

FCC SAR EVALUATION REPORT

**In accordance with the requirements of
FCC 47 CFR Part 2(2.1093) and
IEEE Std 1528-2013**

Product Name : Mobile Phone

Brand Name : Bmobile

Model Name : TRITON 4G

Family Model : Tritón 4G

Report No. : S24062802203001

FCC ID : ZSW-10-049

Prepared for

b mobile HK Limited

Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung;
New Territories; Hong Kong, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community,
Xixiang Street Bao'an District, Shenzhen 518126 P.R. China

Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090

Website: <http://www.ntek.org.cn>

TEST RESULT CERTIFICATION**Applicant's name** b mobile HK LimitedAddress..... Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai
Chung; New Territories; Hong Kong, China**Manufacturer's Name** . b mobile HK LimitedAddress..... Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai
Chung; New Territories; Hong Kong, China**Product description**

Product name Mobile Phone

Brand Name Bmobile

Model and/or type
reference TRITON 4G

Family Model Tritón 4G

FCC 47 CFR Part 2(2.1093)

Standards 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). 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.

This report shall not be reproduced except in full, without the written approval of Shenzhen NTEK, this document may be altered or revised by Shenzhen NTEK, personal only, and shall be noted in the revision of the document.

Date of Test

Date (s) of performance of tests... Jun. 29, 2024 ~ Jul. 08, 2024

Date of Issue Aug. 08, 2024

Test Result **Pass**Prepared
By*Jack Li*Jack Li
(Project Engineer)Reviewed
By*Aaron Cheng*Aaron Cheng
(Supervisor)Approved
By*Alex Li*Alex Li
(Manager)

※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Aug. 08, 2024	Jack Li

TABLE OF CONTENTS

1. General Information	6
1.1. RF exposure limits	6
1.2. Statement of Compliance	7
1.3. EUT Description	7
1.4. Test specification(s)	8
1.5. Ambient Condition	8
2. SAR Measurement System	9
2.1. SATIMO SAR Measurement Set-up Diagram	9
2.2. Robot	10
2.3. E-Field Probe	11
2.3.1. E-Field Probe Calibration	11
2.4. SAM phantoms	12
2.4.1. Technical Data	13
2.5. Device Holder	14
2.6. Test Equipment List	15
3. SAR Measurement Procedures	17
3.1. Power Reference	17
3.2. Area scan & Zoom scan	17
3.3. Description of interpolation/extrapolation scheme	19
3.4. Volumetric Scan	19
3.5. Power Drift	19
4. System Verification Procedure	20
4.1. Tissue Verification	20
4.1.1. Tissue Dielectric Parameter Check Results	21
4.2. System Verification Procedure	22
4.2.1. System Verification Results	23
5. SAR Measurement variability and uncertainty	24
5.1. SAR measurement variability	24
5.2. SAR measurement uncertainty	24
6. RF Exposure Positions	25
6.1. Ear and handset reference point	25
6.2. Definition of the cheek position	25
6.3. Definition of the tilt position	27
6.4. Body Worn Accessory	27
6.5. Wireless Router Devices	28
7. RF Output Power	29
7.1. GSM Conducted Power	29
7.2. WCDMA Conducted Power	29
7.3. LTE Conducted Power	31

7.4. Bluetooth Output Power.....	40
8. Antenna Location.....	41
9. Stand-alone SAR test exclusion.....	41
10. SAR Results	42
10.1. SAR measurement Result.....	42
10.1.1. SAR measurement Result of GSM850.....	42
10.1.2. SAR measurement Result of GSM1900.....	43
10.1.3. SAR measurement Result of WCDMA Band 2.....	43
10.1.4. SAR measurement Result of WCDMA Band 4.....	44
10.1.5. SAR measurement Result of WCDMA Band 5.....	45
10.1.6. SAR measurement Result of LTE Band 2	45
10.1.7. SAR measurement Result of LTE Band 4	47
10.1.8. SAR measurement Result of LTE Band 5	48
10.1.9. SAR measurement Result of LTE Band 7	49
10.2. Simultaneous Transmission Analysis.....	50
11. Appendix A. Photo documentation	50
12. Appendix B. System Check Plots.....	51
13. Appendix C. Plots of High SAR Measurement.....	60
14. Appendix D. Calibration Certificate	97

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 TRITON 4G are as follows.

RF Exposure Conditions		Equipment Class -Highest Reported SAR (W/kg)				Max. Reported SAR (W/kg)
		PCE	DTS	NII	DSS	
1-g Head		0.606	/	/	/	0.606
1-g Body-Worn (Separation distance of 10mm)		1.042	/	/	/	1.042
Max Simultaneous Tx	Head	0.608	/	/	0.608	0.608
	Body-Worn	1.075	/	/	1.075	1.075

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 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		
Brand Name	Bmobile		
Model Name	TRITON 4G		
Family Model	Tritón 4G		
Model Difference	All the model are the same circuit and RF module, except the model names.		
FCC ID	ZSW-10-049		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna Type	PIFA Antenna		
Battery Information	DC 3.7V, 2500mAh		
HW Version	TRITON 4G_HW_V1.0		
SW Version	Bmobile_TRITON 4G_OM_LATAM_V001		
Device Operating Configurations			
Supporting Mode(s)	GSM850/1900,WCDMA Band2/4/5,LTE Band2/4/5/7, Bluetooth		
Test Modulation	GSM(GMSK), WCDMA(QPSK), LTE(QPSK/16QAM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK)		
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
	Bluetooth	2402-2480	
GPRS 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)		

1.4. Test specification(s)

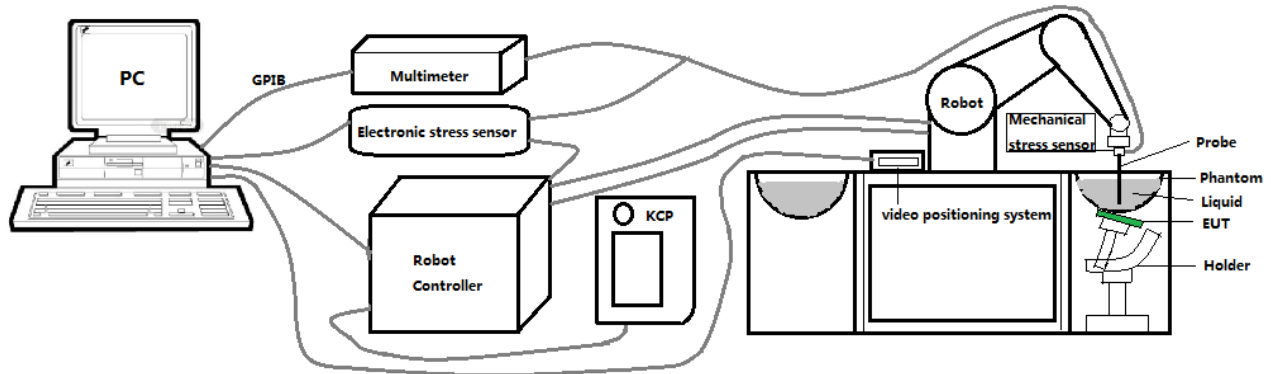
FCC 47 CFR Part 2(2.1093)
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 648474 D04 Handset SAR

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 3423-EPGO-426 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: ± 0.06 dB
- Axial isotropy: ± 0.01 dB
- Hemispherical Isotropy: ± 0.01 dB
- Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
- Lower detection limit: 8mW/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.

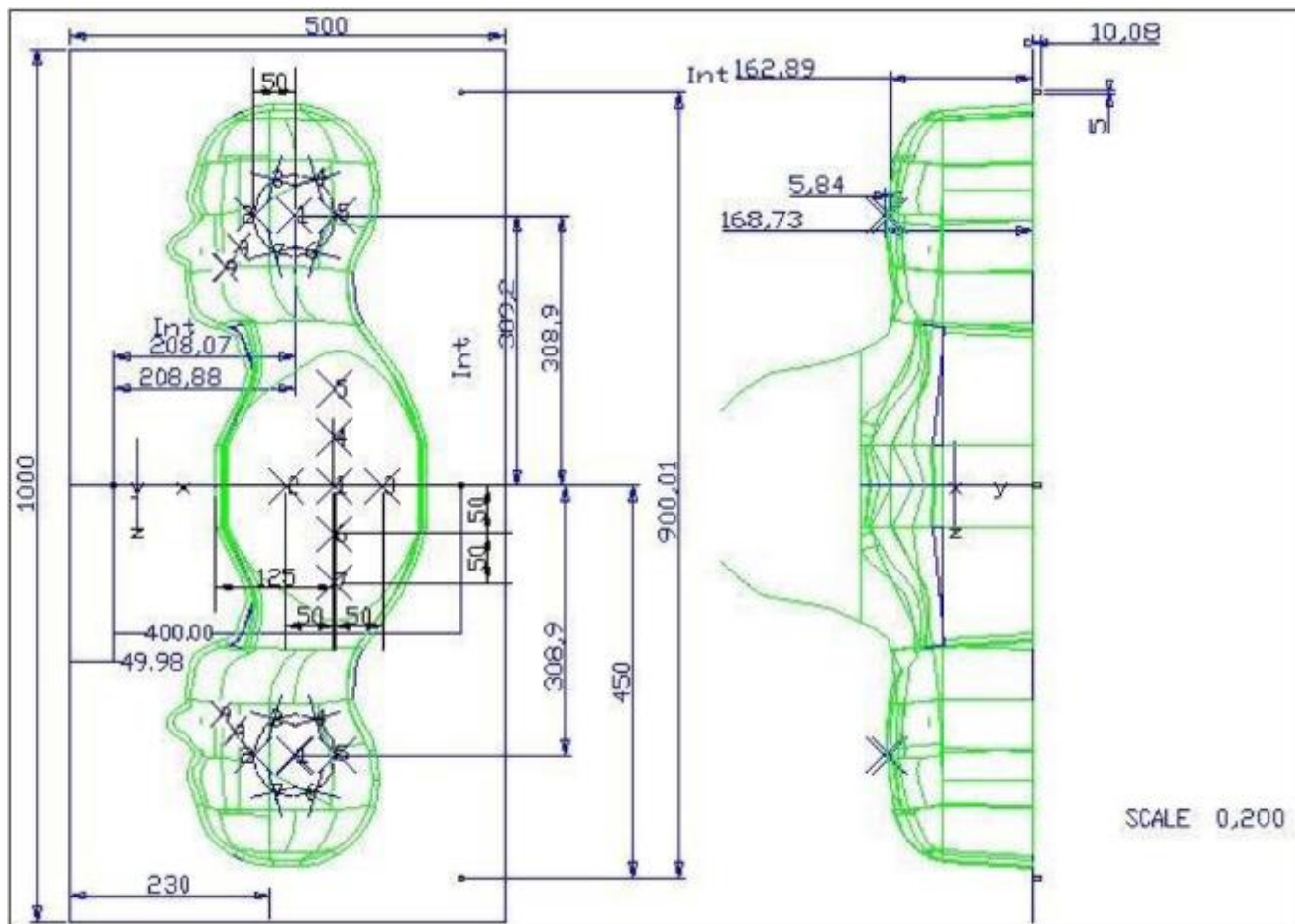
2.4. SAM phantoms

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 Smart Phones.

Serial Number	Shell thickness	Filling volume	Dimensions	Positionner Material	Permittivity	Loss Tangent
SN 16/15 SAM119	2 mm ±0.2 mm	27 liters	Length:1000 mm Width:500 mm Height:200 mm	Gelcoat with fiberglass	3.4	0.02

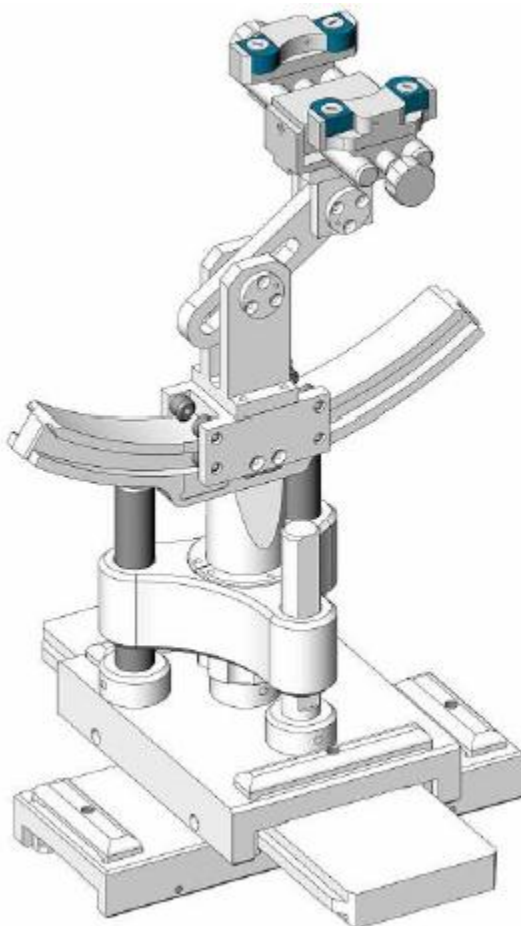


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

The test, based on ultrasonic system, allows measuring the thickness with an accuracy of 10 μm .

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
☒	MVG	E FIELD PROBE	SSE2	3423-EPGO-426	Sep. 18, 2023	Sep. 17, 2024
☐	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	3500 MHz Dipole	SID3500	SN 09/12 DIP 3G500-360	Oct. 15, 2022	Oct. 14, 2025
☐	MVG	3700 MHz Dipole	SID3700	SN 09/12 DIP 3G/700-361	Oct. 15, 2022	Oct. 14, 2025
☐	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
☒	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
☒	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
☒	R&S	Universal radio communication tester	CMU200	105747	Apr. 26, 2024	Apr. 25, 2025

☒	R&S	Wideband radio communication tester	CMW500	103917	Apr. 26, 2024	Apr. 25, 2025
☒	HP	Network Analyzer	8753D	3410J01136	Apr. 26, 2024	Apr. 25, 2025
☒	Agilent	MXG Vector Signal Generator	N5182A	MY47070317	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power meter	E4419B	MY45102538	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	MY41495644	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	US39212148	Apr. 25, 2024	Apr. 24, 2025
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Apr. 26, 2024	Apr. 25, 2027
☒	N/A	Thermometer	N/A	LES-085	Mar. 27, 2023	Mar. 26, 2026
☒	MVG	SAM Phantom	SSM2	SN 16/15 SAM119	NCR	NCR
☒	MVG	Device Holder	SMPPD	SN 16/15 MSH100	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 835	Head 835	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 1800	Head 1800	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 1900	Head 1900	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 2600	Head 2600	NCR	NCR

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 Wi-Fi/BT power measurement, use engineering software to configure EUT Wi-Fi/BT 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 Wi-Fi/BT output power.

<SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT Wi-Fi/BT 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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$			≤ 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: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: 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
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{\text{Zoom}}(n-1)$	
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 using to determinate this 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 to a full 3D scan over a specific area. This 3D scan is useful form multi Tx SAR measurement. Indeed, it is possible with OpenSAR to add, point by point, several volumetric scan to calculate the SAR value of the combined measurement as it is define in the standard IEEE1528 and IEC62209.

3.5. Power Drift

All SAR testing is under the EUT install 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									
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200	5800
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

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.

Photo of Liquid depth for Head Position	Photo of Liquid depth for Body Position
	

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.

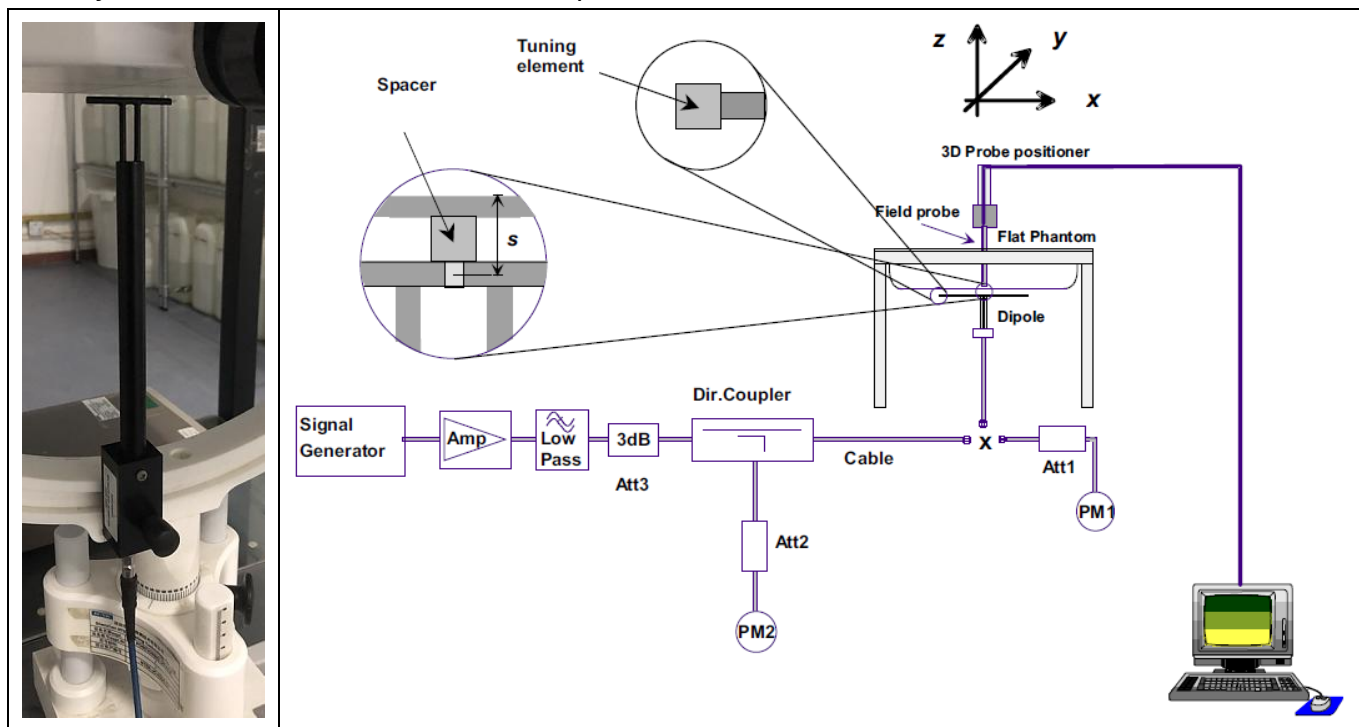
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	$\sigma \text{ (S/m)} (\pm 5\%)$	ϵ_r	$\sigma \text{ (S/m)}$		
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.51	0.91	21.5 °C	Jul. 07, 2024
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.08	1.39	21.7 °C	Jun. 29, 2024
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.87	1.45	21.5 °C	Jul. 08, 2024
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	38.88	1.98	21.4 °C	Jul. 06, 2024

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)		Measured SAR		Liquid Temp.	Test Date
	(±10%)		(Normalized to 1W)			
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
835MHz	9.40 (8.46~10.34)	6.28 (5.65~6.91)	9.52	5.82	21.5 °C	Jul. 07, 2024
1800MHz	37.06 (33.35~40.77)	20.01 (18.01~22.01)	38.05	21.57	21.7 °C	Jun. 29, 2024
1900MHz	39.69 (35.72~43.66)	20.92 (18.83~23.01)	41.31	22.53	21.5 °C	Jul. 08, 2024
2600MHz	54.16 (48.74~59.58)	24.85 (22.37~27.34)	50.54	24.10	21.4 °C	Jul. 06, 2024

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 ($\sim 10\%$ 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”.

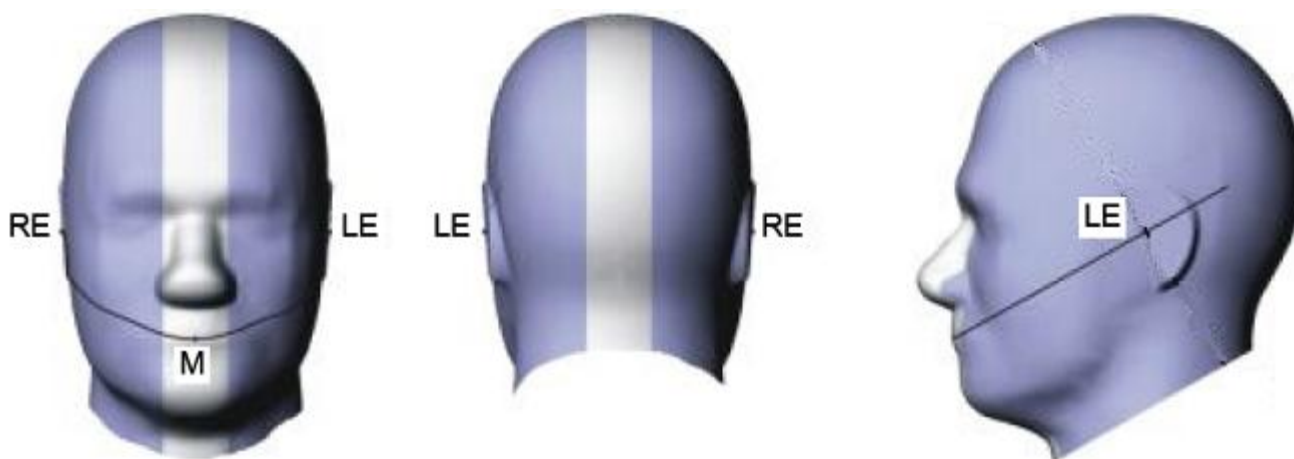


Fig 6.1.1 Front, back, and side views of SAM phantom

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.

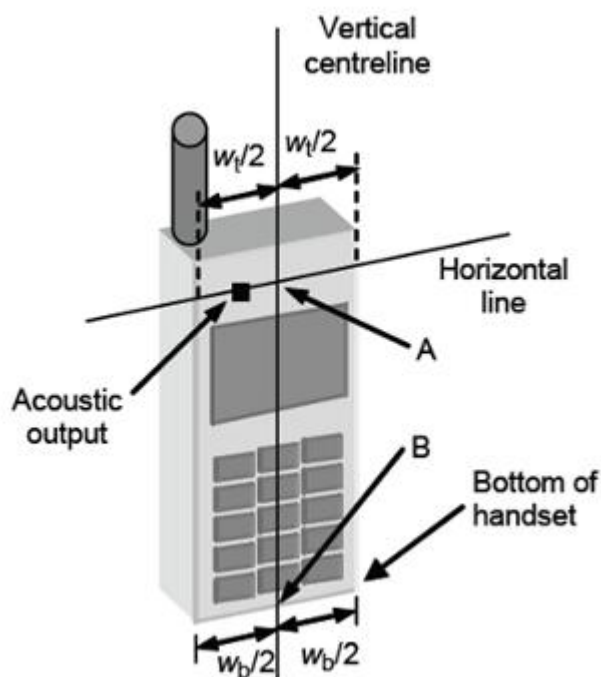


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case"

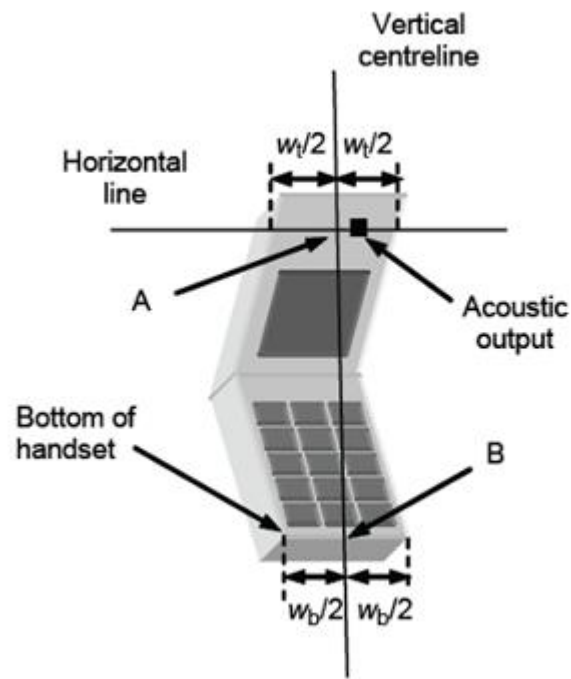


Fig 6.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

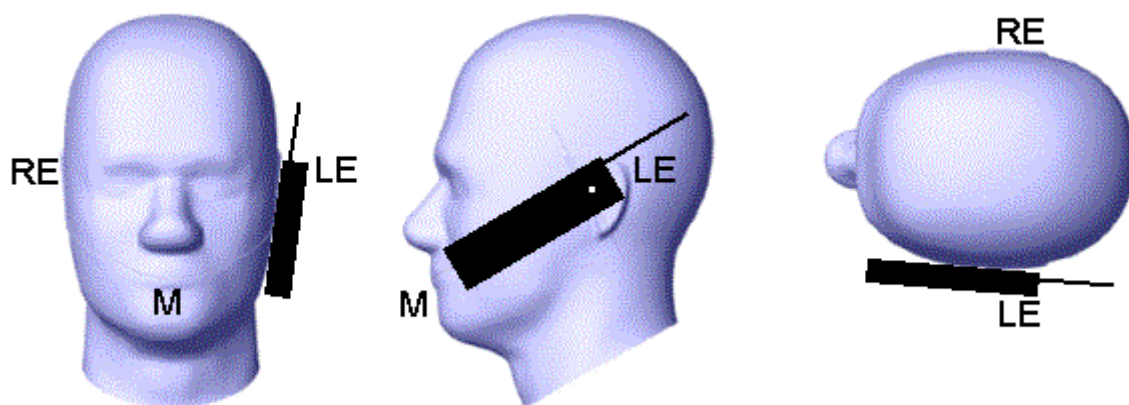


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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.

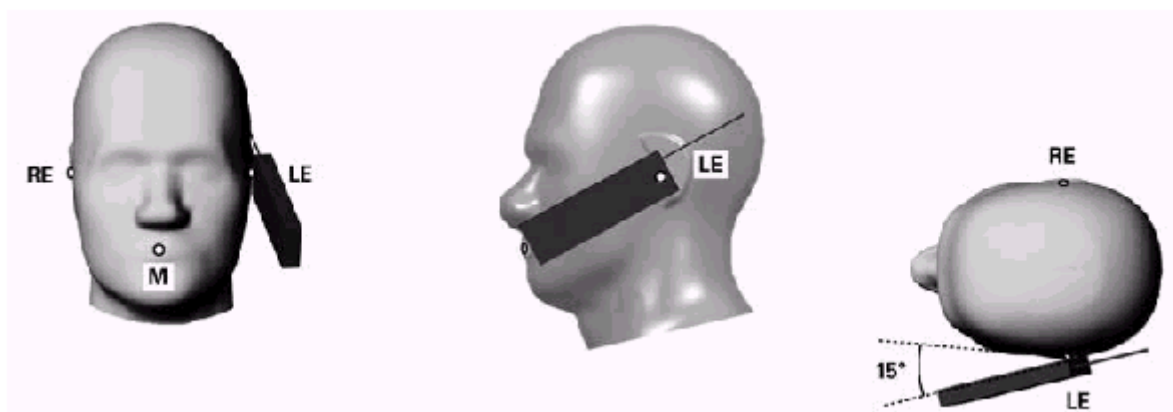


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

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 tested 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.

