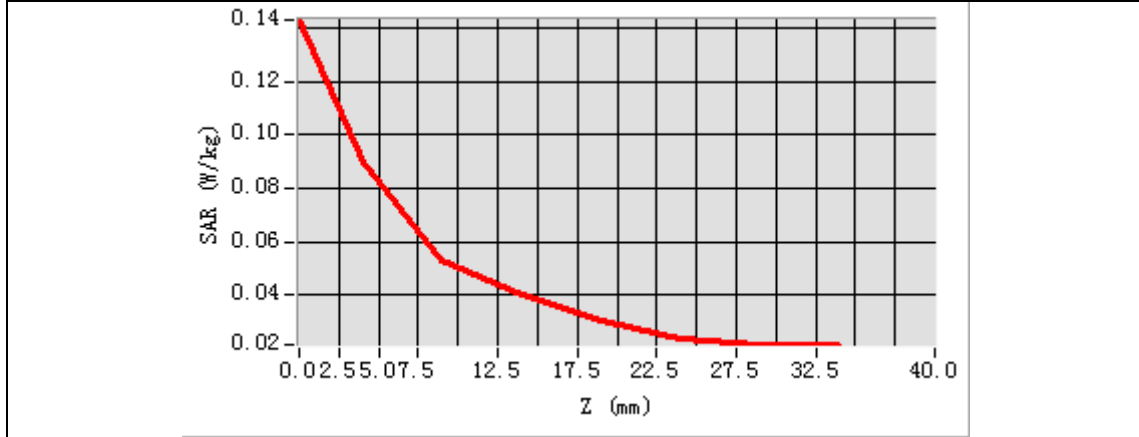


Maximum location: X=-59.00, Y=-49.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.053044
SAR 1g (W/Kg)	0.085834

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.1432	0.0901	0.0530	0.0403	0.0300	0.0236	0.0214



3D screen shot	Hot spot position
<p>A 3D rendering of a human head model. A small, localized area on the side of the head is highlighted with a color gradient from blue to red, indicating the location of the maximum SAR exposure.</p>	<p>A 2D cross-sectional view of the head model showing the SAR distribution. The highest SAR values are concentrated in a central region, indicated by red and yellow colors, surrounded by green and blue areas representing lower SAR values.</p>

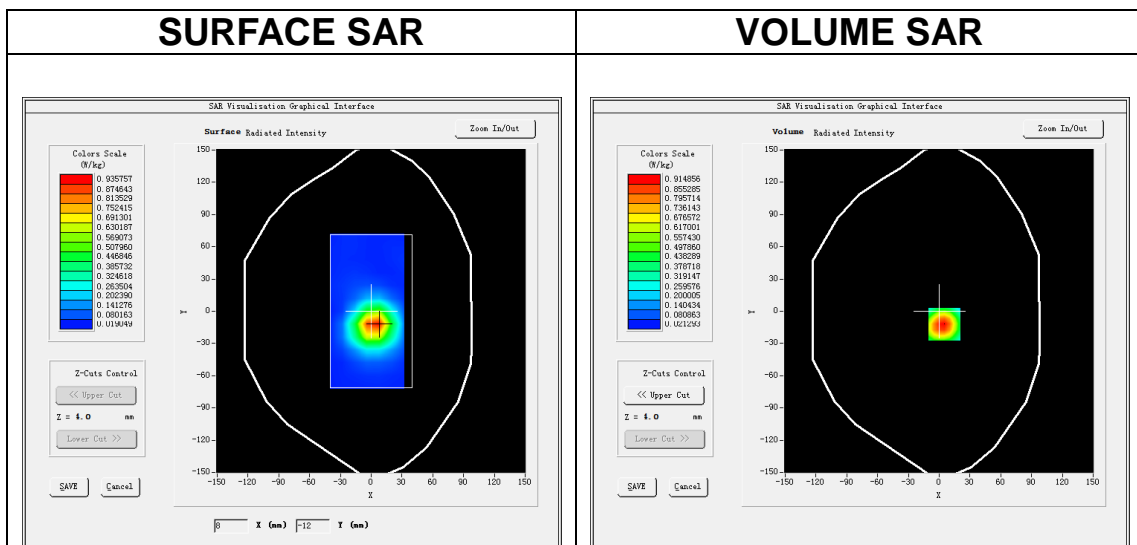
MEASUREMENT 22

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 7</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

