

FCC SAR EVALUATION REPORT

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

Product Name : Tablet

Trademark : ulefone

Model Name : GQ3109

Family Model : Armor Pad, Armor Pad Pro, Armor Pad Lite

FCC ID : 2AOWK-3109

Report No. : STR221208002008E

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TEST RESULT CERTIFICATION**Applicant's name**.....: Shenzhen Gotron Electronic CO.,LTD.Address.....: 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,
Shenzhen City, Guangdong Province China**Manufacturer's Name**.....: Shenzhen Gotron Electronic CO.,LTD.Address.....: 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,
Shenzhen City, Guangdong Province China**Product description**

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FCC 47 CFR Part 2(2.1093)

ANSI/IEEE C95.1-1992

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) and ANSI/IEEE C95.1-1992. The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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Test Sample Number..... T221208001R003

Date of Test

Date (s) of performance of tests.....: Dec. 08, 2022 ~ Dec. 22, 2022

Date of Issue: Feb. 15, 2023

Test Result: **Pass**Prepared By
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(Lab Manager): Alex
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※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Feb. 15, 2023	Jacob Chen

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1. General Information

1.1. RF exposure limits

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

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

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

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

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

Occupational/Controlled Environments:

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

General Population/Uncontrolled Environments:

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

NOTE
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 GQ3109 are as follows.

RF Exposure Conditions		Equipment Class -Highest Reported SAR (W/kg)			
		PCE	DTS	NII	DSS
1-g Head		0.503	0.220	0.700	N/A
1-g Body-Worn (Separation distance of 0mm)		0.882	0.296	0.686	N/A
Max Simultaneous Tx	Head	1.203	0.723	1.203	0.670
	Body-Worn	1.568	1.178	1.568	1.049

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

1.3. EUT Description

Device Information	
Product Name	Tablet
Trade Name	ulefone
Model Name	GQ3109
Family Model	Armor Pad, Armor Pad Pro, Armor Pad Lite
Model Difference	All the model are the same circuit and RF module, only color and model name are different.
FCC ID	2AOWK-3109
Device Phase	Identical Prototype
Exposure Category	General population / Uncontrolled environment
Antenna	PIFA Antenna
Battery	DC 3.85V, 7650mAh, 29.45Wh
Hardware version	MB_TP787_A1_V1.1
Software version	Armor Pad_SH1_EEA_V1
Device Operating Configurations	
Supporting Mode(s)	GSM 850/1900, WCDMA Band 2/4/5, LTE Band 2/4/5/7/12/17/41, WLAN 2.4G/5G, Bluetooth
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), 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
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	LTE Band 41	2540-2650	
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	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
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control "all 1"(WCDMA Band 2)		
	3, tested with power control "all 1"(WCDMA Band 4)		
	3, tested with power control "all 1"(WCDMA Band 5)		
	3, tested with power control all Max.(LTE Band 2)		
	3, tested with power control all Max.(LTE Band 4)		
	3, tested with power control all Max.(LTE Band 5)		
	3, tested with power control all Max.(LTE Band 7)		
	3, tested with power control all Max.(LTE Band 12)		
	3, tested with power control all Max.(LTE Band 17)		
	3, tested with power control all Max.(LTE Band 41)		

1.4. Test specification(s)

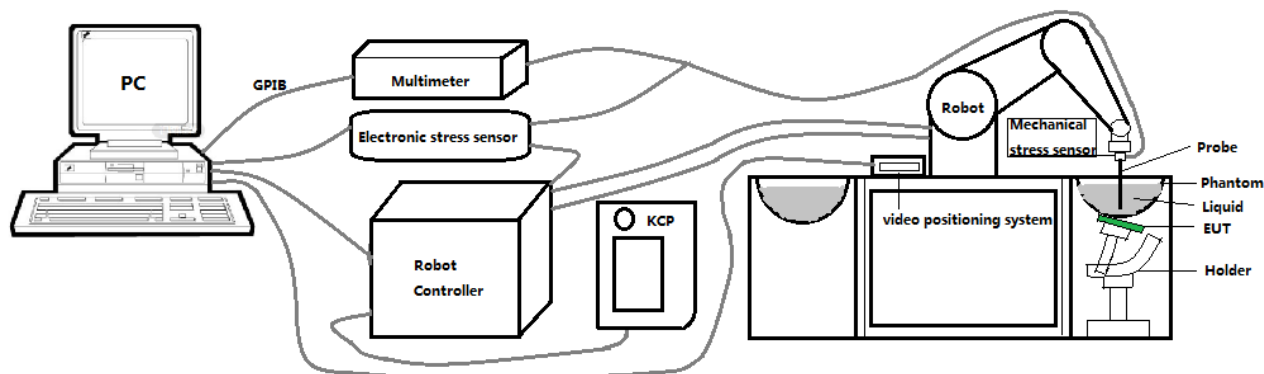
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 616217 D04 SAR for laptop and tablets

1.5. Ambient Condition

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

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



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

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

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

2.2. Robot

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



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

2.3. E-Field Probe

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

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



- Dynamic range: 0.01-100 W/kg
 - Tip Diameter : 2.5 mm
 - Distance between probe tip and sensor center: 1 mm
 - Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
 - Probe linearity: ± 0.08 dB
 - Axial isotropy: ± 0.01 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

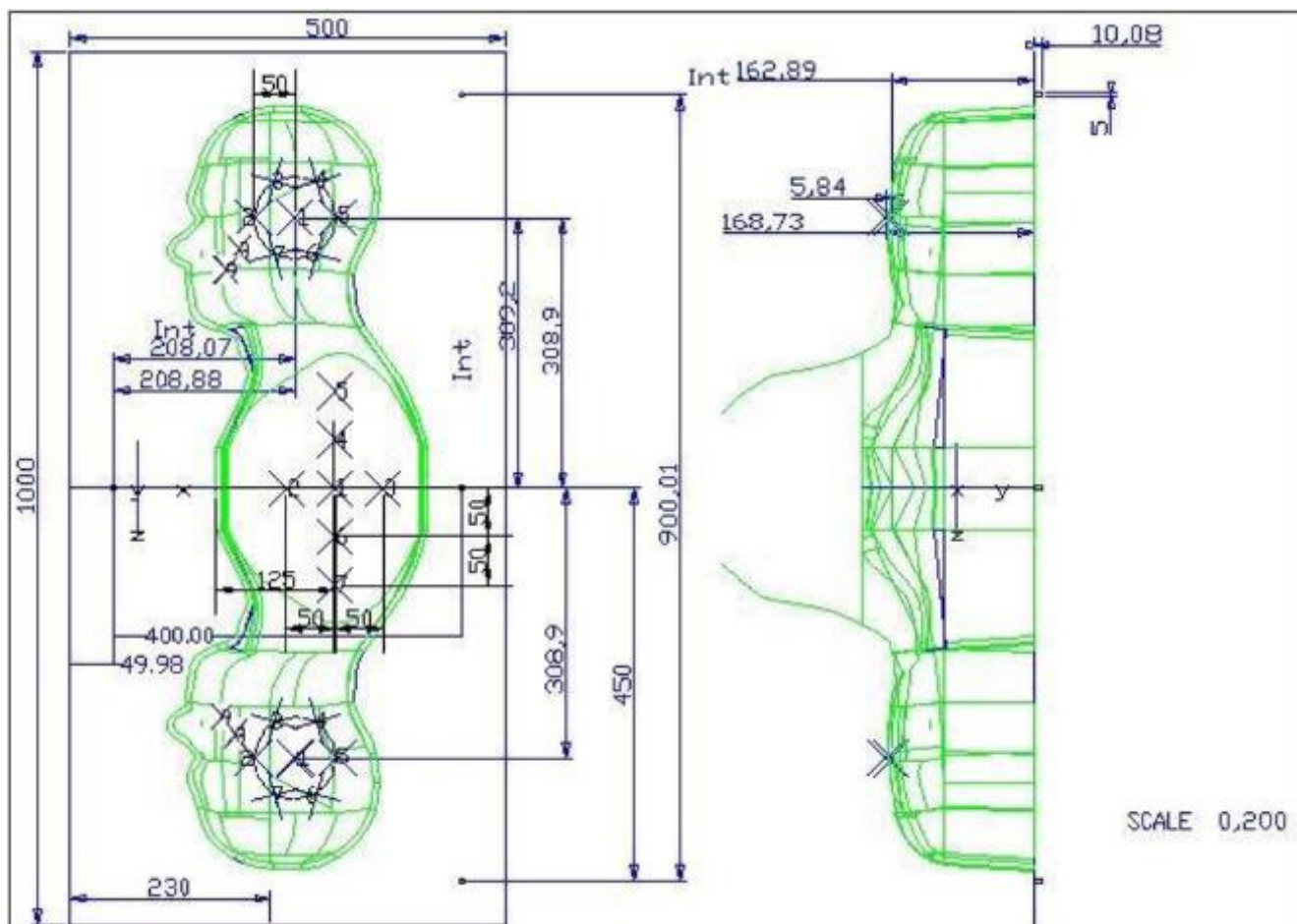
Photo of SAM phantom SN 16/15 SAM119



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

2.4.1. Technical Data

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

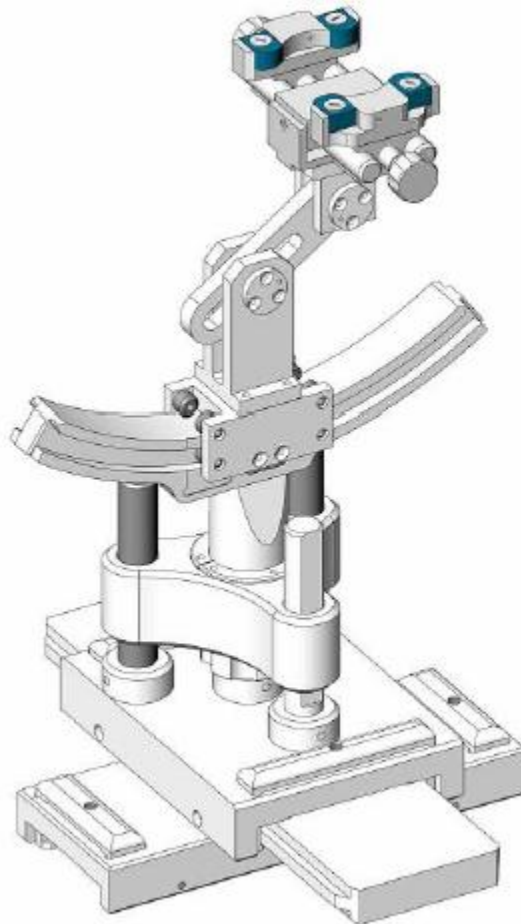


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

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

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	SN 08/16 EPGO287	Feb. 01, 2022	Jan. 31, 2023
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Mar. 01, 2021	Feb. 28, 2024
☒	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	117858	Jun. 17, 2022	Jun. 16, 2023
☒	R&S	Wideband radio communication tester	CMW500	103917	Jun. 17, 2022	Jun. 16, 2023
☒	HP	Network Analyzer	8753D	3410J01136	Jun. 17, 2022	Jun. 16, 2023

☒	Agilent	MXG Vector Signal Generator	N5182A	MY47070317	Jun. 16, 2022	Jun. 15, 2023
☒	Agilent	Power meter	E4419B	MY45102538	Jun. 17, 2022	Jun. 16, 2023
☒	Agilent	Power sensor	E9301A	MY41495644	Jun. 17, 2022	Jun. 16, 2023
☒	Agilent	Power sensor	E9301A	US39212148	Jun. 17, 2022	Jun. 16, 2023
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Jul. 17, 2020	Jul. 16, 2023

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

3.1. Power Reference

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

3.2. Area scan & Zoom scan

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

Measurement of the SAR distribution with a grid of 8 to 16 mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8 * 4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g., 1 W/kg for 1,6 W/kg 1 g limit, or 1,26 W/kg for 2 W/kg, 10 g limit).

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

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$			$\leq 2 \text{ GHz}: \leq 15 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 12 \text{ mm}$	$3 - 4 \text{ GHz}: \leq 12 \text{ mm}$ $4 - 6 \text{ GHz}: \leq 10 \text{ mm}$
			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: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			$\leq 2 \text{ GHz}: \leq 8 \text{ mm}$ $2 - 3 \text{ GHz}: \leq 5 \text{ mm}^*$	$3 - 4 \text{ GHz}: \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz}: \leq 4 \text{ mm}^*$
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	$3 - 4 \text{ GHz}: \leq 4 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 3 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	$3 - 4 \text{ GHz}: \leq 3 \text{ mm}$ $4 - 5 \text{ GHz}: \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz}: \leq 2 \text{ mm}$
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{\text{Zoom}}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	$3 - 4 \text{ GHz}: \geq 28 \text{ mm}$ $4 - 5 \text{ GHz}: \geq 25 \text{ mm}$ $5 - 6 \text{ GHz}: \geq 22 \text{ mm}$

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

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

3.3. Description of interpolation/extrapolation scheme

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

An extrapolation is used to determine 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 for 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 defined 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.

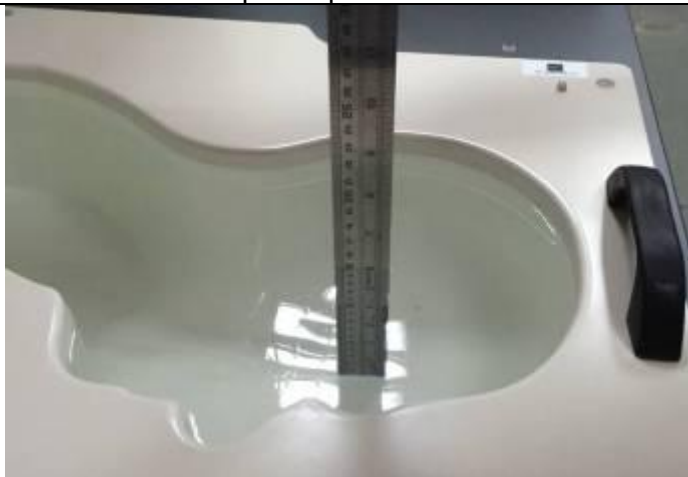
4. System Verification Procedure

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
Ingredients (% of weight)	Body Tissue									
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200	5800
Water	50.30	50.30	50.30	69.91	69.91	71.88	71.88	71.88	79.54	79.54
NaCl	0.60	0.60	0.60	0.13	0.13	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	49.10	49.10	49.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	9.99	9.99	19.97	19.97	19.97	11.24	11.24
DGBE	0.00	0.00	0.00	19.97	19.97	7.99	7.99	7.99	9.22	9.22

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid depth from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm.

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.

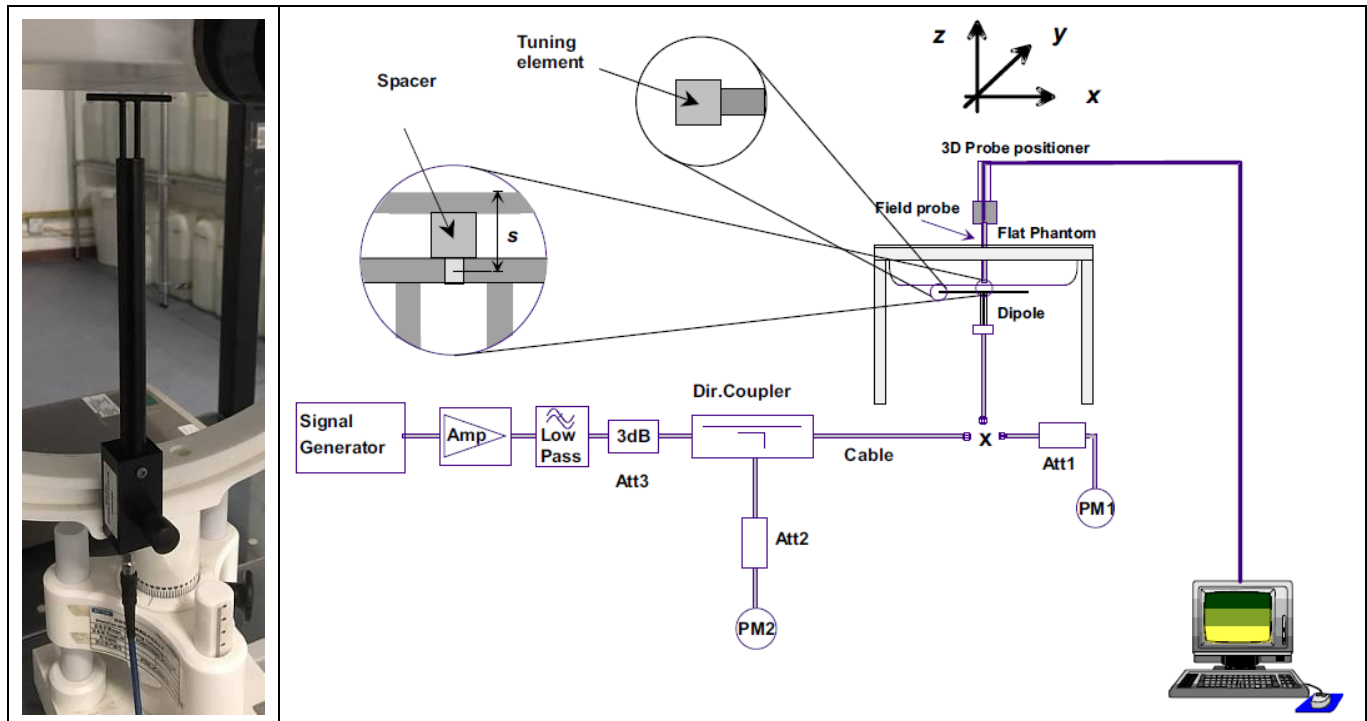
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	σ (S/m) ($\pm 5\%$)	ϵ_r	σ (S/m)		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	40.64	0.90	21.4 °C	Dec. 13, 2022
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.38	0.93	21.7 °C	Dec. 12, 2022
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.04	1.40	21.3 °C	Dec. 16, 2022
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.78	1.45	21.8 °C	Dec. 09, 2022
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.12	1.84	21.4 °C	Dec. 15, 2022
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	38.08	1.98	21.4 °C	Dec. 08, 2022
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	36.03	4.74	21.6 °C	Dec. 22, 2022
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	34.61	5.26	21.5 °C	Dec. 21, 2022

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

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

System Verification	Target SAR (1W) ($\pm 10\%$)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
750MHz	8.53 (7.68~9.38)	5.56 (5.01~6.11)	7.71	6.00	21.4 °C	Dec. 13, 2022
835MHz	9.84 (8.86~10.82)	6.22 (5.60~6.84)	9.16	6.78	21.7 °C	Dec. 12, 2022
1800MHz	37.96 (34.17~41.75)	19.81 (17.83~21.79)	41.26	18.22	21.3 °C	Dec. 16, 2022
1900MHz	40.37 (36.34~44.40)	20.48 (18.44~22.52)	38.04	22.16	21.8 °C	Dec. 09, 2022
2450MHz	53.69 (48.33~59.05)	23.94 (21.55~26.33)	55.34	22.20	21.4 °C	Dec. 15, 2022
2600MHz	55.83 (50.25~61.41)	24.19 (21.78~26.60)	51.38	26.02	21.4 °C	Dec. 08, 2022
5200MHz	162.34 (146.11~178.57)	55.42 (49.88~60.96)	159.66	55.73	21.6 °C	Dec. 22, 2022
5800MHz	178.89 (161.01~196.77)	59.32 (53.39~65.25)	166.88	62.19	21.5 °C	Dec. 21, 2022

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.

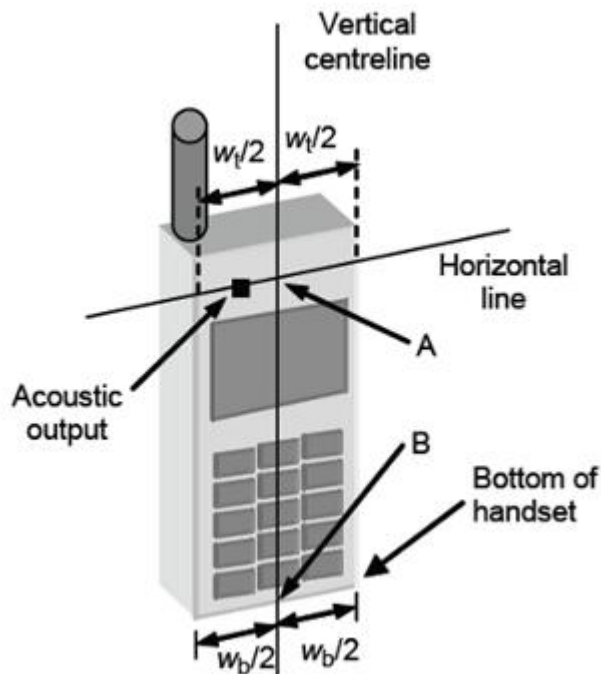


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case"

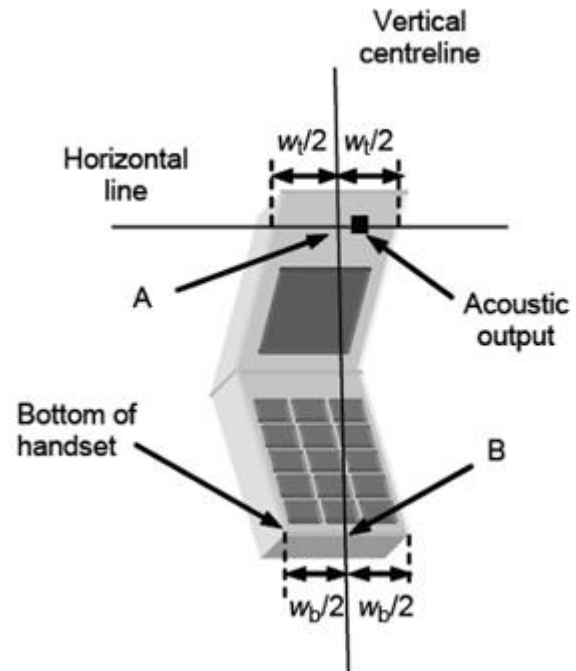


Fig 6.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

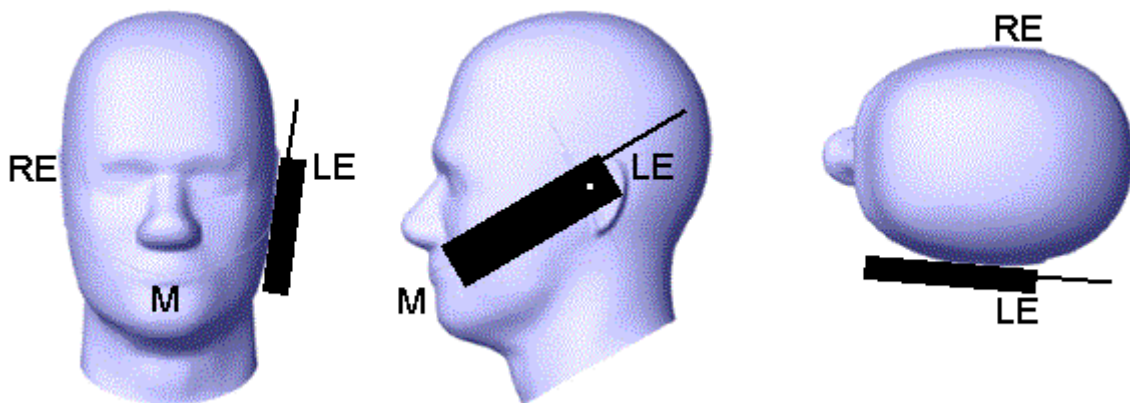


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

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.