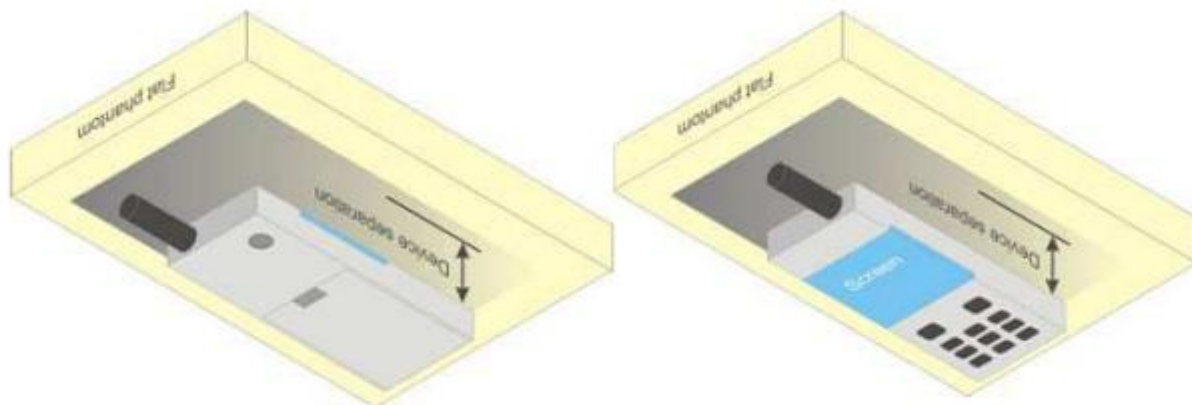


Figure 6.4.1 – Test positions for body-worn devices

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	128	189	251	Tune-up	128	189	251
Frequency (MHz)	(dBm)	824.2	836.4	848.8	(dBm)	824.2	836.4	848.8
GSM (GMSK)	32.50	32.05	32.23	32.21	23.47	23.02	23.20	23.18
GPRS(GMSK,1 Tx slot)	32.50	32.02	32.20	32.16	23.47	22.99	23.17	23.13
GPRS(GMSK,2 Tx slot)	30.50	30.01	30.06	30.05	24.48	23.99	24.04	24.03
GPRS(GMSK,3 Tx slot)	28.50	28.19	28.25	28.27	24.24	23.93	23.99	24.01
GPRS(GMSK,4 Tx slot)	26.50	26.04	26.10	26.17	23.49	23.03	23.09	23.16
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	512	661	810	Tune-up	512	661	810
Frequency (MHz)	(dBm)	1850.2	1880	1909.8	(dBm)	1850.2	1880	1909.8
GSM (GMSK)	29.00	28.51	28.42	28.03	19.97	19.48	19.39	19.00
GPRS(GMSK,1 Tx slot)	29.00	28.57	28.50	28.08	19.97	19.54	19.47	19.05
GPRS(GMSK,2 Tx slot)	26.50	26.34	26.09	25.42	20.48	20.32	20.07	19.40
GPRS(GMSK,3 Tx slot)	25.00	24.82	24.63	24.01	20.74	20.56	20.37	19.75
GPRS(GMSK,4 Tx slot)	23.00	22.78	22.64	22.10	19.99	19.77	19.63	19.09

7.2. WCDMA Conducted Power

WCDMA Band 2	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up	9262	9400	9538
Frequency (MHz)	(dBm)	1852.4	1880	1907.6
RMC12.2K	21.50	21.41	21.18	21.14
HSDPA Sub 1	21.00	20.86	20.36	20.45
HSDPA Sub 2	20.50	20.49	20.12	20.27
HSDPA Sub 3	20.50	20.33	19.83	20.06
HSDPA Sub 4	20.50	20.06	19.66	19.72
HSUPA Sub 1	21.00	20.54	20.35	20.36
HSUPA Sub 2	21.00	20.72	20.30	20.31
HSUPA Sub 3	21.00	20.64	20.08	20.07
HSUPA Sub 4	21.00	20.75	20.31	20.31
HSUPA Sub 5	21.00	20.66	20.33	20.20
WCDMA Band 4	Burst-Averaged output Power (dBm)			

Tx Channel	Tune-up (dBm)	1312	1413	1513
Frequency (MHz)		1712.4	1732.6	1752.6
RMC12.2K	22.50	22.06	21.99	22.08
HSDPA Sub 1	21.50	21.07	21.29	20.84
HSDPA Sub 2	21.50	20.76	21.17	20.66
HSDPA Sub 3	21.00	20.69	20.75	20.50
HSDPA Sub 4	21.00	20.57	20.70	20.30
HSUPA Sub 1	21.50	20.89	21.20	20.67
HSUPA Sub 2	21.50	21.09	21.26	20.72
HSUPA Sub 3	21.50	21.08	21.08	20.42
HSUPA Sub 4	21.50	20.97	21.21	20.74
HSUPA Sub 5	21.00	20.71	20.87	20.83
WCDMA Band 5	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6
RMC12.2K	22.00	21.82	21.86	21.88
HSDPA Sub 1	21.50	21.27	20.89	20.87
HSDPA Sub 2	21.50	21.09	20.64	20.78
HSDPA Sub 3	21.00	20.68	20.21	20.41
HSDPA Sub 4	21.00	20.60	20.10	20.34
HSUPA Sub 1	21.50	21.34	20.62	20.80
HSUPA Sub 2	21.50	21.34	20.89	20.88
HSUPA Sub 3	21.50	21.33	20.75	20.44
HSUPA Sub 4	21.50	21.38	20.88	20.89
HSUPA Sub 5	21.50	21.34	20.85	20.65

7.3. LTE Conducted Power

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	22.50	20.79	21.78	21.79
			1	2	22.50	21.99	21.78	21.74
			1	5	22.50	22.03	21.74	21.75
			3	0	22.50	21.94	21.72	21.67
			3	1	22.50	22.03	21.60	21.65
			3	2	22.50	22.00	21.73	21.68
			6	0	21.00	20.82	20.60	20.63
		16QAM	1	0	22.00	21.91	20.72	20.92
			1	2	22.00	21.96	20.69	21.02
			1	5	22.00	21.88	20.73	20.87
			3	0	21.50	21.12	20.63	21.01
			3	1	21.50	21.06	20.66	21.02
			3	2	21.50	21.05	20.68	20.95
			6	0	20.50	20.22	19.68	20.11
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5
LTE Band 2	3MHz	QPSK	1	0	22.00	20.82	21.80	21.83
			1	7	22.00	21.89	21.74	21.86
			1	14	22.00	21.83	21.84	21.89
			8	0	21.00	20.86	20.76	20.57
			8	4	21.00	20.84	20.77	20.61
			8	7	21.00	20.84	20.60	20.67
			15	0	21.00	20.78	20.72	20.72
		16QAM	1	0	22.00	21.98	20.81	21.06
			1	7	22.00	21.88	20.75	20.96
			1	14	22.00	21.95	20.72	21.01
			8	0	20.50	20.04	19.74	19.72
			8	4	20.50	20.01	19.80	19.97
			8	7	20.50	19.88	19.95	19.99
			15	0	20.50	20.22	19.65	19.95
Band	Band	Modulation	RB		Tune-up	Channel/Frequency(MHz)		

	Width		Configuration		(dBm)			
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5
LTE Band 2	5MHz	QPSK	1	0	22.00	21.92	21.80	21.74
			1	12	22.00	21.83	21.79	21.72
			1	24	22.00	21.76	21.80	21.74
			12	0	21.00	20.94	20.79	20.72
			12	6	21.00	20.90	20.76	20.62
			12	11	21.00	20.95	20.80	20.73
			25	0	21.50	21.02	20.70	20.64
		16QAM	1	0	22.00	21.69	20.95	20.33
			1	12	22.00	21.66	20.94	20.33
			1	24	22.00	21.50	20.93	20.41
			12	0	20.50	20.28	19.78	19.54
			12	6	20.50	20.08	19.70	19.56
			12	11	20.50	20.00	19.91	19.79
			25	0	20.50	20.14	19.92	19.77
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18650/1855	18900/1880	19150/1905
LTE Band 2	10MHz	QPSK	1	0	22.50	22.04	21.68	21.78
			1	24	22.50	21.97	21.70	21.87
			1	49	22.50	21.93	21.78	21.88
			25	0	21.00	20.99	20.81	20.66
			25	12	21.00	20.89	20.73	20.69
			25	24	21.00	20.97	20.75	20.62
			50	0	21.00	20.86	20.86	20.58
		16QAM	1	0	22.50	22.14	21.57	20.96
			1	24	22.50	22.08	21.58	20.93
			1	49	22.50	21.98	21.49	20.99
			25	0	20.50	20.04	20.12	19.68
			25	12	20.50	20.11	19.88	20.02
			25	24	20.50	20.07	20.11	19.79
			50	0	22.00	21.68	21.78	20.77
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5
LTE	15MHz	QPSK	1	0	22.50	20.77	22.09	21.73

Band 2			1	37	22.50	21.97	22.02	21.54
			1	74	22.50	21.84	21.96	21.70
			36	0	21.00	20.91	20.81	20.67
			36	18	21.00	20.84	20.80	20.71
			36	37	21.00	20.84	20.87	20.66
			75	0	21.00	20.91	20.65	20.71
			1	0	22.50	21.85	22.06	21.75
		16QAM	1	37	22.50	21.68	21.93	21.35
			1	74	22.50	21.51	21.86	21.40
			36	0	20.50	20.10	19.99	20.03
			36	18	20.50	20.08	19.78	19.80
			36	37	20.50	19.88	19.99	19.81
			75	0	22.50	22.09	21.73	20.78
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18700/1860	18900/1880	19100/1900
LTE Band 2	20MHz	QPSK	1	0	22.50	20.78	21.84	21.78
			1	49	22.50	22.02	21.68	21.68
			1	99	22.50	21.99	21.63	21.73
			50	0	21.00	20.95	20.90	20.82
			50	24	21.00	20.86	20.86	20.62
			50	49	21.00	20.79	20.93	20.79
			100	0	21.00	20.83	20.79	20.71
		16QAM	1	0	21.50	21.27	20.27	20.81
			1	49	21.50	20.94	20.15	20.79
			1	99	21.50	20.96	20.06	20.79
			50	0	20.50	20.20	20.05	20.04
			50	24	20.50	19.97	19.85	20.10
			50	49	20.50	20.11	19.83	19.88

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19957/1710.7	20175/1732.5	20393/1754.3
LTE Band 4	1.4MHz	QPSK	1	0	23.00	22.58	22.45	22.89
			1	2	23.00	22.52	22.39	22.89
			1	5	23.00	22.58	22.45	22.90
			3	0	23.00	22.52	22.42	22.63
			3	1	23.00	22.52	22.46	22.69

			3	2	23.00	22.49	22.42	22.64
			6	0	22.00	21.42	21.36	21.63
		16QAM	1	0	23.00	22.56	21.51	22.07
			1	2	23.00	22.57	21.51	22.17
			1	5	23.00	22.65	21.54	22.24
			3	0	22.50	21.72	21.40	21.96
			3	1	22.50	21.68	21.44	22.05
			3	2	22.50	21.72	21.54	22.01
			6	0	21.50	20.68	20.65	21.07
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19965/1711.5	20175/1732.5	20385/1753.5
LTE Band 4	3MHz	QPSK	1	0	23.00	22.44	22.45	22.82
			1	7	23.00	22.48	22.46	22.85
			1	14	23.00	22.52	22.45	22.89
			8	0	22.00	21.59	21.43	21.48
			8	4	22.00	21.59	21.48	21.56
			8	7	22.00	21.53	21.48	21.58
			15	0	22.00	21.57	21.45	21.54
		16QAM	1	0	23.00	22.56	22.31	22.02
			1	7	23.00	22.64	22.30	22.15
			1	14	23.00	22.73	22.29	22.11
			8	0	21.00	20.50	20.77	20.57
			8	4	21.00	20.48	20.73	20.59
			8	7	21.00	20.54	20.70	20.96
			15	0	21.00	20.69	20.59	20.51
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19975/1712.5	20175/1732.5	20375/1752.5
LTE Band 4	5MHz	QPSK	1	0	23.00	22.40	22.51	22.44
			1	12	23.00	22.46	22.50	22.56
			1	24	23.00	22.44	22.51	22.62
			12	0	22.00	21.57	21.49	21.63
			12	6	22.00	21.53	21.43	21.48
			12	11	22.00	21.60	21.55	21.57
			25	0	22.00	21.61	21.55	21.58
		16QAM	1	0	22.00	21.46	21.60	21.24
			1	12	22.00	21.51	21.65	21.23

			1	24	22.00	21.60	21.69	21.31
			12	0	21.00	20.50	20.51	20.87
			12	6	21.00	20.55	20.40	20.48
			12	11	21.00	20.58	20.39	20.48
			25	0	21.00	20.53	20.62	20.60
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20000/1715	20175/1732.5	20350/1750
LTE Band 4	10MHz	QPSK	1	0	23.00	22.50	22.41	22.68
			1	24	23.00	22.49	22.50	22.84
			1	49	23.00	22.57	22.34	22.89
			25	0	22.00	21.55	21.52	21.49
			25	12	22.00	21.61	21.47	21.51
			25	24	22.00	21.63	21.53	21.49
			50	0	22.00	21.65	21.46	21.59
		16QAM	1	0	23.00	22.74	22.37	22.54
			1	24	23.00	22.90	22.29	22.68
			1	49	23.00	22.76	22.26	22.76
			25	0	21.00	20.50	20.63	20.57
			25	12	21.00	20.58	20.56	20.64
			25	24	21.00	20.51	20.54	20.57
			50	0	23.00	22.41	22.68	22.60
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717.5	20175/1732.5	20325/1747.5
LTE Band 4	15MHz	QPSK	1	0	23.00	22.60	22.45	22.28
			1	37	23.00	22.54	22.59	22.28
			1	74	23.00	22.58	22.30	22.39
			36	0	22.00	21.67	21.47	21.55
			36	18	22.00	21.57	21.54	21.54
			36	37	22.00	21.64	21.53	21.54
			75	0	22.00	21.56	21.52	21.49
		16QAM	1	0	23.00	22.82	22.39	22.32
			1	37	23.00	22.77	22.35	22.39
			1	74	23.00	22.79	22.30	22.49
			36	0	21.50	20.74	20.74	20.46
			36	18	21.50	20.70	20.69	20.54
			36	37	21.50	20.61	21.05	20.93

			75	0	23.00	22.45	22.28	22.75
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20050/1720	20175/1732.5	20300/1745
LTE Band 4	20MHz	QPSK	1	0	23.00	22.75	22.49	22.43
			1	49	23.00	22.66	22.42	22.43
			1	99	23.00	22.66	22.49	22.54
			50	0	22.00	21.68	21.53	21.39
			50	24	22.00	21.59	21.51	21.58
			50	49	22.00	21.55	21.49	21.59
			100	0	22.00	21.49	21.54	21.52
		16QAM	1	0	22.50	21.30	21.67	22.06
			1	49	22.50	21.23	21.60	22.01
			1	99	22.50	21.30	21.55	22.22
			50	0	21.50	20.82	20.59	20.67
			50	24	21.50	20.73	20.51	20.65
			50	49	21.50	21.17	20.96	20.70

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20407/824.7	20525/836.5	20643/848.3
LTE Band 5	1.4MHz	QPSK	1	0	23.00	22.36	22.30	22.62
			1	2	23.00	22.35	22.28	22.61
			1	5	23.00	22.34	22.28	22.69
			3	0	23.00	22.33	22.32	22.36
			3	1	23.00	22.30	22.38	22.52
			3	2	23.00	22.39	22.29	22.40
			6	0	21.50	21.29	21.32	21.34
		16QAM	1	0	23.00	22.31	22.06	22.43
			1	2	23.00	22.33	22.16	22.43
			1	5	23.00	22.32	22.16	22.54
			3	0	22.00	21.56	21.45	21.75
			3	1	22.00	21.56	21.39	21.77
			3	2	22.00	21.55	21.44	21.73
			6	0	21.00	20.37	20.34	20.51
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB	RB		20415/825.5	20525/836.5	20635/847.5

			Size	Offset				
LTE Band 5	3MHz	QPSK	1	0	23.00	22.25	22.30	22.61
			1	7	23.00	22.33	22.30	22.64
			1	14	23.00	22.38	22.33	22.59
			8	0	21.50	21.22	21.24	21.33
			8	4	21.50	21.32	21.30	21.34
			8	7	21.50	21.32	21.25	21.34
			15	0	21.50	21.28	21.25	21.41
		16QAM	1	0	22.50	22.39	22.07	22.25
			1	7	22.50	22.37	22.09	22.24
			1	14	22.50	22.33	22.10	22.29
			8	0	21.00	20.31	20.61	20.79
			8	4	21.00	20.25	20.68	20.69
			8	7	21.00	20.27	20.63	20.34
			15	0	21.00	20.40	20.41	20.70
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20425/826.5	20525/836.5	20625/846.5
LTE Band 5	5MHz	QPSK	1	0	22.50	22.20	22.44	22.12
			1	12	22.50	22.22	22.43	22.14
			1	24	22.50	22.18	22.45	22.12
			12	0	21.50	21.34	21.33	21.35
			12	6	21.50	21.39	21.32	21.24
			12	11	21.50	21.33	21.33	21.31
			25	0	21.50	21.35	21.35	21.32
		16QAM	1	0	22.00	21.51	20.98	21.37
			1	12	22.00	21.52	20.98	21.29
			1	24	22.00	21.50	21.06	21.29
			12	0	21.00	20.26	20.26	20.39
			12	6	21.00	20.30	20.34	20.68
			12	11	21.00	20.32	20.26	20.72
			25	0	21.00	20.39	20.43	20.74
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20450/829	20525/836.5	20600/844
LTE Band	10MHz	QPSK	1	0	23.00	22.23	22.20	22.50
			1	24	23.00	22.30	22.29	22.54

5			1	49	23.00	22.17	22.27	22.58
			25	0	21.50	21.29	21.26	21.34
			25	12	21.50	21.27	21.24	21.35
			25	24	21.50	21.25	21.36	21.37
			50	0	21.50	21.20	21.31	21.26
		16QAM	1	0	23.00	22.46	22.07	21.73
			1	24	23.00	22.51	22.03	21.67
			1	49	23.00	22.53	22.12	21.69
			25	0	21.00	20.36	20.49	20.50
			25	12	21.00	20.33	20.50	20.46
			25	24	21.00	20.33	20.75	20.80

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20775/2502.5	21100/2535	21425/2567.5
LTE Band 7	5MHz	QPSK	1	0	23.00	21.83	22.47	22.72
			1	12	23.00	21.84	22.38	22.74
			1	24	23.00	21.89	22.49	22.69
			12	0	22.00	20.88	21.36	21.70
			12	6	22.00	20.99	21.46	21.76
			12	11	22.00	20.98	21.32	21.73
			25	0	22.00	20.87	21.35	21.81
		16QAM	1	0	22.50	21.21	21.09	22.09
			1	12	22.50	21.20	21.20	22.18
			1	24	22.50	21.32	21.14	22.14
			12	0	21.00	19.81	20.29	20.74
			12	6	21.00	19.91	20.43	20.74
			12	11	21.00	19.92	20.39	20.70
			25	0	21.00	20.07	20.52	20.86
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20800/2505	21100/2535	21400/2565
LTE Band 7	10MHz	QPSK	1	0	23.00	21.89	22.33	22.78
			1	24	23.00	22.02	22.37	22.97
			1	49	23.00	21.94	22.51	22.97
			25	0	22.00	20.96	21.35	21.71
			25	12	22.00	21.07	21.39	21.63
			25	24	22.00	21.09	21.49	21.80

			50	0	22.00	21.03	21.44	21.67
		16QAM	1	0	22.50	22.04	21.24	21.56
			1	24	22.50	22.09	21.43	21.59
			1	49	22.50	22.20	21.41	21.65
			25	0	21.00	19.96	20.37	20.78
			25	12	21.00	20.05	20.56	20.70
			25	24	21.00	19.91	20.59	20.82
			50	0	23.00	22.33	22.78	21.92
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5
LTE Band 7	15MHz	QPSK	1	0	23.00	21.92	22.24	22.28
			1	37	23.00	21.88	22.36	22.37
			1	74	23.00	22.01	22.52	22.47
			36	0	22.00	20.99	21.30	21.70
			36	18	22.00	21.00	21.37	21.69
			36	37	22.00	20.94	21.44	21.87
			75	0	22.00	21.03	21.43	21.72
		16QAM	1	0	23.00	22.03	22.02	22.67
			1	37	23.00	22.10	22.05	22.82
			1	74	23.00	22.22	22.06	22.76
			36	0	21.50	20.13	20.60	21.06
			36	18	21.50	20.00	20.59	20.76
			36	37	21.50	20.19	20.56	20.72
			75	0	22.50	22.24	22.28	22.05
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20850/2510	21100/2535	21350/2560
LTE Band 7	20MHz	QPSK	1	0	23.00	22.05	22.04	22.44
			1	49	23.00	21.98	22.18	22.54
			1	99	23.00	22.14	22.30	22.68
			50	0	22.00	21.02	21.28	21.57
			50	24	22.00	20.96	21.36	21.59
			50	49	22.00	21.09	21.52	21.79
			100	0	22.00	21.01	21.46	21.71
		16QAM	1	0	22.50	20.79	21.36	22.02
			1	49	22.50	20.70	21.66	21.99
			1	99	22.50	20.91	21.63	22.11

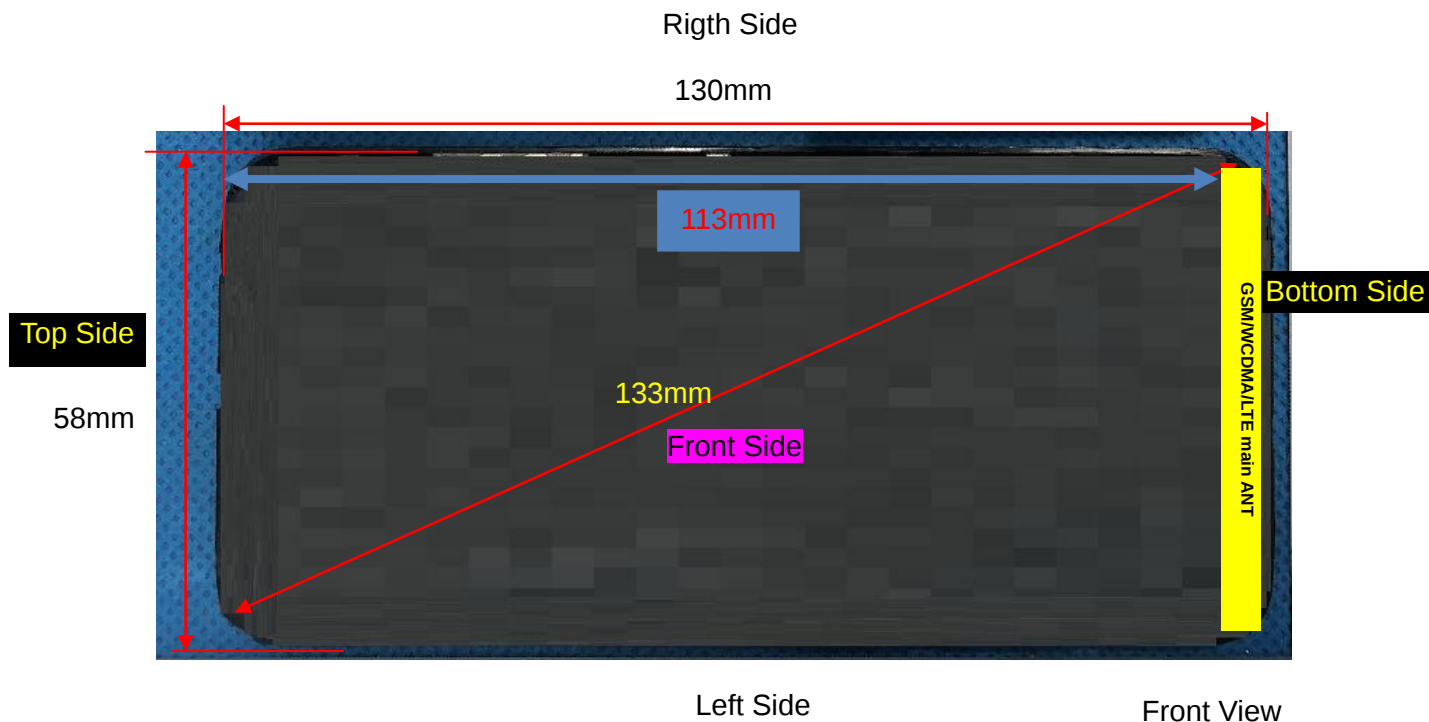
			50	0	21.50	20.23	20.44	20.77
			50	24	21.50	20.19	20.49	21.16
			50	49	21.50	20.31	20.52	20.78

7.4. Bluetooth Output Power

BR+EDR	Output Power (dBm)				
	Channel	Tune-up (dBm)	Data Rates		
			1M	2M	3M
	0CH	2	0.02	1.31	1.55
	39CH	2	0.20	1.37	1.62
	78CH	-2	-2.49	-1.29	-1.04

NOTE: Power measurement results of Bluetooth.

8. Antenna Location



Note: Since the confidentiality request of EUT, the antenna location example diagram see as above.

Distance of the Antenna to the EUT surface/edge						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WWAN Main ANT	≤ 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 ANT	Yes	Yes	Yes	Yes	NO	Yes

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:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}]$
 ≤ 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	2.00	1.58	5	2.480	0.50	3	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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] * $[\sqrt{f_{\text{GHz}}}/x]$ 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	2.00	1.58	5	2.48	7.5	0.067
Bluetooth	Body	2.00	1.58	10	2.48	7.5	0.033

NOTE: Estimated SAR calculation for Bluetooth

10. SAR Results

10.1. SAR measurement Result

10.1.1. SAR measurement Result of GSM850

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	189/836.4	GPRS(GMSK 2TS)	0.548	0.377	-2.70	30.06	30.50	0.606	2024/7/07	1#
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 2TS)	0.282	0.188	2.99	30.06	30.50	0.312	2024/7/07	
Right Cheek	189/836.4	GPRS(GMSK 2TS)	0.489	0.333	0.03	30.06	30.50	0.541	2024/7/07	
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 2TS)	0.224	0.148	-1.42	30.06	30.50	0.248	2024/7/07	

NOTE: Head SAR test results of GSM850.