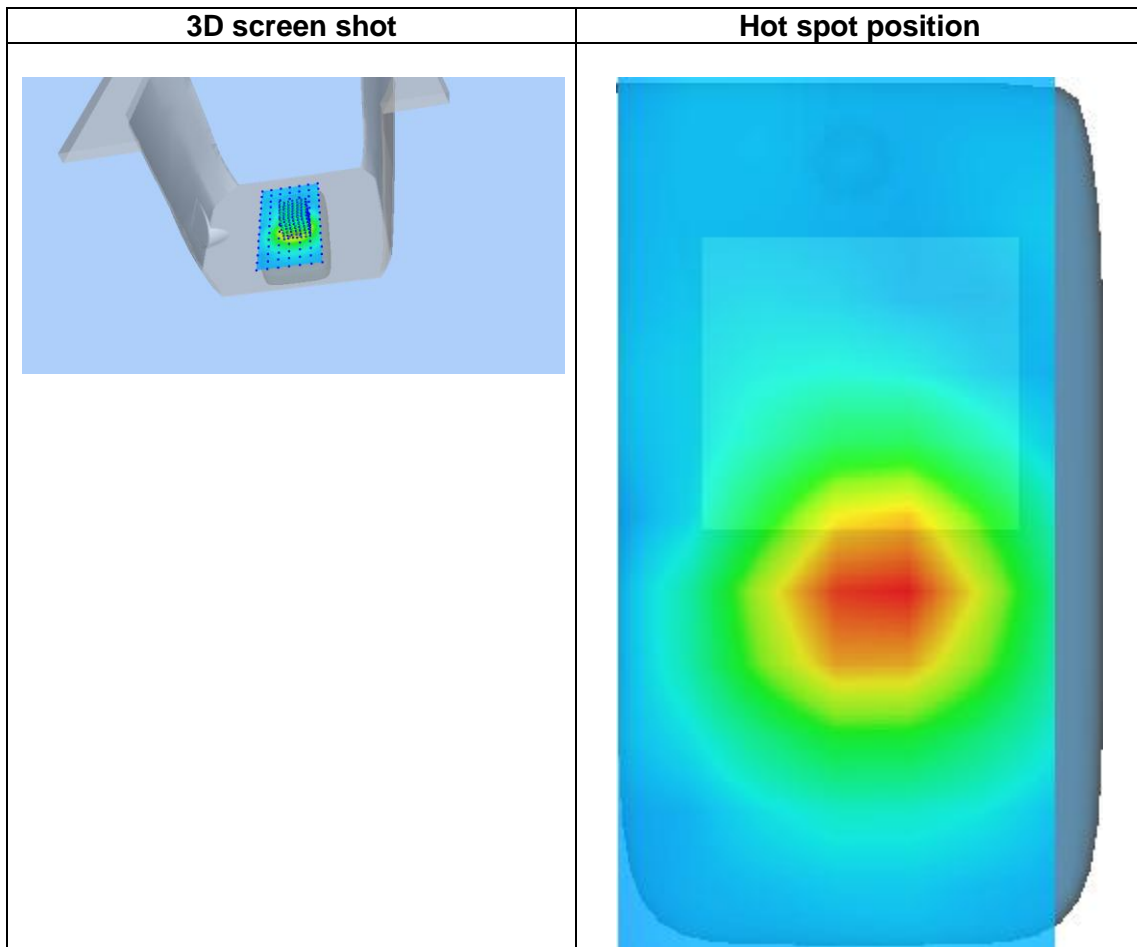
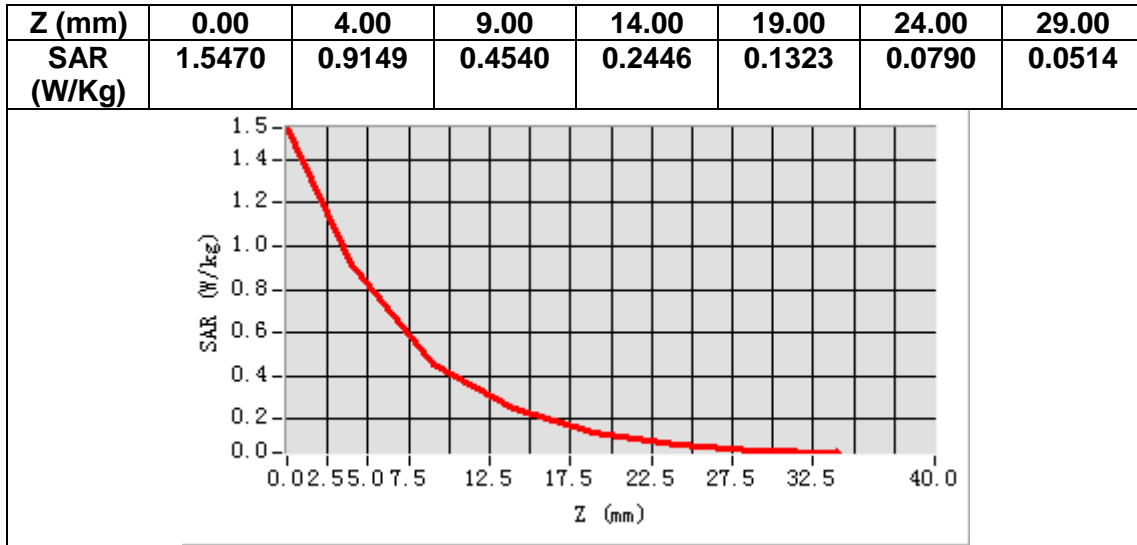
Frequency (MHz)	2535.000000
Relative permittivity (real part)	53.136948
Relative permittivity (imaginary part)	15.227840
Conductivity (S/m)	2.144587
Variation (%)	-0.760000