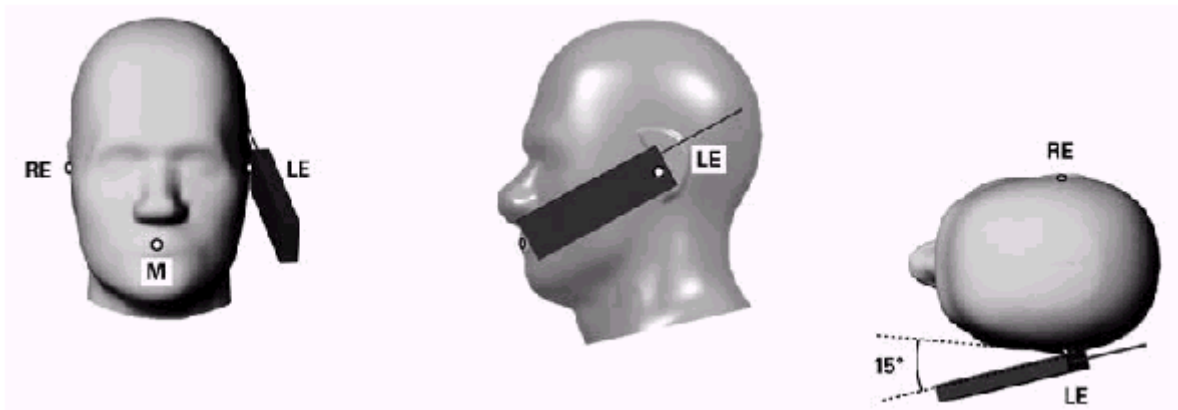


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

6.4. Tablet host platform exposure conditions

Refer to KDB616217 D04, when the modular approach is used, transmitters and modules must be initially tested for standalone operations in generic host conditions according to the following minimum test separation distance and antenna installation requirements for incorporation in the tablet platform. The separation distance required for incorporation in qualified hosts is described in KDB 447498; item 5) of section 4.1 and item 1) of section 5.2.2 etc.

- ≤ 5 mm between the antenna and user for both back surface and edge exposure conditions
- the antennas used by the host must have been tested for equipment approval or qualify for SAR test exclusion
- the antenna polarization, physical orientation, rotation and installation configurations used by the host must have been tested for compliance or qualify for test exclusion
- when the *SAR Test Exclusion Threshold* in KDB 447498 applies, a *test separation distance* of 5 mm is required to determine test exclusion for the tablet platform

The antennas embedded in tablets are typically ≤ 5 mm from the outer housing. The required antenna to user test separation distance is a “not to exceed test” distance required to apply the modular approach. Instead of the typical zero gap tablet edge test requirement between the edge of a tablet and the user, when an antenna has been tested at ≤ 5 mm according to the modular approach it can be incorporated into tablets with at least twice the tested distance from the outer housing of the tablet edge; otherwise, the tablet edge zero gap test requirement applies. When the dedicated host approach is applied, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom.

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune - up (dBm)	128	189	251	Tune - up (dBm)	128	189	251
Frequency (MHz)		824.2	836.4	848.8		824.2	836.4	848.8
GSM (GMSK)	33.00	32.62	32.56	32.56	23.97	23.59	23.53	23.53
GPRS(GMSK, 1 TS)	33.00	32.69	32.60	32.60	23.97	23.66	23.57	23.57
GPRS(GMSK, 2 TS)	32.00	31.73	31.64	31.63	25.98	25.71	25.62	25.61
GPRS(GMSK, 3 TS)	30.00	29.73	29.60	29.62	25.74	25.47	25.34	25.36
GPRS(GMSK, 4 TS)	29.00	28.61	28.49	28.51	25.99	25.60	25.48	25.50
EGPRS(8PSK, 1 TS)	25.00	24.87	24.63	24.83	15.97	15.84	15.60	15.80
EGPRS(8PSK, 2 TS)	24.00	24.00	23.99	23.81	17.98	17.98	17.97	17.79
EGPRS(8PSK, 3 TS)	22.00	21.85	21.91	21.68	17.74	17.59	17.65	17.42
EGPRS(8PSK, 4 TS)	21.00	20.86	20.23	20.51	17.99	17.85	17.22	17.50
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune - up (dBm)	512	661	810	Tune - up (dBm)	512	661	810
Frequency (MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8
GSM (GMSK)	29.50	29.37	29.12	29.13	20.47	20.34	20.09	20.10
GPRS(GMSK, 1 TS)	29.50	29.40	29.16	29.16	20.47	20.37	20.13	20.13
GPRS(GMSK, 2 TS)	28.50	28.45	28.20	28.21	22.48	22.43	22.18	22.19
GPRS(GMSK, 3 TS)	26.50	26.46	26.21	26.25	22.24	22.20	21.95	21.99
GPRS(GMSK, 4 TS)	25.50	25.37	25.11	25.17	22.49	22.36	22.10	22.16
EGPRS(8PSK, 1 TS)	27.00	25.92	26.74	26.93	17.97	16.89	17.71	17.90
EGPRS(8PSK, 2 TS)	26.00	25.44	25.89	25.61	19.98	19.42	19.87	19.59
EGPRS(8PSK, 3 TS)	24.50	23.44	24.28	24.12	20.24	19.18	20.02	19.86
EGPRS(8PSK, 4 TS)	23.50	22.74	23.36	23.22	20.49	19.73	20.35	20.21

Note: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots. The calculated method are shown as below:

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

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

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

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

7.2. WCDMA Conducted Power

WCDMA Band 2		Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	9262	9400	9538	
Frequency (MHz)		1852.4	1880	1907.6	
RMC12.2K	23.00	22.80	22.80	22.71	
HSDPA Sub 1	22.00	21.87	21.83	21.78	
HSDPA Sub 2	21.50	21.38	21.22	21.26	
HSDPA Sub 3	20.50	20.13	20.48	20.45	
HSDPA Sub 4	20.50	20.23	20.47	20.21	
HSUPA Sub 1	22.00	20.72	21.64	21.57	
HSUPA Sub 2	22.00	21.83	21.71	21.66	
HSUPA Sub 3	21.00	20.23	20.53	20.57	
HSUPA Sub 4	22.00	21.86	21.82	21.76	
HSUPA Sub 5	21.50	20.57	20.96	21.12	
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	23.00	22.70	22.63	22.74	
HSDPA Sub 1	22.00	21.73	21.72	21.75	
HSDPA Sub 2	21.50	21.44	21.05	21.32	
HSDPA Sub 3	20.50	20.48	19.84	20.01	
HSDPA Sub 4	20.50	20.36	20.25	20.32	
HSUPA Sub 1	22.00	20.48	21.55	21.56	
HSUPA Sub 2	22.00	21.68	21.55	21.64	
HSUPA Sub 3	21.00	20.00	20.36	20.53	
HSUPA Sub 4	22.00	21.79	21.72	21.73	
HSUPA Sub 5	21.00	20.23	20.91	20.91	
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	23.00	22.58	22.61	22.61	
HSDPA Sub 1	22.00	21.55	21.62	21.61	
HSDPA Sub 2	21.50	21.11	21.24	21.23	
HSDPA Sub 3	20.50	20.15	20.27	19.97	
HSDPA Sub 4	20.50	19.96	20.00	20.26	
HSUPA Sub 1	21.50	20.66	21.42	21.44	

HSUPA Sub 2	22.00	21.48	21.50	21.51
HSUPA Sub 3	20.50	19.76	20.23	20.19
HSUPA Sub 4	22.00	21.56	21.60	21.63
HSUPA Sub 5	21.00	20.01	20.89	20.97

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	24.00	22.40	23.47	23.33
			1	2	24.00	23.54	23.62	23.53
			1	5	24.00	23.36	23.48	23.26
			3	0	24.00	23.45	23.49	23.28
			3	1	24.00	23.39	23.52	23.26
			3	2	24.00	23.38	23.49	23.16
			6	0	22.50	22.38	22.48	22.30
		16QAM	1	0	23.00	22.25	22.64	22.24
			1	2	23.00	22.40	22.76	22.25
			1	5	23.00	22.27	22.65	22.19
			3	0	23.00	22.57	22.70	22.31
			3	1	23.00	22.58	22.71	22.19
			3	2	23.00	22.61	22.68	22.23
			6	0	22.00	21.60	21.67	21.16
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	24.00	23.41	23.07	22.98
			1	7	24.00	23.72	23.32	22.97
			1	14	24.00	23.48	23.01	22.92
			8	0	22.50	22.47	22.05	22.00
			8	4	22.50	22.47	22.11	22.02
			8	7	22.50	22.49	22.03	21.97
			15	0	22.50	22.43	22.01	22.00
		16QAM	1	0	23.00	22.56	21.94	22.43
			1	7	23.00	22.73	22.16	22.41
			1	14	23.00	22.26	21.92	22.40
			8	0	21.50	21.41	21.01	21.04

				8	4	21.50	21.40	21.03	21.06
				8	7	21.50	21.24	21.00	21.01
				15	0	21.50	21.27	21.07	20.98
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)			
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5	
LTE Band 2	5MHz	QPSK	1	0	24.00	22.87	22.91	22.91	
			1	12	24.00	23.23	23.29	23.06	
			1	24	24.00	22.88	22.87	22.90	
			12	0	22.50	21.96	22.06	22.04	
			12	6	22.50	22.03	22.09	22.03	
			12	11	22.50	21.91	22.07	21.94	
			25	0	22.50	21.97	22.05	22.02	
		16QAM	1	0	23.00	22.20	22.27	22.44	
			1	12	23.00	22.50	22.56	22.43	
			1	24	23.00	22.25	22.27	22.44	
			12	0	21.50	20.92	21.06	21.04	
			12	6	21.50	20.93	21.10	21.03	
			12	11	21.50	20.86	21.06	20.93	
			25	0	21.50	21.01	21.01	20.96	
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	24.00	22.54	23.00	22.94	
			1	24	24.00	23.65	23.07	23.07	
			1	49	24.00	23.49	22.98	22.92	
			25	0	23.00	22.56	22.14	22.14	
			25	12	23.00	22.52	22.07	22.04	
			25	24	23.00	22.58	22.09	22.01	
			50	0	23.00	22.51	22.12	22.01	
		16QAM	1	0	23.00	22.22	22.50	22.18	
			1	24	23.00	22.25	22.55	22.34	
			1	49	23.00	21.99	22.43	22.14	
			25	0	21.50	21.46	21.18	21.12	
			25	12	21.50	21.07	21.12	21.03	
			25	24	21.50	21.06	21.10	20.98	
			50	0	21.50	21.08	21.10	21.04	
Band	Band	Modulation	RB		Tune-up	Channel/Frequency(MHz)			

	Width		Configuration		(dBm)			
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5
LTE Band 2	15MHz	QPSK	1	0	24.00	22.84	23.01	22.97
			1	37	24.00	23.04	23.32	23.11
			1	74	24.00	22.87	22.93	22.83
			36	0	22.50	22.10	22.15	22.09
			36	18	22.50	22.05	22.13	22.10
			36	37	22.50	22.10	22.09	22.03
			75	0	22.50	22.10	22.10	22.09
		16QAM	1	0	23.00	22.38	22.22	22.14
			1	37	23.00	22.64	22.51	22.57
			1	74	23.00	22.42	22.17	22.04
			36	0	21.50	21.05	21.19	21.05
			36	18	21.50	21.09	21.17	21.01
			36	37	21.50	21.09	21.13	20.97
			75	0	21.50	21.01	21.07	21.07
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	24.00	22.72	22.87	22.88
			1	49	24.00	23.08	23.16	23.12
			1	99	24.00	22.77	22.79	22.77
			50	0	22.50	22.13	22.17	22.05
			50	24	22.50	22.06	22.07	22.05
			50	49	22.50	22.17	22.09	21.93
			100	0	22.50	22.09	22.11	21.95
		16QAM	1	0	22.50	22.12	22.16	22.20
			1	49	22.50	22.41	22.41	22.38
			1	99	22.50	22.12	22.12	22.09
			50	0	21.50	21.05	21.16	21.07
			50	24	21.50	21.09	21.04	21.08
			50	49	21.50	21.19	21.07	20.96
			100	0	21.50	21.09	21.13	20.97

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	23.50	21.92	22.81	22.77
			1	2	23.50	23.09	22.97	22.89
			1	5	23.50	22.86	22.80	22.72
			3	0	23.00	22.94	22.86	22.86
			3	1	23.00	22.95	22.92	22.86
			3	2	23.00	22.91	22.88	22.81
			6	0	22.00	21.95	21.82	21.85
		16QAM	1	0	22.50	21.72	21.93	21.93
			1	2	22.50	21.91	22.11	22.09
			1	5	22.50	21.76	21.93	21.95
			3	0	22.50	22.04	22.04	22.01
			3	1	22.50	22.05	22.01	22.04
			3	2	22.50	22.10	21.99	22.06
			6	0	21.50	21.06	20.99	20.99
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	23.50	22.94	22.80	22.80
			1	7	23.50	23.16	23.13	23.17
			1	14	23.50	22.97	22.76	22.84
			8	0	22.00	21.88	21.80	21.83
			8	4	22.00	21.92	21.83	21.89
			8	7	22.00	21.92	21.81	21.85
			15	0	22.00	21.85	21.76	21.81
		16QAM	1	0	22.50	21.80	22.22	22.02
			1	7	22.50	22.13	22.49	22.45
			1	14	22.50	21.73	22.19	21.99
			8	0	21.00	20.89	20.84	20.83
			8	4	21.00	20.87	20.86	20.86
			8	7	21.00	20.86	20.84	20.83
			15	0	21.00	20.89	20.82	20.77
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	23.50	22.79	22.61	22.73
			1	12	23.50	23.22	23.18	23.15
			1	24	23.50	22.81	22.71	22.71
			12	0	22.00	21.89	21.82	21.76

				12	6	22.00	21.92	21.85	21.88
				12	11	22.00	21.94	21.72	21.77
				25	0	22.00	21.90	21.74	21.80
			16QAM	1	0	23.00	22.32	22.00	22.08
				1	12	23.00	22.73	22.61	22.52
				1	24	23.00	22.30	22.03	21.97
				12	0	21.00	20.81	20.70	20.78
				12	6	21.00	20.91	20.77	20.88
				12	11	21.00	20.85	20.61	20.79
				25	0	21.00	20.82	20.80	20.74
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	23.50	22.89	22.76	22.85	
			1	24	23.50	23.02	22.86	22.95	
			1	49	23.50	22.89	22.78	22.85	
			25	0	22.50	21.82	21.83	21.80	
			25	12	22.50	21.92	21.80	21.81	
			25	24	22.50	22.03	21.67	21.82	
			50	0	22.00	21.91	21.76	21.78	
		16QAM	1	0	22.50	22.28	21.93	21.72	
			1	24	22.50	22.34	22.10	21.81	
			1	49	22.50	22.22	21.99	21.66	
			25	0	21.50	20.85	20.82	20.83	
			25	12	21.50	20.90	20.80	20.80	
			25	24	21.50	21.05	20.69	20.85	
			50	0	21.00	20.93	20.80	20.78	
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	23.50	22.76	22.69	22.75	
			1	37	23.50	22.97	23.06	23.04	
			1	74	23.50	22.53	22.75	22.67	
			36	0	22.00	21.95	21.83	21.88	
			36	18	22.00	21.96	21.89	21.96	
			36	37	22.00	21.99	21.79	21.97	
			75	0	22.00	21.99	21.84	21.95	
		16QAM	1	0	23.00	22.23	21.87	21.89	

			1	37	23.00	22.51	22.32	22.25
			1	74	23.00	22.01	21.98	21.82
			36	0	21.00	20.90	20.85	20.85
			36	18	21.00	20.94	20.92	20.88
			36	37	21.00	20.97	20.82	20.83
			75	0	21.00	20.91	20.82	20.92
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	23.50	22.67	22.57	22.62
			1	49	23.50	23.05	22.95	23.01
			1	99	23.50	22.62	22.63	22.65
			50	0	22.00	21.71	21.74	21.94
			50	24	22.00	21.80	21.84	21.90
			50	49	22.00	21.95	21.65	21.98
			100	0	22.00	21.85	21.74	22.00
		16QAM	1	0	22.50	21.94	21.84	21.89
			1	49	22.50	22.24	22.19	22.28
			1	99	22.50	21.86	21.98	21.84
			50	0	21.50	20.76	20.80	20.94
			50	24	21.50	20.84	20.88	20.86
			50	49	21.50	21.03	20.73	21.01
			100	0	21.50	20.84	20.75	21.02

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	23.50	21.67	22.61	22.62
			1	2	23.50	22.83	22.72	22.76
			1	5	23.50	22.67	22.63	22.63
			3	0	23.00	22.72	22.68	22.73
			3	1	23.00	22.70	22.70	22.74
			3	2	23.00	22.64	22.66	22.77
			6	0	22.00	21.64	21.64	21.62
		16QAM	1	0	22.00	21.89	21.47	21.82
			1	2	22.00	21.96	21.60	21.91
			1	5	22.00	21.81	21.44	21.77
			3	0	22.00	21.97	21.79	21.84

			3	1	22.00	21.97	21.81	21.88
			3	2	22.00	21.95	21.84	21.87
			6	0	21.00	20.81	20.82	20.83
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE Band 5	3MHz	QPSK	1	0	23.50	22.71	22.65	22.70
			1	7	23.50	23.01	22.84	23.03
			1	14	23.50	22.64	22.62	22.69
			8	0	22.00	21.67	21.66	21.68
			8	4	22.00	21.69	21.71	21.71
			8	7	22.00	21.67	21.64	21.65
			15	0	22.00	21.65	21.66	21.69
		16QAM	1	0	22.50	22.18	21.86	21.63
			1	7	22.50	22.41	22.16	22.08
			1	14	22.50	22.11	21.83	21.57
			8	0	21.00	20.72	20.69	20.71
			8	4	21.00	20.74	20.70	20.70
			8	7	21.00	20.73	20.64	20.68
			15	0	21.00	20.72	20.65	20.78
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	23.50	22.59	22.62	22.59
			1	12	23.50	22.90	22.94	22.96
			1	24	23.50	22.54	22.55	22.59
			12	0	22.00	21.64	21.69	21.73
			12	6	22.00	21.69	21.70	21.74
			12	11	22.00	21.69	21.62	21.64
			25	0	22.00	21.69	21.68	21.70
		16QAM	1	0	23.00	21.94	22.08	21.93
			1	12	23.00	22.32	22.50	22.36
			1	24	23.00	21.95	22.06	21.91
			12	0	21.00	20.70	20.71	20.67
			12	6	21.00	20.73	20.73	20.69
			12	11	21.00	20.76	20.61	20.60
			25	0	21.00	20.67	20.66	20.76
Band	Band	Modulation	RB		Tune-up	Channel/Frequency(MHz)		

	Width		Configuration		(dBm)			
			RB Size	RB Offset		20450/829	20525/836.5	20600/844
LTE Band 5	10MHz	QPSK	1	0	23.50	22.71	22.68	22.67
			1	24	23.50	22.83	22.78	22.82
			1	49	23.50	22.73	22.73	22.70
			25	0	22.00	21.64	21.80	21.77
			25	12	22.00	21.69	21.70	21.74
			25	24	22.00	21.70	21.63	21.65
			50	0	22.00	21.68	21.74	21.80
		16QAM	1	0	22.50	21.88	21.57	22.11
			1	24	22.50	22.00	21.62	22.23
			1	49	22.50	21.86	21.61	22.10
			25	0	21.00	20.67	20.80	20.82
			25	12	21.00	20.70	20.74	20.84
			25	24	21.00	20.73	20.70	20.75
			50	0	21.00	20.73	20.76	20.81

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	22.50	22.03	22.00	21.94
			1	12	22.50	22.29	22.32	22.31
			1	24	22.50	22.00	22.02	22.04
			12	0	21.50	21.06	21.02	21.02
			12	6	21.50	21.12	21.11	21.10
			12	11	21.50	21.02	21.07	21.09
			25	0	21.50	21.12	21.10	21.07
		16QAM	1	0	22.00	21.44	21.35	21.54
			1	12	22.00	21.71	21.71	21.93
			1	24	22.00	21.36	21.35	21.58
			12	0	20.50	20.07	20.16	20.09
			12	6	20.50	20.15	20.18	20.17
			12	11	20.50	20.10	20.14	20.18
			25	0	20.50	20.18	20.14	20.13
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	22.50	22.14	22.12	22.10
			1	24	22.50	22.19	22.25	22.20
			1	49	22.50	22.15	22.15	22.13
			25	0	21.50	21.17	21.08	21.12
			25	12	21.50	21.16	21.11	21.11
			25	24	21.50	21.18	21.17	21.16
			50	0	21.50	21.20	21.11	21.13
		16QAM	1	0	22.00	21.32	20.99	21.49
			1	24	22.00	21.42	21.14	21.57
			1	49	22.00	21.38	21.00	21.56
			25	0	20.50	20.26	20.16	20.21
			25	12	20.50	20.24	20.20	20.15
			25	24	20.50	20.28	20.22	20.31
			50	0	20.50	20.31	20.19	20.21
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	22.50	22.07	22.09	22.11
			1	37	22.50	22.47	22.36	22.26
			1	74	22.50	22.03	22.10	22.05
			36	0	21.50	21.15	21.08	21.10
			36	18	21.50	21.14	21.11	21.14
			36	37	21.50	21.13	21.13	21.14
			75	0	21.50	21.15	21.13	21.12
		16QAM	1	0	22.00	21.20	21.53	21.23
			1	37	22.00	21.52	21.88	21.62
			1	74	22.00	21.13	21.46	21.28
			36	0	20.50	20.15	20.12	20.26
			36	18	20.50	20.17	20.18	20.21
			36	37	20.50	20.15	20.23	20.29
			75	0	20.50	20.27	20.18	20.17
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	22.50	21.98	21.92	21.91
			1	49	22.50	22.36	22.21	22.20
			1	99	22.50	21.96	21.91	21.94
			50	0	21.50	21.09	21.09	21.13

			50	24	21.50	21.14	21.10	21.15
			50	49	21.50	21.08	21.16	21.15
			100	0	21.50	21.18	21.12	21.14
		16QAM	1	0	22.00	21.20	21.24	21.20
			1	49	22.00	21.55	21.55	21.49
			1	99	22.00	21.21	21.27	21.22
			50	0	20.50	20.19	20.21	20.17
			50	24	20.50	20.28	20.23	20.19
			50	49	20.50	20.23	20.29	20.15
			100	0	20.50	20.25	20.25	20.21

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23017/699.7	23095/707.5	23173/715.3
LTE Band 12	1.4MHz	QPSK	1	0	23.00	21.27	22.36	22.55
			1	2	23.00	22.42	22.51	22.65
			1	5	23.00	22.35	22.41	22.47
			3	0	23.00	22.31	22.49	22.61
			3	1	23.00	22.36	22.50	22.59
			3	2	23.00	22.44	22.49	22.57
			6	0	22.00	21.28	21.40	21.50
		16QAM	1	0	22.00	21.46	21.62	21.43
			1	2	22.00	21.67	21.73	21.55
			1	5	22.00	21.68	21.67	21.41
			3	0	22.00	21.58	21.76	21.70
			3	1	22.00	21.61	21.77	21.75
			3	2	22.00	21.70	21.84	21.76
			6	0	21.00	20.52	20.65	20.75
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23025/700.5	23095/707.5	23165/714.5
LTE Band 12	3MHz	QPSK	1	0	23.00	22.24	22.48	22.57
			1	7	23.00	22.83	22.78	22.92
			1	14	23.00	22.51	22.52	22.53
			8	0	22.00	21.37	21.44	21.55
			8	4	22.00	21.50	21.47	21.56
			8	7	22.00	21.53	21.48	21.53
			15	0	22.00	21.43	21.49	21.53