[illegible]

with 10mm								(W/Kg)		
Front Side	189/836.4	GPRS(GMSK 2TS)	0.402	0.277	-3.97	30.06	30.50	0.445	2024/7/07	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.651	0.462	3.70	30.06	30.50	0.720	2024/7/07	2#

NOTE: Body-Worn SAR test results of GSM850

10.1.2. SAR measurement Result of GSM1900

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	661/1880	GPRS(GMSK 3TS)	0.174	0.108	-1.08	24.63	25.00	0.189	2024/7/08	3#
Left Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.103	0.062	2.48	24.63	25.00	0.112	2024/7/08	
Right Cheek	661/1880	GPRS(GMSK 3TS)	0.163	0.096	3.63	24.63	25.00	0.177	2024/7/08	
Right Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.086	0.053	2.61	24.63	25.00	0.094	2024/7/08	

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)	Date	Plot
			1g	10g						
Front Side	661/1880	GPRS(GMSK 3TS)	0.264	0.143	2.92	24.63	25.00	0.287	2024/7/08	
Back Side	661/1880	GPRS(GMSK 3TS)	0.413	0.231	-4.61	24.63	25.00	0.450	2024/7/08	4#

NOTE: Body-Worn SAR test results of GSM1900

10.1.3. SAR measurement Result of WCDMA Band 2

Test Position of Head	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g	Date	Plot
			1-g	10-g						

								(W/Kg)		
Left Cheek	9400/1880	RMC12.2K	0.415	0.251	-4.38	21.18	21.50	0.447	2024/7/08	5#
Left Tilt 15 Degree	9400/1880	RMC12.2K	0.233	0.140	-2.76	21.18	21.50	0.251	2024/7/08	
Right Cheek	9400/1880	RMC12.2K	0.379	0.229	2.32	21.18	21.50	0.408	2024/7/08	
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.178	0.103	3.56	21.18	21.50	0.192	2024/7/08	

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)	Date	Plot
			1g	10g						
Front Side	9400/1880	RMC12.2K	0.480	0.271	-2.08	21.18	21.50	0.517	2024/7/08	
Back Side	9400/1880	RMC12.2K	0.779	0.440	-0.57	21.18	21.50	0.839	2024/7/08	6#
Back Side	9262/1852.4	RMC12.2K	0.711	0.382	1.22	21.41	21.50	0.726	2024/7/08	
Back Side	9538/1907.6	RMC12.2K	0.656	0.352	1.34	21.14	21.50	0.713	2024/7/08	

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

10.1.4. SAR measurement Result of WCDMA Band 4

Test Position of Head	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	1413/1732.6	RMC12.2K	0.289	0.187	-1.12	21.99	22.50	0.325	2024/6/29	7#
Left Tilt 15 Degree	1413/1732.6	RMC12.2K	0.165	0.102	3.92	21.99	22.50	0.186	2024/6/29	
Right Cheek	1413/1732.6	RMC12.2K	0.248	0.152	-1.55	21.99	22.50	0.279	2024/6/29	
Right Tilt 15 Degree	1413/1732.6	RMC12.2K	0.124	0.080	1.57	21.99	22.50	0.139	2024/6/29	

NOTE: Head SAR test results of WCDMA Band 4

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

with 10mm								(W/Kg)		
Front Side	1413/1732.6	RMC12.2K	0.258	0.139	2.60	21.99	22.50	0.290	2024/6/29	
Back Side	1413/1732.6	RMC12.2K	0.411	0.226	-1.06	21.99	22.50	0.462	2024/6/29	8#

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

10.1.5. SAR measurement Result of WCDMA Band 5

Test Position of Head	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	4182/836.4	RMC12.2K	0.344	0.242	0.65	21.86	22.00	0.355	2024/7/07	9#
Left Tilt 15 Degree	4182/836.4	RMC12.2K	0.182	0.122	-1.42	21.86	22.00	0.188	2024/7/07	
Right Cheek	4182/836.4	RMC12.2K	0.309	0.211	-3.88	21.86	22.00	0.319	2024/7/07	
Right Tilt 15 Degree	4182/836.4	RMC12.2K	0.141	0.095	3.60	21.86	22.00	0.146	2024/7/07	

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)	Date	Plot
			1g	10g						
Front Side	4182/836.4	RMC12.2K	0.276	0.198	-3.49	21.86	22.00	0.285	2024/7/07	
Back Side	4182/836.4	RMC12.2K	0.443	0.321	-0.51	21.86	22.00	0.458	2024/7/07	10#

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

10.1.6. SAR measurement Result of LTE Band 2

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	18900/1880	20M QPSK(1,49)	0.415	0.254	-0.68	21.68	22.50	0.501	2024/7/08	11#
Left Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.213	0.130	-2.53	21.68	22.50	0.257	2024/7/08	

Right Cheek	18900/1880	20M QPSK(1,49)	0.378	0.220	0.81	21.68	22.50	0.457	2024/7/08	
Right Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.176	0.107	3.64	21.68	22.50	0.213	2024/7/08	
50%RB										
Left Cheek	18900/1880	20M QPSK(50,0)	0.211	0.145	3.75	20.90	21.00	0.216	2024/7/08	
Left Tilt 15 Degree	18900/1880	20M QPSK(50,0)	0.121	0.072	4.34	20.90	21.00	0.124	2024/7/08	
Right Cheek	18900/1880	20M QPSK(50,0)	0.199	0.112	0.08	20.90	21.00	0.204	2024/7/08	
Right Tilt 15 Degree	18900/1880	20M QPSK(50,0)	0.094	0.060	-1.49	20.90	21.00	0.096	2024/7/08	

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)	Date	Plot
			1g	10g						
1RB										
Front Side	18900/1880	20M QPSK(1,49)	0.570	0.297	-0.02	21.68	22.50	0.688	2024/7/08	
Back Side	18900/1880	20M QPSK(1,49)	0.860	0.459	3.65	21.68	22.50	1.039	2024/7/08	
Back Side	18700/1860	20M QPSK(1,49)	0.933	0.515	0.00	22.02	22.50	1.042	2024/7/08	12#
Back Side	19100/1900	20M QPSK(1,49)	0.850	0.466	2.78	21.68	22.50	1.027	2024/7/08	
50%RB										
Front Side	18900/1880	20M QPSK(50,0)	0.292	0.164	-1.38	20.90	21.00	0.299	2024/7/08	
Back Side	18900/1880	20M QPSK(50,0)	0.535	0.279	2.68	20.90	21.00	0.547	2024/7/08	
100%RB										
Back Side	18900/1880	20M QPSK(100,0)	0.476	0.271	-4.57	20.79	21.00	0.500	2024/7/08	

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

10.1.7. SAR measurement Result of LTE Band 4

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	20175/1732.5	20M QPSK(1,0)	0.221	0.141	-0.90	22.49	23.00	0.249	2024/6/29	13#
Left Tilt 15 Degree	20175/1732.5	20M QPSK(1,0)	0.122	0.074	3.38	22.49	23.00	0.137	2024/6/29	
Right Cheek	20175/1732.5	20M QPSK(1,0)	0.206	0.131	2.75	22.49	23.00	0.232	2024/6/29	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,0)	0.099	0.060	-1.91	22.49	23.00	0.111	2024/6/29	
50%RB										
Left Cheek	20175/1732.5	20M QPSK(50,0)	0.117	0.071	-3.95	21.53	22.00	0.130	2024/6/29	
Left Tilt 15 Degree	20175/1732.5	20M QPSK(50,0)	0.071	0.040	-0.06	21.53	22.00	0.079	2024/6/29	
Right Cheek	20175/1732.5	20M QPSK(50,0)	0.107	0.067	-3.14	21.53	22.00	0.119	2024/6/29	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(50,0)	0.051	0.032	-3.42	21.53	22.00	0.057	2024/6/29	

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)	Date	Plot
			1g	10g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,0)	0.252	0.133	-0.51	22.49	23.00	0.283	2024/6/29	
Back Side	20175/1732.5	20M	0.371	0.204	-4.79	22.49	23.00	0.417	2024/6/29	14#

		QPSK(1,0)								
50%RB										
Front Side	20175/1732.5	20M QPSK(50,0)	0.148	0.078	0.51	21.53	22.00	0.165	2024/6/29	
Back Side	20175/1732.5	20M QPSK(50,0)	0.207	0.105	-3.87	21.53	22.00	0.231	2024/6/29	

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

10.1.8. SAR measurement Result of LTE Band 5

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	20525/836.5	10M QPSK(1,49)	0.379	0.273	-4.88	22.27	23.00	0.448	2024/7/07	15#
Left Tilt 15 Degree	20525/836.5	10M QPSK(1,49)	0.216	0.156	3.28	22.27	23.00	0.256	2024/7/07	
Right Cheek	20525/836.5	10M QPSK(1,49)	0.326	0.230	2.84	22.27	23.00	0.386	2024/7/07	
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,49)	0.147	0.101	0.71	22.27	23.00	0.174	2024/7/07	
50%RB										
Left Cheek	20525/836.5	10M QPSK(25,24)	0.196	0.152	0.45	21.36	21.50	0.202	2024/7/07	
Left Tilt 15 Degree	20525/836.5	10M QPSK(25,24)	0.128	0.089	-2.10	21.36	21.50	0.132	2024/7/07	
Right Cheek	20525/836.5	10M QPSK(25,24)	0.186	0.132	-0.92	21.36	21.50	0.192	2024/7/07	
Right Tilt 15 Degree	20525/836.5	10M QPSK(25,24)	0.079	0.051	0.42	21.36	21.50	0.082	2024/7/07	

NOTE: Head SAR test results of LTE Band 5

Test Position	Test channel	Test Mode	SAR Value (W/kg)	Power Drift	Conducted power	Tune-up power	Scaled SAR	Date	Plot
------------------	-----------------	-----------	---------------------	----------------	--------------------	------------------	---------------	------	------

of Body-Worn with 10mm	/Freq.		1g	10g	(±5%)	(dBm)	(dBm)	1g (W/Kg)		
1RB										
Front Side	20525/836.5	10M QPSK(1,49)	0.300	0.214	-2.92	22.27	23.00	0.355	2024/7/07	
Back Side	20525/836.5	10M QPSK(1,49)	0.493	0.356	-0.76	22.27	23.00	0.583	2024/7/07	16#
50%RB										
Front Side	20525/836.5	10M QPSK(25,24)	0.151	0.122	-1.55	21.36	21.50	0.156	2024/7/07	
Back Side	20525/836.5	10M QPSK(25,24)	0.254	0.201	-1.41	21.36	21.50	0.262	2024/7/07	

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

10.1.9. SAR measurement Result of LTE Band 7

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	21100/2535	20M QPSK(1,99)	0.038	0.024	-1.24	22.30	23.00	0.045	2024/7/06	17#
Left Tilt 15 Degree	21100/2535	20M QPSK(1,99)	0.021	0.013	2.96	22.30	23.00	0.025	2024/7/06	
Right Cheek	21100/2535	20M QPSK(1,99)	0.033	0.020	1.46	22.30	23.00	0.039	2024/7/06	
Right Tilt 15 Degree	21100/2535	20M QPSK(1,99)	0.016	0.014	1.06	22.30	23.00	0.019	2024/7/06	
50%RB										
Left Cheek	21100/2535	20M QPSK(50,49)	0.020	0.012	1.59	21.52	22.00	0.022	2024/7/06	
Left Tilt 15 Degree	21100/2535	20M QPSK(50,0)	0.012	0.007	-0.71	21.52	22.00	0.013	2024/7/06	

Right Cheek	21100/2535	20M QPSK(50,0)	0.019	0.012	1.09	21.52	22.00	0.021	2024/7/06	
Right Tilt 15 Degree	21100/2535	20M QPSK(50,0)	0.009	0.008	0.01	21.52	22.00	0.010	2024/7/06	

NOTE: Head SAR test results of LTE Band 7

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	21100/2535	20M QPSK(1,99)	0.342	0.164	-0.35	22.30	23.00	0.402	2024/7/06	
Back Side	21100/2535	20M QPSK(1,99)	0.561	0.274	-1.45	22.30	23.00	0.659	2024/7/06	18#
50%RB										
Front Side	21100/2535	20M QPSK(50,0)	0.180	0.092	3.20	21.52	22.00	0.201	2024/7/06	
Back Side	21100/2535	20M QPSK(50,0)	0.298	0.149	3.45	21.52	22.00	0.333	2024/7/06	

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

10.2. Simultaneous Transmission Analysis

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Head	Left Cheek	0.501	0.067	0.568	N/A	N/A
	Left Tilt 15 Degree	0.312	0.067	0.379	N/A	N/A
	Right Cheek	0.541	0.067	0.608	N/A	N/A
	Right Tilt 15 Degree	0.248	0.067	0.315	N/A	N/A
Body-Worn	Front Side	0.688	0.033	0.721	N/A	N/A
	Back Side	1.042	0.033	1.075	N/A	N/A

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

Table of contents
MEASUREMENT 2 System Performance Check - 835MHz
MEASUREMENT 3 System Performance Check - 1800MHz
MEASUREMENT 5 System Performance Check - 2450MHz
MEASUREMENT 6 System Performance Check - 2600MHz

MEASUREMENT 1

Date of measurement: 7/7/2024

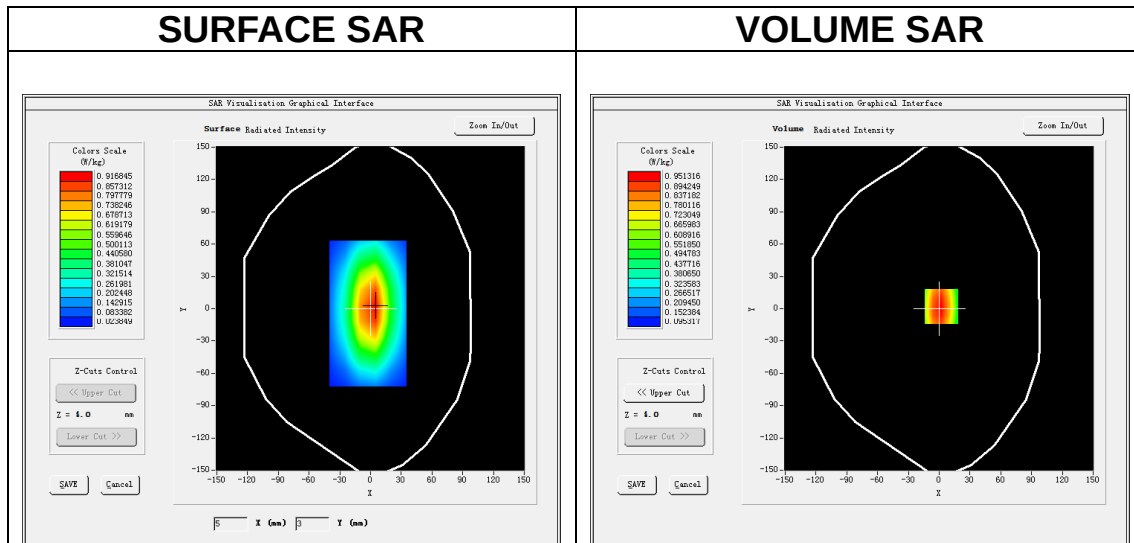
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW835</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.513135
Relative permittivity (imaginary part)	19.549945
Conductivity (S/m)	0.906900
Variation (%)	1.970000

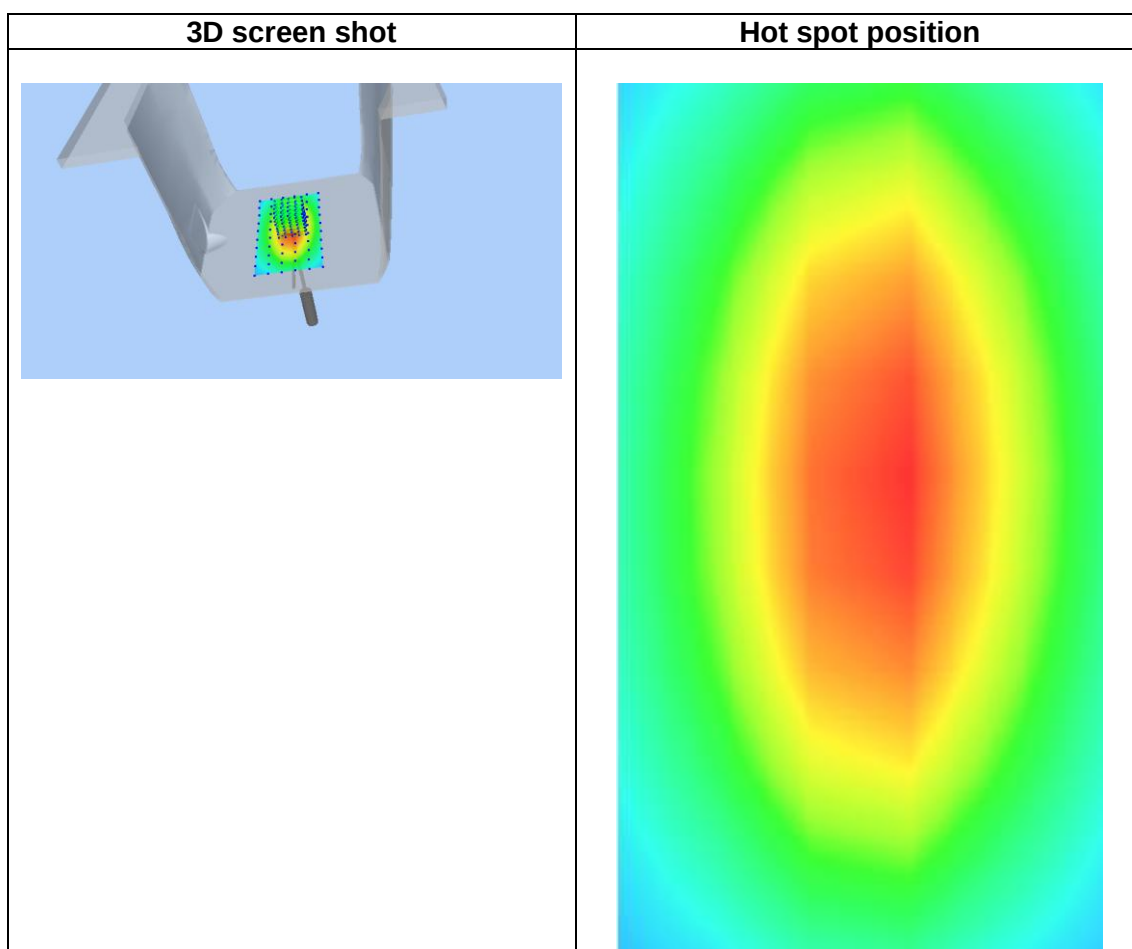
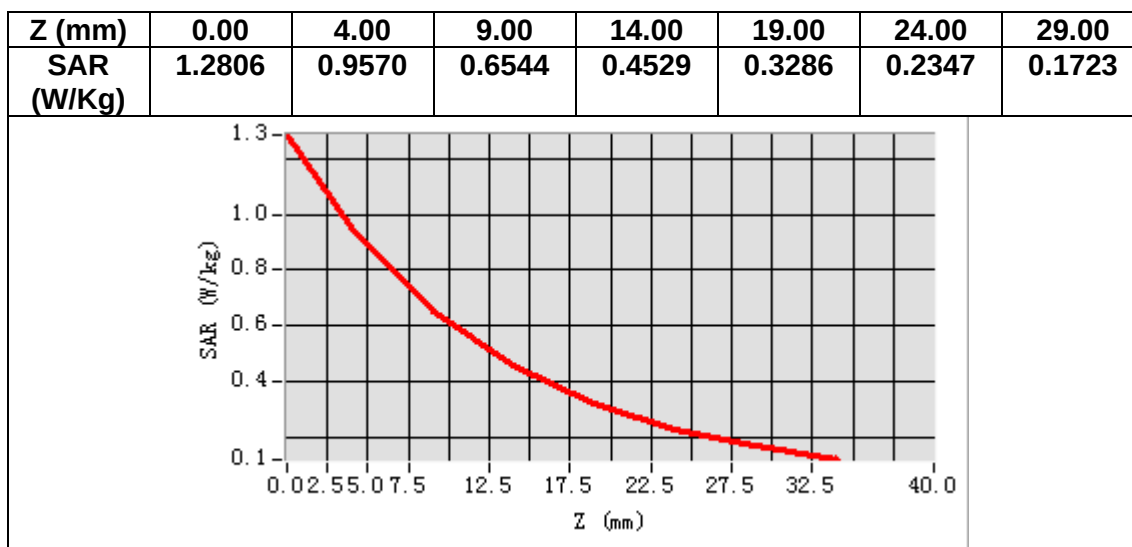
SURFACE SAR



Maximum location: X=2.00, Y=2.00

SAR Peak: 1.29 W/kg

SAR 10g (W/Kg)	0.582191
SAR 1g (W/Kg)	0.952231



MEASUREMENT 2

Date of measurement: 29/6/2024

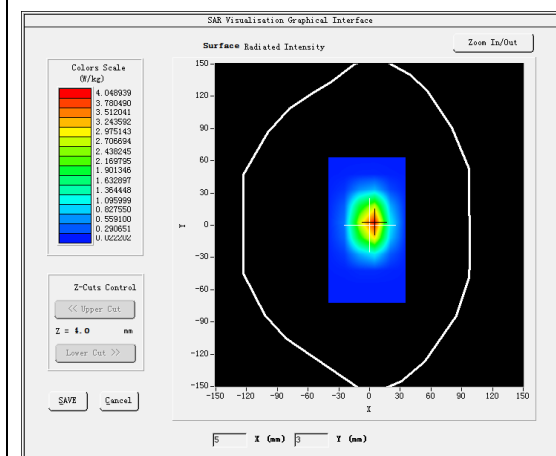
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW1800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

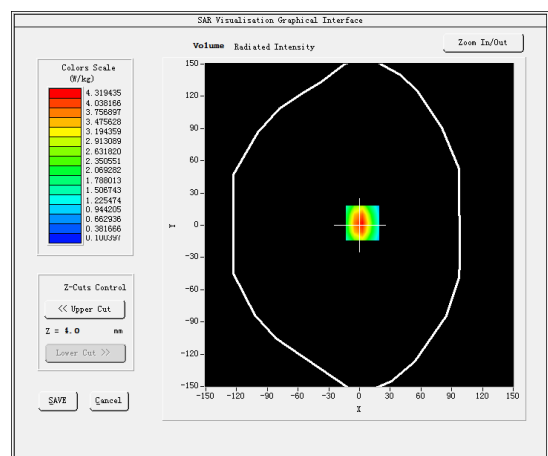
B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.077704
Relative permittivity (imaginary part)	13.865005
Conductivity (S/m)	1.386501
Variation (%)	-2.520000

SURFACE SAR



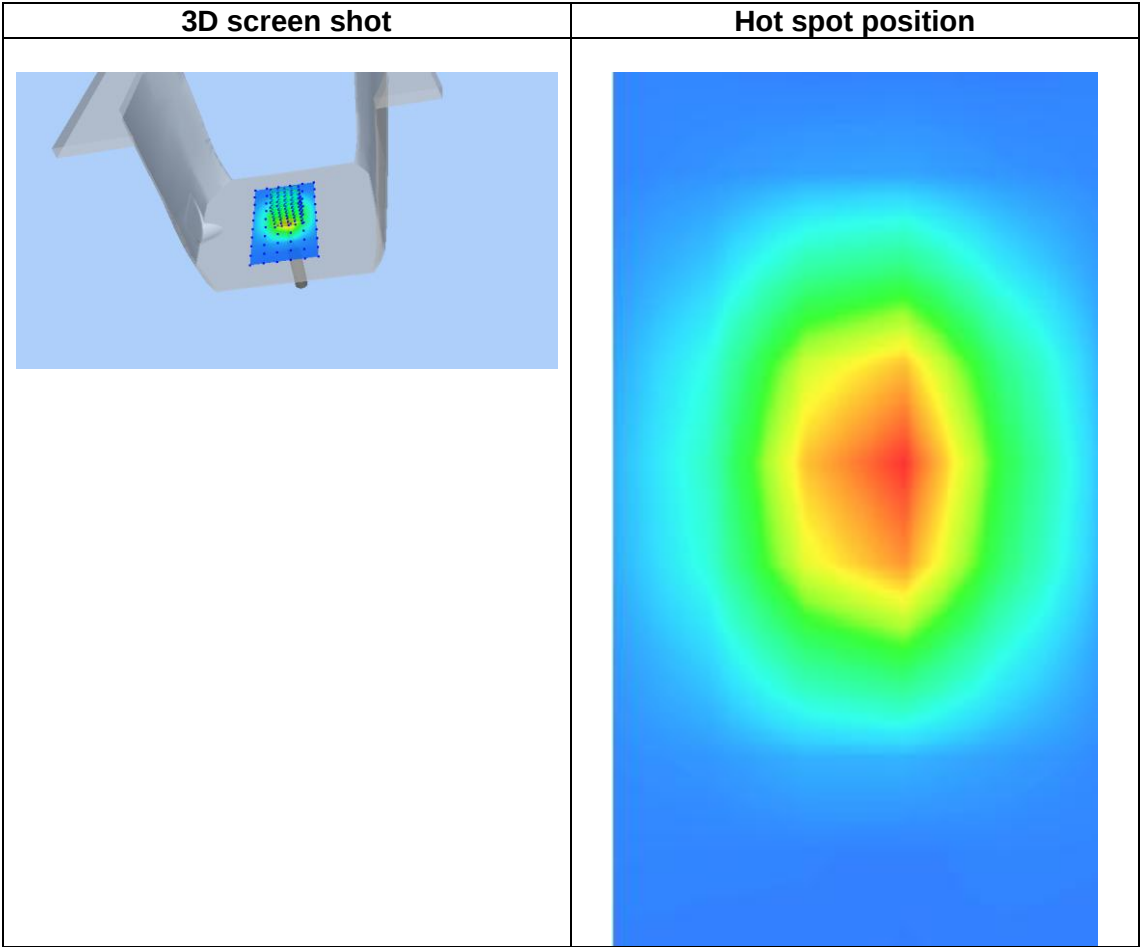
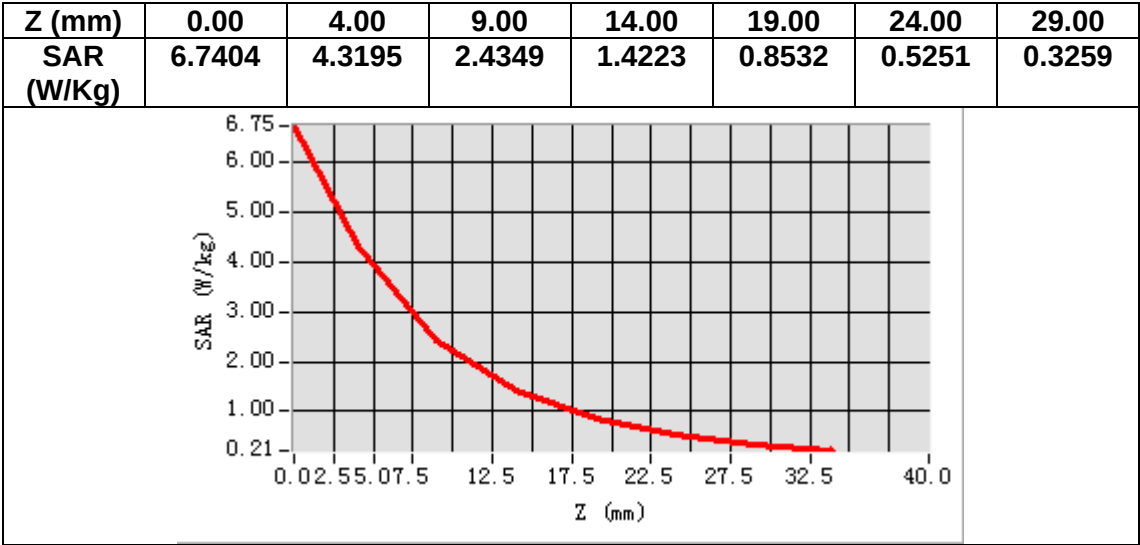
VOLUME SAR



Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	2.157296
SAR 1g (W/Kg)	3.805160



MEASUREMENT 3

Date of measurement: 8/7/2024

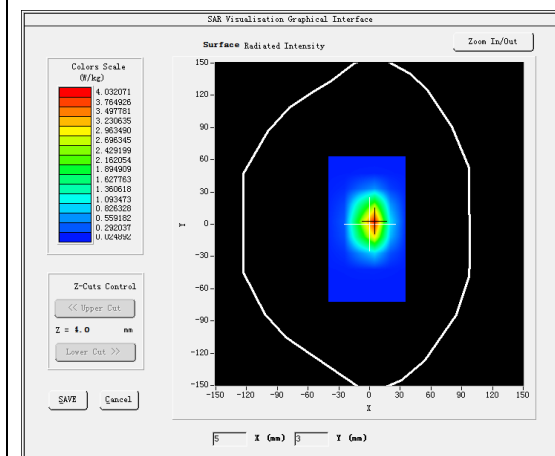
A. Experimental conditions.