Maximum location: X=5.00, Y=-12.00

SAR Peak: 1.53 W/kg

SAR 10g (W/Kg)	0.436912
SAR 1g (W/Kg)	0.872189



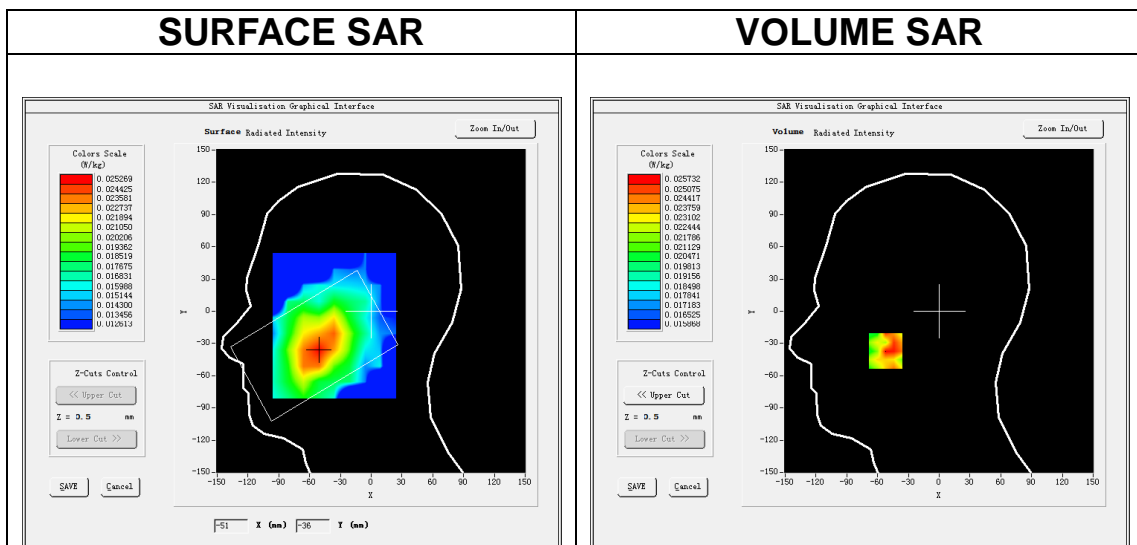
MEASUREMENT 23

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 12</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

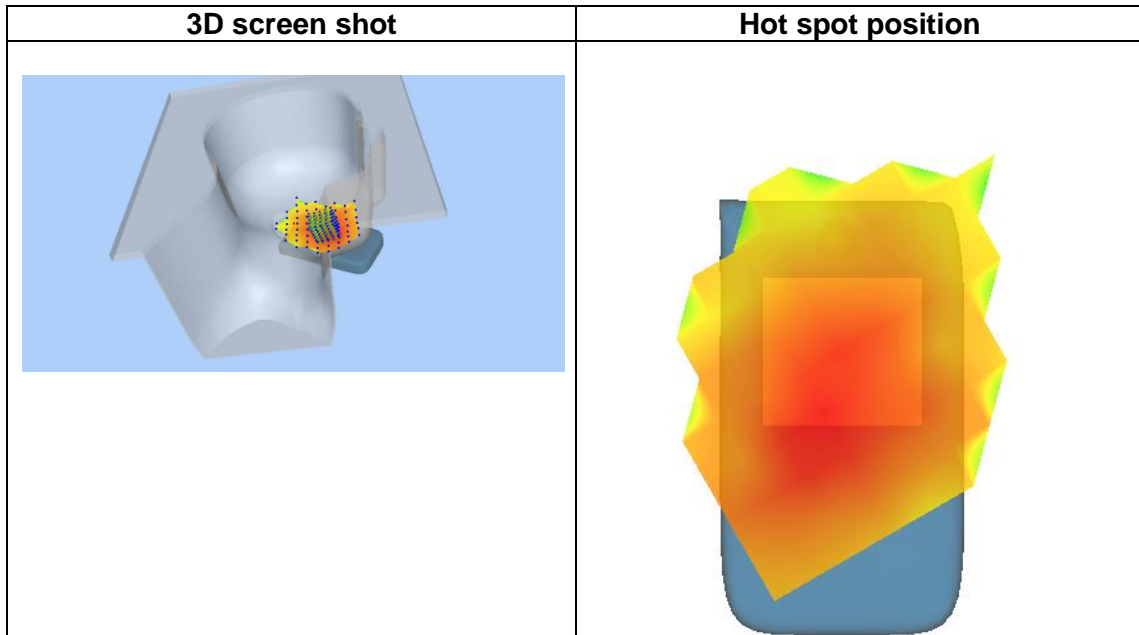
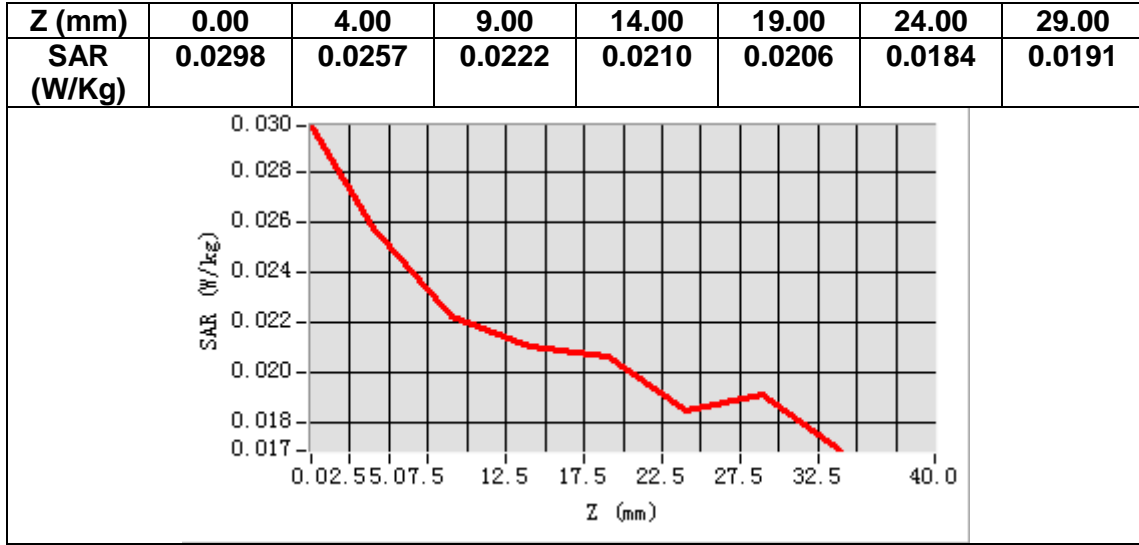
Frequency (MHz)	707.500000
Relative permittivity (real part)	42.057961
Relative permittivity (imaginary part)	22.107779
Conductivity (S/m)	0.868959
Variation (%)	-2.070000