			16QAM	1	0	22.50	21.53	21.40	22.06
				1	7	22.50	22.10	21.74	22.36
				1	14	22.50	21.75	21.38	22.00
				8	0	21.00	20.41	20.49	20.69
				8	4	21.00	20.54	20.57	20.66
				8	7	21.00	20.53	20.57	20.65
				15	0	21.00	20.44	20.63	20.68
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)			
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5	
LTE Band 12	5MHz	QPSK	1	0	23.00	22.16	22.41	22.39	
			1	12	23.00	22.80	22.93	22.86	
			1	24	23.00	22.37	22.45	22.47	
			12	0	22.00	21.48	21.38	21.59	
			12	6	22.00	21.60	21.54	21.58	
			12	11	22.00	21.44	21.65	21.49	
			25	0	22.00	21.54	21.56	21.55	
		16QAM	1	0	23.00	21.86	21.78	21.80	
			1	12	23.00	22.65	22.33	22.19	
			1	24	23.00	22.04	21.80	21.84	
			12	0	21.00	20.52	20.50	20.68	
			12	6	21.00	20.62	20.56	20.68	
			12	11	21.00	20.49	20.59	20.64	
			25	0	21.00	20.52	20.68	20.63	
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)			
			RB Size	RB Offset		23060/704	23095/707.5	23130/711	
LTE Band 12	10MHz	QPSK	1	0	23.00	22.32	22.45	22.50	
			1	24	23.00	22.51	22.56	22.57	
			1	49	23.00	22.55	22.54	22.63	
			25	0	22.00	21.62	21.51	21.37	
			25	12	22.00	21.59	21.53	21.55	
			25	24	22.00	21.61	21.67	21.39	
			50	0	22.00	21.67	21.62	21.42	
		16QAM	1	0	22.50	21.58	21.41	21.95	
			1	24	22.50	21.81	21.50	22.07	
			1	49	22.50	21.72	21.44	22.00	
			25	0	21.00	20.70	20.62	20.50	

			25	12	21.00	20.58	20.59	20.63
			25	24	21.00	20.70	20.74	20.51
			50	0	21.00	20.78	20.69	20.49

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23755/706.5	23790/710	23825/713.5
LTE Band 17	5MHz	QPSK	1	0	23.50	22.44	22.42	22.46
			1	12	23.50	23.04	22.93	23.07
			1	24	23.50	22.48	22.45	22.51
			12	0	22.00	21.53	21.47	21.66
			12	6	22.00	21.61	21.65	21.67
			12	11	22.00	21.66	21.56	21.57
			25	0	22.00	21.66	21.53	21.62
		16QAM	1	0	23.00	22.09	21.84	21.84
			1	12	23.00	22.60	22.38	22.35
			1	24	23.00	22.08	21.86	21.91
			12	0	21.00	20.64	20.41	20.70
			12	6	21.00	20.67	20.66	20.75
			12	11	21.00	20.74	20.58	20.66
			25	0	21.00	20.69	20.65	20.67
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23780/709	23790/710	23800/711
LTE Band 17	10MHz	QPSK	1	0	23.50	22.52	22.53	22.53
			1	24	23.50	22.61	22.65	22.71
			1	49	23.50	22.61	22.60	22.66
			25	0	22.00	21.48	21.41	21.41
			25	12	22.00	21.56	21.55	21.58
			25	24	22.00	21.63	21.52	21.48
			50	0	22.00	21.56	21.50	21.48
		16QAM	1	0	22.50	22.00	21.73	21.48
			1	24	22.50	22.14	21.83	21.61
			1	49	22.50	22.06	21.83	21.57
			25	0	21.00	20.55	20.49	20.53
			25	12	21.00	20.72	20.66	20.67
			25	24	21.00	20.73	20.62	20.56
			50	0	21.00	20.63	20.61	20.53

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40115/2542.5	40640/2595	41165/2647.5
LTE Band 41	5MHz	QPSK	1	0	23.50	22.86	22.83	22.72
			1	12	23.50	23.09	23.14	23.01
			1	24	23.50	22.81	22.88	22.70
			12	0	22.00	21.77	21.90	21.81
			12	6	22.00	21.92	21.96	21.90
			12	11	22.00	21.94	21.90	21.75
			25	0	23.00	22.79	21.90	21.81
		16QAM	1	0	23.00	22.14	22.34	21.99
			1	12	23.00	22.40	22.63	22.27
			1	24	23.00	22.13	22.37	21.98
			12	0	21.00	20.86	20.86	20.78
			12	6	21.00	21.00	20.92	20.81
			12	11	21.00	21.00	20.89	20.74
			25	0	21.00	20.88	20.86	20.84
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40140/2545	40640/2595	41140/2645
LTE Band 41	10MHz	QPSK	1	0	23.50	22.94	22.92	22.84
			1	24	23.50	23.08	23.08	22.99
			1	49	23.50	22.92	22.91	22.78
			25	0	22.50	21.85	21.98	21.97
			25	12	22.50	21.98	21.99	21.92
			25	24	22.50	22.10	22.00	21.82
			50	0	22.00	21.97	21.97	21.89
		16QAM	1	0	23.00	22.43	22.06	21.80
			1	24	23.00	22.59	22.17	21.99
			1	49	23.00	22.39	22.09	21.80
			25	0	21.50	20.90	21.02	20.98
			25	12	21.50	21.04	21.00	20.91
			25	24	21.50	21.13	21.04	20.82
			50	0	21.00	21.00	21.00	20.91
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40165/2547.5	40640/2595	41115/2642.5

LTE Band 41	15MHz	QPSK	1	0	23.50	22.82	22.90	22.80
			1	37	23.50	23.16	23.16	23.08
			1	74	23.50	22.84	22.86	22.71
			36	0	22.50	21.92	21.97	21.96
			36	18	22.50	22.05	22.01	21.96
			36	37	22.50	22.14	22.01	21.86
			75	0	22.50	22.03	22.00	21.91
		16QAM	1	0	23.00	22.38	22.01	22.07
			1	37	23.00	22.69	22.32	22.34
			1	74	23.00	22.33	22.01	21.97
			36	0	21.50	20.90	21.06	20.92
			36	18	21.50	21.04	21.05	20.88
			36	37	21.50	21.12	21.06	20.81
			75	0	21.50	21.02	20.98	20.91
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40190/2550	40640/2595	41090/2640
LTE Band 41	20MHz	QPSK	1	0	23.50	22.75	22.72	22.69
			1	49	23.50	23.20	23.04	23.08
			1	99	23.50	22.74	22.70	22.62
			50	0	22.50	21.75	22.00	21.89
			50	24	22.50	21.99	21.99	21.97
			50	49	22.50	22.01	21.99	21.78
			100	0	22.00	21.88	21.98	21.83
		16QAM	1	0	22.50	22.05	21.92	21.92
			1	49	22.50	22.47	22.31	22.26
			1	99	22.50	21.98	21.97	21.84
			50	0	21.50	20.80	21.00	20.92
			50	24	21.50	21.05	20.99	20.99
			50	49	21.50	21.05	20.99	20.80
			100	0	21.00	20.92	21.00	20.87

7.4. WLAN & Bluetooth Output Power

7.4.1. Output Power Results Of WLAN

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11b	1	2412	16.00	15.21

	6	2437	16.00	15.59
	11	2462	16.00	15.26
802.11g	1	2412	13.50	13.16
	6	2437	13.50	13.39
	11	2462	13.50	13.01
802.11n HT20	1	2412	11.50	11.16
	6	2437	11.50	11.39
	11	2462	11.50	11.43
802.11n HT40	3	2422	12.50	12.25
	6	2437	12.50	11.44
	9	2452	12.50	11.04

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	36	5180	10.50	9.54
	40	5200	10.50	10.46
	48	5240	10.50	9.72
802.11n HT20	36	5180	10.00	9.50
	40	5200	10.00	9.77
	48	5240	10.00	9.53
802.11n HT40	38	5190	10.00	9.56
	46	5230	10.00	9.62
802.11ac VHT20	36	5180	10.00	9.06
	40	5200	10.00	10.00
	48	5240	10.00	9.45
802.11ac VHT40	38	5190	10.00	9.54
	46	5230	10.00	9.58
802.11ac VHT80	42	5210	10.50	10.21

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	149	5745	10.50	9.75
	157	5785	10.50	9.98
	165	5825	10.50	10.42
802.11n HT20	149	5745	10.50	9.59
	157	5785	10.50	9.80
	165	5825	10.50	10.27
802.11n HT40	151	5755	10.50	10.29

	159	5795	10.50	10.04
802.11ac VHT20	149	5745	10.00	9.26
	157	5785	10.00	9.30
	165	5825	10.00	9.81
	151	5755	10.00	9.93
802.11ac VHT40	159	5795	10.00	9.61
	155	5775	10.00	9.83

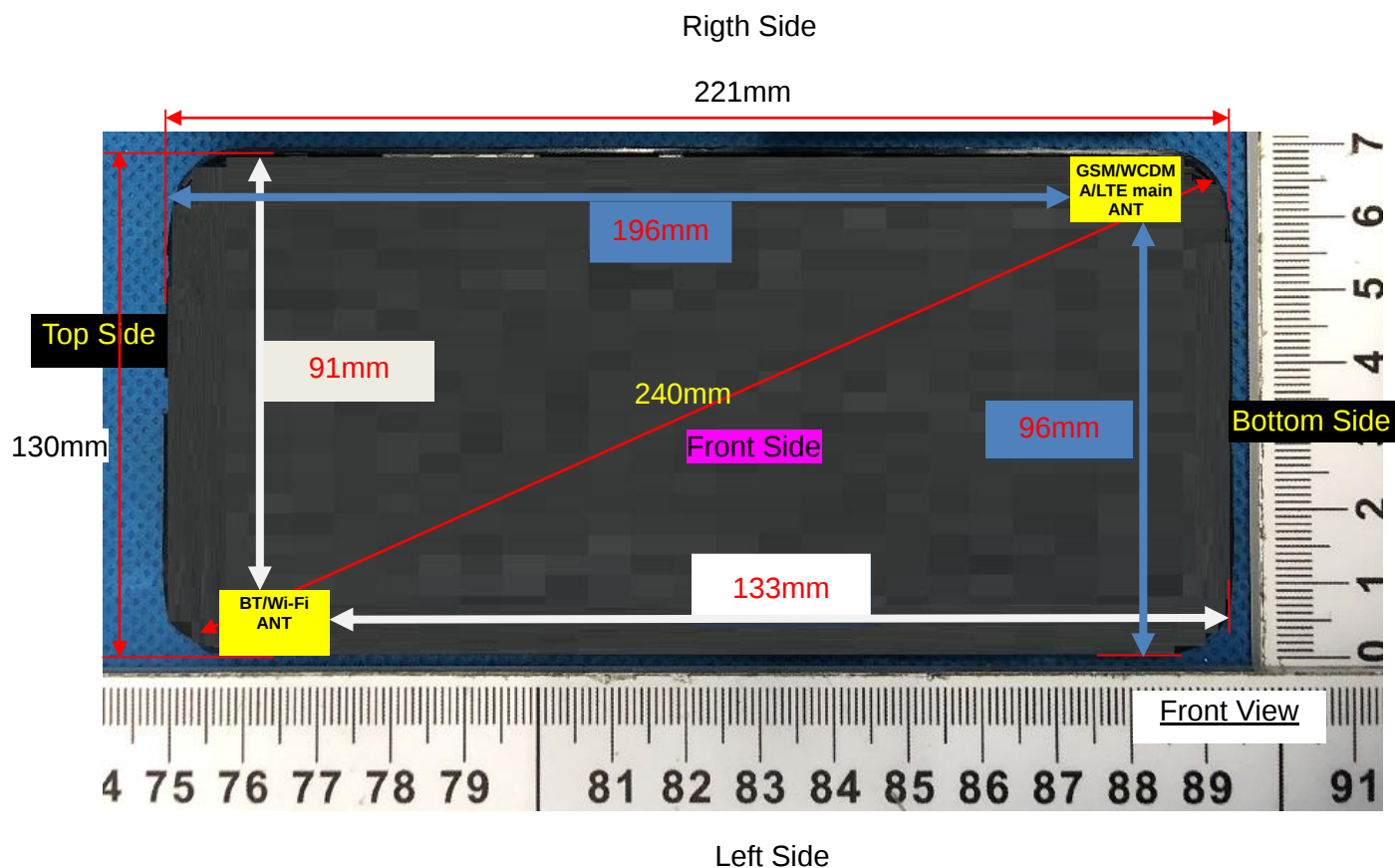
NOTE: Power measurement results of WLAN 5.8G.

7.4.2. Output Power Results Of Bluetooth

BR+EDR	Output Power (dBm)				
	Channel	Tune-up (dBm)	Data Rates		
			1M	2M	3M
	0CH	5.00	4.35	3.86	3.92
	39CH	4.00	3.62	2.98	2.97
	78CH	6.00	5.19	4.43	4.43

BLE	Channel	Tune-up (dBm)	Output Power (dBm)	
			1M	2M
	0CH	-3.00	-3.93	-4.24
	19CH	-2.00	-2.65	-3.03
	39CH	-3.00	-3.38	-3.77

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	5	5	96	5	196	5
WLAN & Bluetooth	5	5	5	91	5	133

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

Positions for SAR tests		
Test separation distances ≤ 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	16.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	12.49
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	12.49
	SAR testing required?	YES

Left Side	Antenna to user(mm)	5
	SAR exclusion threshold	12.49
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	12.49
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	10.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.14
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.14
	SAR testing required?	YES
Left Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.14
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.14
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	10.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.42
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.42
	SAR testing required?	YES
Left Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.42
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	5.42
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 850	
	33.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	367.91
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5

	SAR exclusion threshold	367.91
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	367.91
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	367.91
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 1900	
	29.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	246.35
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	246.35
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	246.35
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	246.35
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 2	
	23.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	55.15
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	55.15
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	55.15
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	55.15
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 4	
	23.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	52.87

	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	52.87
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	52.87
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	52.87
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 5	
	23.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.79
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.79
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.79
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.79
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 2	
	24.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	69.43
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	69.43
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	69.43
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	69.43
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 4	
	23.50dBm	

Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	66.55
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	66.55
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	66.55
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	66.55
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 5	
	23.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.28
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.28
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.28
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.28
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 7	
	22.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	57.02
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	57.02
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	57.02
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	57.02
	SAR testing required?	YES

Exposure Positions	Tune-up Maximum power of LTE Band 12	
	23.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	33.77
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	33.77
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	33.77
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	33.77
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 17	
	23.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	37.89
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	37.89
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	37.89
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5
	SAR exclusion threshold	37.89
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 41	
	23.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	72.89
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	72.89
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	72.89
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	5

	SAR exclusion threshold	72.89
	SAR testing required?	YES

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

Positions for SAR tests		
Test separation distances > 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	16.00dBm	39.81mW
Right Side	Antenna to user(mm)	91
	SAR exclusion threshold(mW)	506
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	133
	SAR exclusion threshold(mW)	926
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	10.50dBm	11.22mW
Right Side	Antenna to user(mm)	91
	SAR exclusion threshold(mW)	476
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	133
	SAR exclusion threshold(mW)	896
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	10.50dBm	11.22mW
Right Side	Antenna to user(mm)	91
	SAR exclusion threshold(mW)	472
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	133
	SAR exclusion threshold(mW)	892
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of GSM 850	
	33.00dBm	1995.26mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	420
	SAR testing required?	YES
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	977
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 1900	
	29.50dBm	891.25mW

Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	569
	SAR testing required?	YES
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1569
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 2	
	23.00dBm	199.53mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	569
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1569
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 4	
	23.00dBm	199.53mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	569
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1569
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 5	
	23.00dBm	199.53mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	420
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	977
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 2	
	24.00dBm	251.19mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	569
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1569
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 4	
	23.50dBm	223.87mW

Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	569
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1569
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 5	
	23.50dBm	223.87mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	420
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	977
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 7	
	22.50dBm	177.83mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	539
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1539
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 12	
	23.00dBm	199.53mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	420
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	977
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 17	
	23.50dBm	223.87mW
Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	420
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	977
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 41	
	23.50dBm	223.87mW

Left Side	Antenna to user(mm)	96
	SAR exclusion threshold(mW)	539
	SAR testing required?	NO
Top Side	Antenna to user(mm)	196
	SAR exclusion threshold(mW)	1539
	SAR testing required?	NO

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

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	6.00	3.98	5	2.480	1.25	3.0	Yes

NOTE: Standalone SAR test exclusion for Bluetooth.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

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

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

Mode	Position	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	x	Estimated SAR (W/Kg)
Bluetooth	Head	6.00	3.98	5	2.48	7.5	0.167
Bluetooth	Body	6.00	3.98	5	2.48	7.5	0.167

NOTE: Estimated SAR calculation for Bluetooth

10. SAR Results

10.1. SAR measurement results

10.1.1. SAR measurement Result of GSM850

Test Position of Head	Test channel /Freq	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 4TS)	0.253	0.190	-1.35	28.49	29.00	0.285	2022/12/12	1#
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.141	0.102	0.58	28.49	29.00	0.159	2022/12/12	
Right Cheek	189/836.4	GPRS(GMSK 4TS)	0.220	0.159	-3.69	28.49	29.00	0.247	2022/12/12	
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.100	0.074	2.99	28.49	29.00	0.112	2022/12/12	

NOTE: Head SAR test results of GSM850

Test Position of Body with 0mm	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						
Front Side	189/836.4	GPRS(GMSK 4TS)	0.498	0.315	-3.57	28.49	29.00	0.560	2022/12/12	
Back Side	189/836.4	GPRS(GMSK 4TS)	0.784	0.511	2.45	28.49	29.00	0.882	2022/12/12	2#
Left Side	189/836.4	GPRS(GMSK 4TS)	0.023	0.016	2.15	28.49	29.00	0.026	2022/12/12	
Right Side	189/836.4	GPRS(GMSK 4TS)	0.237	0.153	3.87	28.49	29.00	0.267	2022/12/12	
Top Side	189/836.4	GPRS(GMSK 4TS)	0.012	0.010	0.32	28.49	29.00	0.013	2022/12/12	
Bottom Side	189/836.4	GPRS(GMSK 4TS)	0.415	0.270	0.42	28.49	29.00	0.467	2022/12/12	
Back Side	128/824.2	GPRS(GMSK 4TS)	0.627	0.388	3.09	28.61	29.00	0.686	2022/12/12	
Back Side	251/848.8	GPRS(GMSK 4TS)	0.690	0.427	-2.61	28.51	29.00	0.772	2022/12/12	

NOTE: Body 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 4TS)	0.246	0.140	-0.55	25.11	25.50	0.269	2022/12/09	3#
Left Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.127	0.071	-1.24	25.11	25.50	0.139	2022/12/09	
Right Cheek	661/1880	GPRS(GMSK 4TS)	0.220	0.120	2.82	25.11	25.50	0.241	2022/12/09	
Right Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.107	0.058	0.51	25.11	25.50	0.117	2022/12/09	

NOTE: Head SAR test results of GSM1900

Test Position of Body with 0mm	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						
Front Side	661/1880	GPRS(GMSK 4TS)	0.348	0.173	-0.03	25.11	25.50	0.381	2022/12/09	
Back Side	661/1880	GPRS(GMSK 4TS)	0.579	0.300	2.06	25.11	25.50	0.633	2022/12/09	4#
Left Side	661/1880	GPRS(GMSK 4TS)	0.020	0.014	1.20	25.11	25.50	0.022	2022/12/09	
Right Side	661/1880	GPRS(GMSK 4TS)	0.180	0.089	1.17	25.11	25.50	0.197	2022/12/09	
Bottom Side	661/1880	GPRS(GMSK 4TS)	0.305	0.155	3.26	25.11	25.50	0.334	2022/12/09	

NOTE: Body 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 (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	9400/1880	RMC12.2K	0.196	0.116	-0.37	22.80	23.00	0.205	2022/12/09	5#

Left Tilt 15 Degree	9400/1880	RMC12.2K	0.104	0.059	1.13	22.80	23.00	0.109	2022/12/09	
Right Cheek	9400/1880	RMC12.2K	0.181	0.102	-1.36	22.80	23.00	0.190	2022/12/09	
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.084	0.047	-0.18	22.80	23.00	0.088	2022/12/09	

NOTE: Head SAR test results of WCDMA Band 2

Test Position of Body with 0mm	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						
Front Side	9400/1880	RMC12.2K	0.258	0.141	-3.36	22.80	23.00	0.270	2022/12/09	
Back Side	9400/1880	RMC12.2K	0.430	0.239	-0.43	22.80	23.00	0.450	2022/12/09	6#
Right Side	9400/1880	RMC12.2K	0.144	0.080	-3.05	22.80	23.00	0.151	2022/12/09	
Bottom Side	9400/1880	RMC12.2K	0.220	0.120	-2.41	22.80	23.00	0.230	2022/12/09	

NOTE: Body 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	0.223	0.139	0.54	22.63	23.00	0.243	2022/12/16	7#
Left Tilt 15 Degree	1413/1732.6	RMC12.2K	0.122	0.074	0.15	22.63	23.00	0.133	2022/12/16	
Right Cheek	1413/1732.6	RMC12.2K	0.208	0.127	-2.39	22.63	23.00	0.226	2022/12/16	
Right Tilt 15 Degree	1413/1732.6	RMC12.2K	0.101	0.060	0.84	22.63	23.00	0.110	2022/12/16	

NOTE: Head SAR test results of WCDMA Band 4

Test Position of Body with 0mm	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						
Front Side	1413/1732.6	RMC12.2K	0.306	0.168	2.11	22.63	23.00	0.333	2022/12/16	
Back Side	1413/1732.6	RMC12.2K	0.467	0.264	-0.72	22.63	23.00	0.509	2022/12/16	8#
Right Side	1413/1732.6	RMC12.2K	0.147	0.082	-2.22	22.63	23.00	0.160	2022/12/16	
Bottom Side	1413/1732.6	RMC12.2K	0.235	0.128	-1.40	22.63	23.00	0.256	2022/12/16	

NOTE: Body SAR test results 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						
1RB										
Left Cheek	18900/1880	20M QPSK(1,49)	0.242	0.145	-1.02	23.16	24.00	0.294	2022/12/09	17#
Left Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.128	0.074	3.89	23.16	24.00	0.155	2022/12/09	
Right Cheek	18900/1880	20M QPSK(1,49)	0.221	0.126	1.14	23.16	24.00	0.268	2022/12/09	
Right Tilt 15 Degree	18900/1880	20M QPSK(1,49)	0.114	0.068	-0.83	23.16	24.00	0.138	2022/12/09	
50%RB										