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>
ConvF	<u>2.63</u>

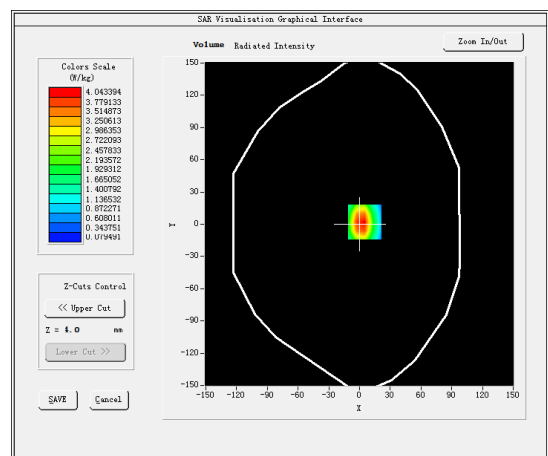
B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.873668
Relative permittivity (imaginary part)	13.744242
Conductivity (S/m)	1.450781
Variation (%)	2.050000

SURFACE SAR



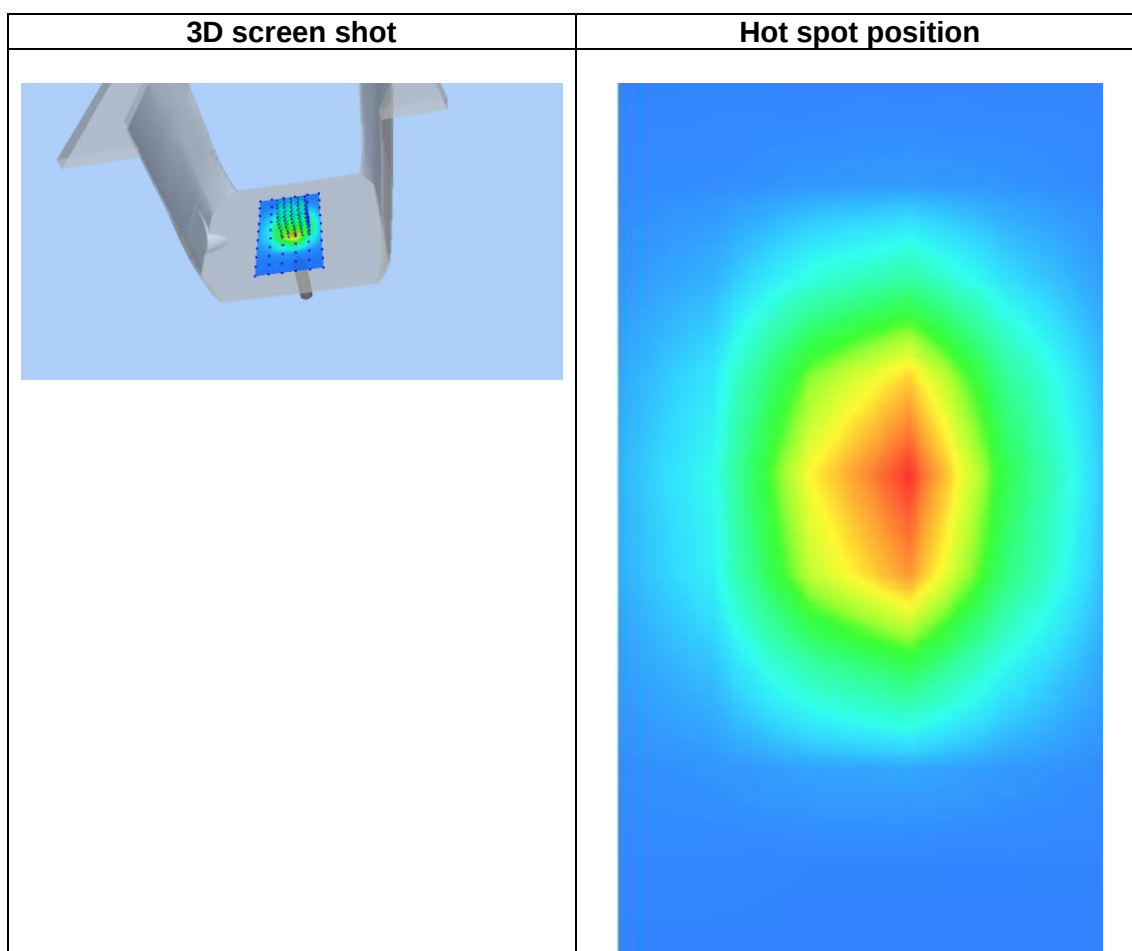
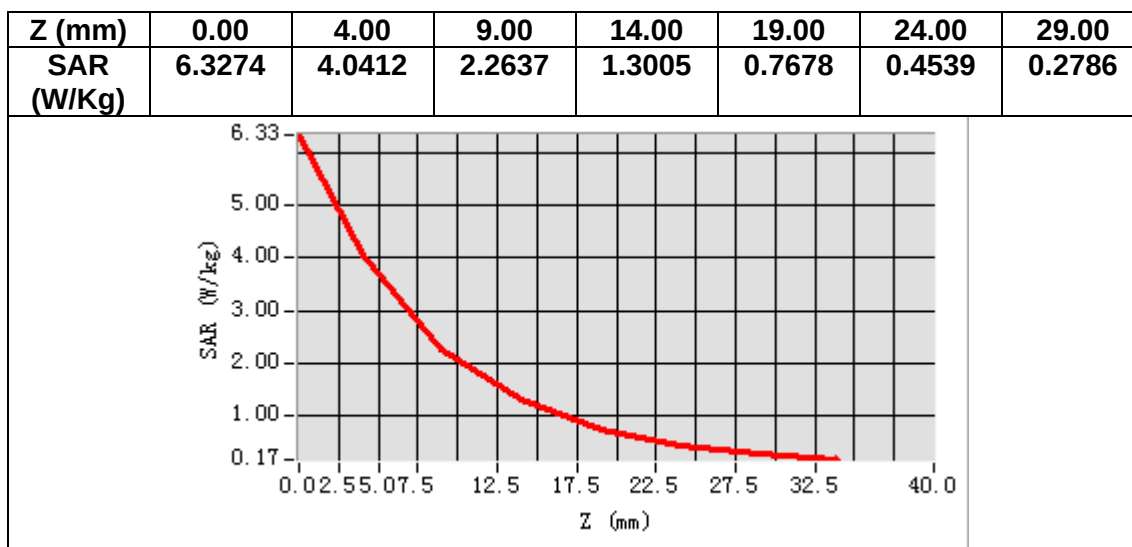
VOLUME SAR



Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	2.253384
SAR 1g (W/Kg)	4.131097



MEASUREMENT 4

Date of measurement: 6/7/2024

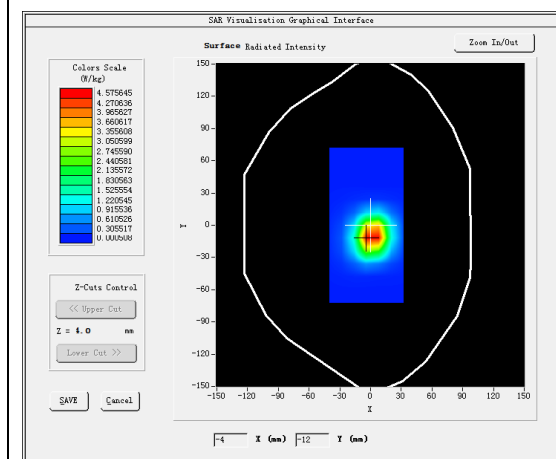
A. Experimental conditions.

<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>CW2600</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.87</u>

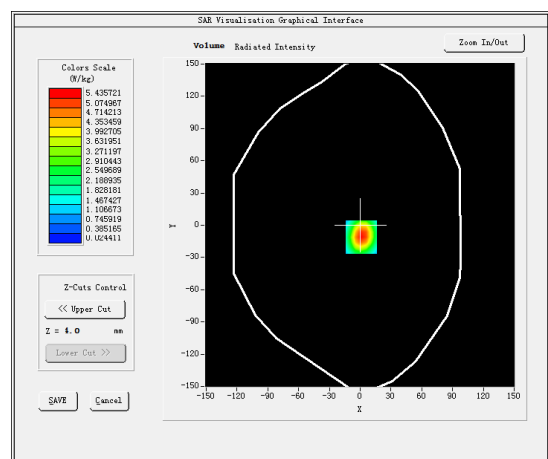
B. SAR Measurement Results

Frequency (MHz)	2600.000000
Relative permittivity (real part)	38.878442
Relative permittivity (imaginary part)	13.731472
Conductivity (S/m)	1.983435
Variation (%)	1.570000

SURFACE SAR



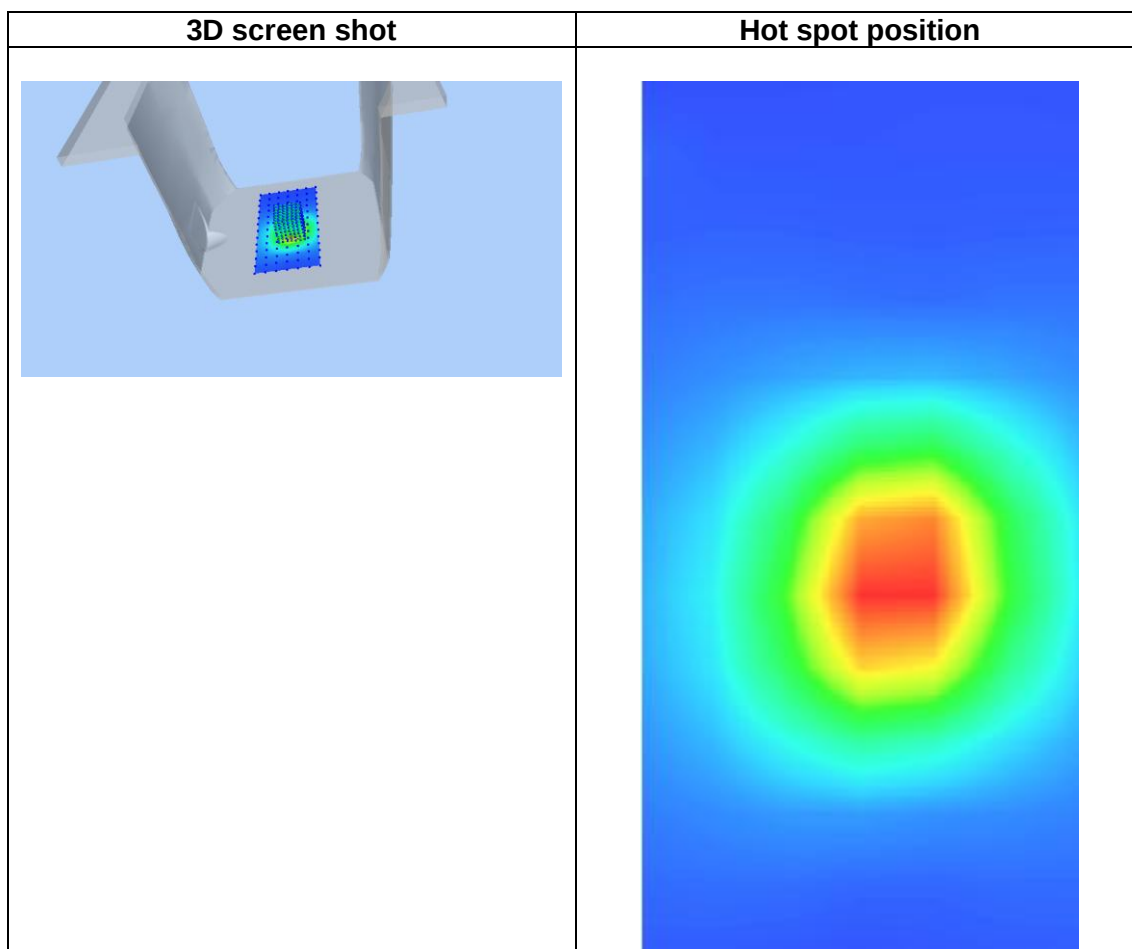
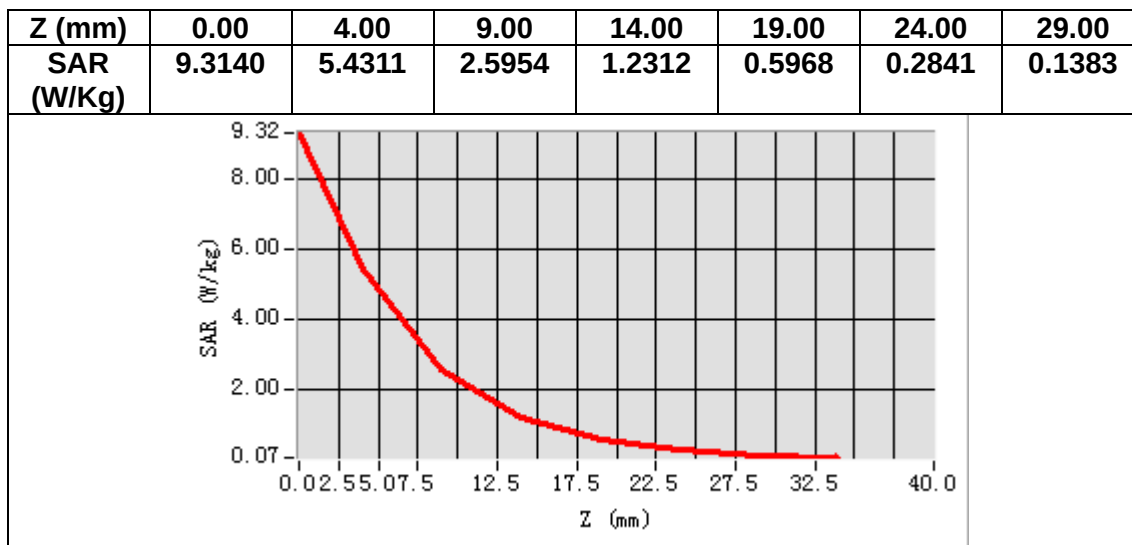
VOLUME SAR



Maximum location: X=1.00, Y=-11.00

SAR Peak: 9.29 W/kg

SAR 10g (W/Kg)	2.410172
SAR 1g (W/Kg)	5.054128



13. Appendix C. Plots of High SAR Measurement

Table of contents
MEASUREMENT 1 GSM 850 Head
MEASUREMENT 2 GSM 850 Body
MEASUREMENT 3 GSM 1900 Head
MEASUREMENT 4 GSM 1900 Body
MEASUREMENT 5 WCDMA Band 2 Head
MEASUREMENT 6 WCDMA Band 2 Body
MEASUREMENT 7 WCDMA Band 4 Head
MEASUREMENT 8 WCDMA Band 4 Body
MEASUREMENT 9 WCDMA Band 5 Head
MEASUREMENT 10 WCDMA Band 5 Body
MEASUREMENT 11 LTE Band 2 Head
MEASUREMENT 12 LTE Band 2 Body
MEASUREMENT 13 LTE Band 4 Head
MEASUREMENT 14 LTE Band 4 Body
MEASUREMENT 15 LTE Band 5 Head
MEASUREMENT 16 LTE Band 5 Body
MEASUREMENT 17 LTE Band 7 Head
MEASUREMENT 18 LTE Band 7 Body

MEASUREMENT 1

Date of measurement: 7/7/2024

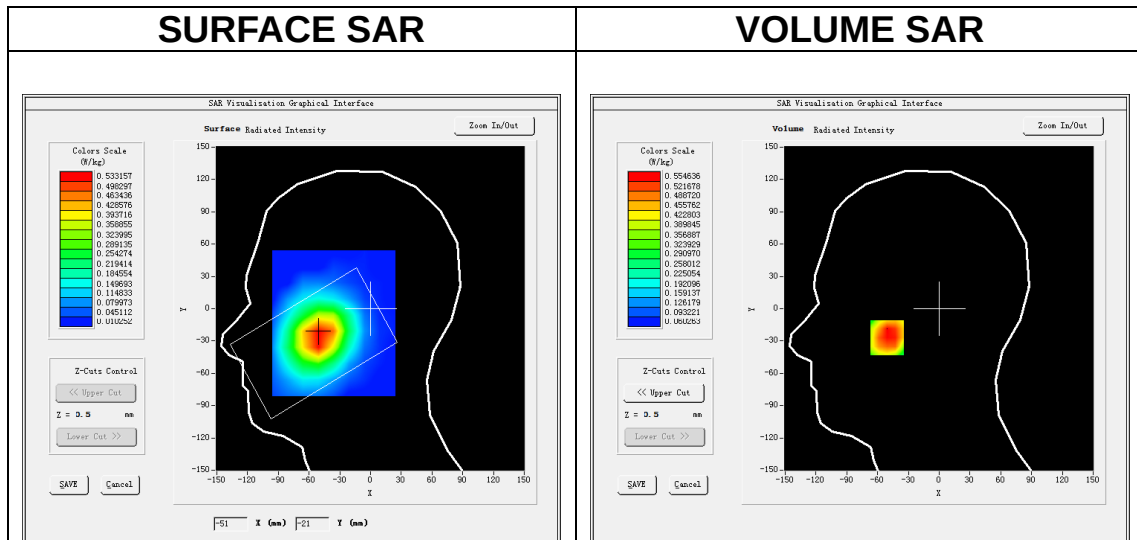
A. Experimental conditions.

<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>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>2.32</u>

B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	-2.700000

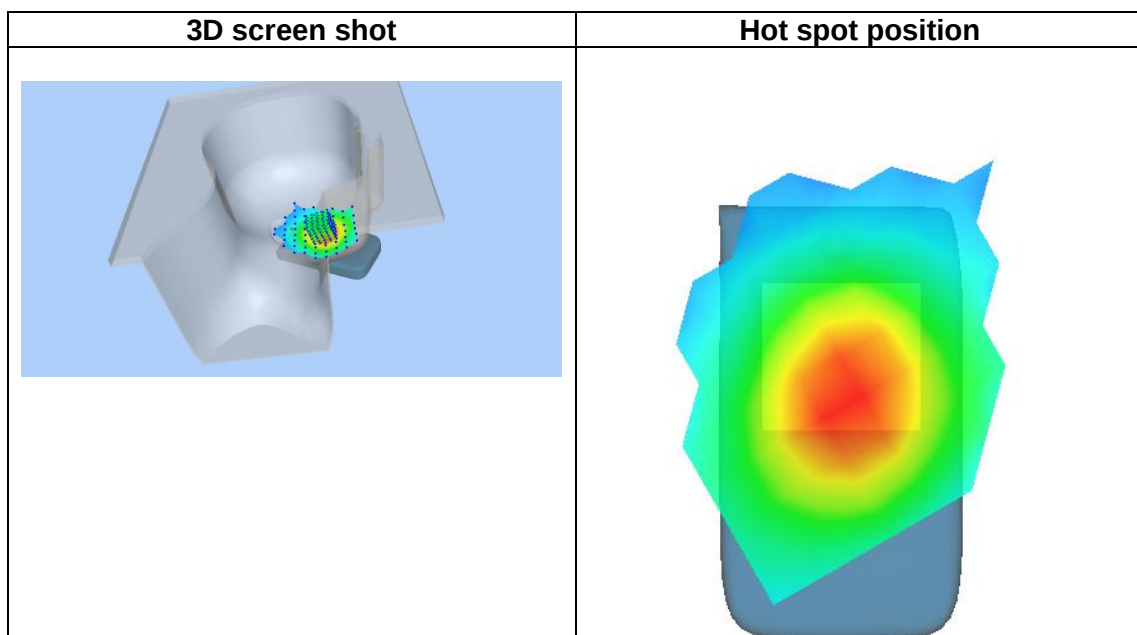
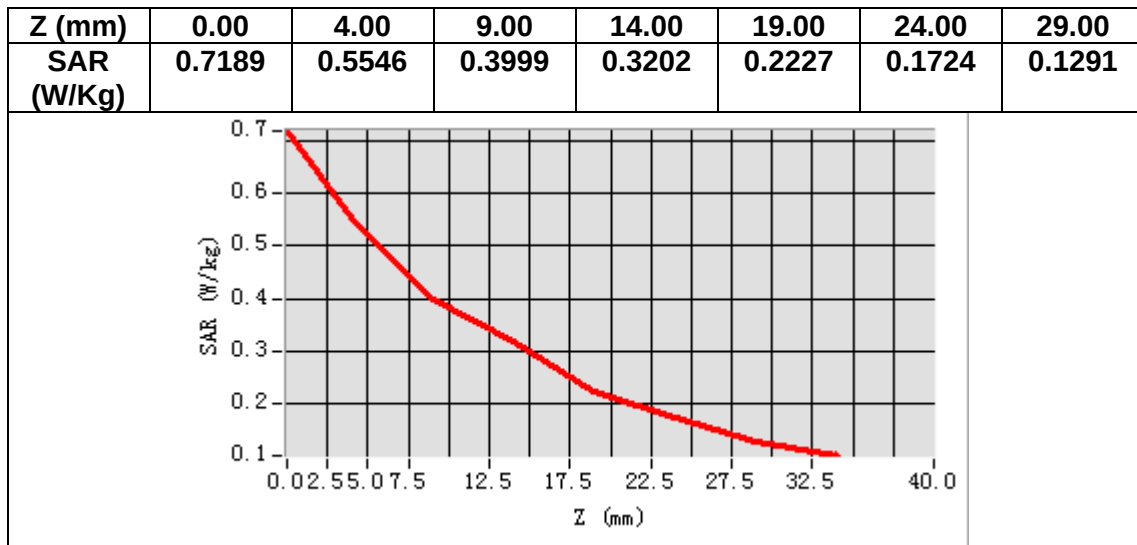
SURFACE SAR



Maximum location: X=-51.00, Y=-27.00

SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.377165
SAR 1g (W/Kg)	0.548095



MEASUREMENT 2

Date of measurement: 7/7/2024

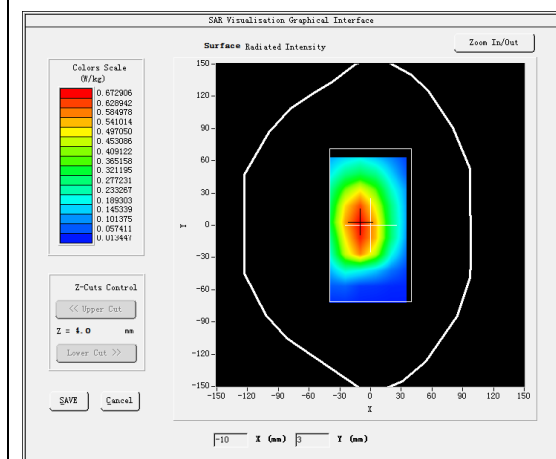
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>2.32</u>

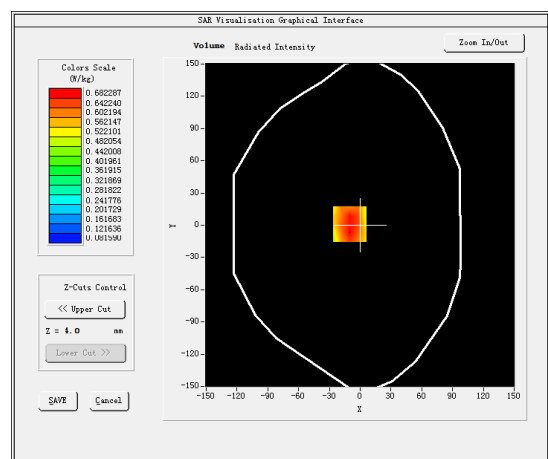
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	3.700000

SURFACE SAR



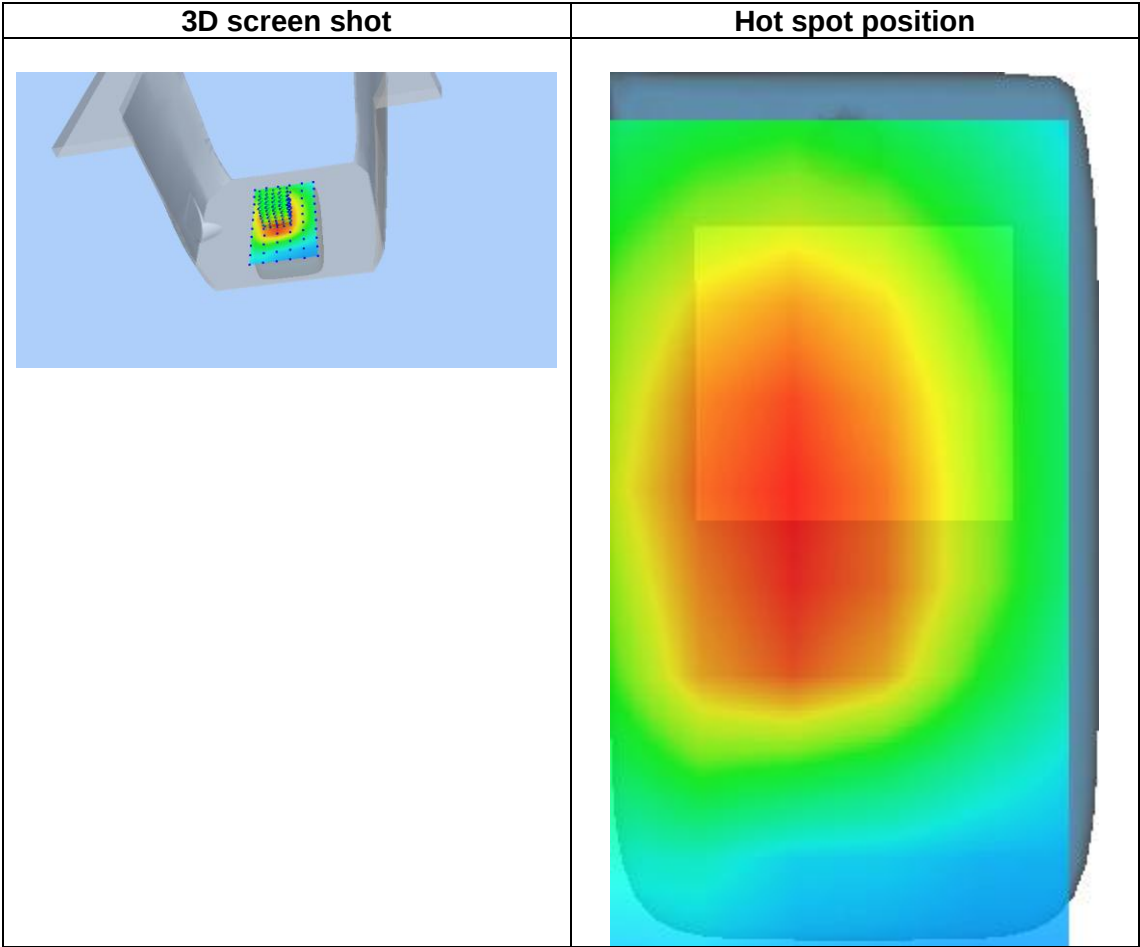
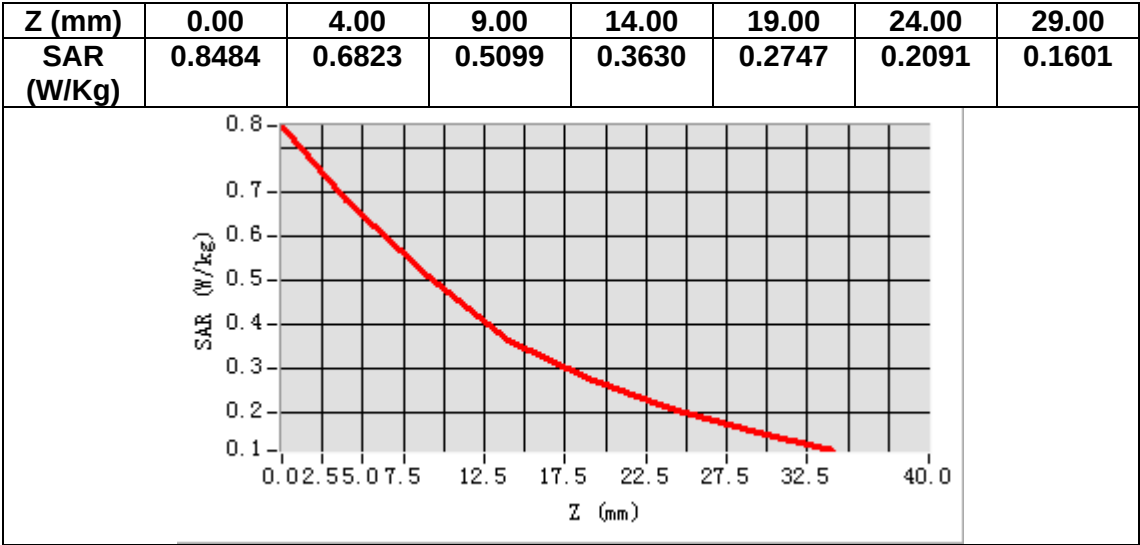
VOLUME SAR



Maximum location: X=-10.00, Y=1.00

SAR Peak: 0.85 W/kg

SAR 10g (W/Kg)	0.461889
SAR 1g (W/Kg)	0.650994



MEASUREMENT 3

Date of measurement: 8/7/2024

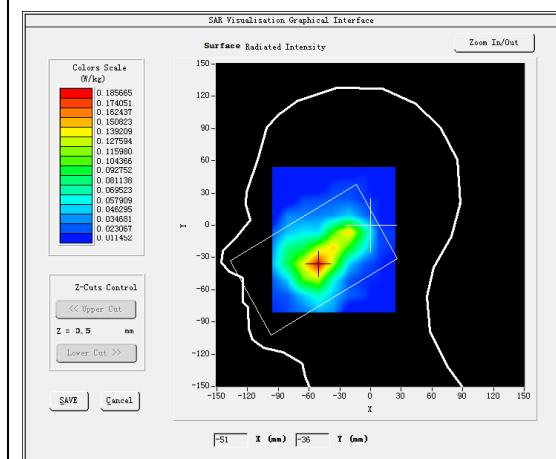
A. Experimental conditions.