Maximum location: X=-52.00, Y=-37.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.022249
SAR 1g (W/Kg)	0.025630



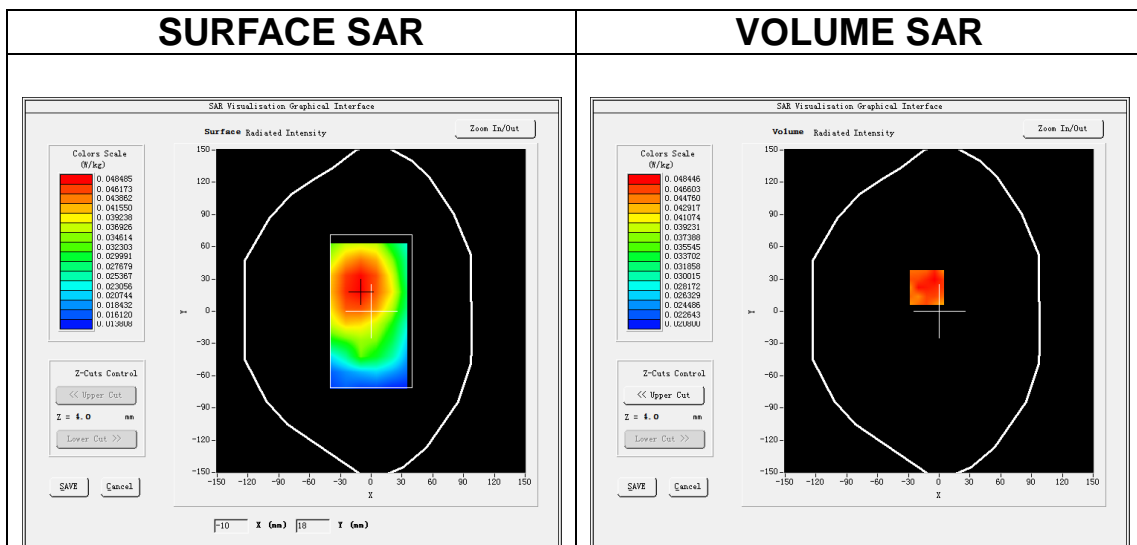
MEASUREMENT 24

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 12</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