Left Cheek	18900/1880	20M QPSK(50,0)	0.128	0.081	-2.56	22.17	22.50	0.138	2022/12/09	
Left Tilt 15 Degree	18900/1880	20M QPSK(50,0)	0.075	0.041	-1.27	22.17	22.50	0.081	2022/12/09	
Right Cheek	18900/1880	20M QPSK(50,0)	0.120	0.070	4.43	22.17	22.50	0.129	2022/12/09	
Right Tilt 15 Degree	18900/1880	20M QPSK(50,0)	0.060	0.039	1.01	22.17	22.50	0.065	2022/12/09	

NOTE: Head SAR test results of LTE Band 2

Test Position of Body with 0mm	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	18900/1880	20M QPSK(1,49)	0.270	0.147	-0.12	23.16	24.00	0.328	2022/12/09	
Back Side	18900/1880	20M QPSK(1,49)	0.439	0.246	0.01	23.16	24.00	0.533	2022/12/09	18#
Right Side	18900/1880	20M QPSK(1,49)	0.144	0.081	1.59	23.16	24.00	0.175	2022/12/09	
Bottom Side	18900/1880	20M QPSK(1,49)	0.240	0.133	-3.75	23.16	24.00	0.291	2022/12/09	
50%RB										
Front Side	18900/1880	20M QPSK(50,0)	0.157	0.074	-2.41	22.17	22.50	0.169	2022/12/09	
Back Side	18900/1880	20M QPSK(50,0)	0.229	0.144	-2.95	22.17	22.50	0.247	2022/12/09	
Right Side	18900/1880	20M QPSK(50,0)	0.078	0.047	-0.43	22.17	22.50	0.084	2022/12/09	
Bottom Side	18900/1880	20M QPSK(50,0)	0.128	0.077	-1.30	22.17	22.50	0.138	2022/12/09	

NOTE: Body 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		Power Drift(%)	Conducted	Tune-up	Scaled	Date	Plot
			(W/kg)			Power	Power	SAR		
			1-g	10-g		(dBm)	(dBm)	1-g		

								(W/Kg)		
1RB										
Left Cheek	20175/1732.5	20M QPSK(1,49)	0.294	0.185	-0.43	22.95	23.50	0.334	2022/12/16	19#
Left Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.165	0.102	2.70	22.95	23.50	0.187	2022/12/16	
Right Cheek	20175/1732.5	20M QPSK(1,49)	0.255	0.154	3.60	22.95	23.50	0.289	2022/12/16	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.129	0.080	0.18	22.95	23.50	0.146	2022/12/16	
50%RB										
Left Cheek	20175/1732.5	20M QPSK(50,49)	0.149	0.097	-0.50	21.65	22.00	0.162	2022/12/16	
Left Tilt 15 Degree	20175/1732.5	20M QPSK(50,49)	0.090	0.061	-4.97	21.65	22.00	0.098	2022/12/16	
Right Cheek	20175/1732.5	20M QPSK(50,49)	0.144	0.090	-3.56	21.65	22.00	0.156	2022/12/16	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(50,49)	0.075	0.046	-4.55	21.65	22.00	0.081	2022/12/16	

NOTE: Head SAR test results of LTE Band 4

Test Position of Body with 0mm	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	20175/1732.5	20M QPSK(1,49)	0.288	0.160	0.62	22.95	23.50	0.327	2022/12/16	
Back Side	20175/1732.5	20M QPSK(1,49)	0.456	0.261	-0.35	22.95	23.50	0.518	2022/12/16	20#
Right Side	20175/1732.5	20M QPSK(1,49)	0.150	0.085	-2.90	22.95	23.50	0.170	2022/12/16	
Bottom Side	20175/1732.5	20M QPSK(1,49)	0.240	0.132	0.60	22.95	23.50	0.272	2022/12/16	
50%RB										

Front Side	20175/1732.5	20M QPSK(50,49)	0.148	0.089	-0.12	21.65	22.00	0.160	2022/12/16	
Back Side	20175/1732.5	20M QPSK(50,49)	0.262	0.133	-0.74	21.65	22.00	0.284	2022/12/16	
Right Side	20175/1732.5	20M QPSK(50,49)	0.081	0.047	-3.79	21.65	22.00	0.088	2022/12/16	
Bottom Side	20175/1732.5	20M QPSK(50,49)	0.144	0.072	4.17	21.65	22.00	0.156	2022/12/16	

NOTE: Body 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(1,24)	0.136	0.106	-2.45	22.78	23.50	0.161	2022/12/12	21#
Left Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.080	0.062	-0.48	22.78	23.50	0.094	2022/12/12	
Right Cheek	20525/836.5	10M QPSK(1,24)	0.124	0.092	2.72	22.78	23.50	0.146	2022/12/12	
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.059	0.044	2.10	22.78	23.50	0.070	2022/12/12	
50%RB										
Left Cheek	20525/836.5	10M QPSK(25,0)	0.080	0.058	1.76	21.80	22.00	0.084	2022/12/12	
Left Tilt 15 Degree	20525/836.5	10M QPSK(25,0)	0.043	0.034	4.12	21.80	22.00	0.045	2022/12/12	
Right Cheek	20525/836.5	10M QPSK(25,0)	0.065	0.051	0.06	21.80	22.00	0.068	2022/12/12	
Right Tilt 15 Degree	20525/836.5	10M QPSK(25,0)	0.032	0.025	0.82	21.80	22.00	0.034	2022/12/12	

NOTE: Head SAR test results of LTE Band 5

Test Position of Body with 0mm	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	20525/836.5	10M QPSK(1,24)	0.300	0.193	0.80	22.78	23.50	0.354	2022/12/12	
Back Side	20525/836.5	10M QPSK(1,24)	0.469	0.315	3.33	22.78	23.50	0.554	2022/12/12	22#
Right Side	20525/836.5	10M QPSK(1,24)	0.150	0.101	2.67	22.78	23.50	0.177	2022/12/12	
Bottom Side	20525/836.5	10M QPSK(1,24)	0.245	0.158	-3.78	22.78	23.50	0.289	2022/12/12	
50%RB										
Front Side	20525/836.5	10M QPSK(25,0)	0.172	0.101	4.32	21.80	22.00	0.180	2022/12/12	
Back Side	20525/836.5	10M QPSK(25,0)	0.265	0.172	-3.86	21.80	22.00	0.277	2022/12/12	
Right Side	20525/836.5	10M QPSK(25,0)	0.077	0.059	3.98	21.80	22.00	0.081	2022/12/12	
Bottom Side	20525/836.5	10M QPSK(25,0)	0.146	0.094	0.94	21.80	22.00	0.153	2022/12/12	

NOTE: Body 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(1,49)	0.065	0.036	4.27	22.21	22.50	0.069	2022/12/08	23#
Left Tilt 15 Degree	21100/2535	20M QPSK(1,49)	0.038	0.020	2.03	22.21	22.50	0.041	2022/12/08	
Right Cheek	21100/2535	20M QPSK(1,49)	0.056	0.030	1.06	22.21	22.50	0.060	2022/12/08	
Right Tilt 15	21100/2535	20M QPSK(1,49)	0.030	0.016	0.00	22.21	22.50	0.032	2022/12/08	

Degree										
50%RB										
Left Cheek	21100/2535	20M QPSK(50,49)	0.033	0.021	3.22	21.16	21.50	0.036	2022/12/08	
Left Tilt 15 Degree	21100/2535	20M QPSK(50,49)	0.020	0.010	1.38	21.16	21.50	0.022	2022/12/08	
Right Cheek	21100/2535	20M QPSK(50,49)	0.028	0.018	-4.16	21.16	21.50	0.030	2022/12/08	
Right Tilt 15 Degree	21100/2535	20M QPSK(50,49)	0.015	0.009	-0.98	21.16	21.50	0.016	2022/12/08	

NOTE: Head SAR test results of LTE Band 7

Test Position of Body with 0mm	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(1,49)	0.384	0.171	-0.18	22.21	22.50	0.411	2022/12/08	
Back Side	21100/2535	20M QPSK(1,49)	0.599	0.278	-3.51	22.21	22.50	0.640	2022/12/08	24#
Right Side	21100/2535	20M QPSK(1,49)	0.180	0.079	-3.87	22.21	22.50	0.192	2022/12/08	
Bottom Side	21100/2535	20M QPSK(1,49)	0.310	0.142	-2.59	22.21	22.50	0.331	2022/12/08	
50%RB										
Front Side	21100/2535	20M QPSK(50,49)	0.214	0.088	-2.51	21.16	21.50	0.231	2022/12/08	
Back Side	21100/2535	20M QPSK(50,49)	0.315	0.146	4.69	21.16	21.50	0.341	2022/12/08	
Right Side	21100/2535	20M QPSK(50,49)	0.097	0.041	-4.84	21.16	21.50	0.105	2022/12/08	
Bottom Side	21100/2535	20M QPSK(50,49)	0.163	0.075	-1.79	21.16	21.50	0.176	2022/12/08	

NOTE: Body SAR test results of LTE Band 7

10.1.10. SAR measurement Result of LTE Band 12

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	23095/707.5	10M QPSK(1,49)	0.113	0.090	-2.63	22.54	23.00	0.126	2022/12/13	25#
Left Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.062	0.049	0.16	22.54	23.00	0.069	2022/12/13	
Right Cheek	23095/707.5	10M QPSK(1,49)	0.107	0.083	0.37	22.54	23.00	0.119	2022/12/13	
Right Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.051	0.039	-3.99	22.54	23.00	0.057	2022/12/13	
50%RB										
Left Cheek	23095/707.5	10M QPSK(25,24)	0.058	0.054	-4.00	21.67	22.00	0.063	2022/12/13	
Left Tilt 15 Degree	23095/707.5	10M QPSK(25,24)	0.036	0.026	-1.13	21.67	22.00	0.039	2022/12/13	
Right Cheek	23095/707.5	10M QPSK(25,24)	0.055	0.044	-2.55	21.67	22.00	0.059	2022/12/13	
Right Tilt 15 Degree	23095/707.5	10M QPSK(25,24)	0.030	0.020	1.78	21.67	22.00	0.032	2022/12/13	

NOTE: Head SAR test results of LTE Band 12

Test Position of Body with 0mm	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	23095/707.5	10M QPSK(1,49)	0.204	0.139	2.07	22.54	23.00	0.227	2022/12/13	
Back Side	23095/707.5	10M QPSK(1,49)	0.309	0.212	-0.74	22.54	23.00	0.344	2022/12/13	26#

Right Side	23095/707.5	10M QPSK(1,49)	0.093	0.063	-1.00	22.54	23.00	0.103	2022/12/13	
Bottom Side	23095/707.5	10M QPSK(1,49)	0.175	0.119	2.69	22.54	23.00	0.195	2022/12/13	
50%RB										
Front Side	23095/707.5	10M QPSK(25,24)	0.118	0.074	1.98	21.67	22.00	0.127	2022/12/13	
Back Side	23095/707.5	10M QPSK(25,24)	0.180	0.123	-1.40	21.67	22.00	0.194	2022/12/13	
Right Side	23095/707.5	10M QPSK(25,24)	0.048	0.033	-4.57	21.67	22.00	0.052	2022/12/13	
Bottom Side	23095/707.5	10M QPSK(25,24)	0.091	0.063	2.41	21.67	22.00	0.098	2022/12/13	

NOTE: Body SAR test results of LTE Band 12

10.1.11. SAR measurement Result of LTE Band 17

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	23790/710	10M QPSK(1,24)	0.121	0.098	-1.88	22.65	23.50	0.147	2022/12/13	27#
Left Tilt 15 Degree	23790/710	10M QPSK(1,24)	0.062	0.049	1.32	22.65	23.50	0.075	2022/12/13	
Right Cheek	23790/710	10M QPSK(1,24)	0.105	0.085	-1.36	22.65	23.50	0.128	2022/12/13	
Right Tilt 15 Degree	23790/710	10M QPSK(1,24)	0.056	0.044	-3.18	22.65	23.50	0.068	2022/12/13	
50%RB										
Left Cheek	23790/710	10M QPSK(25,24)	0.061	0.055	-4.58	21.52	22.00	0.068	2022/12/13	
Left Tilt 15 Degree	23790/710	10M QPSK(25,24)	0.035	0.025	3.39	21.52	22.00	0.039	2022/12/13	
Right Cheek	23790/710	10M QPSK(25,24)	0.063	0.047	3.52	21.52	22.00	0.070	2022/12/13	
Right	23790/710	10M	0.033	0.026	3.40	21.52	22.00	0.037	2022/12/13	

Tilt 15 Degree		QPSK(25,24)								
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NOTE: Head SAR test results of LTE Band 17

Test Position of Body with 0mm	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	23790/710	10M QPSK(1,24)	0.216	0.141	2.52	22.65	23.50	0.263	2022/12/13	
Back Side	23790/710	10M QPSK(1,24)	0.318	0.214	2.97	22.65	23.50	0.387	2022/12/13	28#
Right Side	23790/710	10M QPSK(1,24)	0.096	0.063	-2.68	22.65	23.50	0.117	2022/12/13	
Bottom Side	23790/710	10M QPSK(1,24)	0.170	0.110	1.07	22.65	23.50	0.207	2022/12/13	
50%RB										
Front Side	23790/710	10M QPSK(25,24)	0.113	0.080	-2.82	21.52	22.00	0.126	2022/12/13	
Back Side	23790/710	10M QPSK(25,24)	0.173	0.120	-1.25	21.52	22.00	0.193	2022/12/13	
Right Side	23790/710	10M QPSK(25,24)	0.057	0.035	1.64	21.52	22.00	0.064	2022/12/13	
Bottom Side	23790/710	10M QPSK(25,24)	0.100	0.059	2.84	21.52	22.00	0.112	2022/12/13	

NOTE: Body SAR test results of LTE Band 17

10.1.12. SAR measurement Result of LTE Band 41

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	40640/2595	20M QPSK(1,49)	0.452	0.212	-2.93	23.04	23.50	0.503	2022/12/08	29#
Left Tilt 15	40640/2595	20M QPSK(1,49)	0.252	0.116	-1.80	23.04	23.50	0.280	2022/12/08	

Degree										
Right Cheek	40640/2595	20M QPSK(1,49)	0.408	0.189	-1.00	23.04	23.50	0.454	2022/12/08	
Right Tilt 15 Degree	40640/2595	20M QPSK(1,49)	0.194	0.086	-1.03	23.04	23.50	0.216	2022/12/08	
50%RB										
Left Cheek	40640/2595	20M QPSK(50,49)	0.250	0.109	3.55	21.99	22.50	0.281	2022/12/08	
Left Tilt 15 Degree	40640/2595	20M QPSK(50,49)	0.129	0.066	-0.17	21.99	22.50	0.145	2022/12/08	
Right Cheek	40640/2595	20M QPSK(50,49)	0.226	0.108	1.24	21.99	22.50	0.254	2022/12/08	
Right Tilt 15 Degree	40640/2595	20M QPSK(50,49)	0.110	0.047	-3.13	21.99	22.50	0.124	2022/12/08	

NOTE: Head SAR test results of LTE Band 41

Test Position of Body with 0mm	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	40640/2595	20M QPSK(1,49)	0.312	0.139	-3.28	23.04	23.50	0.347	2022/12/08	
Back Side	40640/2595	20M QPSK(1,49)	0.473	0.219	-0.28	23.04	23.50	0.526	2022/12/08	30#
Right Side	40640/2595	20M QPSK(1,49)	0.144	0.064	-1.25	23.04	23.50	0.160	2022/12/08	
Bottom Side	40640/2595	20M QPSK(1,49)	0.240	0.107	0.68	23.04	23.50	0.267	2022/12/08	
50%RB										
Front Side	40640/2595	20M QPSK(50,49)	0.167	0.081	-4.59	21.99	22.50	0.188	2022/12/08	
Back Side	40640/2595	20M QPSK(50,49)	0.247	0.127	-2.51	21.99	22.50	0.278	2022/12/08	
Right Side	40640/2595	20M QPSK(50,49)	0.086	0.033	-1.12	21.99	22.50	0.097	2022/12/08	

Bottom Side	40640/2595	20M QPSK(50,49)	0.124	0.062	3.26	21.99	22.50	0.139	2022/12/08	
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NOTE: Body SAR test results of LTE Band 41

10.1.13. SAR measurement Result of WLAN 2.4G

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	6/2437	802.11b	0.200	0.101	0.77	15.59	16.00	0.220	2022/12/15	15#
Left Tilt 15 Degree	6/2437	802.11b	0.112	0.057	-0.07	15.59	16.00	0.123	2022/12/15	
Right Cheek	6/2437	802.11b	0.180	0.091	2.83	15.59	16.00	0.198	2022/12/15	
Right Tilt 15 Degree	6/2437	802.11b	0.091	0.044	0.27	15.59	16.00	0.100	2022/12/15	

NOTE: Head SAR test results of WLAN 2.4G

Test Position of Body with 0mm	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						
Front Side	6/2437	802.11b	0.186	0.085	-3.46	15.59	16.00	0.204	2022/12/15	
Back Side	6/2437	802.11b	0.269	0.128	2.72	15.59	16.00	0.296	2022/12/15	16#
Left Side	6/2437	802.11b	0.090	0.042	3.38	15.59	16.00	0.099	2022/12/15	
Top Side	6/2437	802.11b	0.093	0.044	-0.11	15.59	16.00	0.102	2022/12/15	

NOTE: Body SAR test results of WLAN 2.4G

10.1.14. SAR measurement Result of WLAN 5.2G

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	40/5200	802.11a	0.586	0.228	-4.85	10.46	10.50	0.591	2022/12/22	11#
Left Tilt 15 Degree	40/5200	802.11a	0.349	0.129	-0.18	10.46	10.50	0.352	2022/12/22	
Right Cheek	40/5200	802.11a	0.510	0.192	1.19	10.46	10.50	0.515	2022/12/22	
Right Tilt 15 Degree	40/5200	802.11a	0.280	0.109	0.86	10.46	10.50	0.283	2022/12/22	

NOTE: Head SAR test results of WLAN 5.2G

Test Position of Body with 0mm	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						
Front Side	40/5200	802.11a	0.318	0.129	1.01	10.46	10.50	0.321	2022/12/22	
Back Side	40/5200	802.11a	0.504	0.206	-3.15	10.46	10.50	0.509	2022/12/22	13#
Left Side	40/5200	802.11a	0.162	0.065	-1.54	10.46	10.50	0.163	2022/12/22	
Top Side	40/5200	802.11a	0.165	0.067	2.34	10.46	10.50	0.167	2022/12/22	

NOTE: Body SAR test results of WLAN 5.2G

10.1.15. SAR measurement Result of WLAN 5.8G

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	165/5825	802.11a	0.687	0.241	1.53	10.42	10.50	0.700	2022/12/21	12#
Left Tilt 15 Degree	165/5825	802.11a	0.407	0.138	3.63	10.42	10.50	0.415	2022/12/21	
Right Cheek	165/5825	802.11a	0.647	0.218	3.64	10.42	10.50	0.659	2022/12/21	
Right Tilt 15 Degree	165/5825	802.11a	0.354	0.122	-2.80	10.42	10.50	0.361	2022/12/21	

NOTE: Head SAR test results of WLAN 5.8G

Test Position of Body with 0mm	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						
Front Side	165/5825	802.11a	0.420	0.155	-1.22	10.42	10.50	0.428	2022/12/21	
Back Side	165/5825	802.11a	0.673	0.262	-4.40	10.42	10.50	0.686	2022/12/21	14#
Left Side	165/5825	802.11a	0.216	0.084	-1.27	10.42	10.50	0.220	2022/12/21	
Top Side	165/5825	802.11a	0.210	0.079	0.05	10.42	10.50	0.214	2022/12/21	

NOTE: Body SAR test results of WLAN 5.8G

10.2. SAR Summation Scenario

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

- 1) Scalar SAR summation $< 1.6\text{W/kg}$.
- 2) $\text{SPLSR} = (\text{SAR}_1 + \text{SAR}_2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan. If $\text{SPLSR} \leq 0.04$, simultaneously

transmission SAR measurement is not necessary.

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DTS			
Head	Left Cheek	0.503	0.220	0.723	N/A	N/A
	Left Tilt 15 Degree	0.280	0.123	0.403	N/A	N/A
	Right Cheek	0.454	0.198	0.652	N/A	N/A
	Right Tilt 15 Degree	0.216	0.100	0.316	N/A	N/A
Body	Front Side	0.560	0.204	0.764	N/A	N/A
	Back Side	0.882	0.296	1.178	N/A	N/A
	Left Side	0.026	0.099	0.125	N/A	N/A
	Right Side	0.267	N/A	0.267	N/A	N/A
	Top Side	0.013	0.102	0.115	N/A	N/A
	Bottom Side	0.467	N/A	0.467	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	NII			
Head	Left Cheek	0.503	0.700	1.203	N/A	N/A
	Left Tilt 15 Degree	0.280	0.415	0.695	N/A	N/A
	Right Cheek	0.454	0.659	1.113	N/A	N/A
	Right Tilt 15 Degree	0.216	0.361	0.577	N/A	N/A
Body	Front Side	0.560	0.428	0.988	N/A	N/A
	Back Side	0.882	0.686	1.568	N/A	N/A
	Left Side	0.026	0.220	0.246	N/A	N/A
	Right Side	0.267	N/A	0.267	N/A	N/A
	Top Side	0.013	0.214	0.227	N/A	N/A
	Bottom Side	0.467	N/A	0.467	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Head	Left Cheek	0.503	0.167	0.670	N/A	N/A
	Left Tilt 15	0.280	0.167	0.447	N/A	N/A

	Degree					
	Right Cheek	0.454	0.167	0.621	N/A	N/A
	Right Tilt 15 Degree	0.216	0.167	0.383	N/A	N/A
Body	Front Side	0.560	0.167	0.727	N/A	N/A
	Back Side	0.882	0.167	1.049	N/A	N/A
	Left Side	0.026	0.167	0.193	N/A	N/A
	Right Side	0.267	N/A	0.267	N/A	N/A
	Top Side	0.013	0.167	0.180	N/A	N/A
	Bottom Side	0.467	N/A	0.467	N/A	N/A

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

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MEASUREMENT 1 System Performance Check - 750MHz
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MEASUREMENT 6 System Performance Check - 2600MHz
MEASUREMENT 7 System Performance Check - 5200MHz
MEASUREMENT 8 System Performance Check - 5800MHz

MEASUREMENT 1

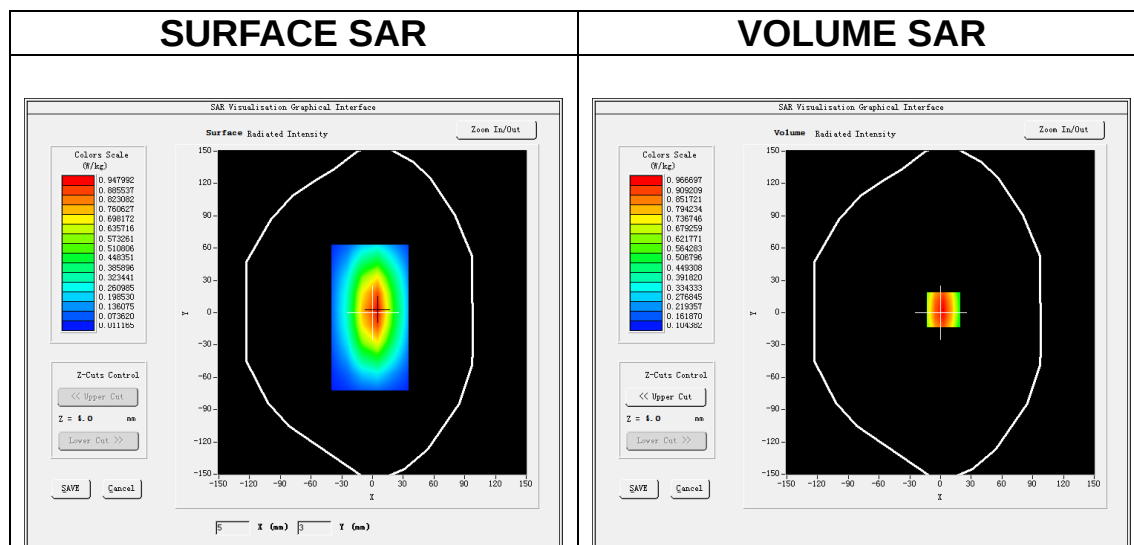
Date of measurement: 13/12/2022

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>CW750</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