<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>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.63</u>

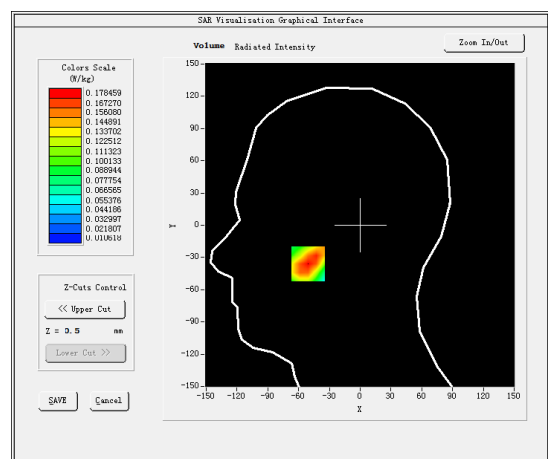
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-1.080000

SURFACE SAR



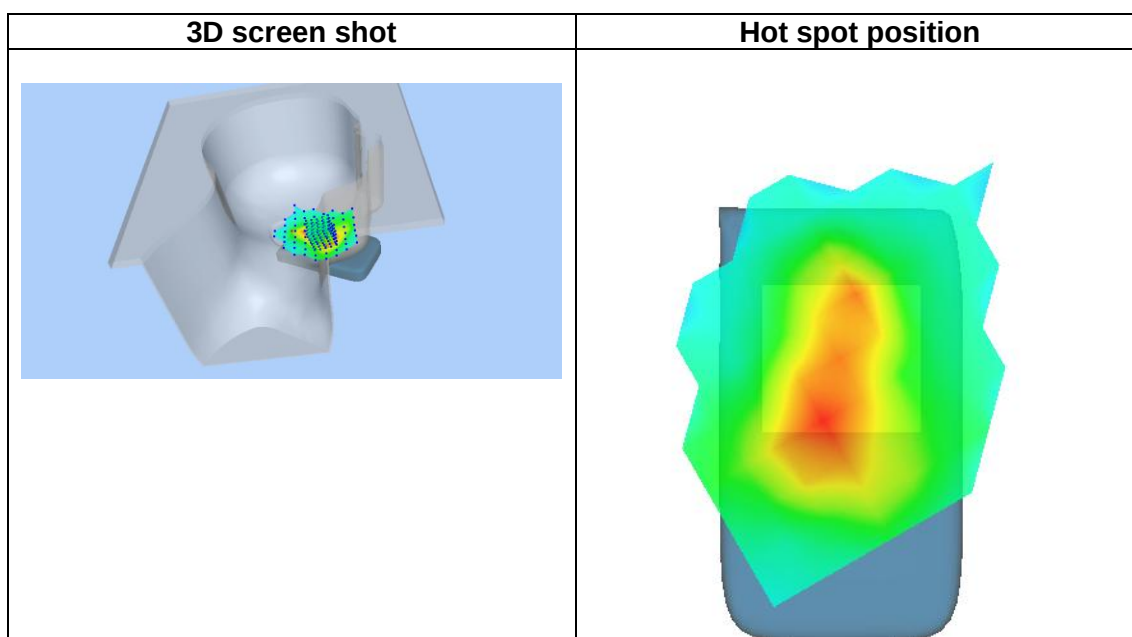
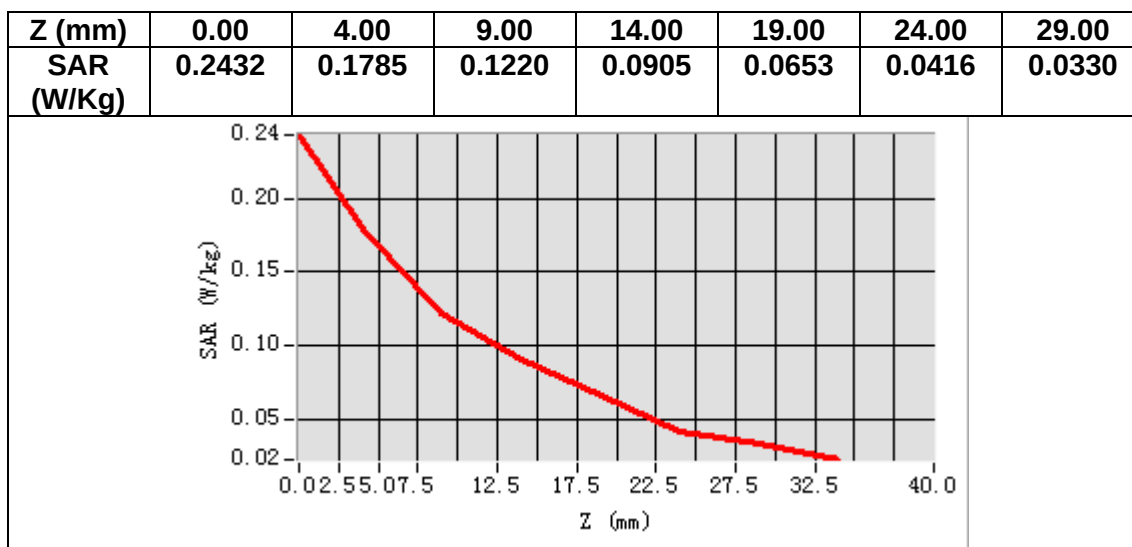
VOLUME SAR



Maximum location: X=-51.00, Y=-36.00

SAR Peak: 0.25 W/kg

SAR 10g (W/Kg)	0.107621
SAR 1g (W/Kg)	0.173563



MEASUREMENT 4

Date of measurement: 8/7/2024

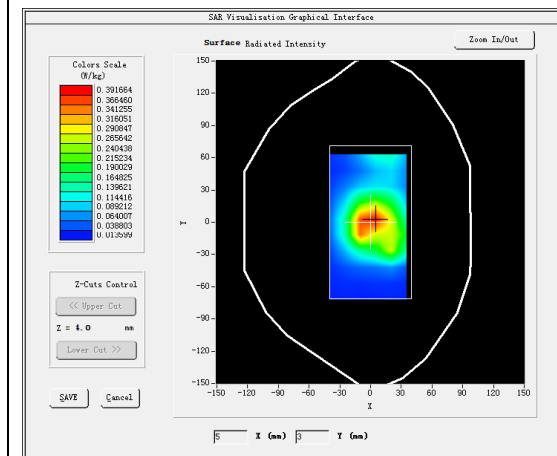
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.63</u>

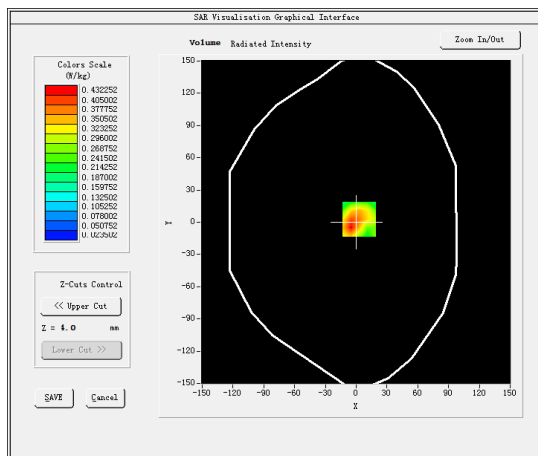
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-4.610000

SURFACE SAR



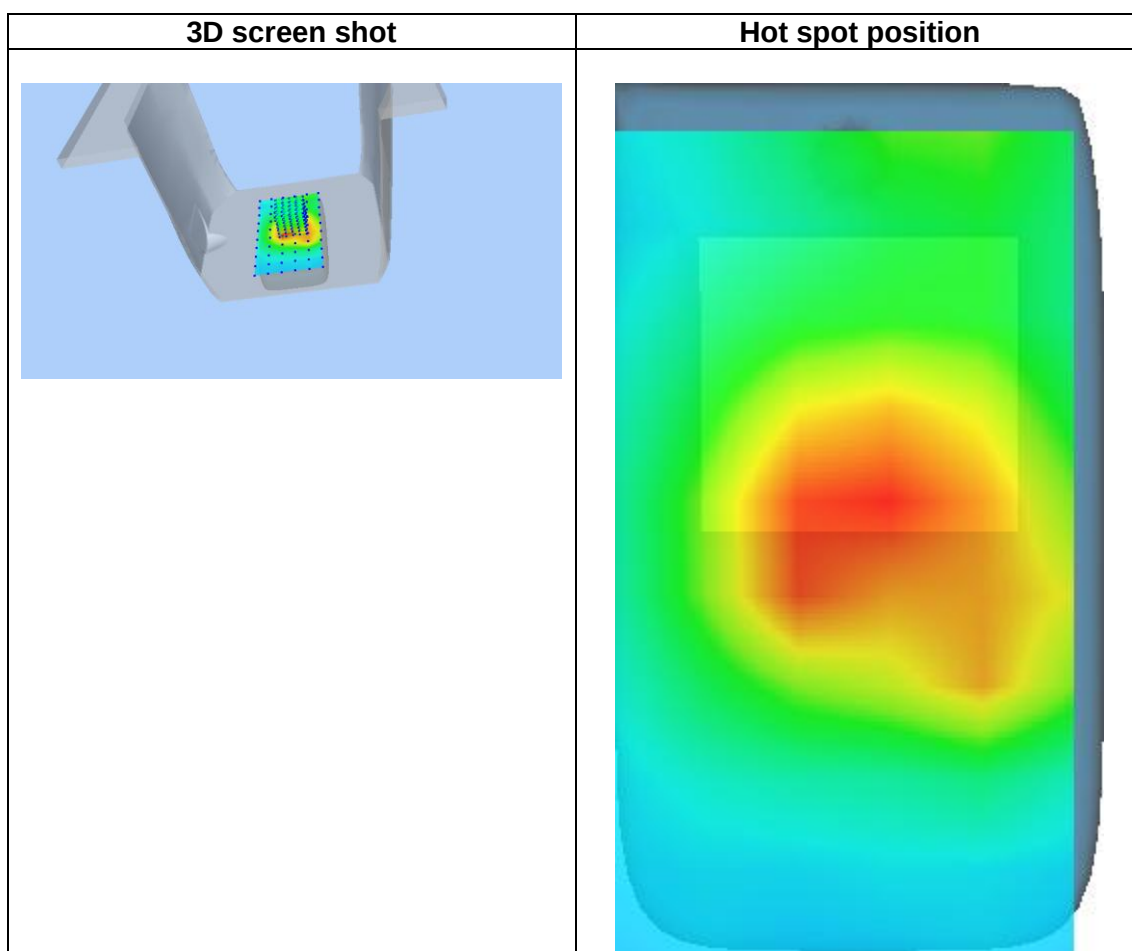
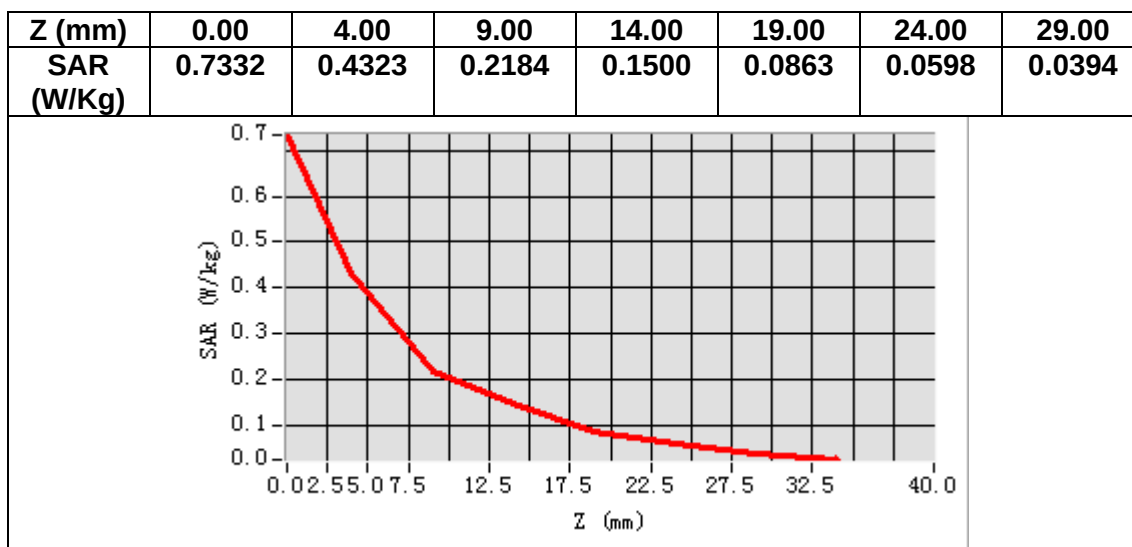
VOLUME SAR



Maximum location: X=3.00, Y=3.00

SAR Peak: 0.68 W/kg

SAR 10g (W/Kg)	0.231437
SAR 1g (W/Kg)	0.412900



MEASUREMENT 5

Date of measurement: 8/7/2024

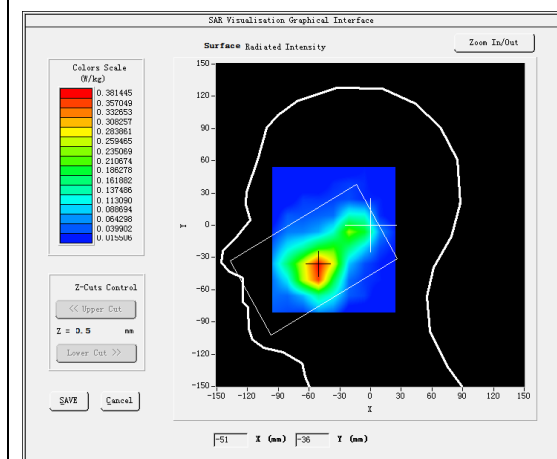
A. Experimental conditions.

<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>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

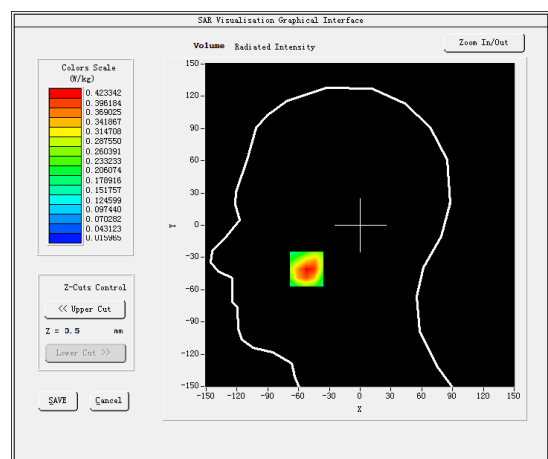
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-4.380000

SURFACE SAR



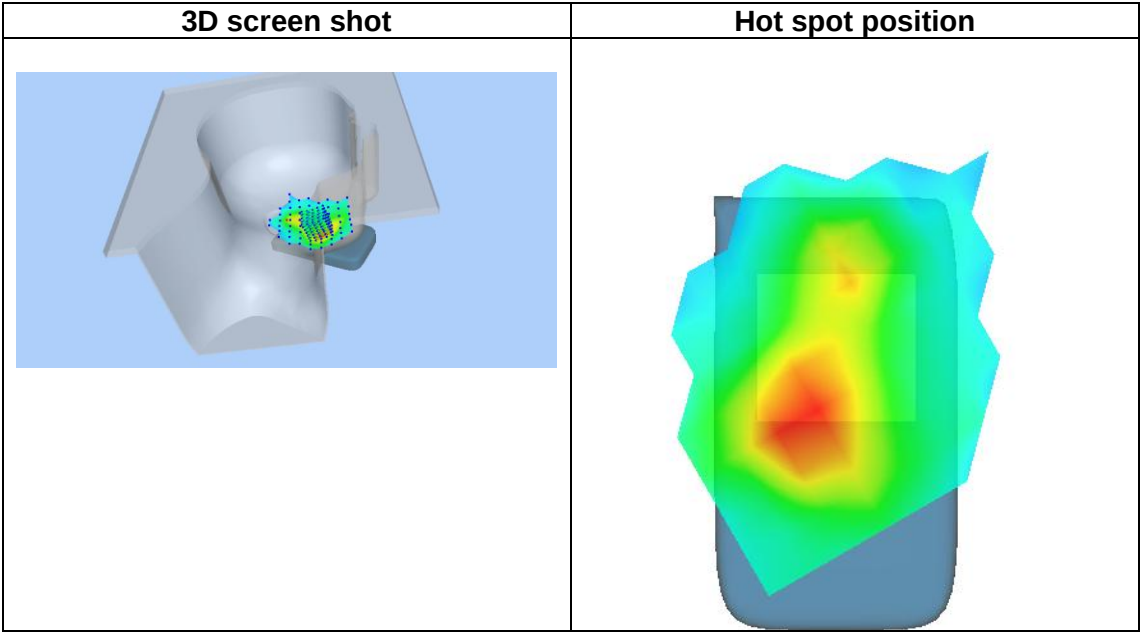
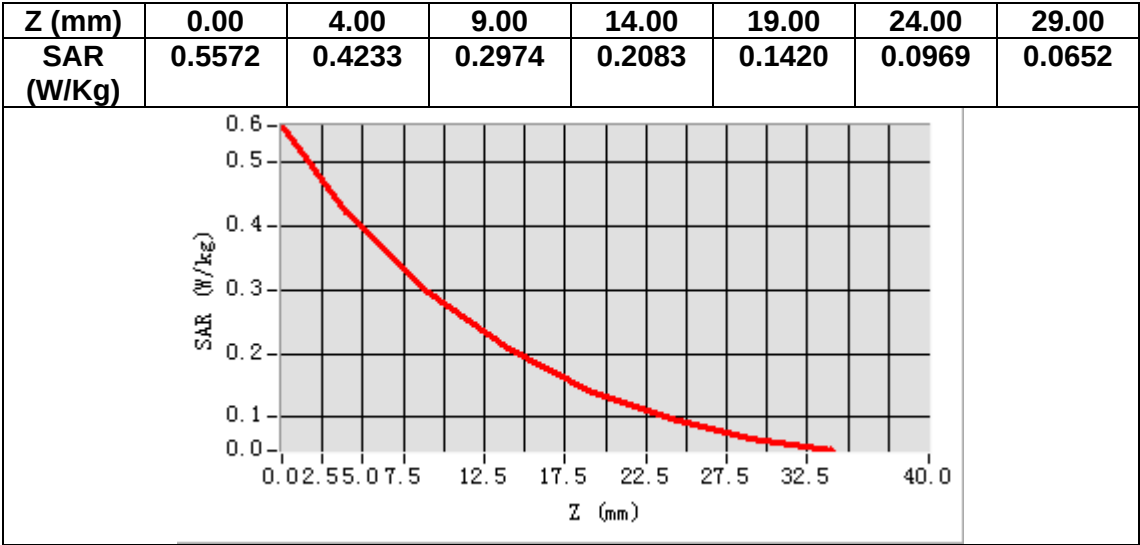
VOLUME SAR



Maximum location: X=-52.00, Y=-41.00

SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.251081
SAR 1g (W/Kg)	0.415495



MEASUREMENT 6

Date of measurement: 8/7/2024

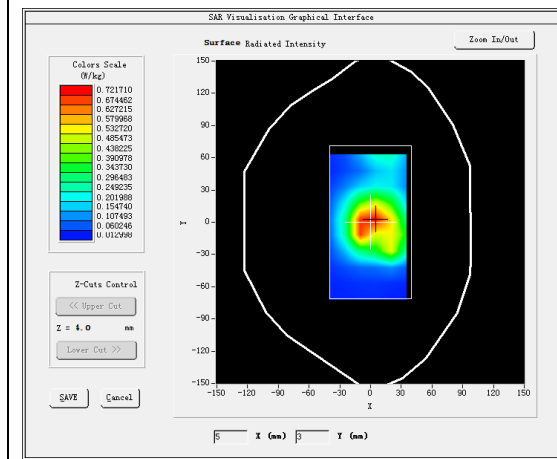
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

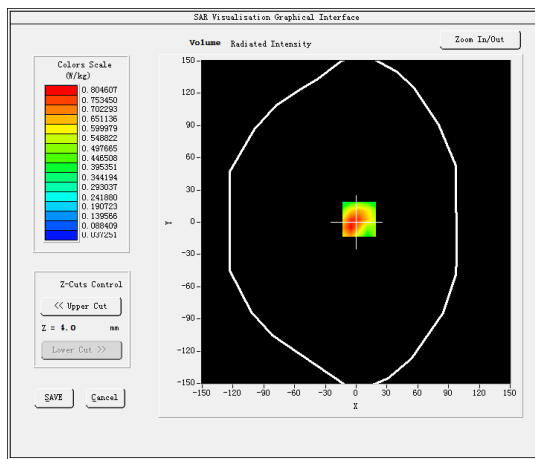
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-0.570000

SURFACE SAR



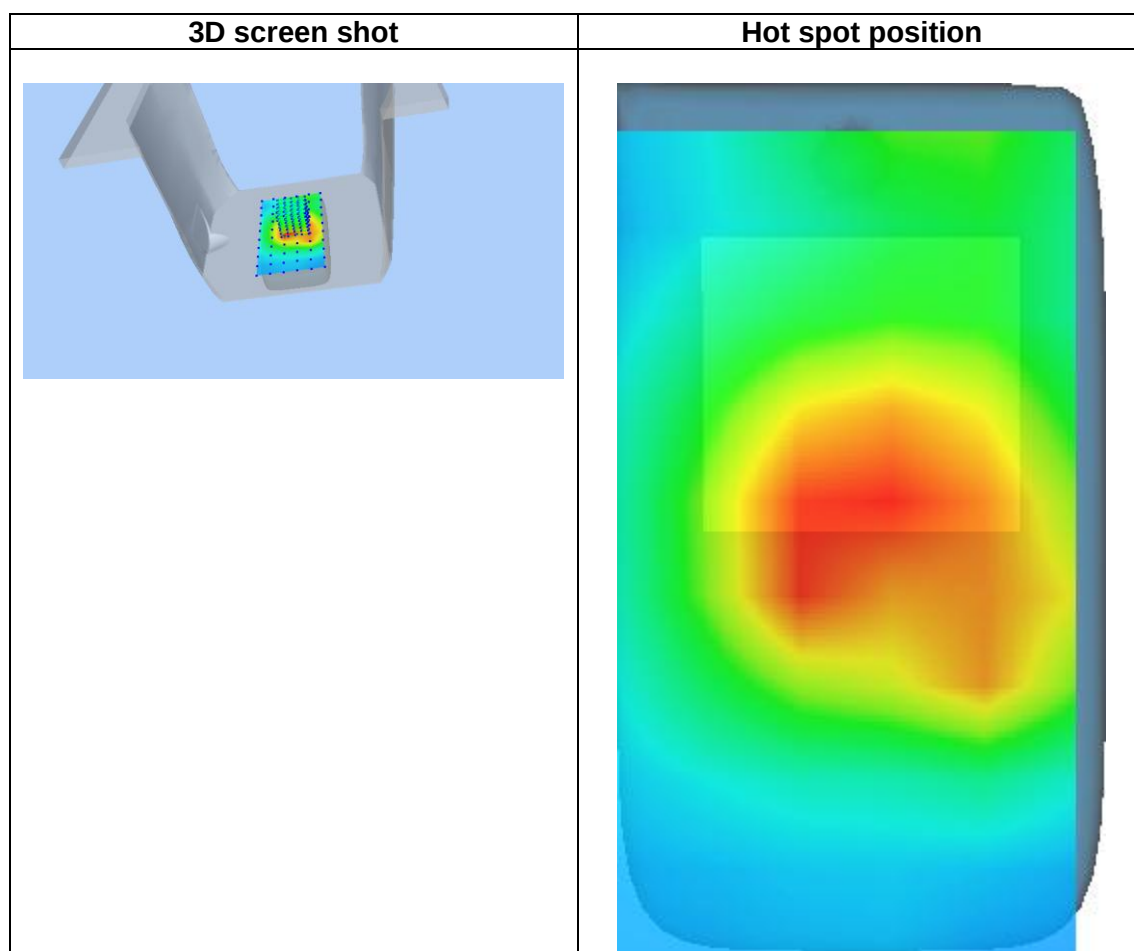
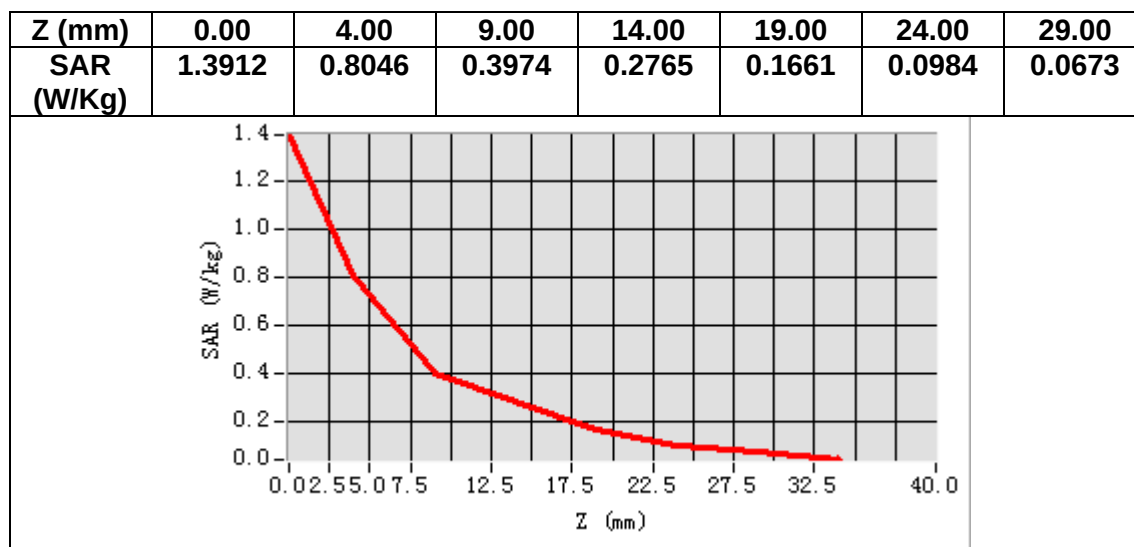
VOLUME SAR



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.24 W/kg

SAR 10g (W/Kg)	0.440191
SAR 1g (W/Kg)	0.779171



MEASUREMENT 7

Date of measurement: 29/6/2024

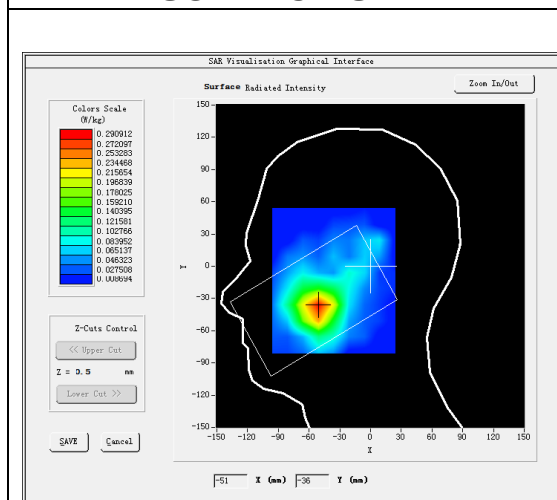
A. Experimental conditions.