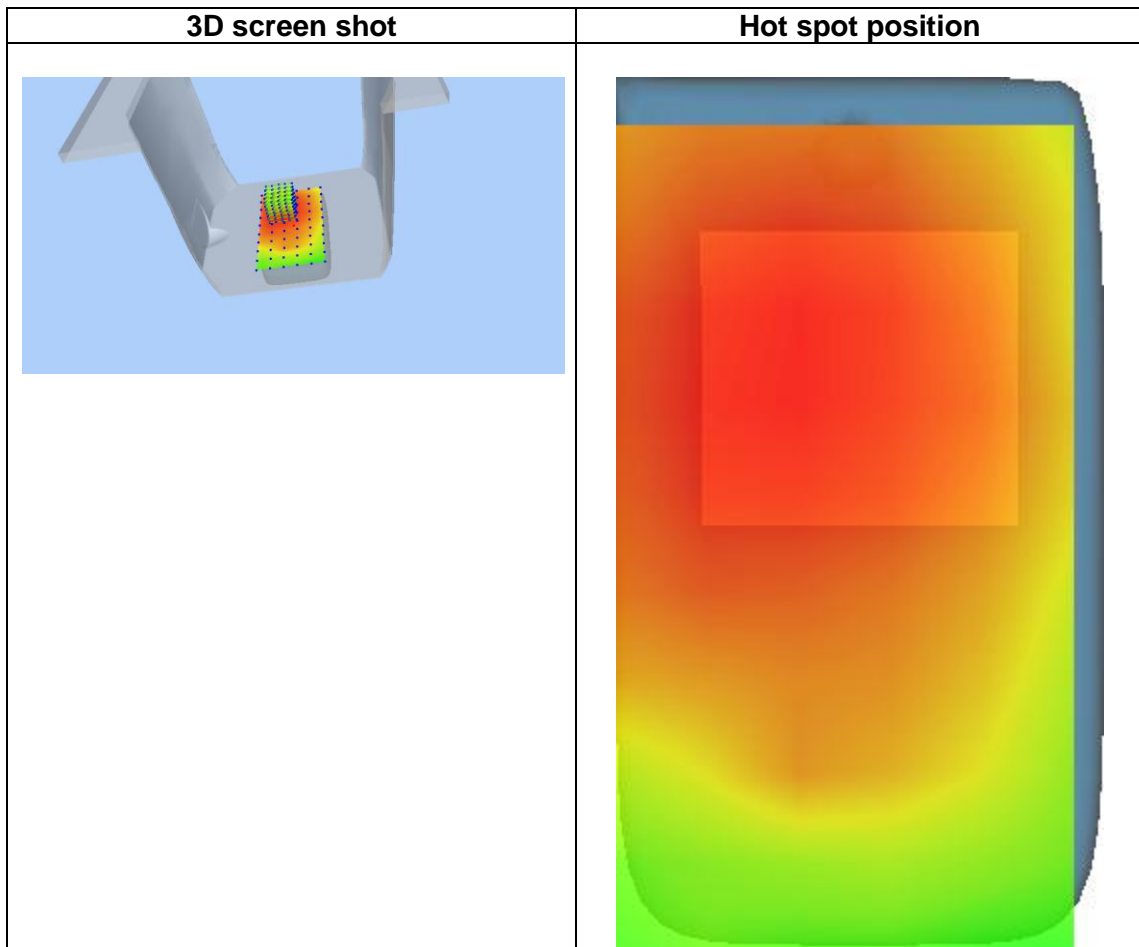
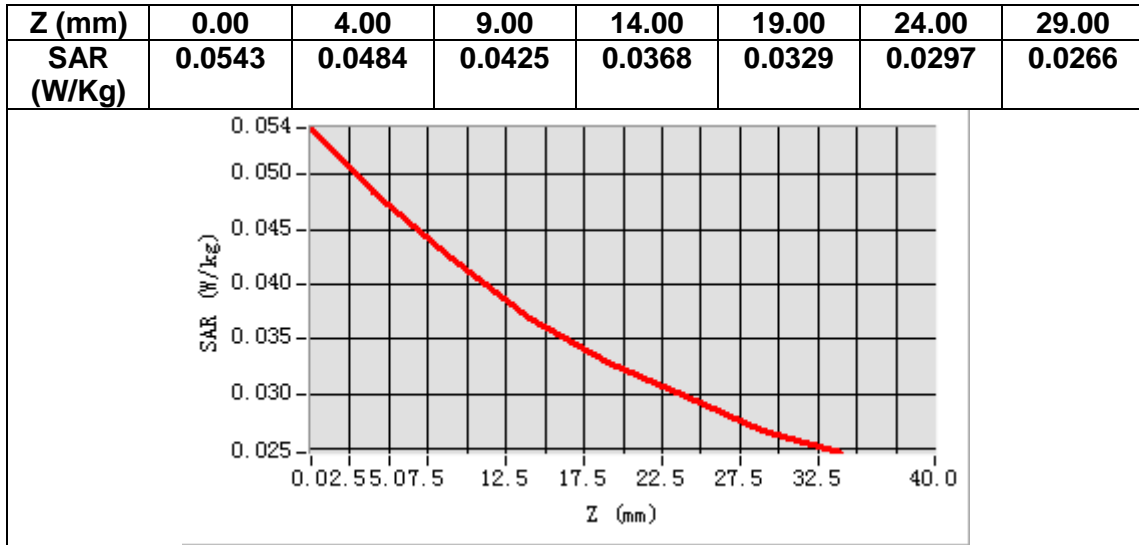
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	55.957958
Relative permittivity (imaginary part)	23.541300
Conductivity (S/m)	0.925304
Variation (%)	-0.780000



Maximum location: X=-12.00, Y=22.00
SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.040803
SAR 1g (W/Kg)	0.047705



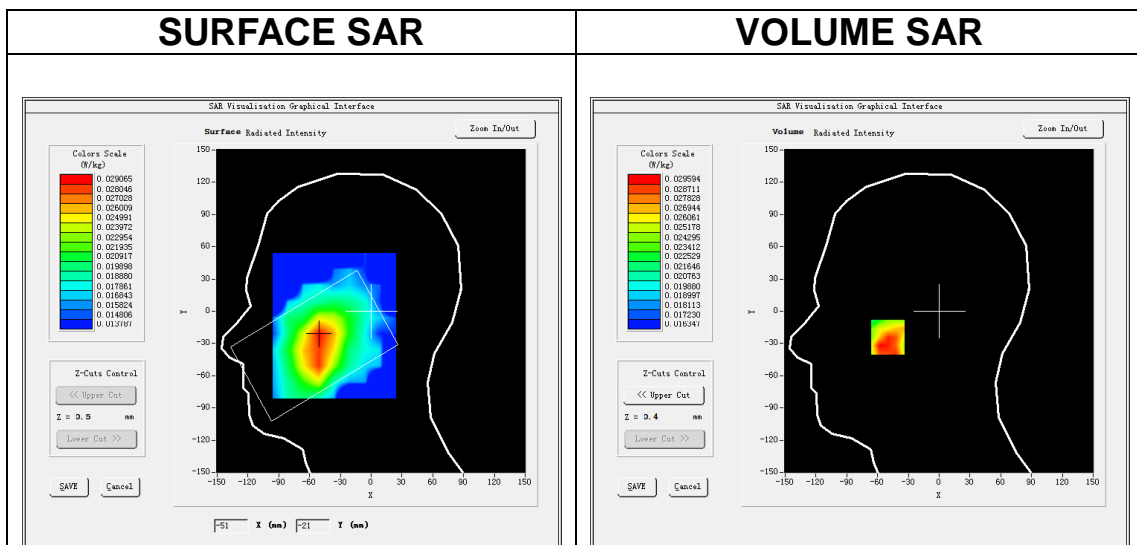
MEASUREMENT 25

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 17</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