B. SAR Measurement Results

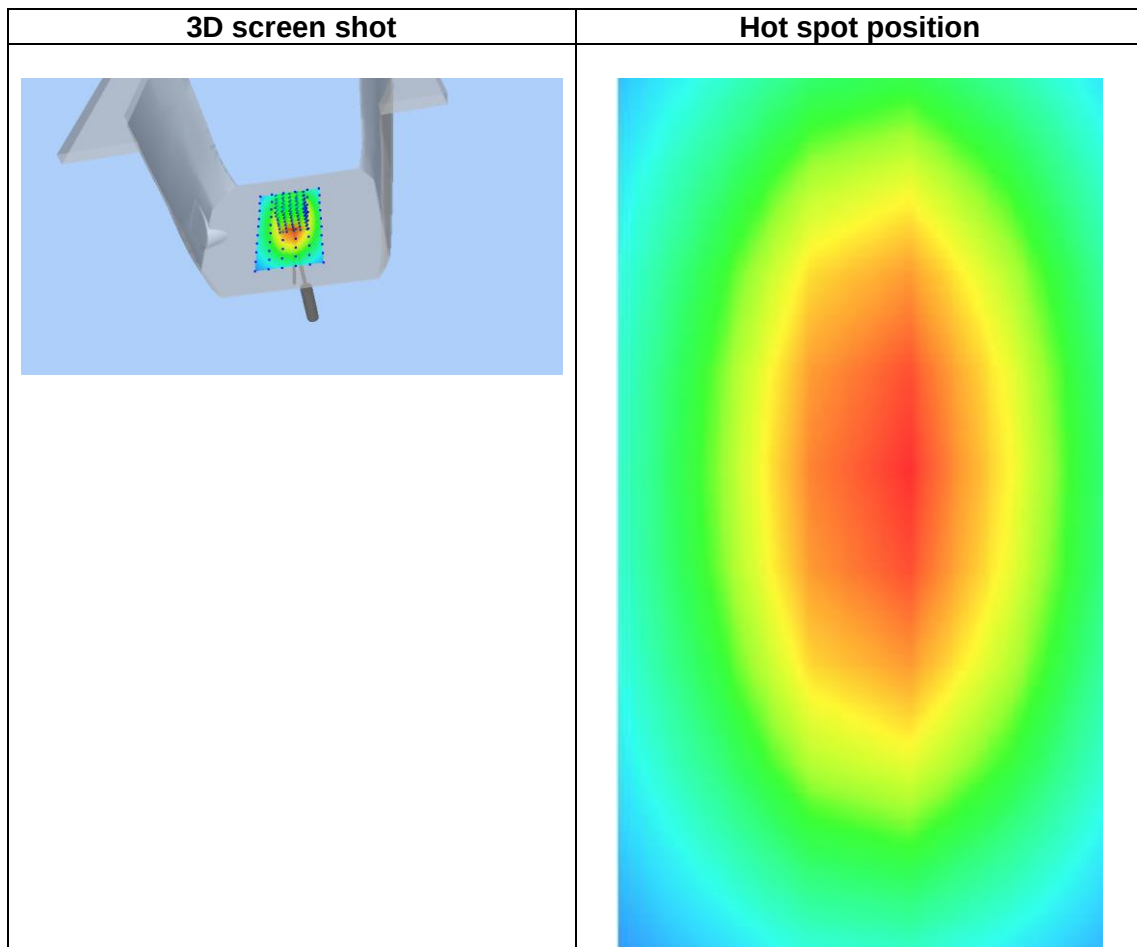
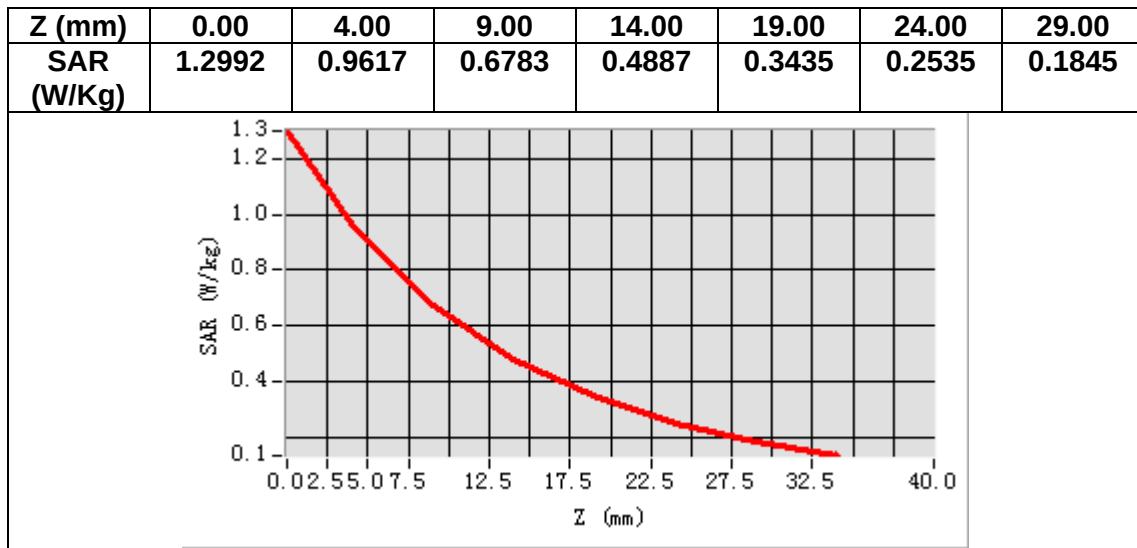
Frequency (MHz)	750.000000
Relative permittivity (real part)	40.638519
Relative permittivity (imaginary part)	21.482917
Conductivity (S/m)	0.895122
Variation (%)	2.730000



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.600332
SAR 1g (W/Kg)	0.771321



MEASUREMENT 2

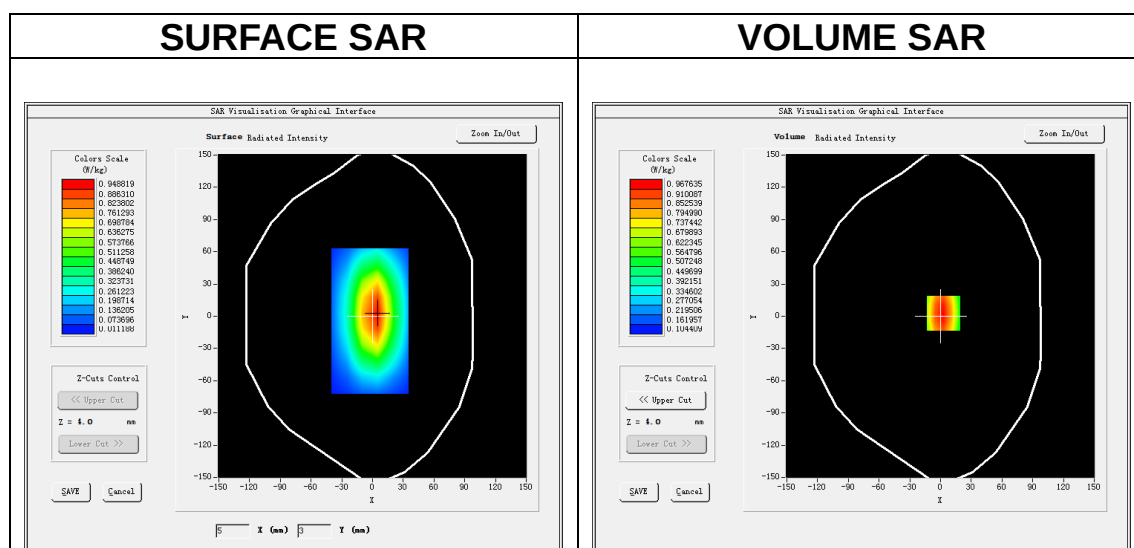
Date of measurement: 12/12/2022

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW835</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>1.50</u>

B. SAR Measurement Results

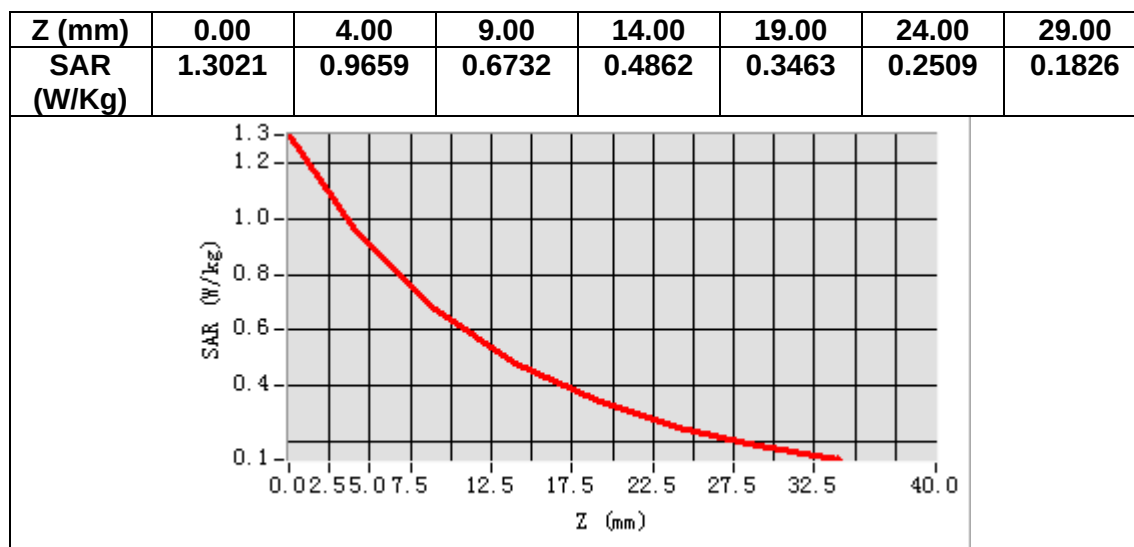
Frequency (MHz)	835.000000
Relative permittivity (real part)	41.375076
Relative permittivity (imaginary part)	20.103582
Conductivity (S/m)	0.932583
Variation (%)	-2.720000



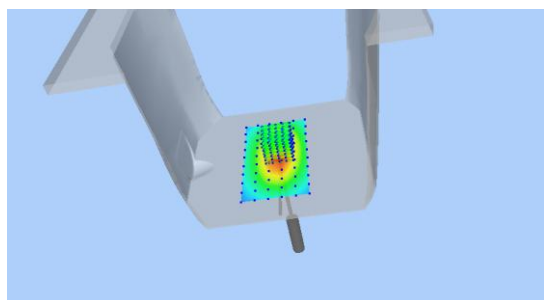
Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

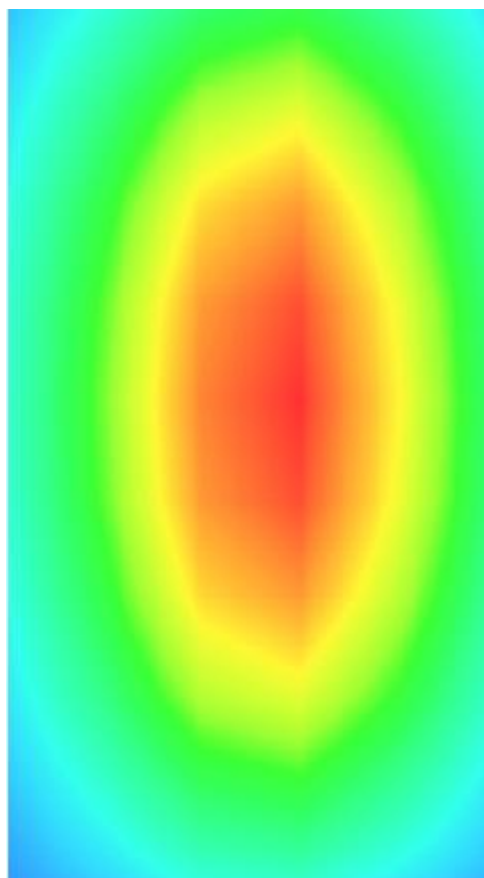
SAR 10g (W/Kg)	0.678333
SAR 1g (W/Kg)	0.916172



3D screen shot



Hot spot position



MEASUREMENT 3

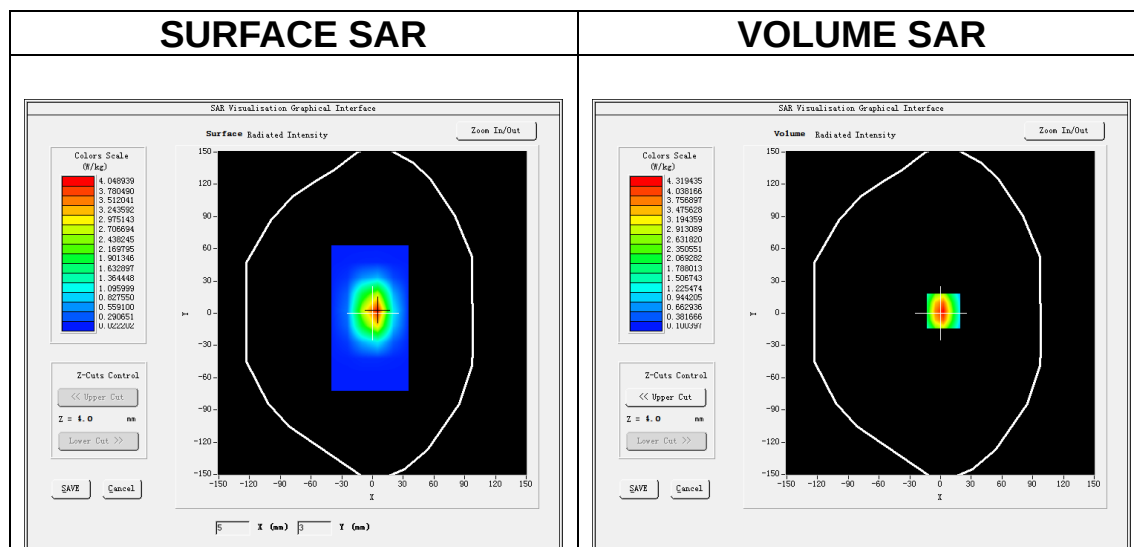
Date of measurement: 16/12/2022

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1800</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>1.73</u>

B. SAR Measurement Results

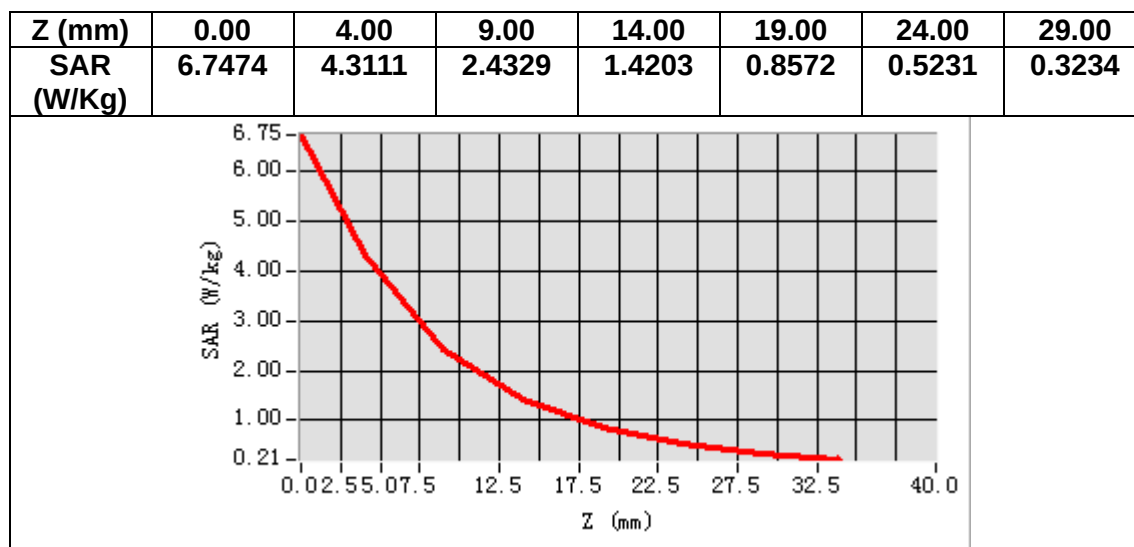
Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.043626
Relative permittivity (imaginary part)	14.026072
Conductivity (S/m)	1.402607
Variation (%)	2.980000



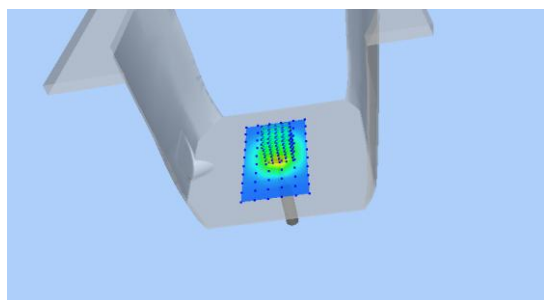
Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

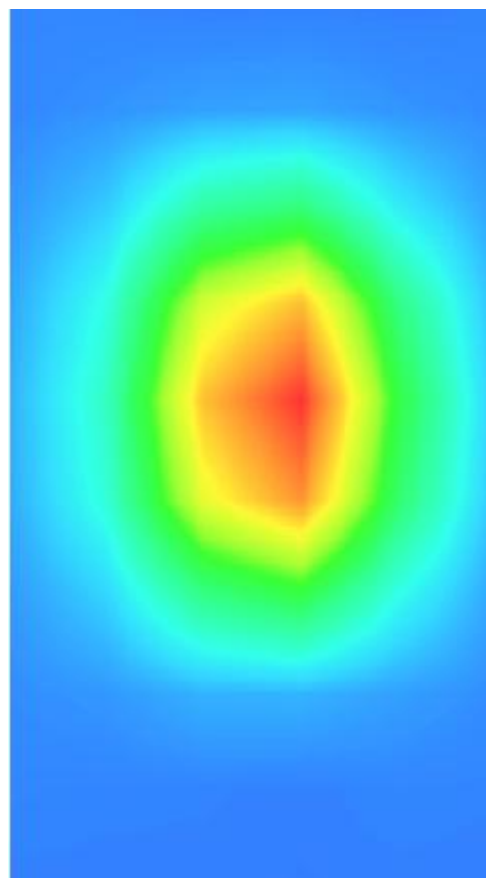
SAR 10g (W/Kg)	1.822307
SAR 1g (W/Kg)	4.126066



3D screen shot



Hot spot position



MEASUREMENT 4

Date of measurement: 9/12/2022

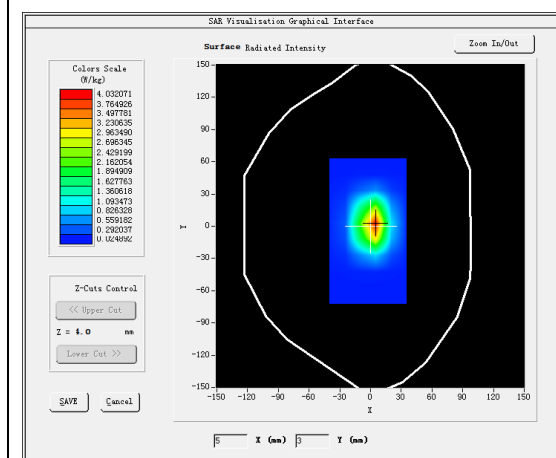
A. Experimental conditions.