<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>
<u>ConvF</u>	<u>2.45</u>

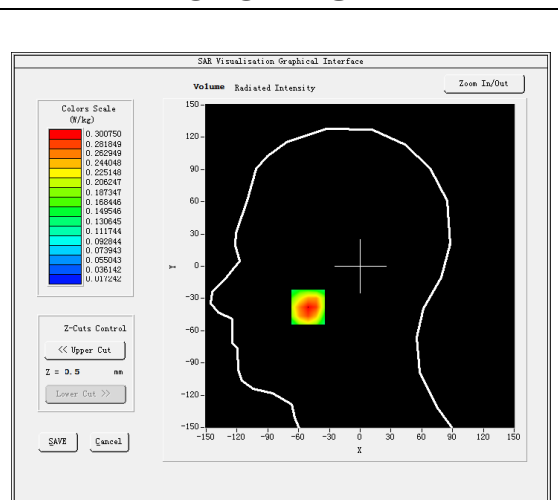
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.537403
Relative permittivity (imaginary part)	13.817305
Conductivity (S/m)	1.329532
Variation (%)	-1.120000

SURFACE SAR



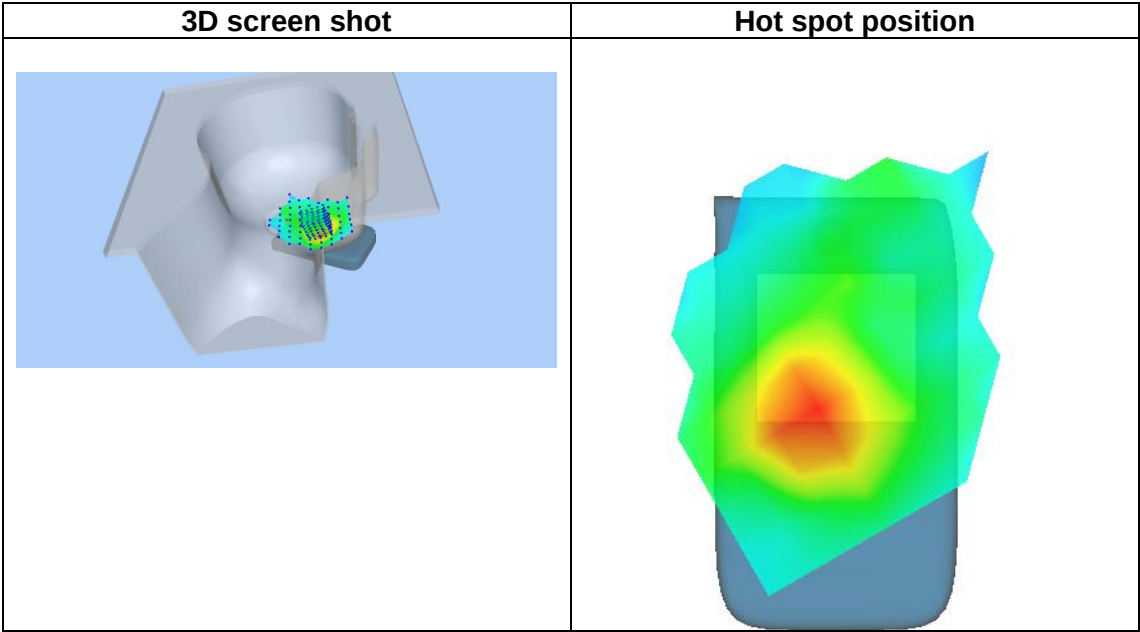
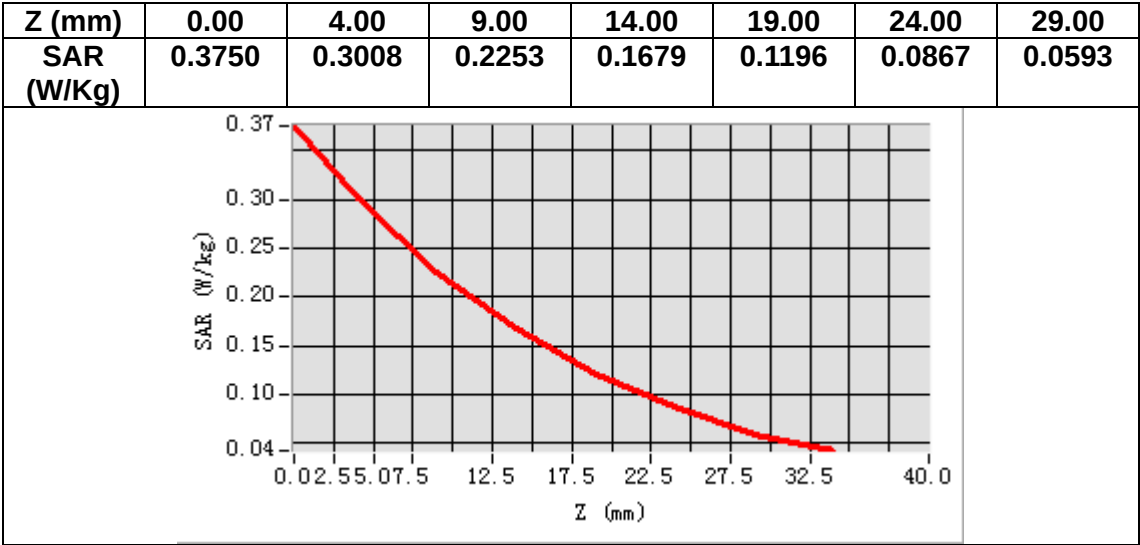
VOLUME SAR



Maximum location: X=-51.00, Y=-38.00

SAR Peak: 0.39 W/kg

SAR 10g (W/Kg)	0.187474
SAR 1g (W/Kg)	0.288543



MEASUREMENT 8

Date of measurement: 29/6/2024

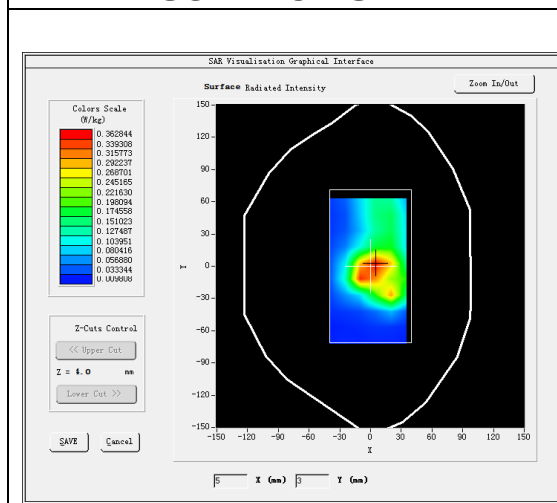
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

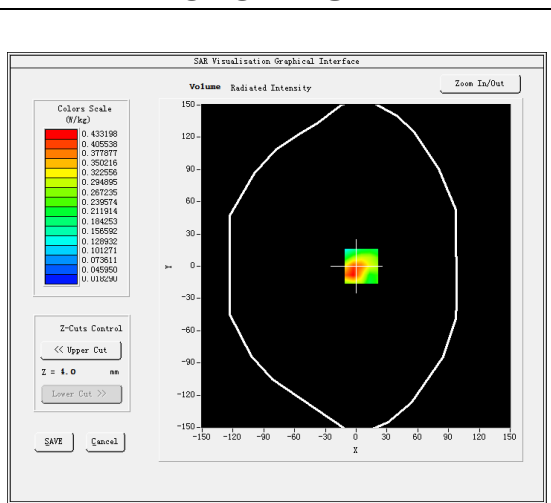
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.537403
Relative permittivity (imaginary part)	13.817305
Conductivity (S/m)	1.329532
Variation (%)	-1.060000

SURFACE SAR



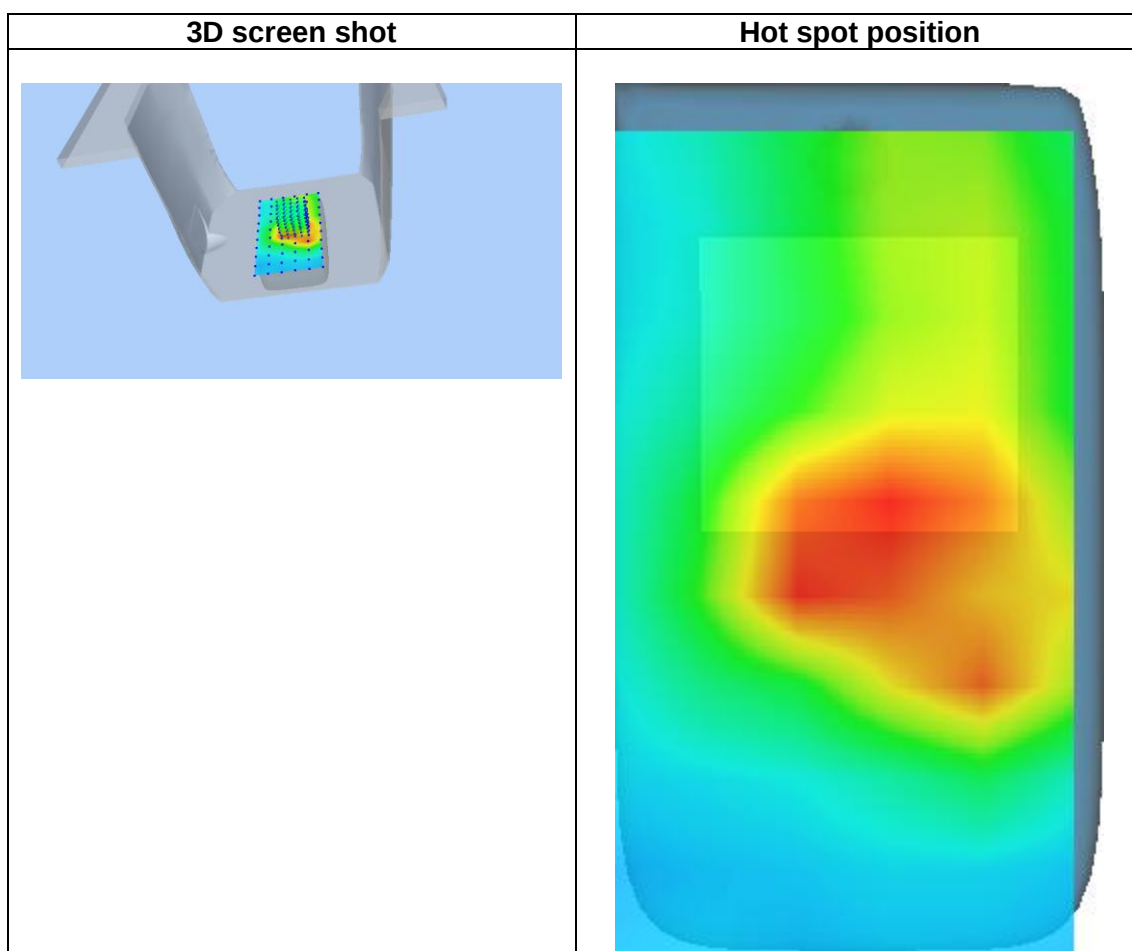
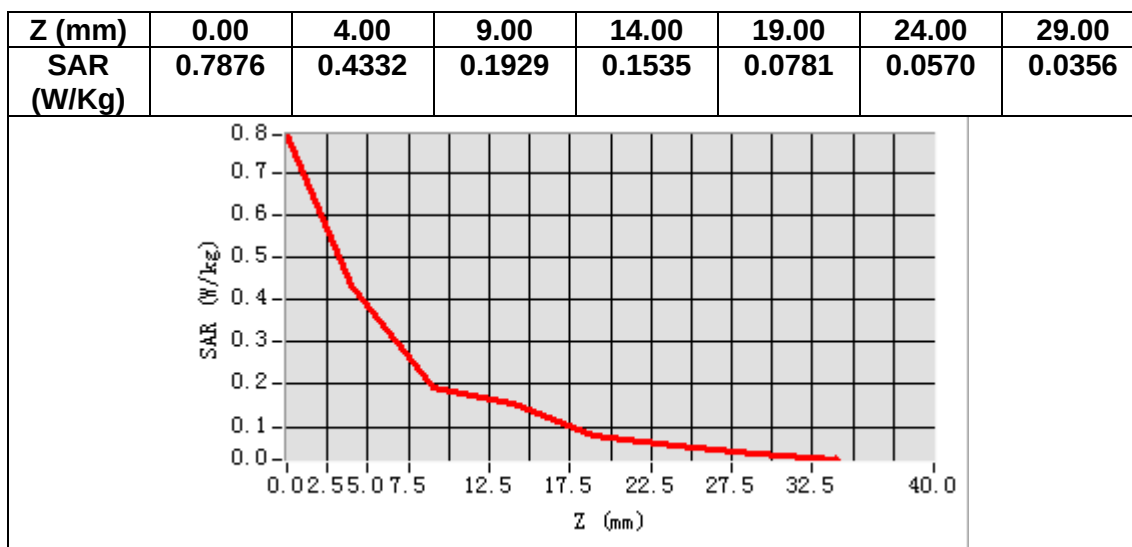
VOLUME SAR



Maximum location: X=5.00, Y=0.00

SAR Peak: 0.67 W/kg

SAR 10g (W/Kg)	0.226112
SAR 1g (W/Kg)	0.410969



MEASUREMENT 9

Date of measurement: 7/7/2024

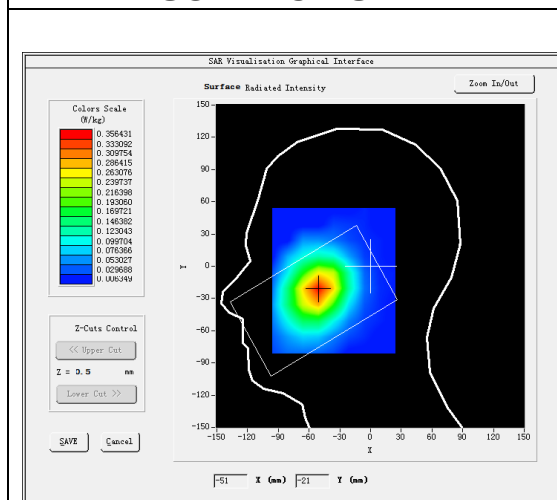
A. Experimental conditions.

<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>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

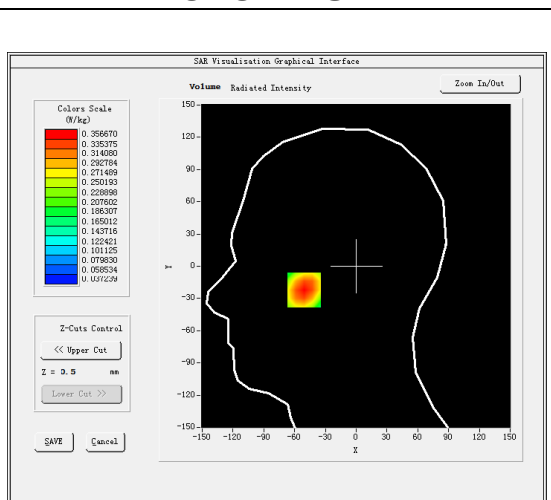
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	0.650000

SURFACE SAR



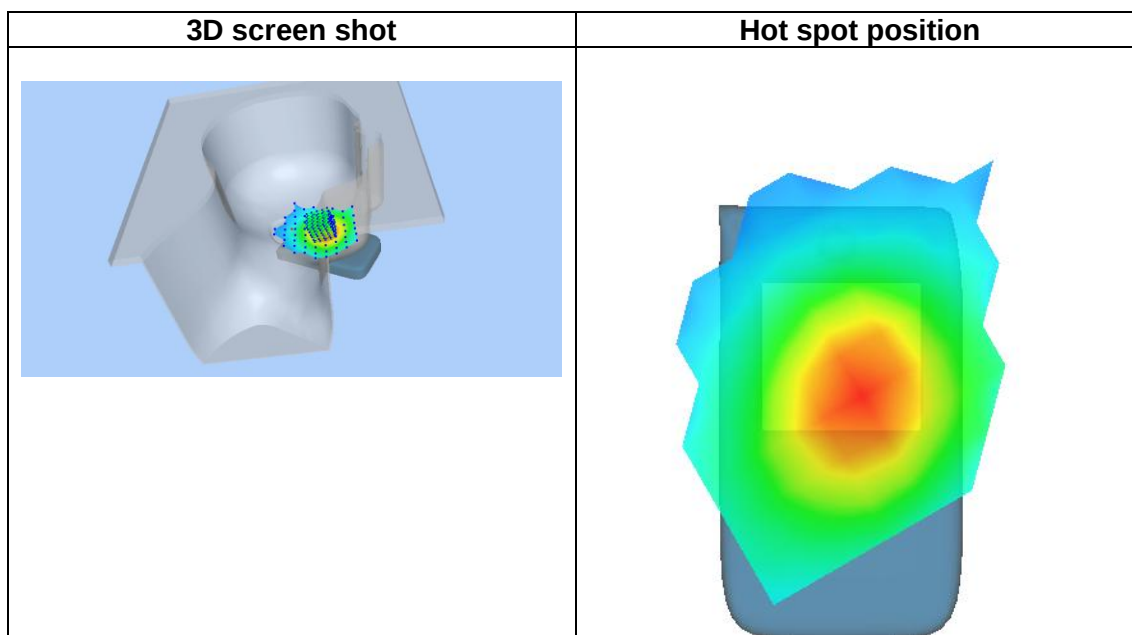
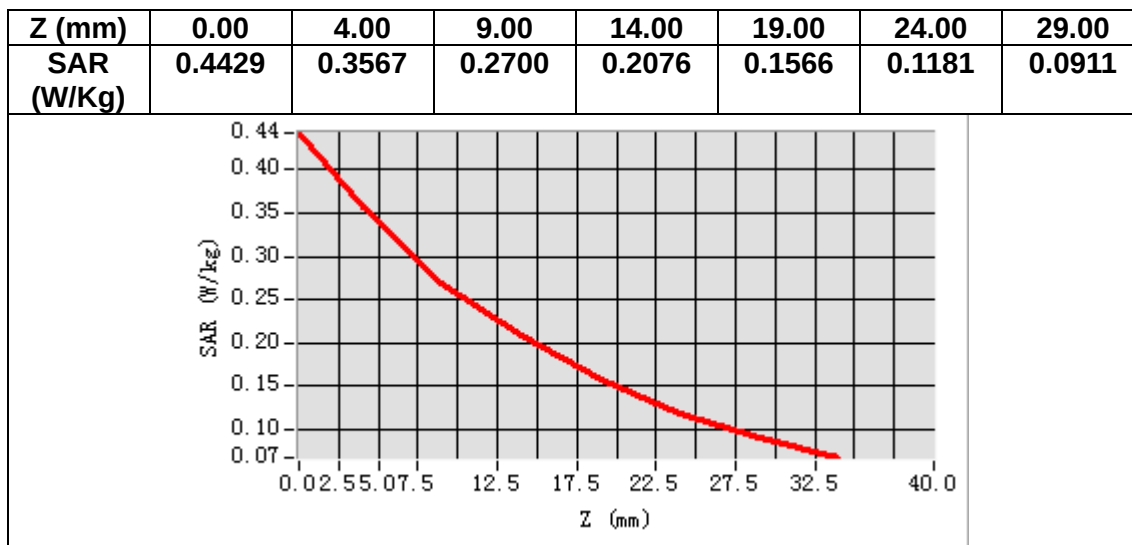
VOLUME SAR



Maximum location: X=-51.00, Y=-22.00

SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.241826
SAR 1g (W/Kg)	0.343926



MEASUREMENT 10

Date of measurement: 7/7/2024

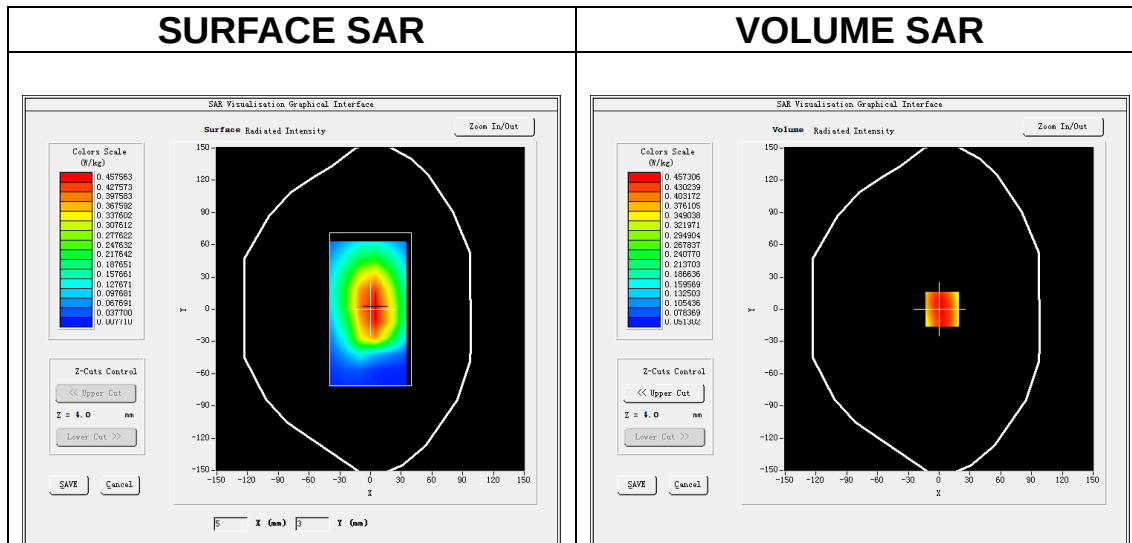
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.522217
Relative permittivity (imaginary part)	19.557144
Conductivity (S/m)	0.908755
Variation (%)	-0.510000

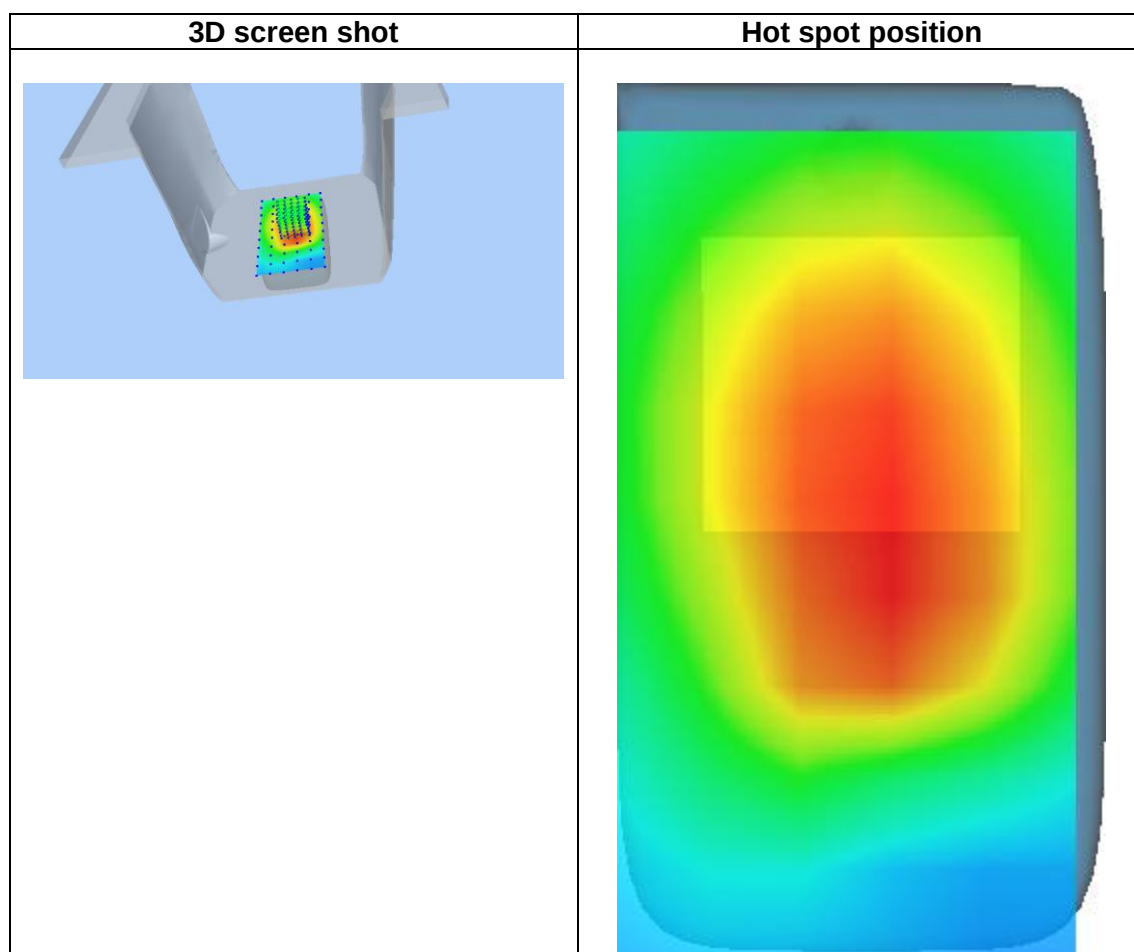
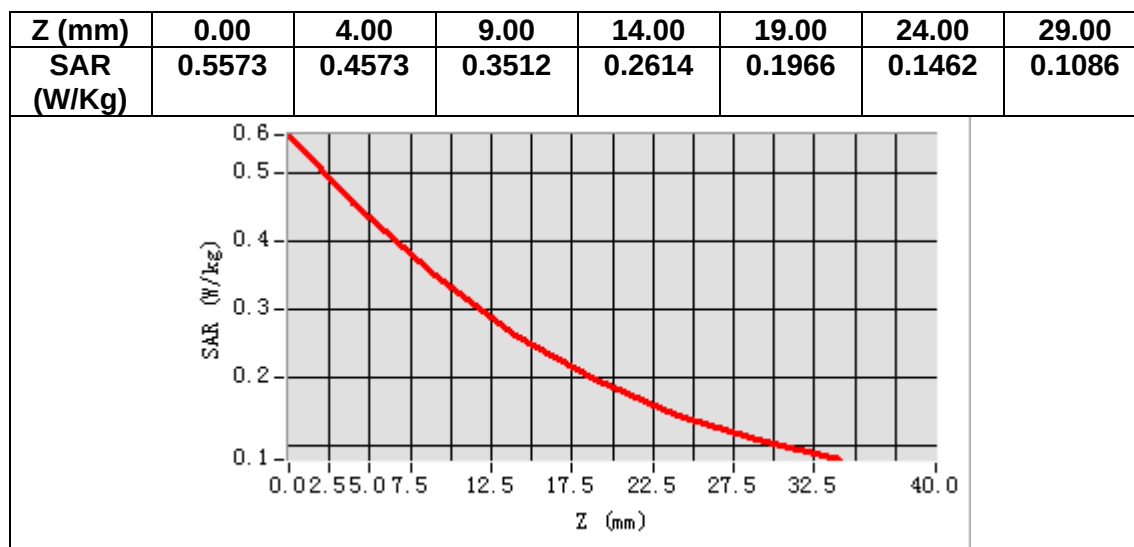
SURFACE SAR



Maximum location: X=3.00, Y=0.00

SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.320887
SAR 1g (W/Kg)	0.443434



MEASUREMENT 11

Date of measurement: 8/7/2024

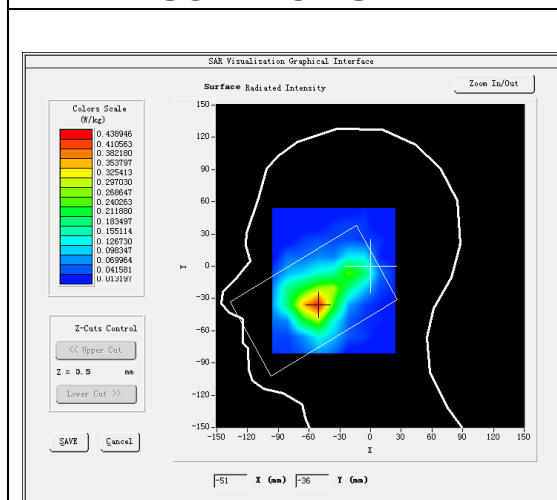
A. Experimental conditions.