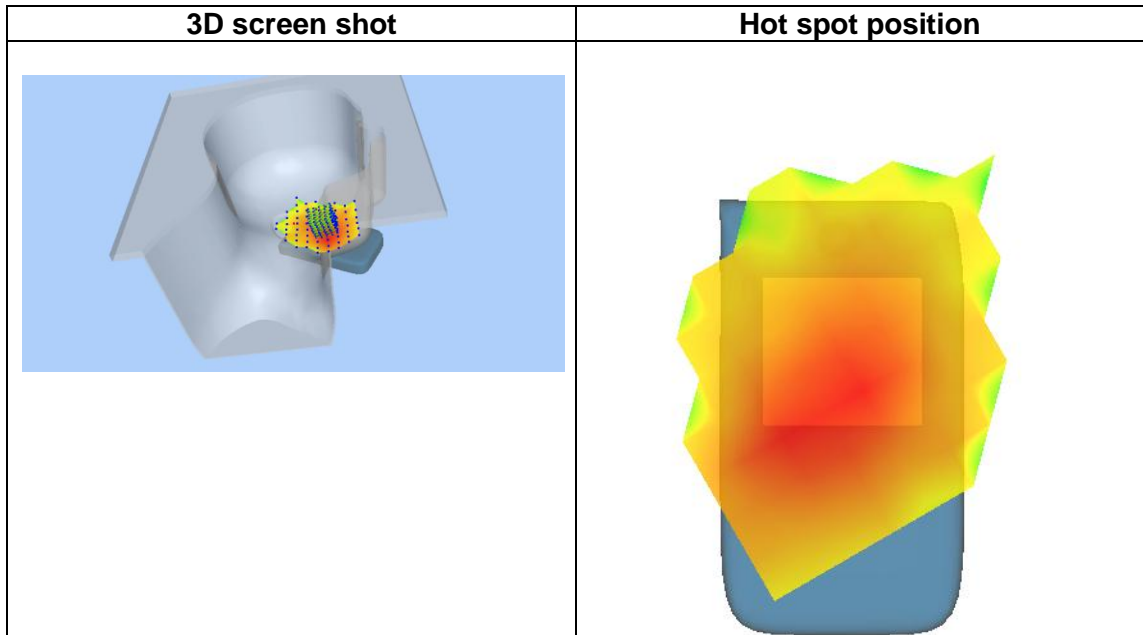
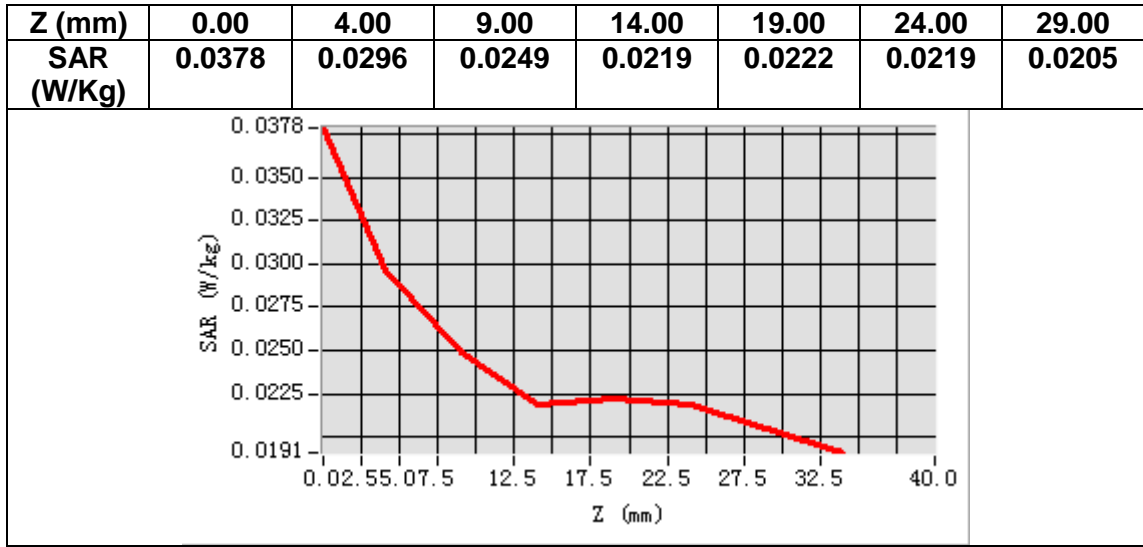
Frequency (MHz)	710.000000
Relative permittivity (real part)	42.036709
Relative permittivity (imaginary part)	22.136179
Conductivity (S/m)	0.873149
Variation (%)	1.740000