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>1.91</u>

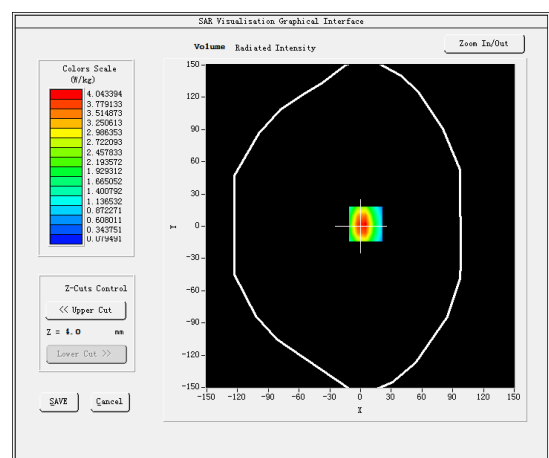
B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.779690
Relative permittivity (imaginary part)	13.744798
Conductivity (S/m)	1.450840
Variation (%)	2.220000

SURFACE SAR



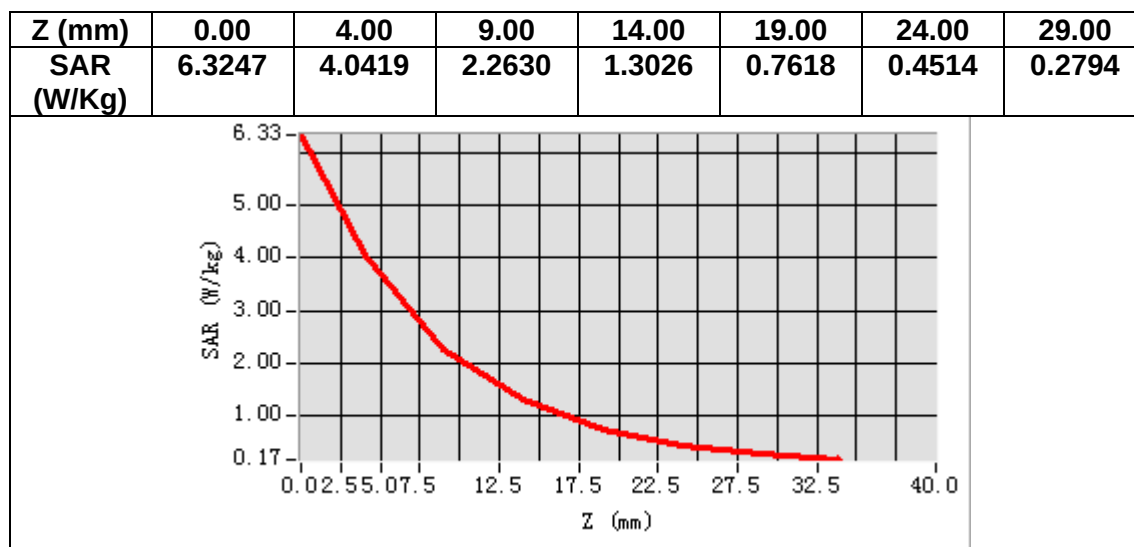
VOLUME SAR



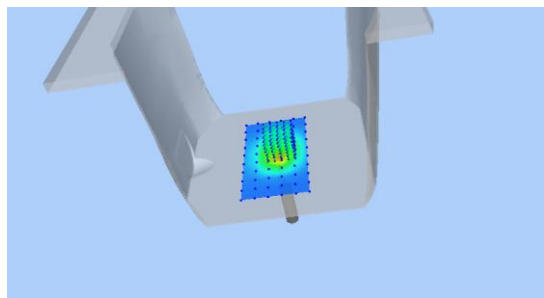
Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

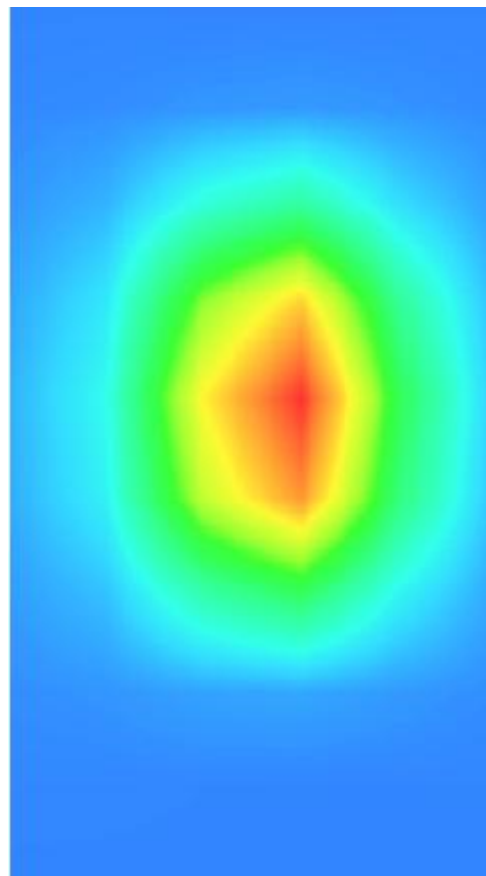
SAR 10g (W/Kg)	2.216347
SAR 1g (W/Kg)	3.804221



3D screen shot



Hot spot position



MEASUREMENT 5

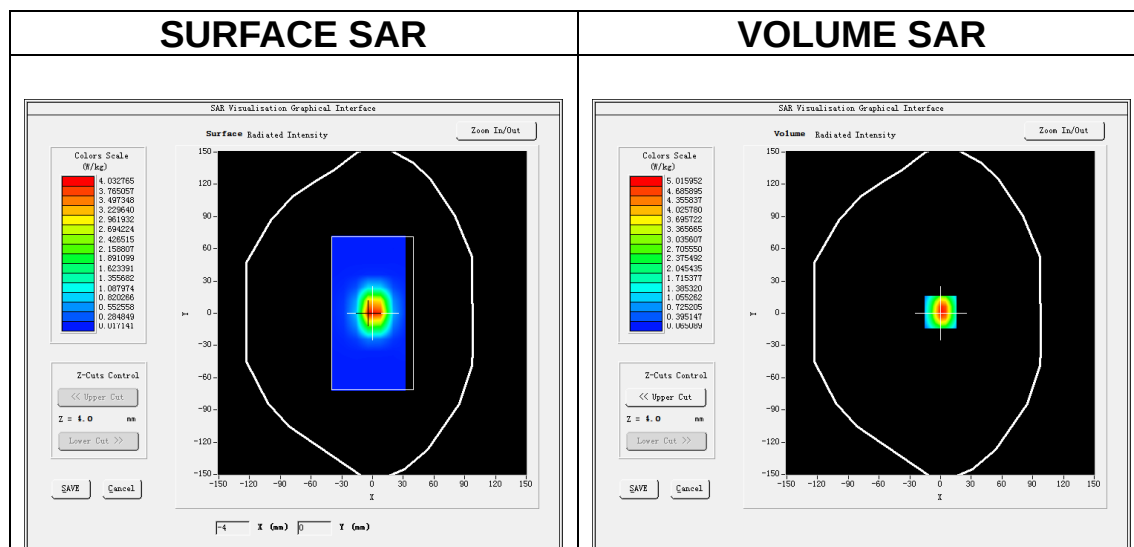
Date of measurement: 15/12/2022

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2450</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.98</u>

B. SAR Measurement Results

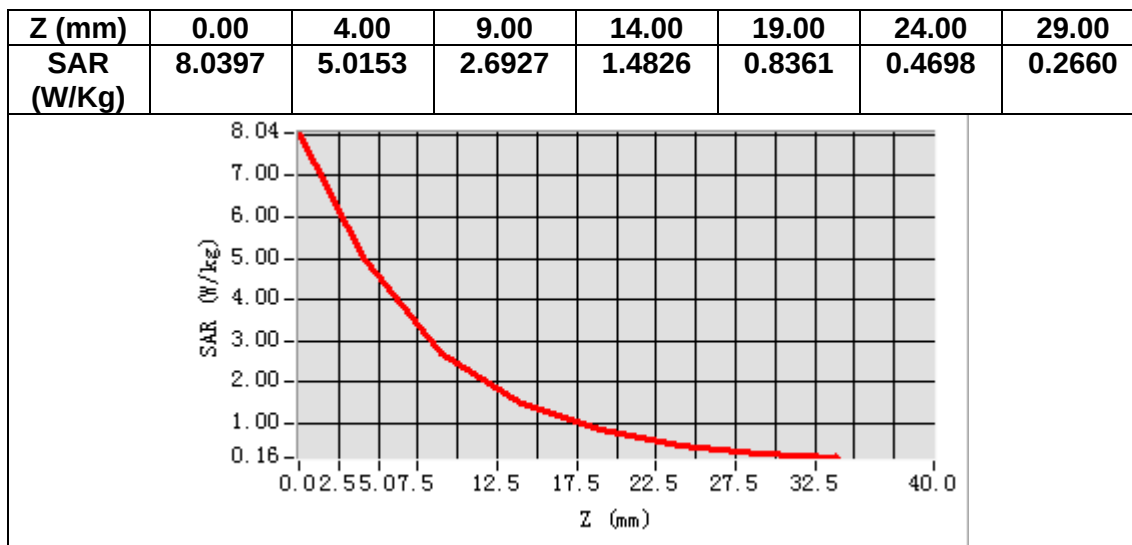
Frequency (MHz)	2450.000000
Relative permittivity (real part)	38.121997
Relative permittivity (imaginary part)	13.551073
Conductivity (S/m)	1.844452
Variation (%)	1.290000



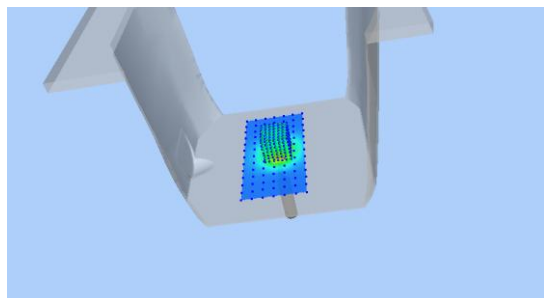
Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

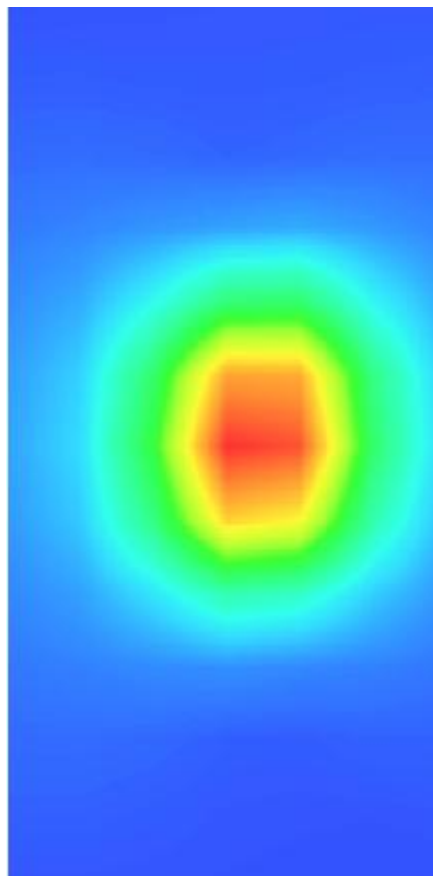
SAR 10g (W/Kg)	2.220106
SAR 1g (W/Kg)	5.534340



3D screen shot



Hot spot position



MEASUREMENT 6

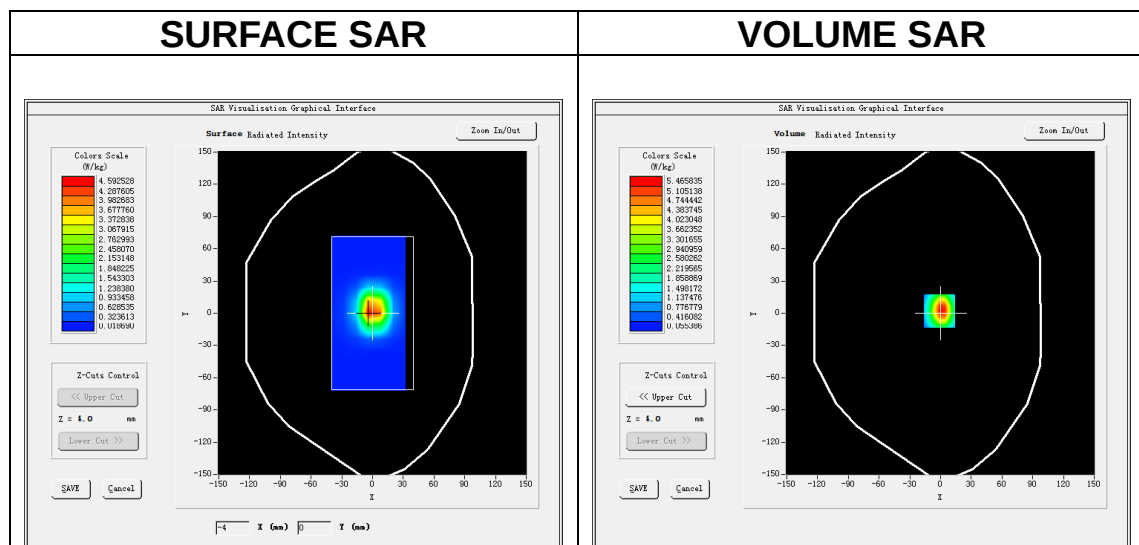
Date of measurement: 8/12/2022

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

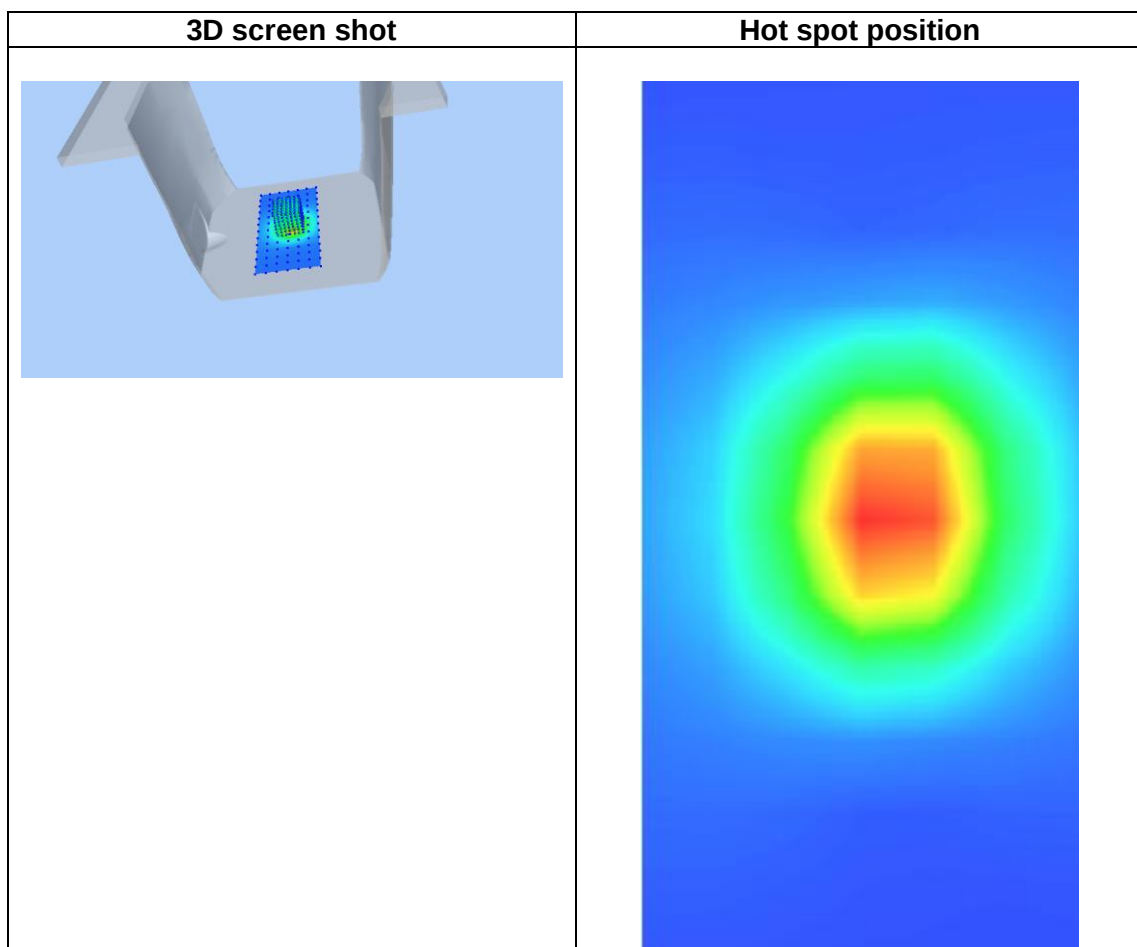
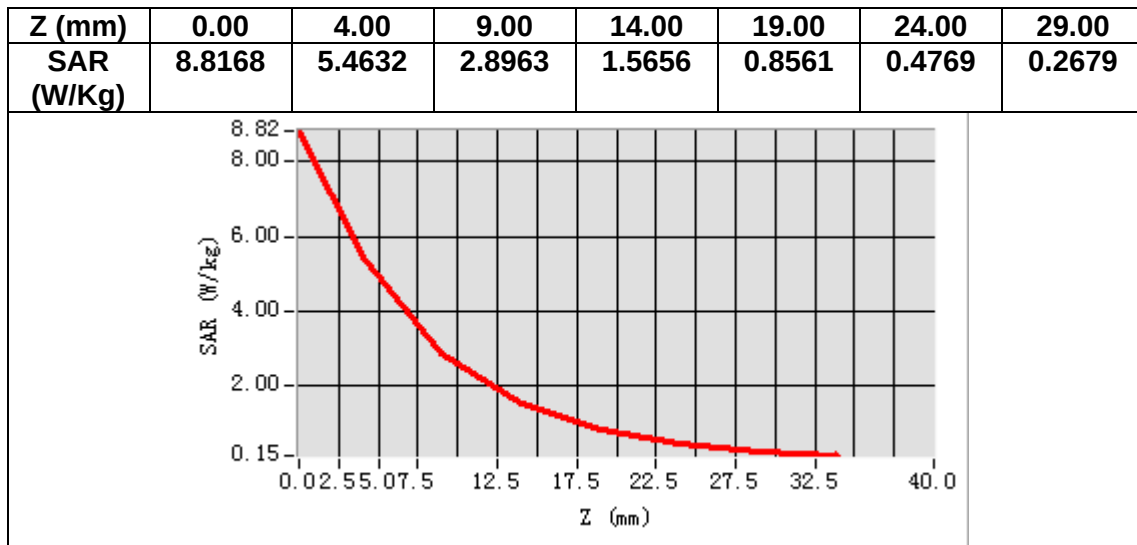
Frequency (MHz)	2600.000000
Relative permittivity (real part)	38.081805
Relative permittivity (imaginary part)	13.711922
Conductivity (S/m)	1.980611
Variation (%)	0.250000



Maximum location: X=-1.00, Y=2.00

SAR Peak: 9.07 W/kg

SAR 10g (W/Kg)	2.602037
SAR 1g (W/Kg)	5.138199



MEASUREMENT 7

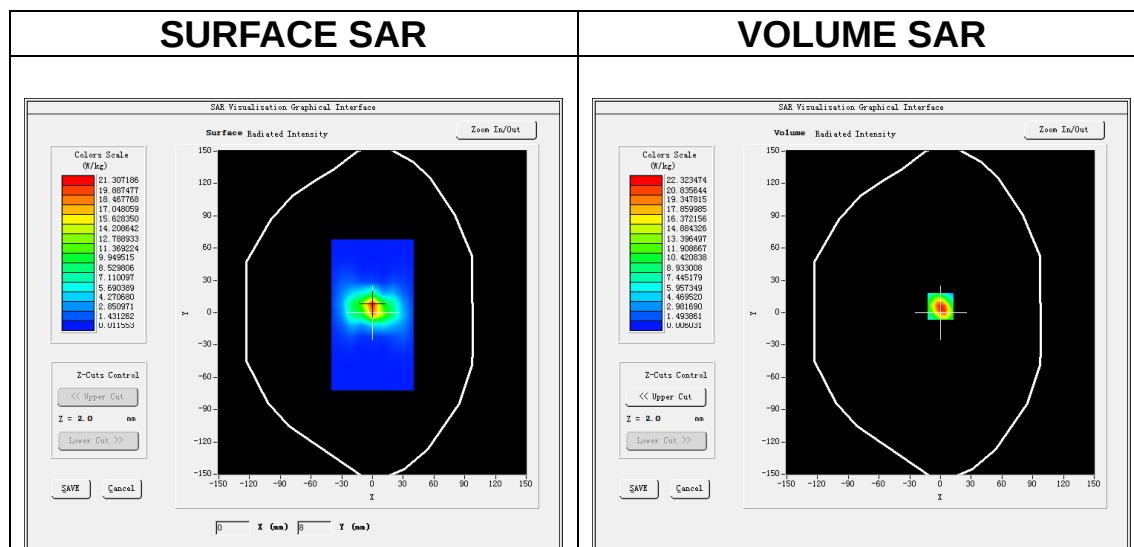
Date of measurement: 22/12/2022

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5200</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.80</u>

B. SAR Measurement Results

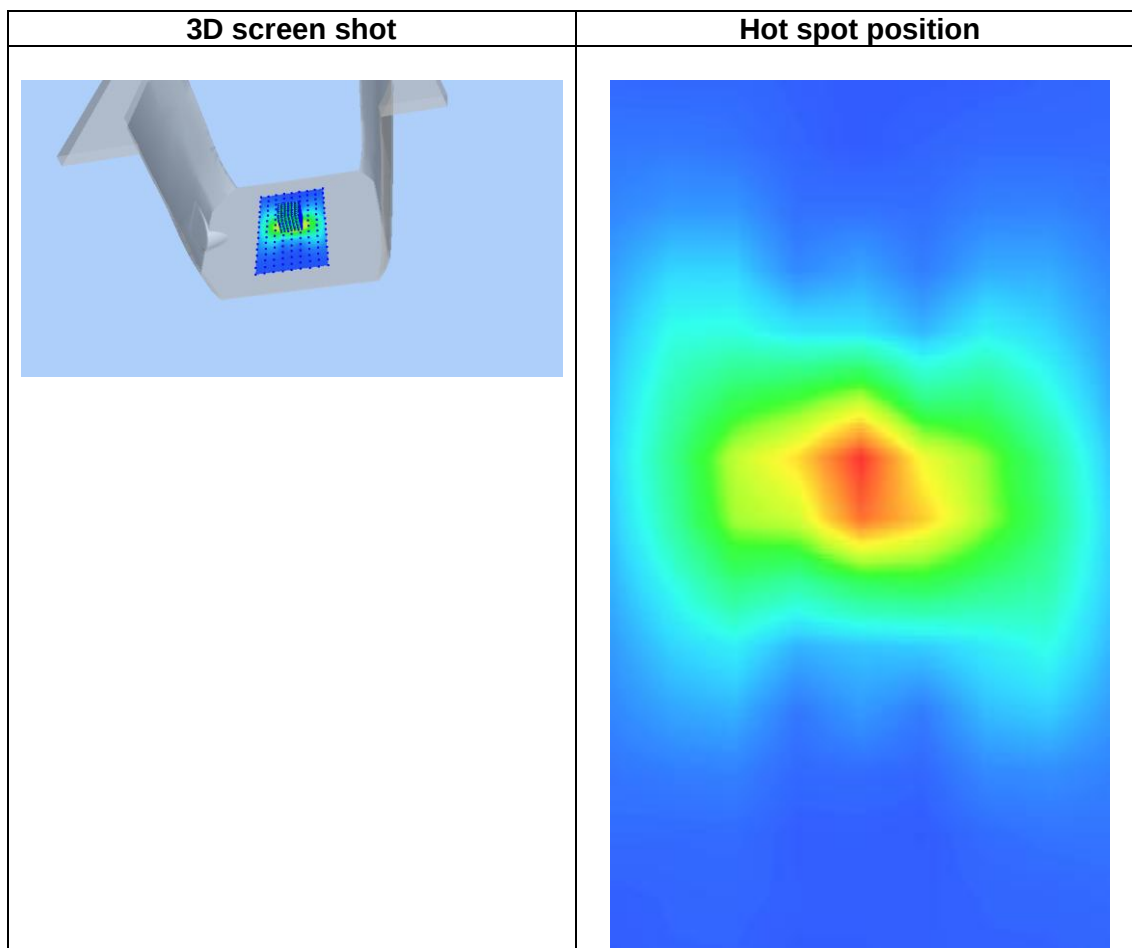
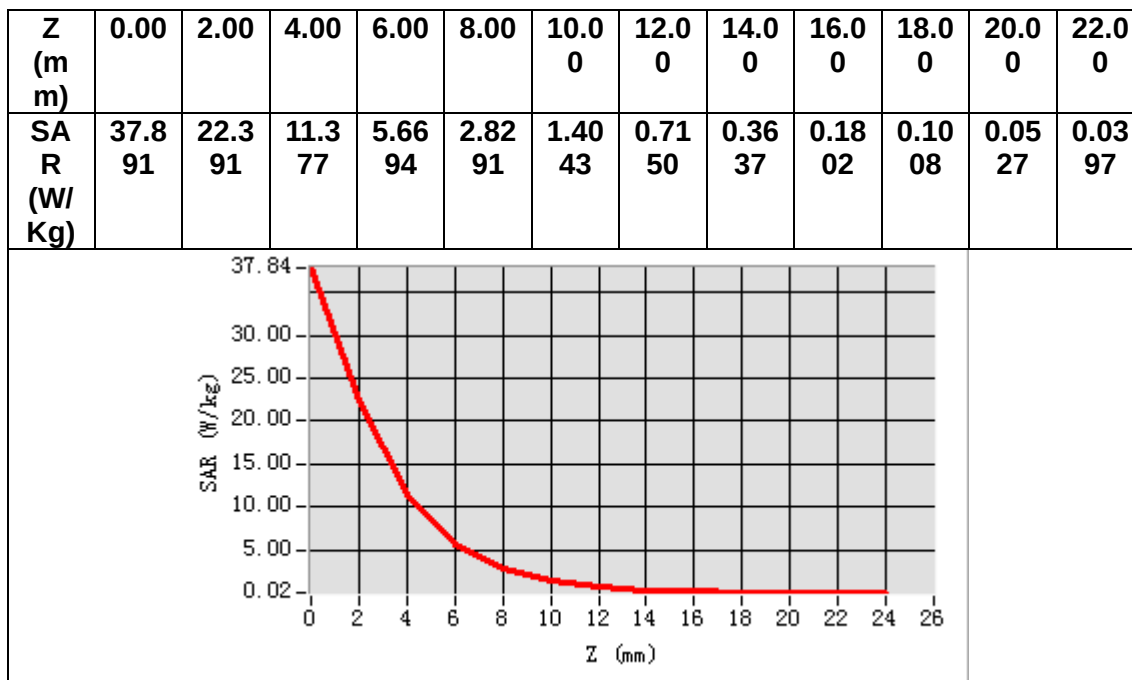
Frequency (MHz)	5200.000000
Relative permittivity (real part)	36.032204
Relative permittivity (imaginary part)	16.390739
Conductivity (S/m)	4.735102
Variation (%)	2.800000