<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>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

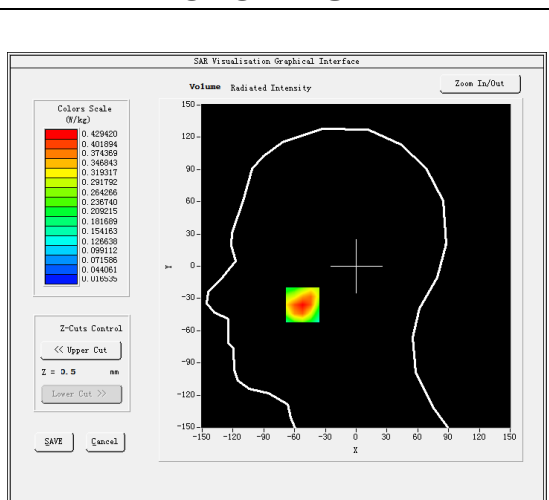
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.948967
Relative permittivity (imaginary part)	13.792142
Conductivity (S/m)	1.440513
Variation (%)	-0.680000

SURFACE SAR



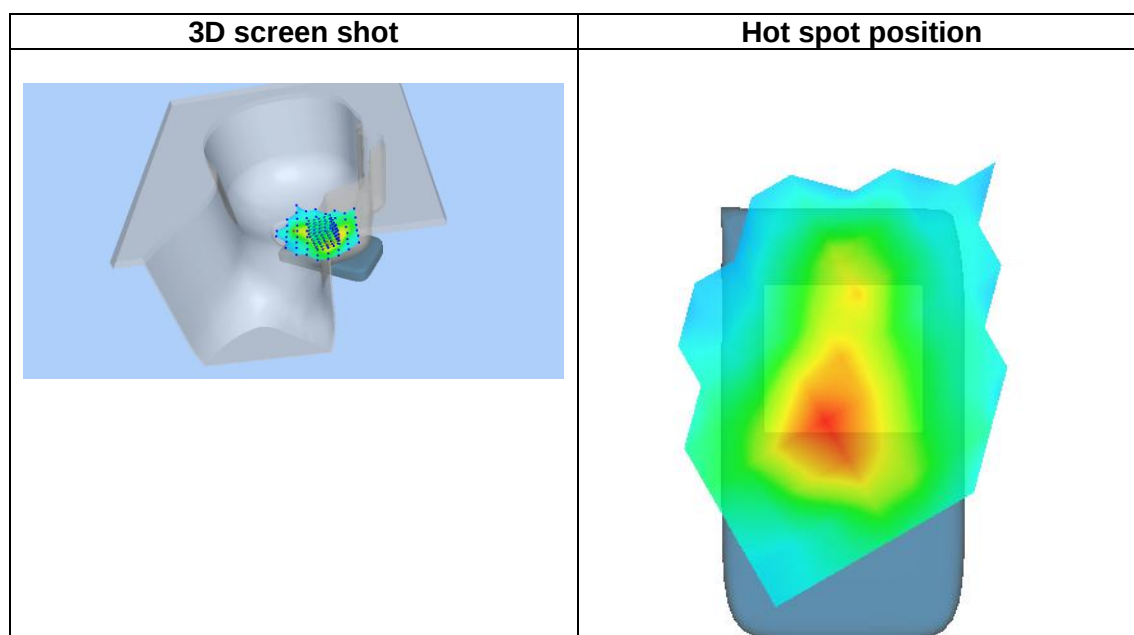
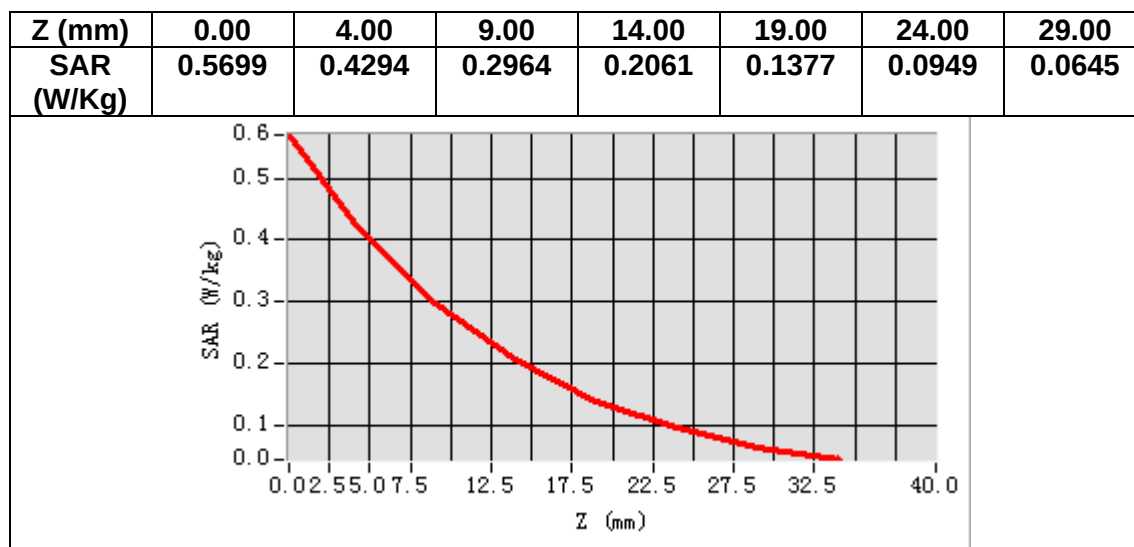
VOLUME SAR



Maximum location: X=-52.00, Y=-36.00

SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.253872
SAR 1g (W/Kg)	0.414889



MEASUREMENT 12

Date of measurement: 8/7/2024

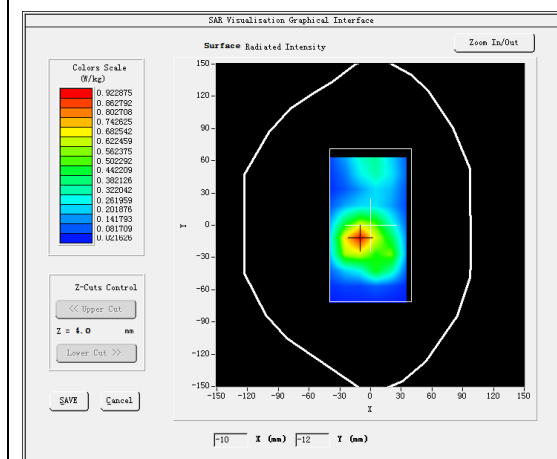
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Low</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

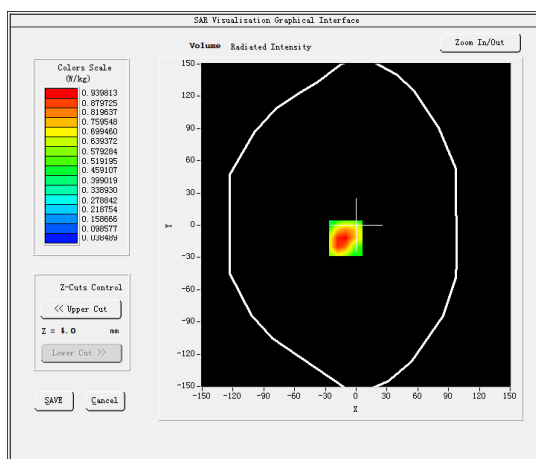
B. SAR Measurement Results

Frequency (MHz)	1860.000000
Relative permittivity (real part)	39.057068
Relative permittivity (imaginary part)	13.809042
Conductivity (S/m)	1.426934
Variation (%)	0.000000

SURFACE SAR



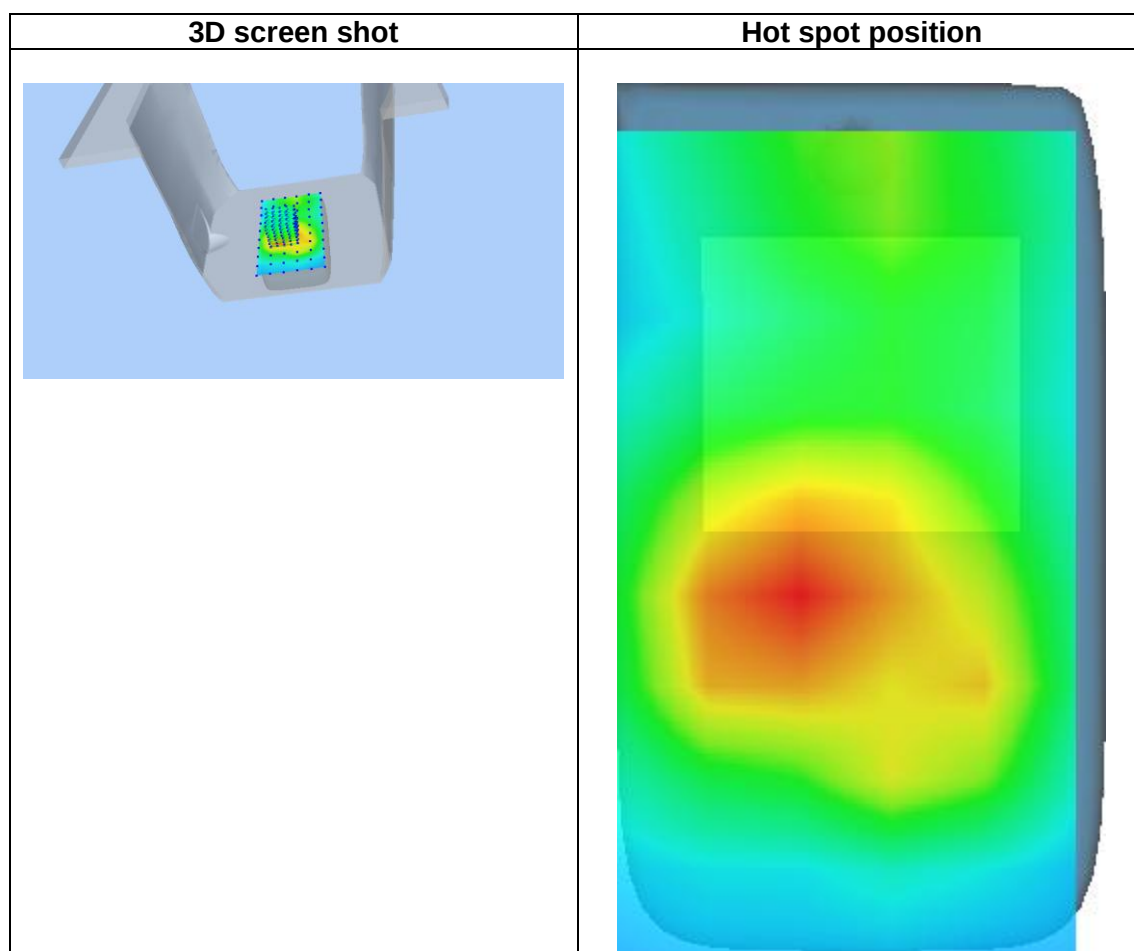
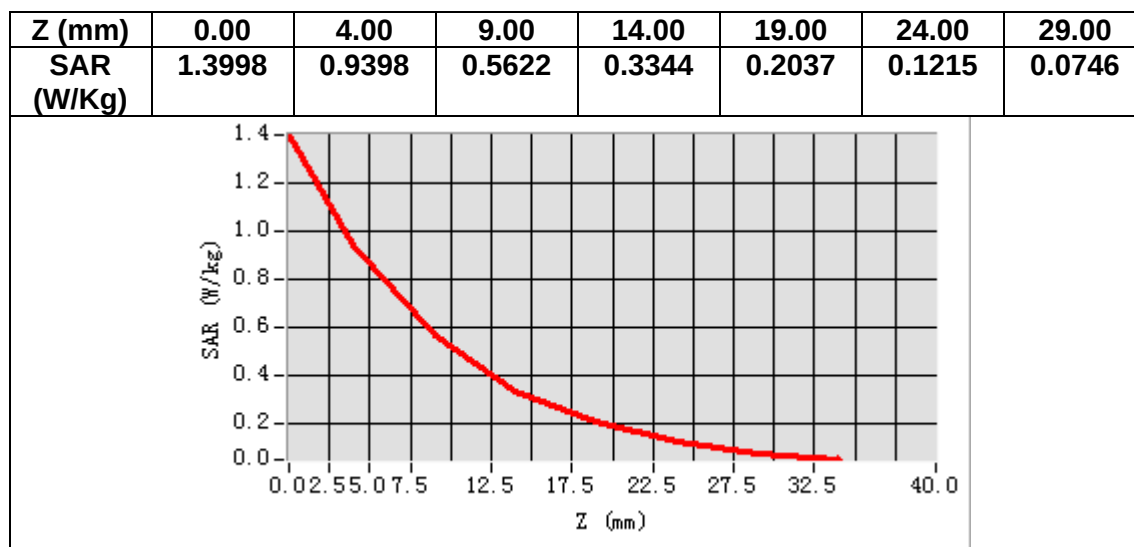
VOLUME SAR



Maximum location: X=-10.00, Y=-12.00

SAR Peak: 1.47 W/kg

SAR 10g (W/Kg)	0.515005
SAR 1g (W/Kg)	0.933462



MEASUREMENT 13

Date of measurement: 29/6/2024

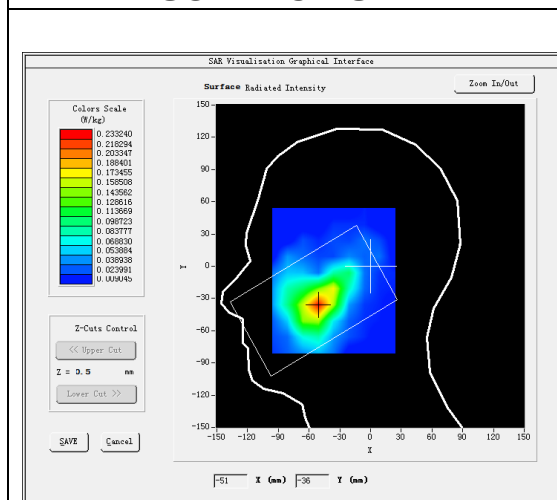
A. Experimental conditions.

<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>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

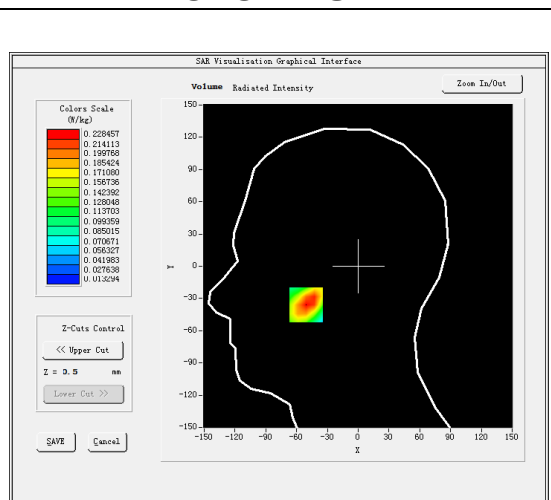
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.545303
Relative permittivity (imaginary part)	13.802155
Conductivity (S/m)	1.328457
Variation (%)	-0.900000

SURFACE SAR



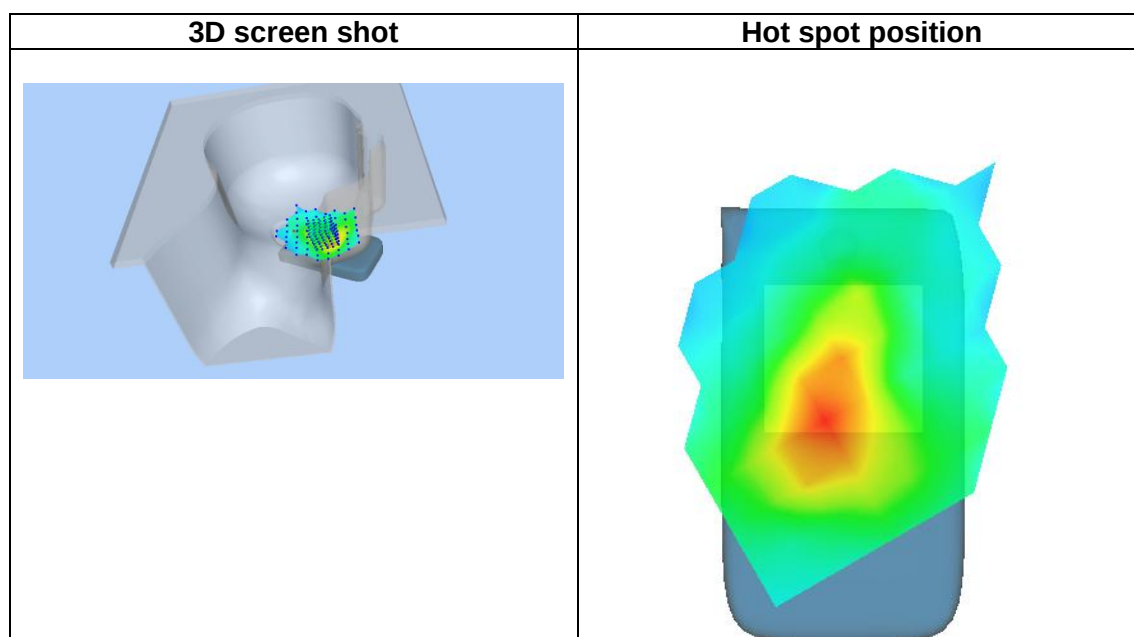
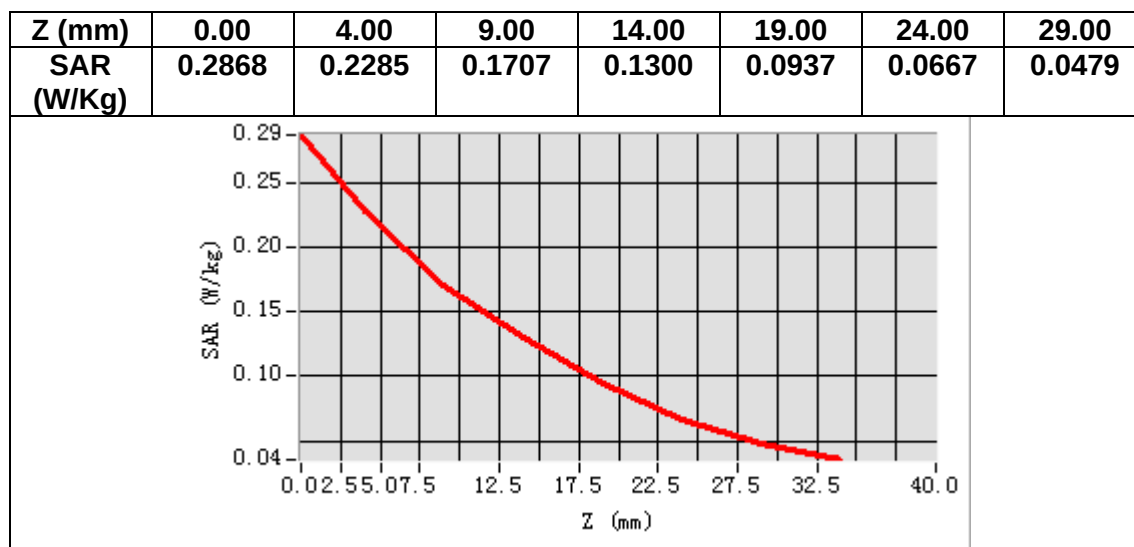
VOLUME SAR



Maximum location: X=-51.00, Y=-36.00

SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)	0.141140
SAR 1g (W/Kg)	0.221055



MEASUREMENT 14

Date of measurement: 29/6/2024

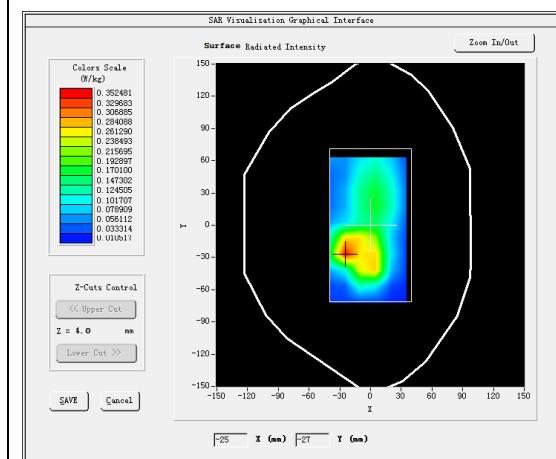
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

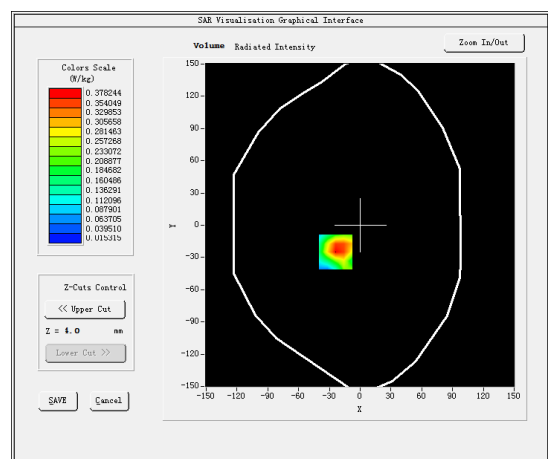
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.545303
Relative permittivity (imaginary part)	13.802155
Conductivity (S/m)	1.328457
Variation (%)	-4.790000

SURFACE SAR



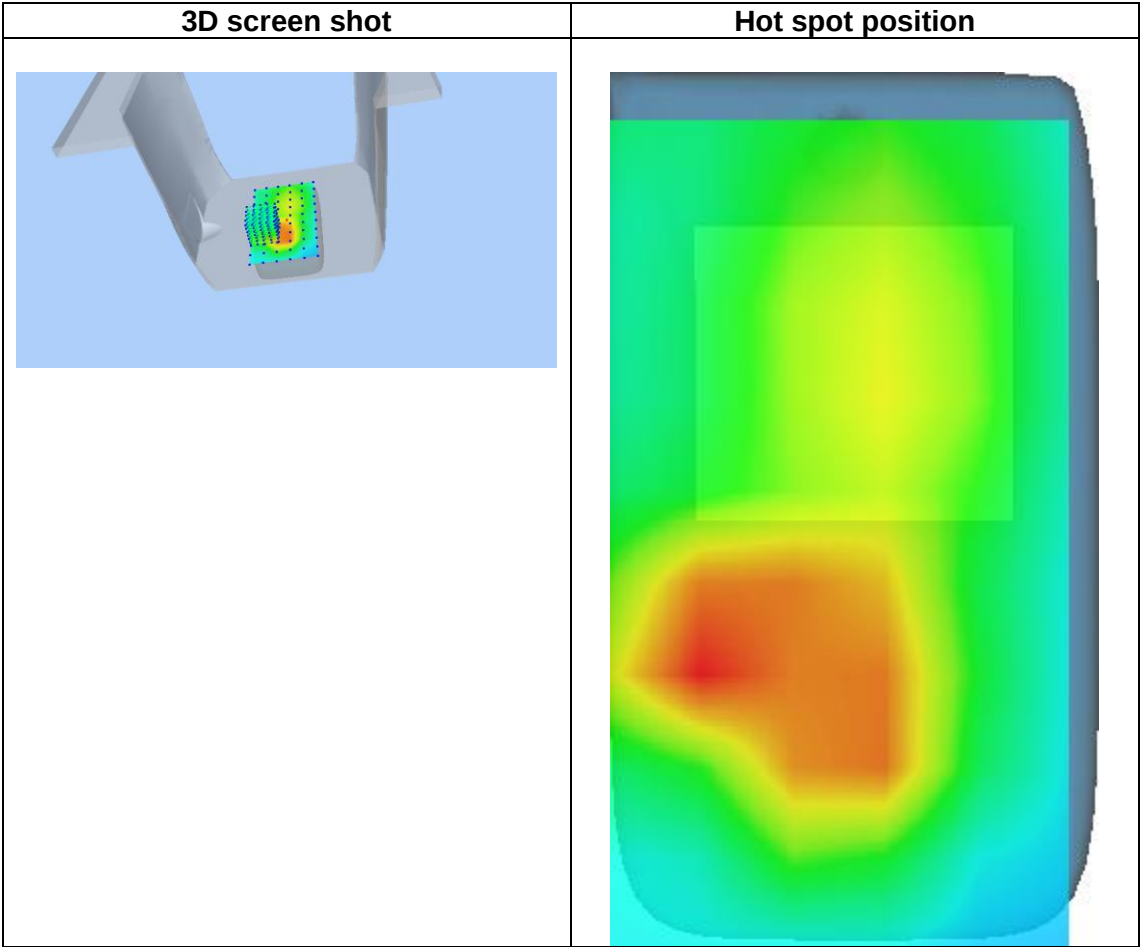
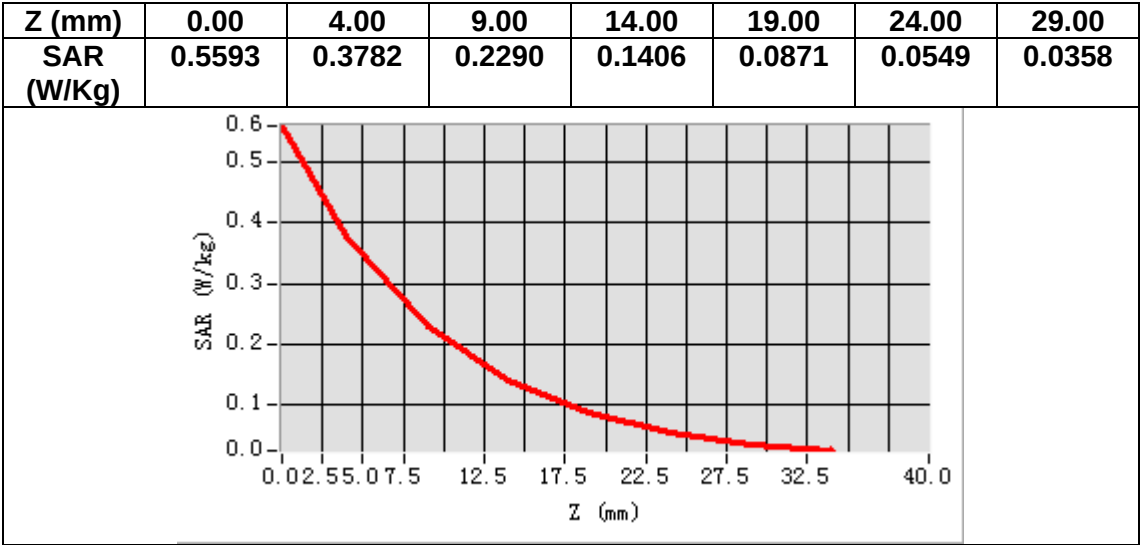
VOLUME SAR



Maximum location: X=-24.00, Y=-25.00

SAR Peak: 0.58 W/kg

SAR 10g (W/Kg)	0.203713
SAR 1g (W/Kg)	0.370599



MEASUREMENT 15

Date of measurement: 7/7/2024

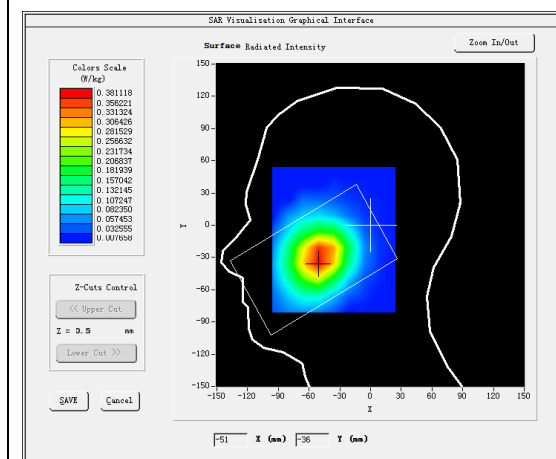
A. Experimental conditions.