Maximum location: X=-50.00, Y=-24.00

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.025232
SAR 1g (W/Kg)	0.029502



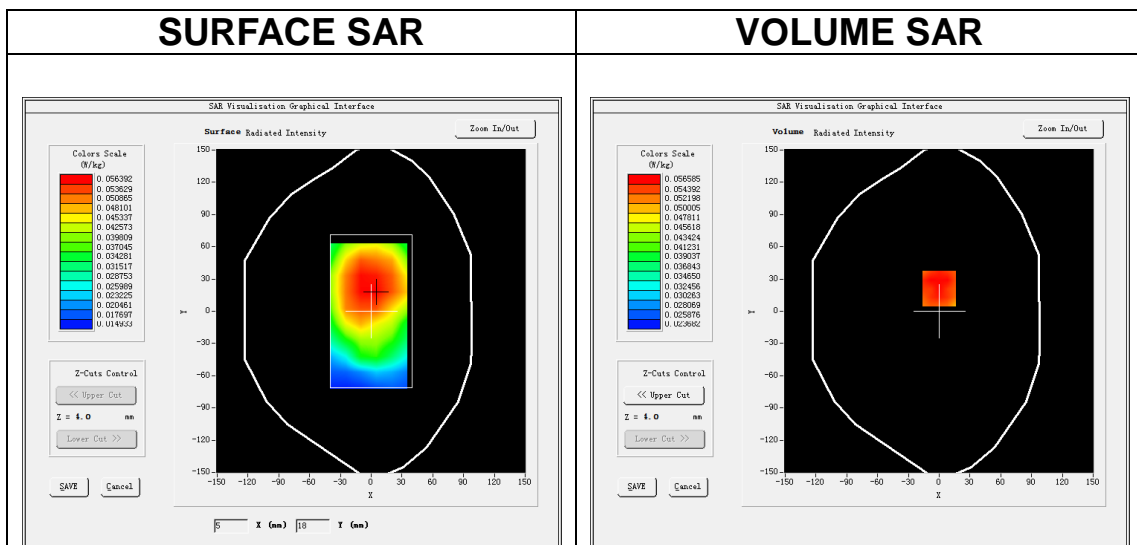
MEASUREMENT 26

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Body</u>
Band	<u>LTE band 17</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>

B. SAR Measurement Results

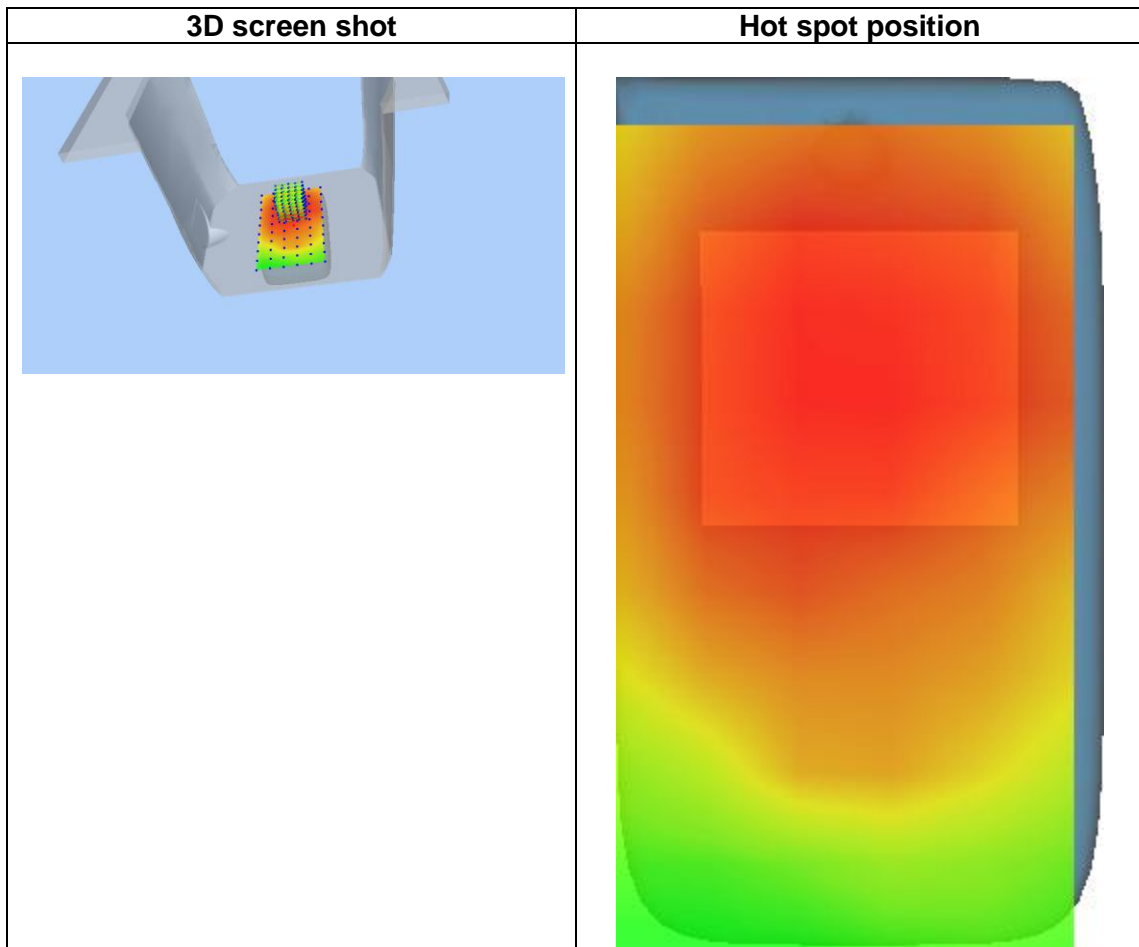
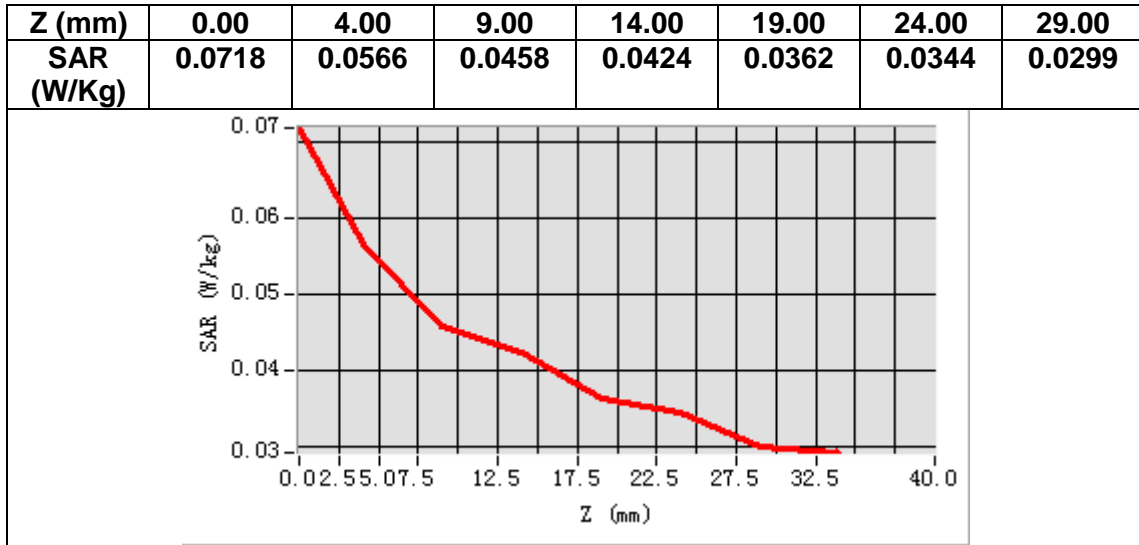
Frequency (MHz)	710.000000
Relative permittivity (real part)	55.936710
Relative permittivity (imaginary part)	23.560499
Conductivity (S/m)	0.929331
Variation (%)	1.160000