Maximum location: X=0.00, Y=6.00

SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.573162
SAR 1g (W/Kg)	15.966032



MEASUREMENT 8

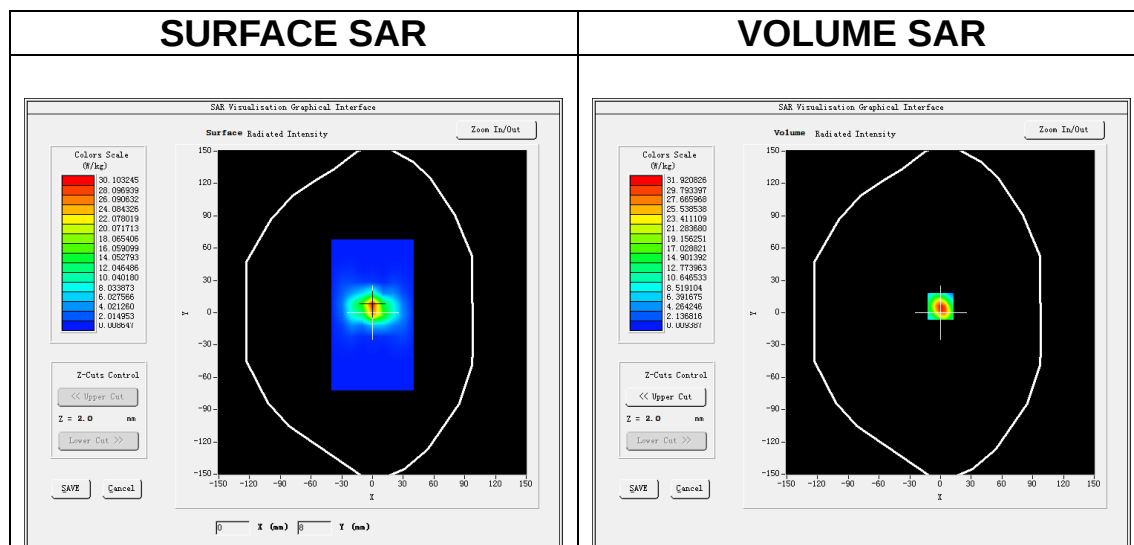
Date of measurement: 21/12/2022

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW5800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.07</u>

B. SAR Measurement Results

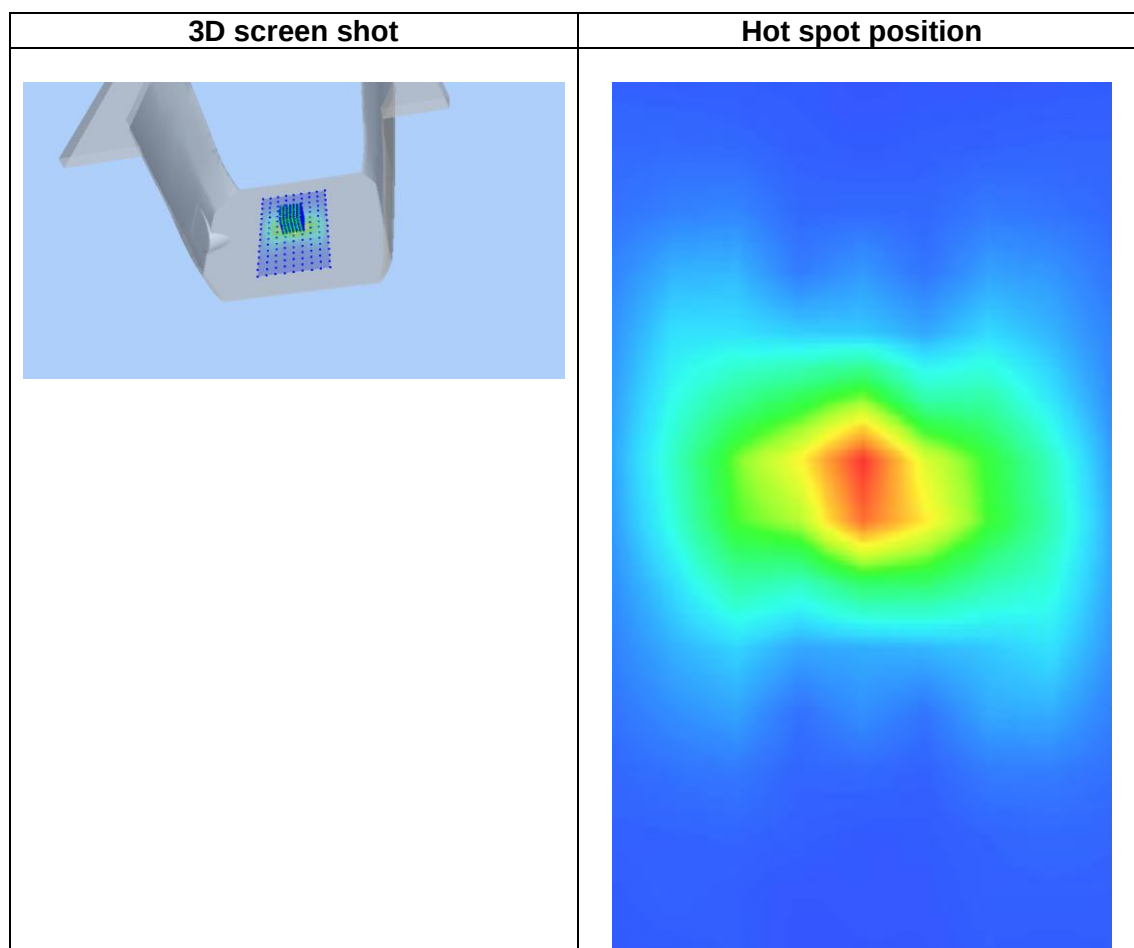
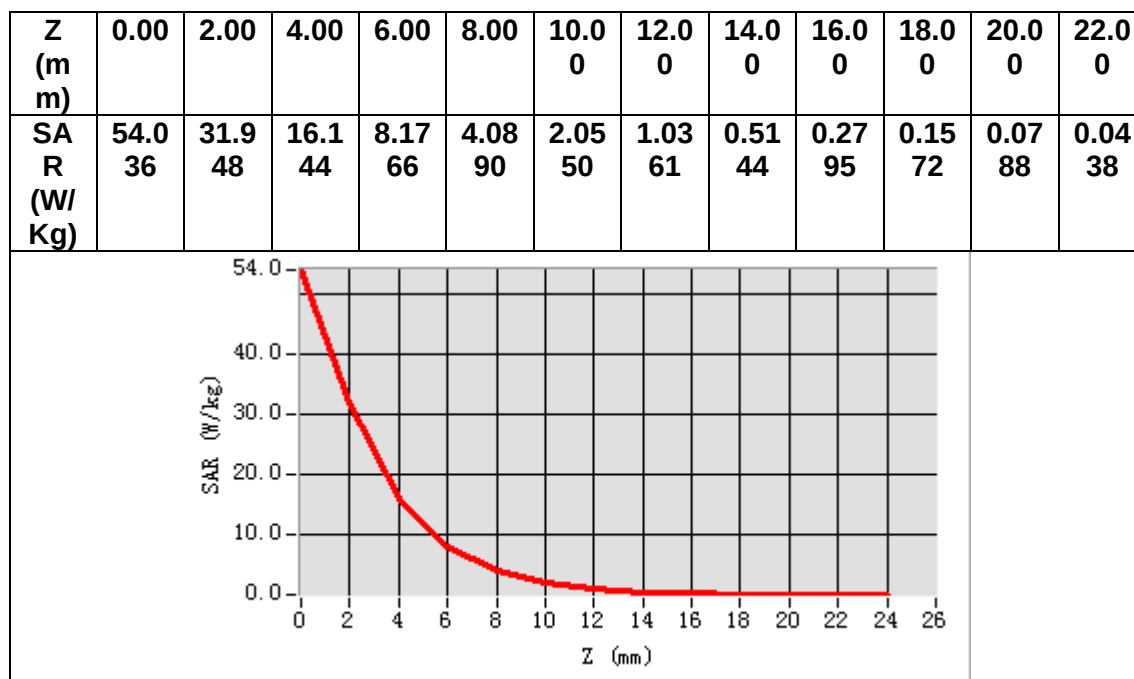
Frequency (MHz)	5800.000000
Relative permittivity (real part)	34.608421
Relative permittivity (imaginary part)	16.312200
Conductivity (S/m)	5.256153
Variation (%)	-0.500000



Maximum location: X=0.00, Y=6.00

SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.219228
SAR 1g (W/Kg)	16.688190



13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 28 LTE Band 17 Body
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MEASUREMENT 30 LTE Band 41 Body

MEASUREMENT 1

Date of measurement: 12/12/2022

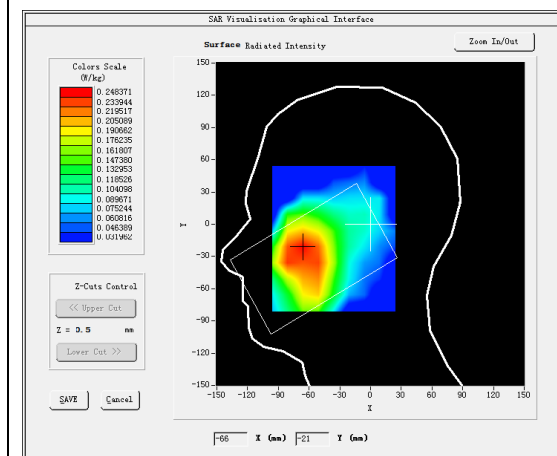
A. Experimental conditions.

<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: 2.0)</u>
<u>ConvF</u>	<u>1.50</u>

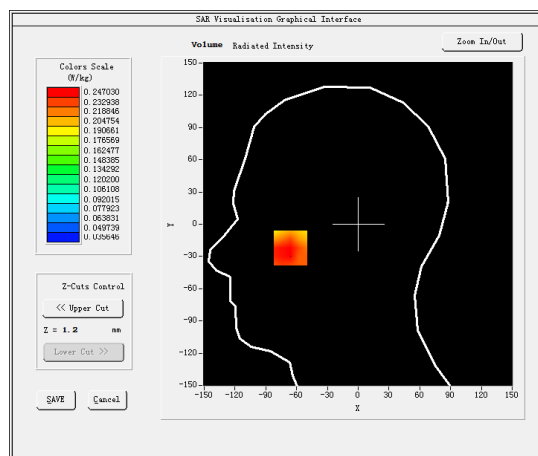
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.290737
Relative permittivity (imaginary part)	20.129421
Conductivity (S/m)	0.935347
Variation (%)	-1.350000

SURFACE SAR



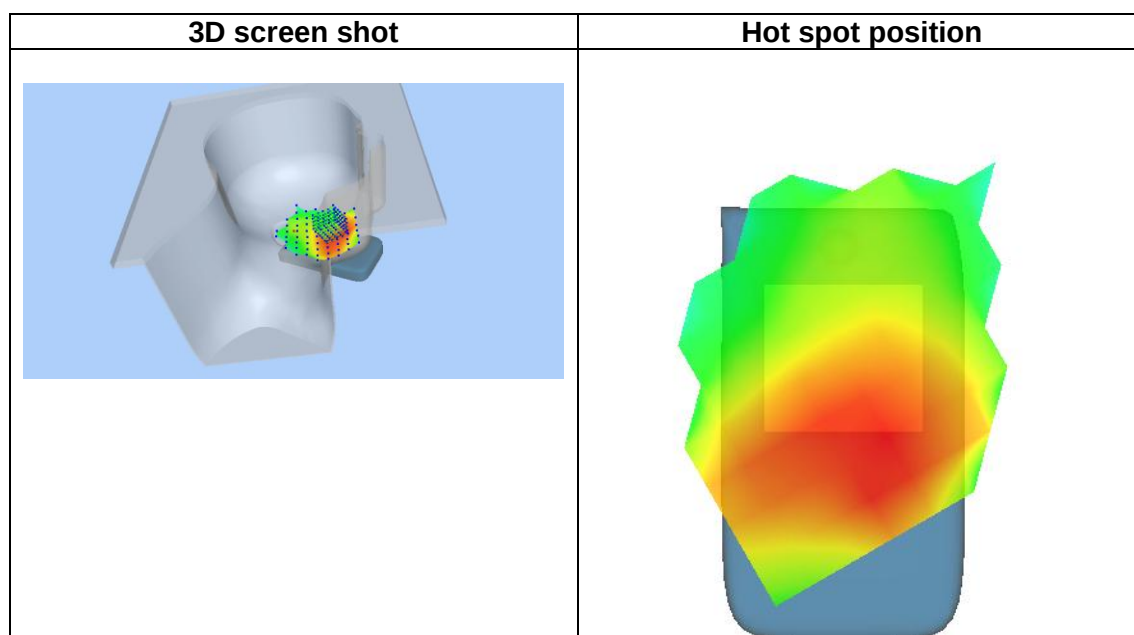
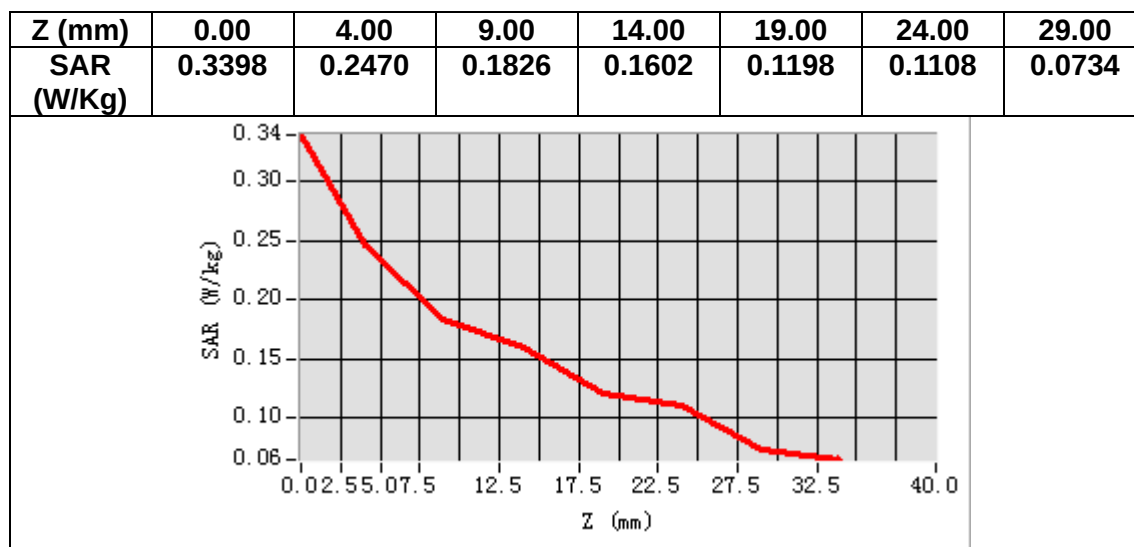
VOLUME SAR



Maximum location: X=-66.00, Y=-22.00

SAR Peak: 0.34 W/kg

SAR 10g (W/Kg)	0.189785
SAR 1g (W/Kg)	0.252721



MEASUREMENT 2

Date of measurement: 12/12/2022

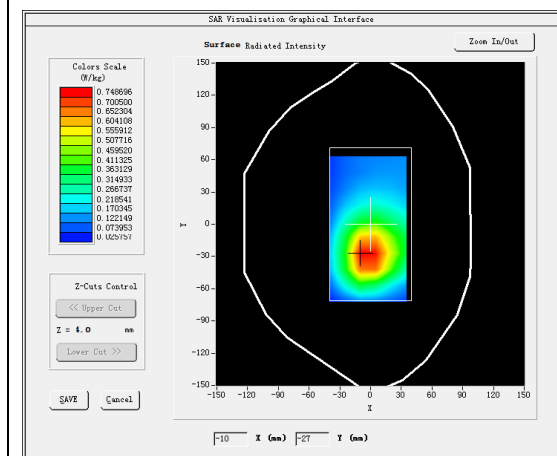
A. Experimental conditions.

<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: 2.0)</u>
<u>ConvF</u>	<u>1.50</u>

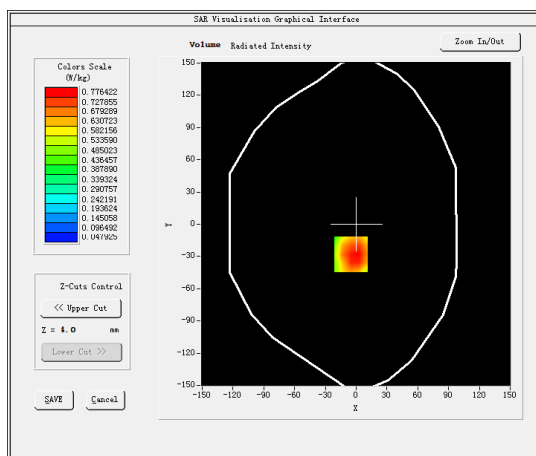
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.290737
Relative permittivity (imaginary part)	20.129421
Conductivity (S/m)	0.935347
Variation (%)	2.450000

SURFACE SAR



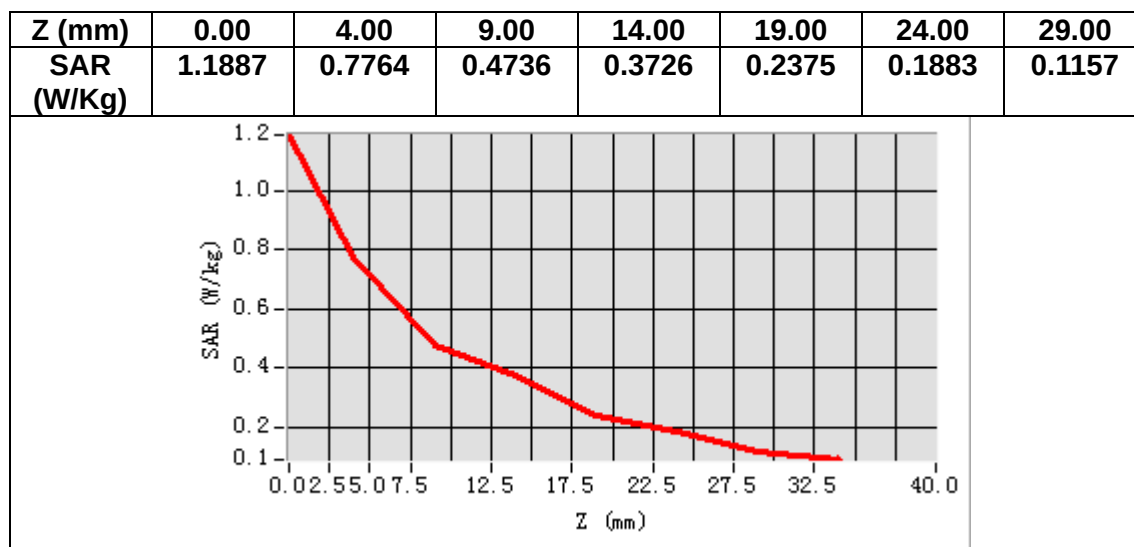
VOLUME SAR



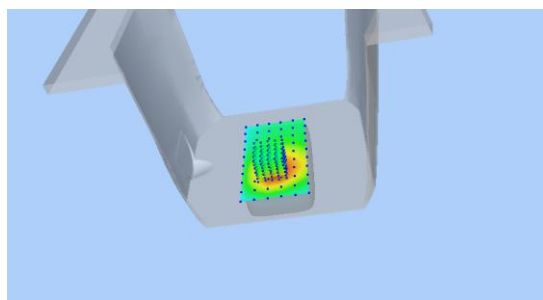
Maximum location: X=-5.00, Y=-28.00

SAR Peak: 1.13 W/kg

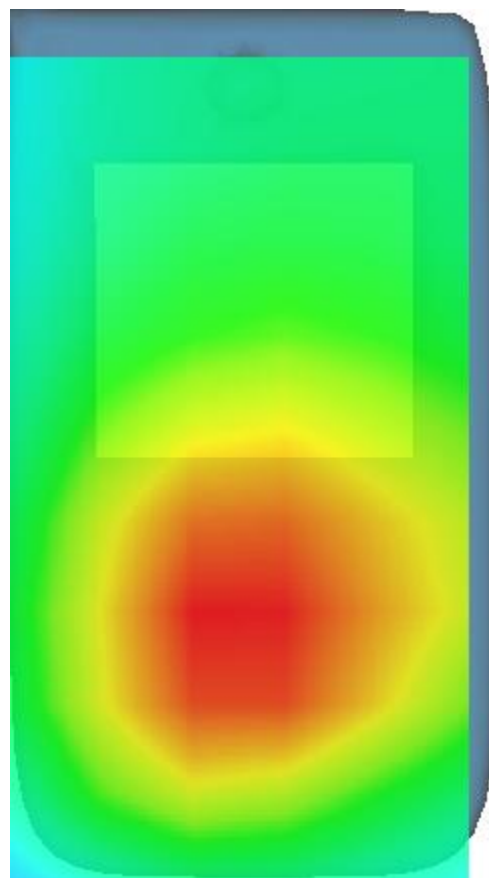
SAR 10g (W/Kg)	0.511355
SAR 1g (W/Kg)	0.783654



3D screen shot



Hot spot position



MEASUREMENT 3

Date of measurement: 9/12/2022

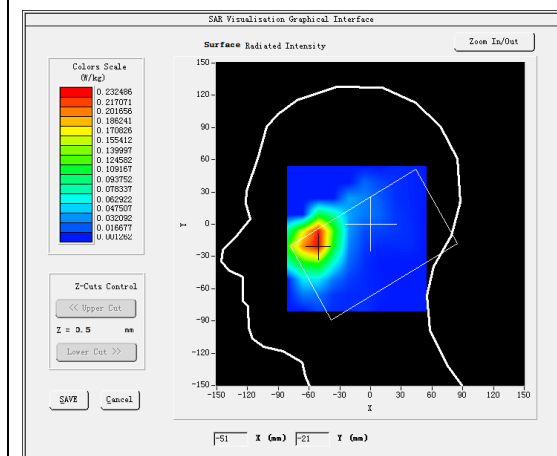
A. Experimental conditions.