<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>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

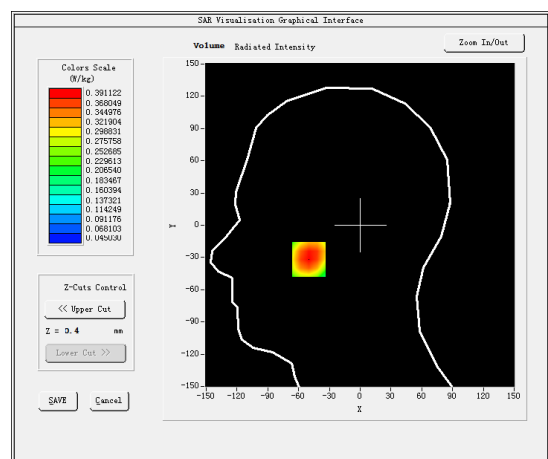
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.524487
Relative permittivity (imaginary part)	19.558945
Conductivity (S/m)	0.908948
Variation (%)	-4.880000

SURFACE SAR



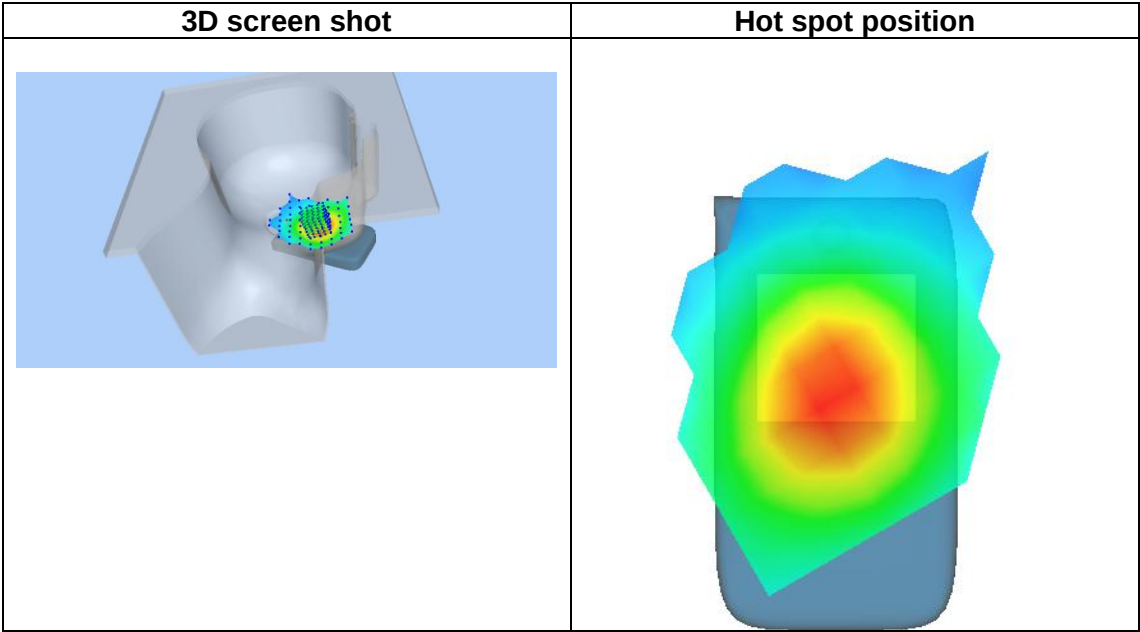
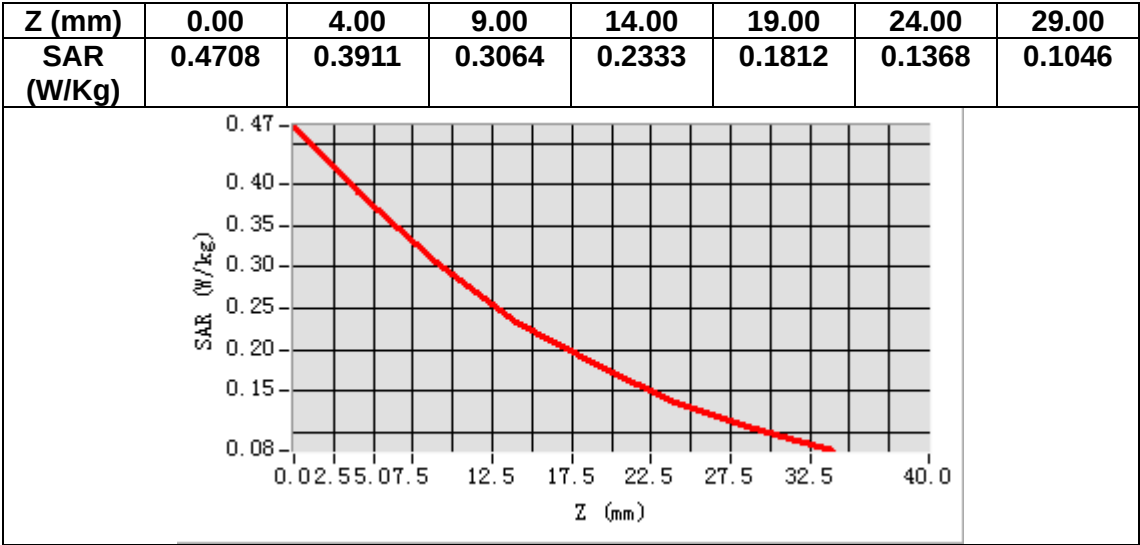
VOLUME SAR



Maximum location: X=-50.00, Y=-32.00

SAR Peak: 0.48 W/kg

SAR 10g (W/Kg)	0.272745
SAR 1g (W/Kg)	0.379494



MEASUREMENT 16

Date of measurement: 7/7/2024

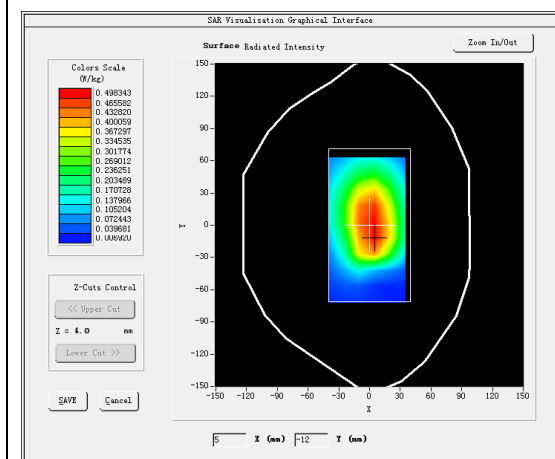
A. Experimental conditions.

<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>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

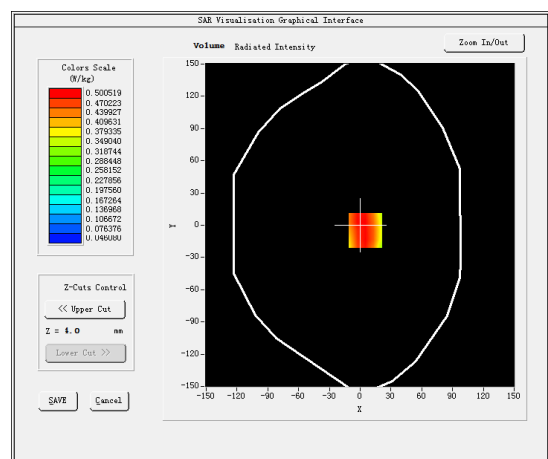
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.524487
Relative permittivity (imaginary part)	19.558945
Conductivity (S/m)	0.908948
Variation (%)	-0.760000

SURFACE SAR



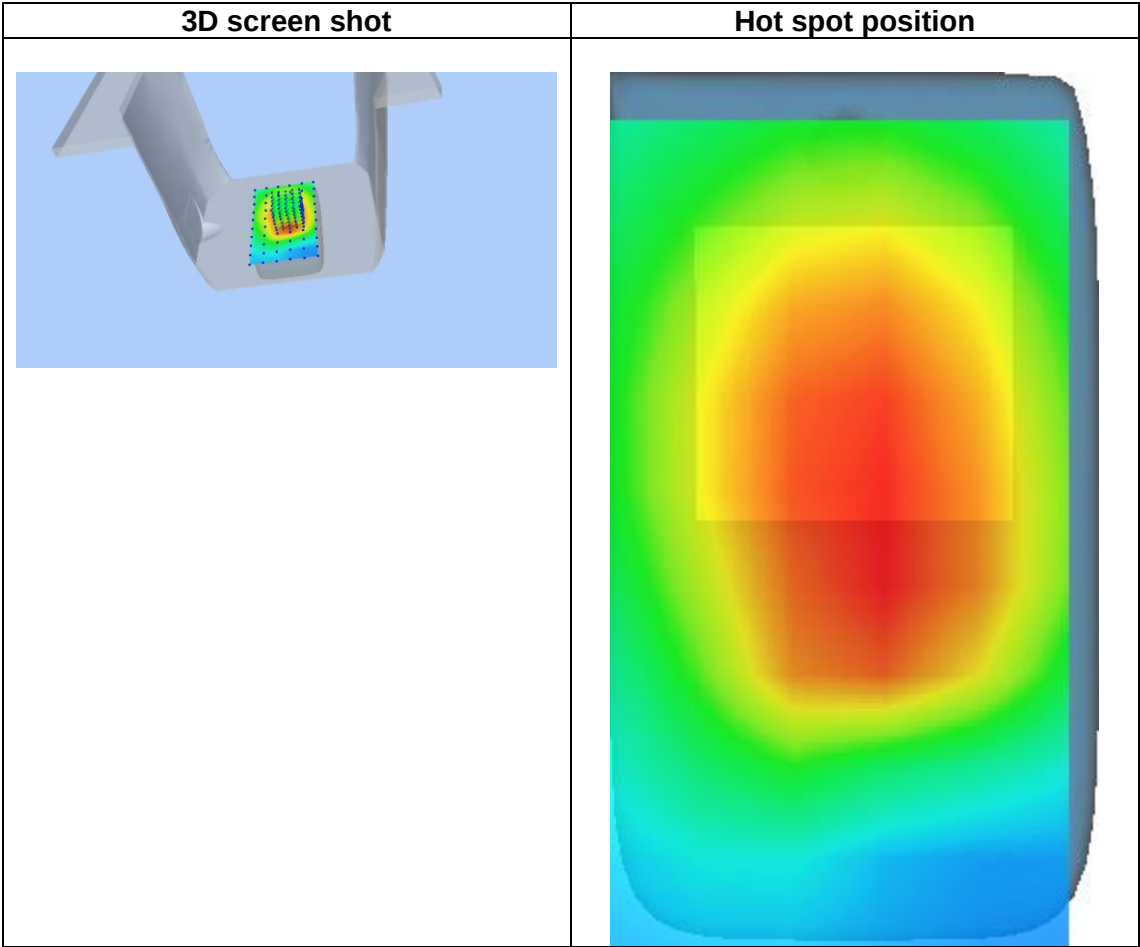
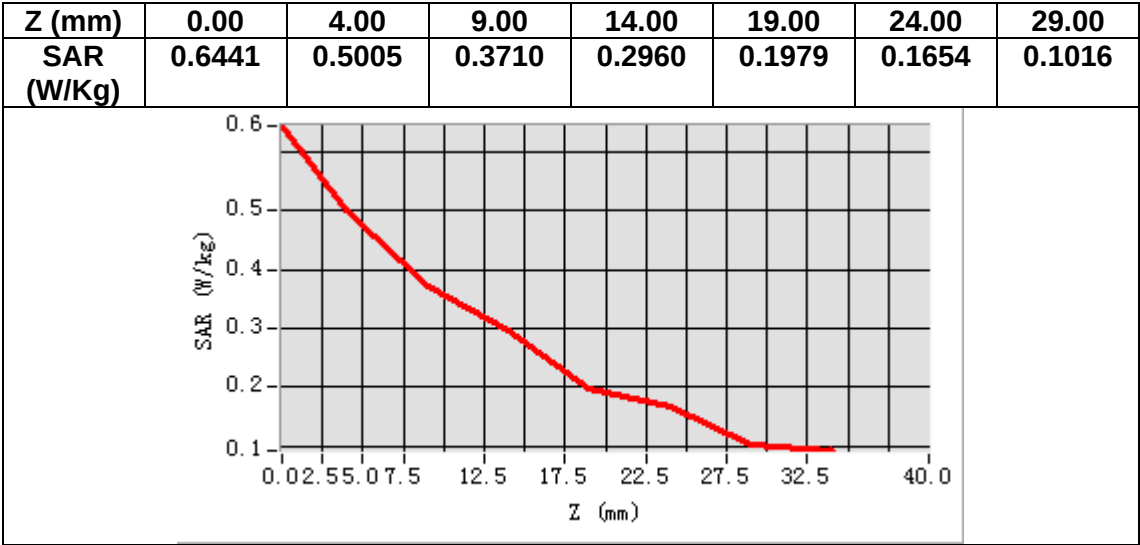
VOLUME SAR



Maximum location: X=5.00, Y=-5.00

SAR Peak: 0.66 W/kg

SAR 10g (W/Kg)	0.356360
SAR 1g (W/Kg)	0.493394



MEASUREMENT 17

Date of measurement: 6/7/2024

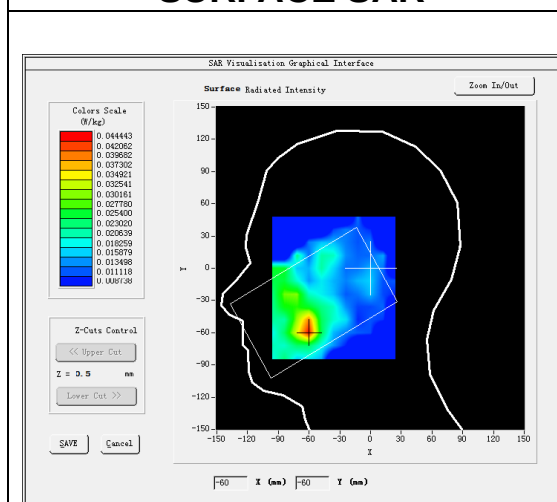
A. Experimental conditions.

<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>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

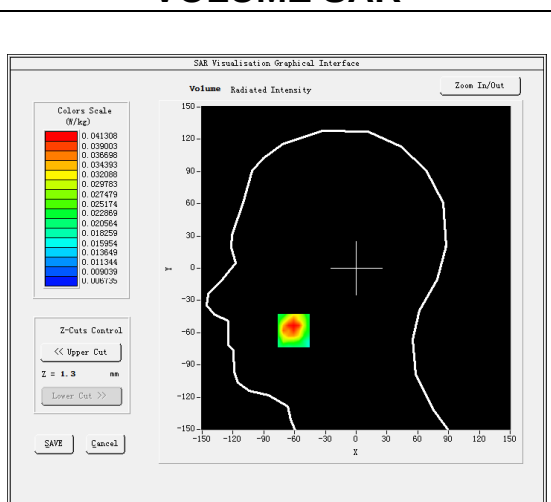
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.213741
Relative permittivity (imaginary part)	13.599372
Conductivity (S/m)	1.915245
Variation (%)	-1.240000

SURFACE SAR



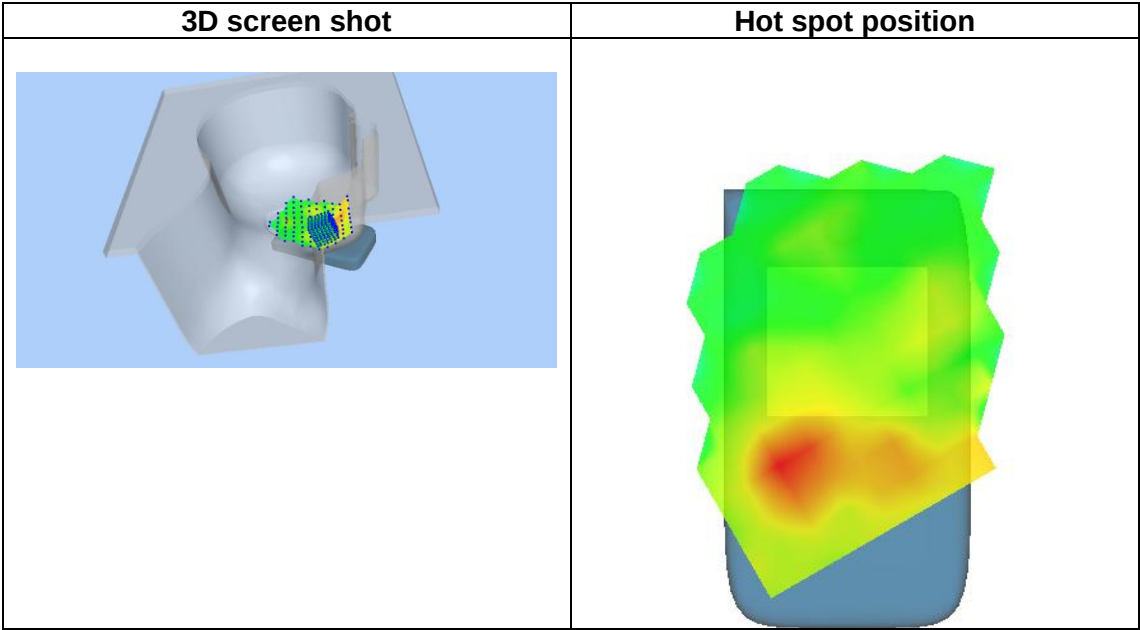
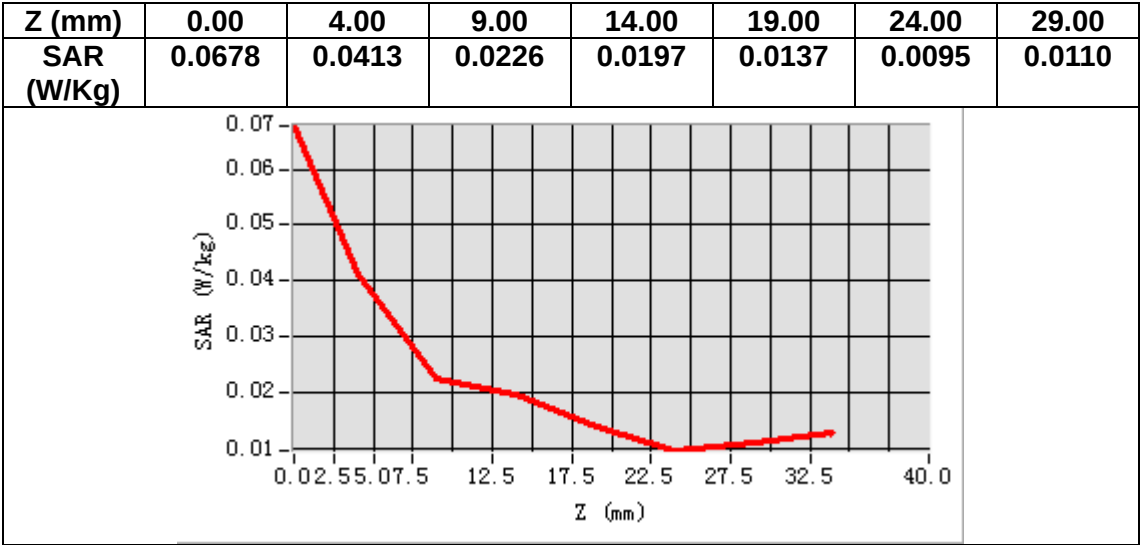
VOLUME SAR



Maximum location: X=-61.00, Y=-58.00

SAR Peak: 0.07 W/kg

SAR 10g (W/Kg)	0.024439
SAR 1g (W/Kg)	0.038497



MEASUREMENT 18

Date of measurement: 6/7/2024

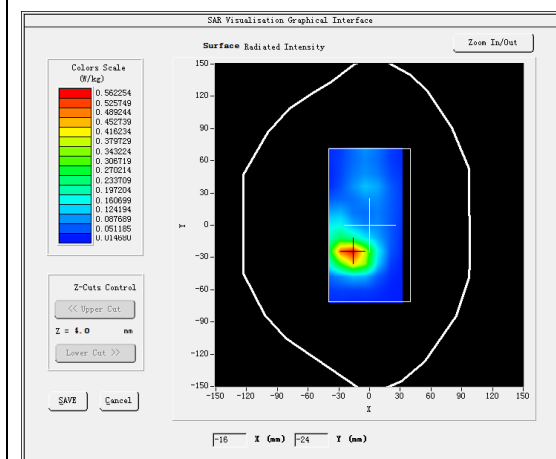
A. Experimental conditions.

<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>Body</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

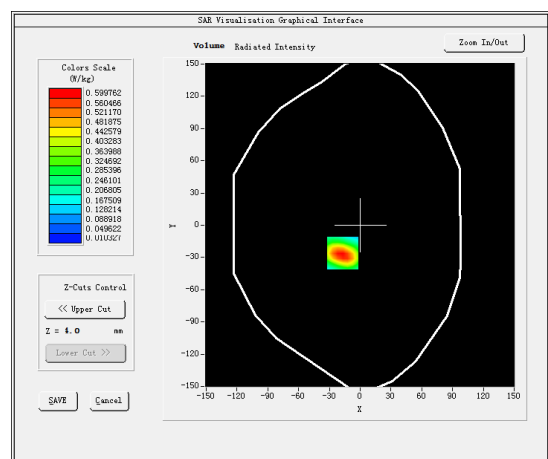
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.213741
Relative permittivity (imaginary part)	13.599372
Conductivity (S/m)	1.915245
Variation (%)	-1.450000

SURFACE SAR



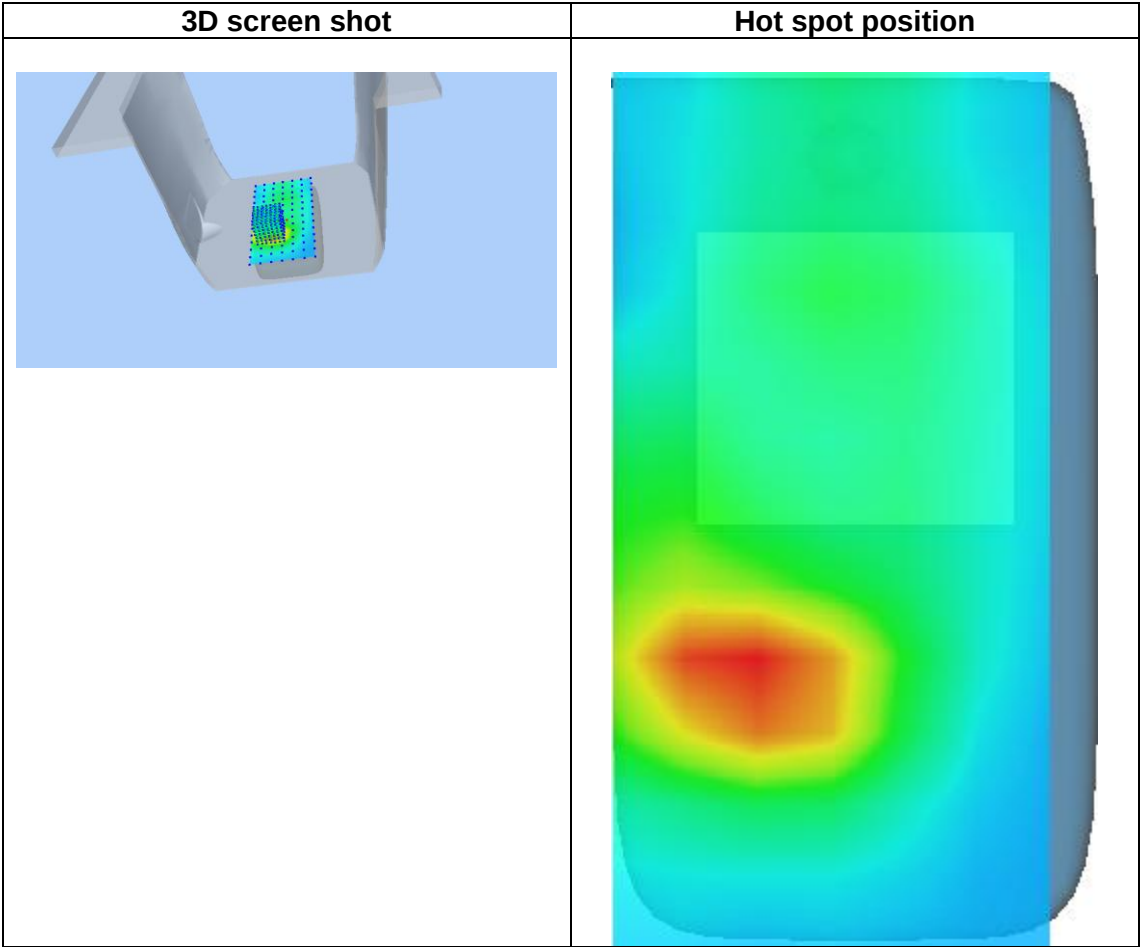
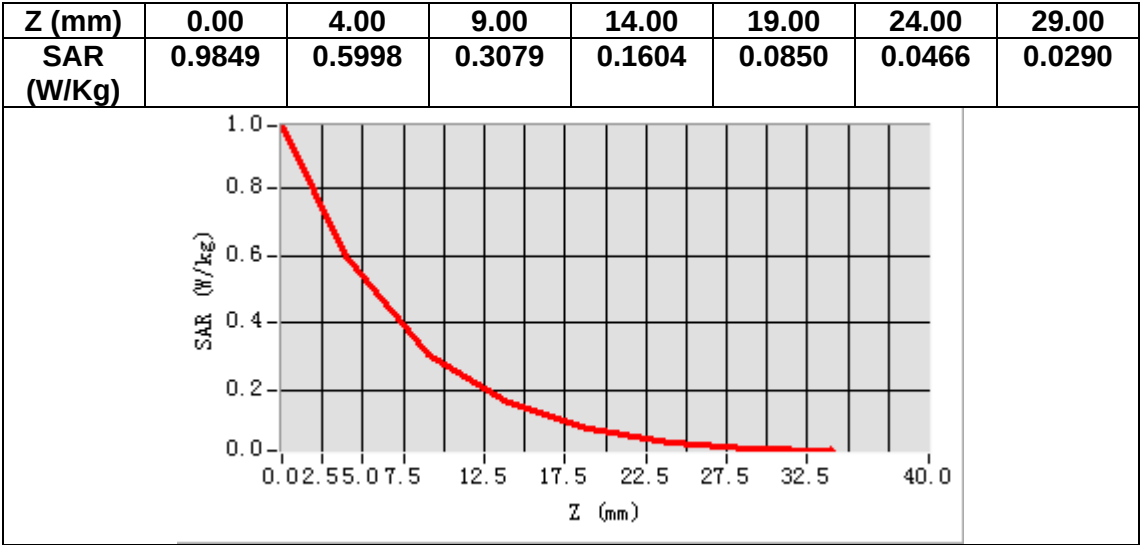
VOLUME SAR



Maximum location: X=-17.00, Y=-26.00

SAR Peak: 0.99 W/kg

SAR 10g (W/Kg)	0.274024
SAR 1g (W/Kg)	0.561169



14. Appendix D. Calibration Certificate

Table of contents
E Field Probe - 3423-EPGO-426
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
2600 MHz Dipole - SN 03/15 DIP 2G600-356



COMOSAR E-Field Probe Calibration Report

Ref : ACR.261.11.23.BES.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.: 3423-EPGO-426

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 09/18/2023



Accreditations #2-6789
Scope available on www.cofrac.fr

The use of the Cofrac brand and the accreditation references is prohibited from any reproduction.

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Cyrille ONNEE	Measurement Responsible	9/18/2023	
<i>Checked & approved by:</i>	Jérôme Luc	Technical Manager	9/18/2023	
<i>Authorized by:</i>	Yann Toutain	Laboratory Director	9/19/2023	

Yann
Toutain ID

Signature
numérique de
Yann Toutain ID
Date : 2023.09.19
09:08:14 +02'00'

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

<i>Issue</i>	<i>Name</i>	<i>Date</i>	<i>Modifications</i>
A	Cyrille ONNEE	9/18/2023	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

TABLE OF CONTENTS

1	Device Under Test	4
2	Product Description	4
2.1	General Information	4
3	Measurement Method	4
3.1	Sensitivity	4
3.2	Linearity	5
3.3	Isotropy	5
3.4	Boundary Effect	5
4	Measurement Uncertainty	6
5	Calibration Results	6
5.1	Calibration in air	6
5.2	Calibration in liquid	7
6	Verification Results	8
7	List of Equipment	9



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	3423-EPGO-426
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-7.5GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.261 MΩ Dipole 2: R2=0.213 MΩ Dipole 3: R3=0.233 MΩ

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards.



Figure 1 – MVG COMOSAR Dosimetric E field Probe

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 IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their effect. All calibrations / measurements performed meet the fore-mentioned standards.

3.1 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 for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

3.2 LINEARITY

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

3.3 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 to 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°).

3.4 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.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and $d_{be} + d_{step}$ along lines that are approximately normal to the surface:

$$SAR_{uncertainty} [\%] = \Delta SAR_{be} \frac{(d_{be} + d_{step})^2}{2d_{step}} \frac{(e^{-d_{be}/\delta} - e^{-(d_{be} + d_{step})/\delta})}{\delta/2} \quad \text{for } (d_{be} + d_{step}) < 10 \text{ mm}$$

where

$SAR_{uncertainty}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest <i>zoom-scan</i> measurement point, in millimetre
Δ_{step}	is the separation distance between the first and second measurement points that are closest to the phantom surface, in millimetre, assuming the boundary effect at the second location is negligible
δ	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;
ΔSAR_{be}	in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

The measured worst case boundary effect SARuncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).