Maximum location: X=0.00, Y=21.00

SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.046993
SAR 1g (W/Kg)	0.056498



14. Appendix D. Calibration Certificate

Table of contents
E Field Probe - SN 08/16 EPGO287
750 MHz Dipole - SN 03/15 DIP 0G750-355
835 MHz Dipole - SN 03/15 DIP 0G835-347
1800 MHz Dipole - SN 03/15 DIP 1G800-349
1900 MHz Dipole - SN 03/15 DIP 1G900-350
2450 MHz Dipole - SN 03/15 DIP 2G450-352
2600 MHz Dipole - SN 03/15 DIP 2G600-356
5000-6000 MHz Dipole - SN 13/14 WGA 33



COMOSAR E-Field Probe Calibration Report

Ref : ACR.260.1.18.SATU.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 08/16 EPGO287

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



Calibration Date: 12/27/2019

Summary:

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.260.1.18.SATU.A

	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Jérôme LUC	Product Manager	12/27/2019	<i>[Signature]</i>
<i>Checked by :</i>	Jérôme LUC	Product Manager	12/27/2019	<i>[Signature]</i>
<i>Approved by :</i>	Kim RUTKOWSKI	Quality Manager	12/27/2019	<i>Kim Rutkowski</i>

	<i>Customer Name</i>
<i>Distribution :</i>	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

<i>Issue</i>	<i>Date</i>	<i>Modifications</i>
A	12/27/2019	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.260.1.18.SATU.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.260.1.18.SATU.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 08/16 EPGO287
Product Condition (new / used)	Used
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.209 MΩ Dipole 2: R2=0.196 MΩ Dipole 3: R3=0.197 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

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



Figure 1 – MVG COMOSAR Dosimetric E field Dipole

Probe Length	330 mm
Length of Individual Dipoles	2 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.5 mm
Distance between dipoles / probe extremity	1 mm

3 MEASUREMENT METHOD

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

3.1 LINEARITY

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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3.2 SENSITIVITY

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

3.3 LOWER DETECTION LIMIT

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

3.4 ISOTROPY

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

3.5 BOUNDARY EFFECT

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

4 MEASUREMENT UNCERTAINTY

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

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					12.0%



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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5 CALIBRATION MEASUREMENT RESULTS

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

5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu\text{V}/(\text{V}/\text{m}^2)$)	Normy dipole 2 ($\mu\text{V}/(\text{V}/\text{m}^2)$)	Normz dipole 3 ($\mu\text{V}/(\text{V}/\text{m}^2)$)
0.66	0.75	0.58

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
93	93	98

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

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