<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: 2.0)</u>
<u>ConvF</u>	<u>1.91</u>

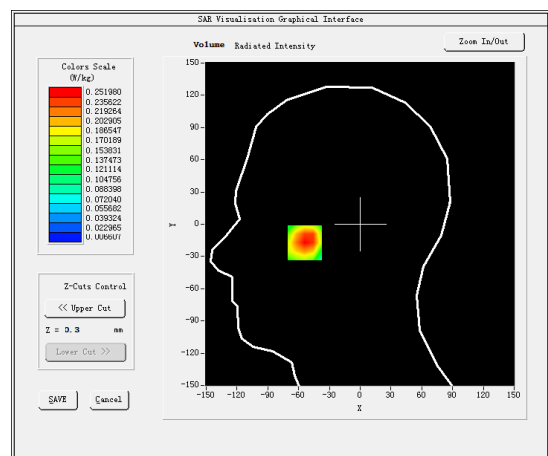
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.866089
Relative permittivity (imaginary part)	13.762598
Conductivity (S/m)	1.437427
Variation (%)	-0.550000

SURFACE SAR



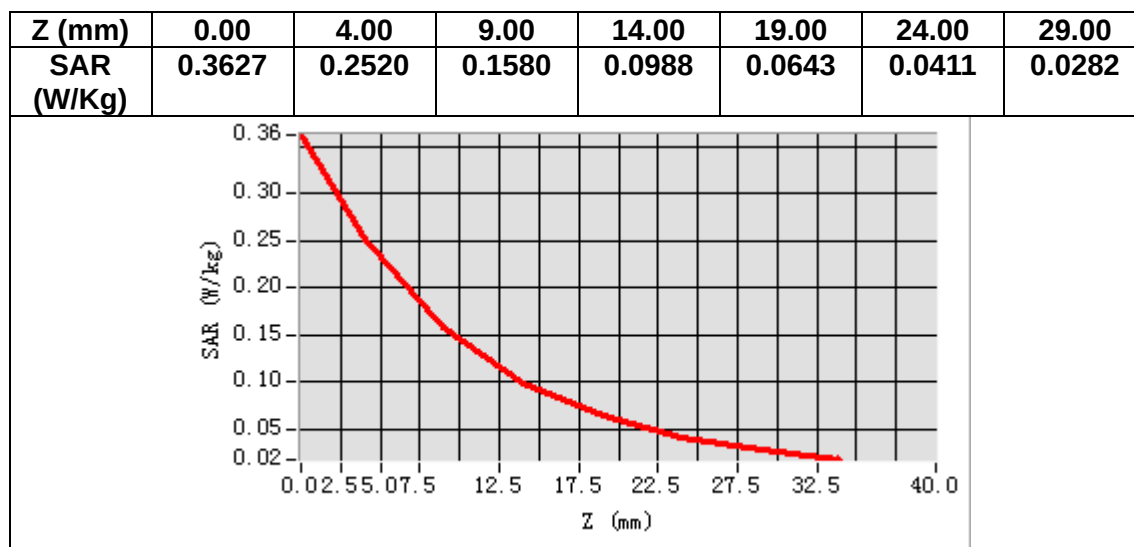
VOLUME SAR



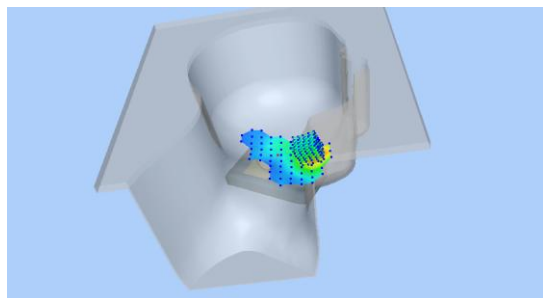
Maximum location: X=-54.00, Y=-16.00

SAR Peak: 0.38 W/kg

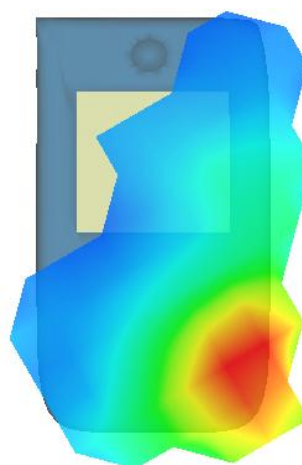
SAR 10g (W/Kg)	0.140136
SAR 1g (W/Kg)	0.245835



3D screen shot



Hot spot position



MEASUREMENT 4

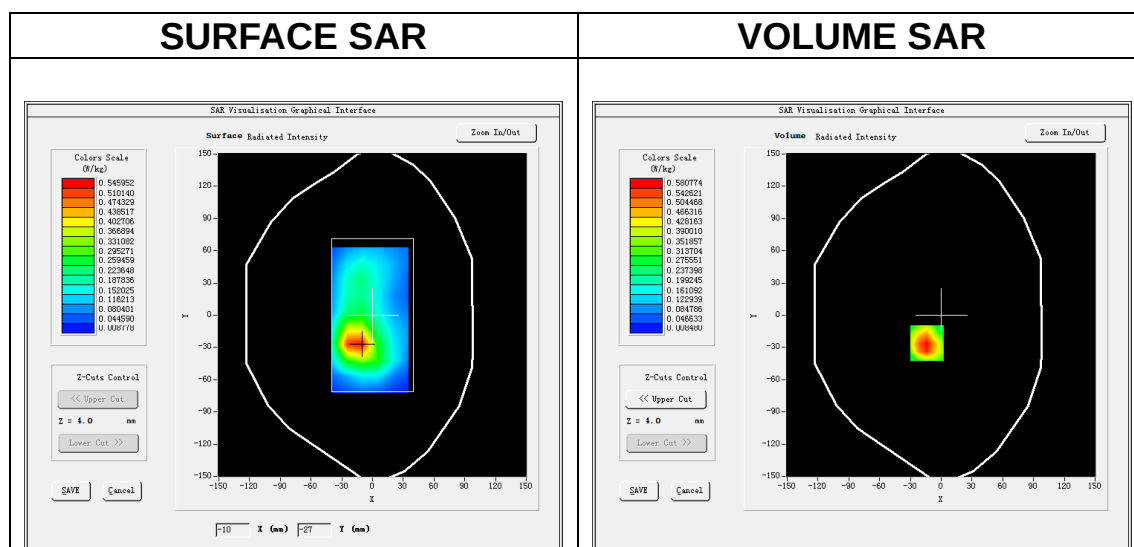
Date of measurement: 9/12/2022

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: 2.0)</u>
<u>ConvF</u>	<u>1.91</u>

B. SAR Measurement Results

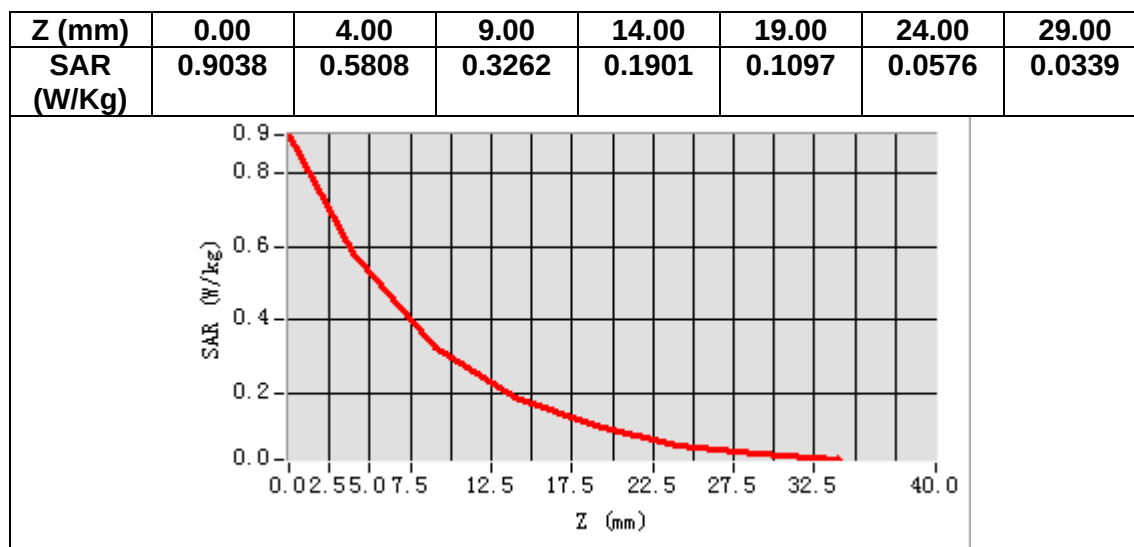
Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.866089
Relative permittivity (imaginary part)	13.762598
Conductivity (S/m)	1.437427
Variation (%)	2.060000



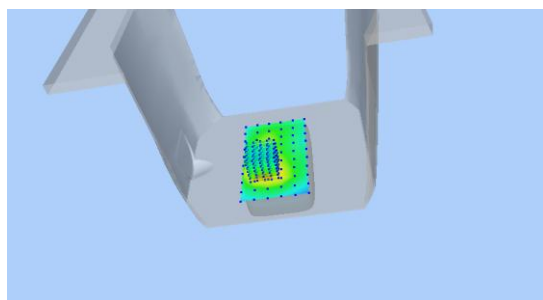
Maximum location: X=-14.00, Y=-26.00

SAR Peak: 0.96 W/kg

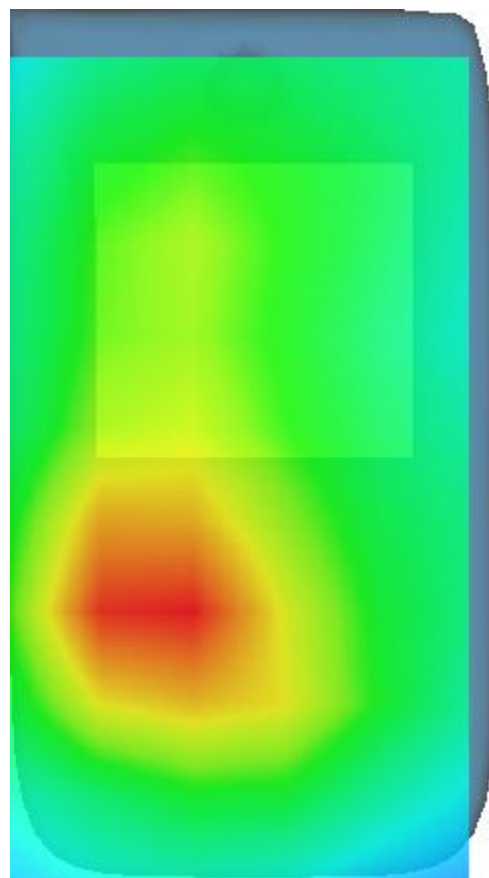
SAR 10g (W/Kg)	0.299594
SAR 1g (W/Kg)	0.578739



3D screen shot



Hot spot position



MEASUREMENT 5

Date of measurement: 9/12/2022

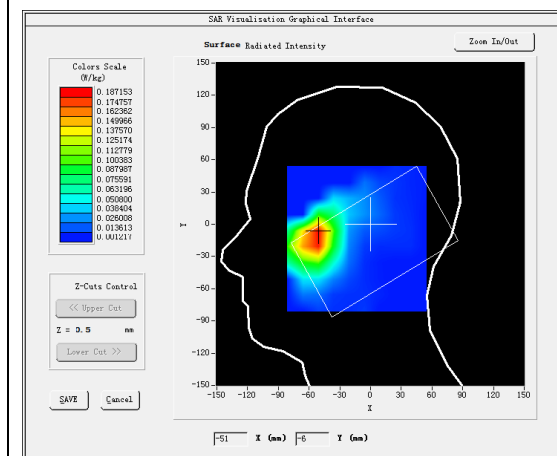
A. Experimental conditions.

<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>1.91</u>

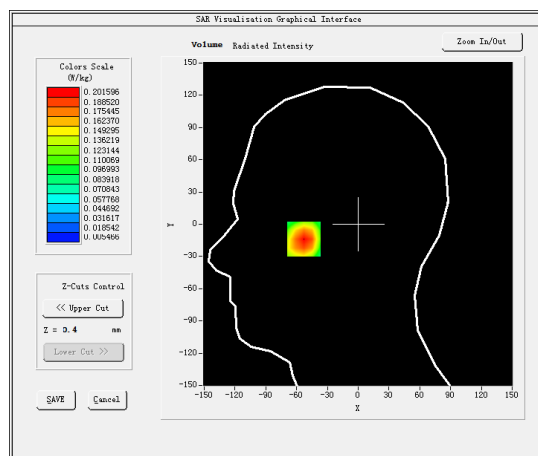
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.866089
Relative permittivity (imaginary part)	13.762598
Conductivity (S/m)	1.437427
Variation (%)	-0.370000

SURFACE SAR



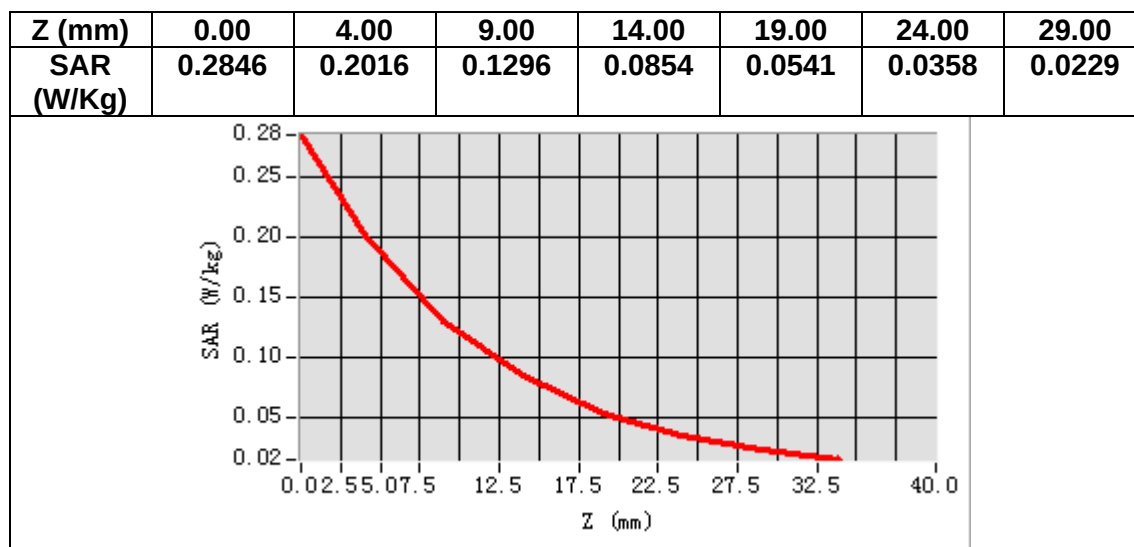
VOLUME SAR



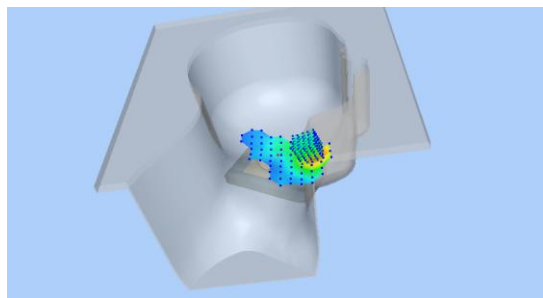
Maximum location: X=-53.00, Y=-12.00

SAR Peak: 0.29 W/kg

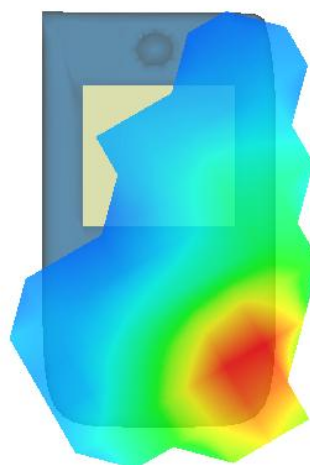
SAR 10g (W/Kg)	0.116460
SAR 1g (W/Kg)	0.196104



3D screen shot



Hot spot position



MEASUREMENT 6

Date of measurement: 9/12/2022

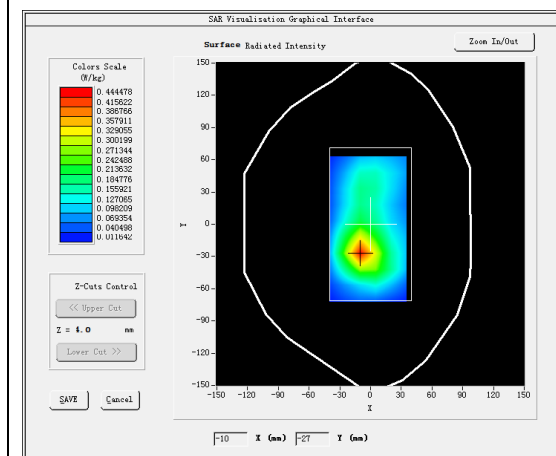
A. Experimental conditions.

<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>1.91</u>

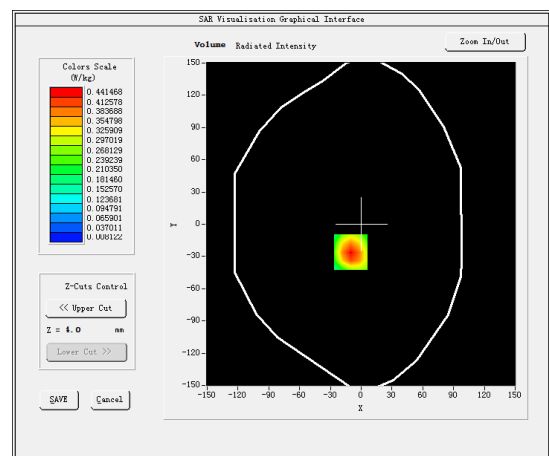
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.866089
Relative permittivity (imaginary part)	13.762598
Conductivity (S/m)	1.437427
Variation (%)	-0.430000

SURFACE SAR



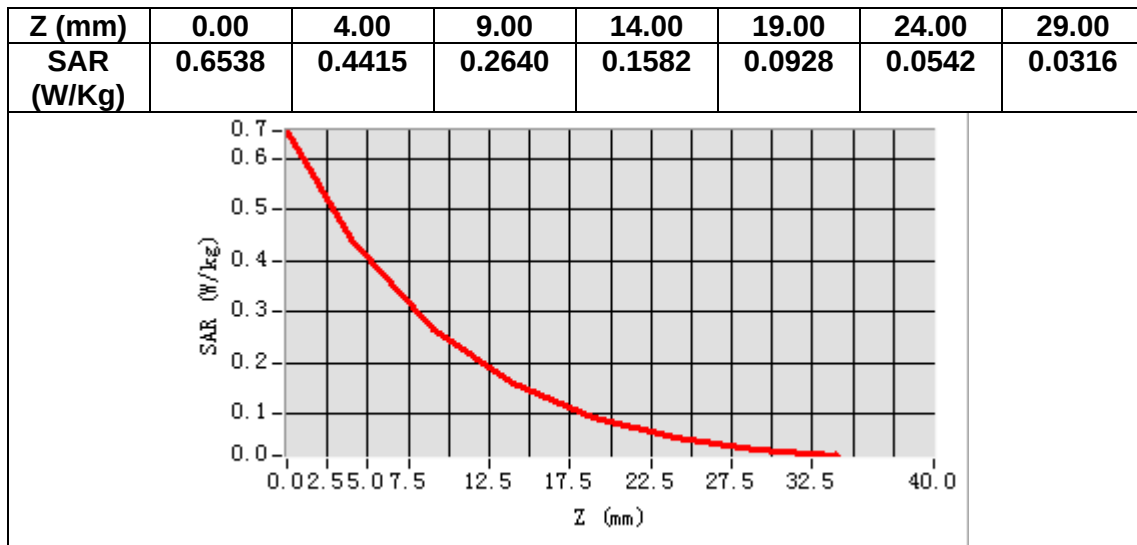
VOLUME SAR



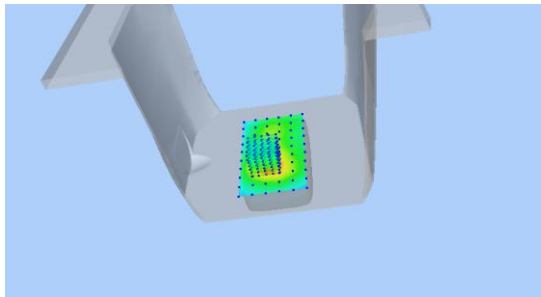
Maximum location: X=-10.00, Y=-26.00

SAR Peak: 0.67 W/kg

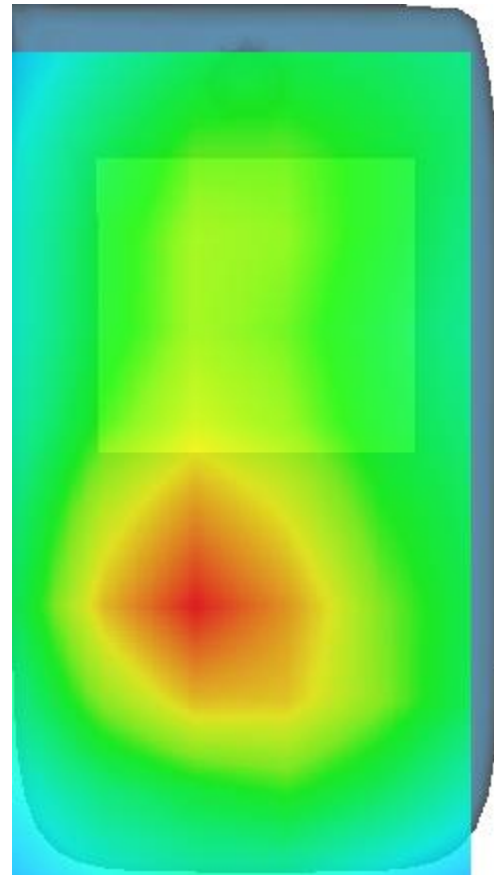
SAR 10g (W/Kg)	0.238864
SAR 1g (W/Kg)	0.430413



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 16/12/2022

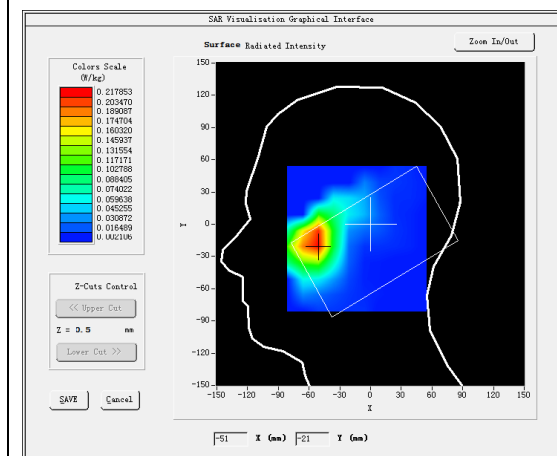
A. Experimental conditions.

<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>1.73</u>

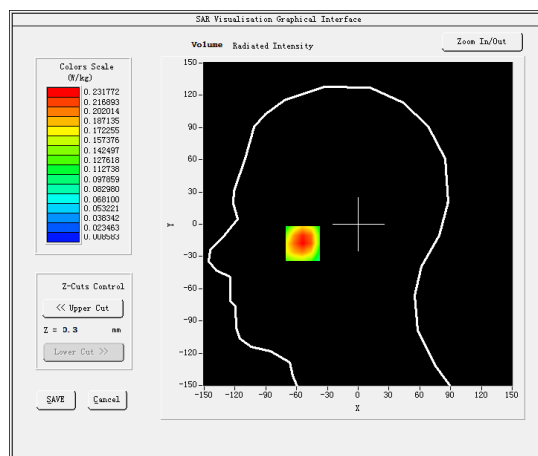
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.503326
Relative permittivity (imaginary part)	13.978372
Conductivity (S/m)	1.345030
Variation (%)	0.540000

SURFACE SAR



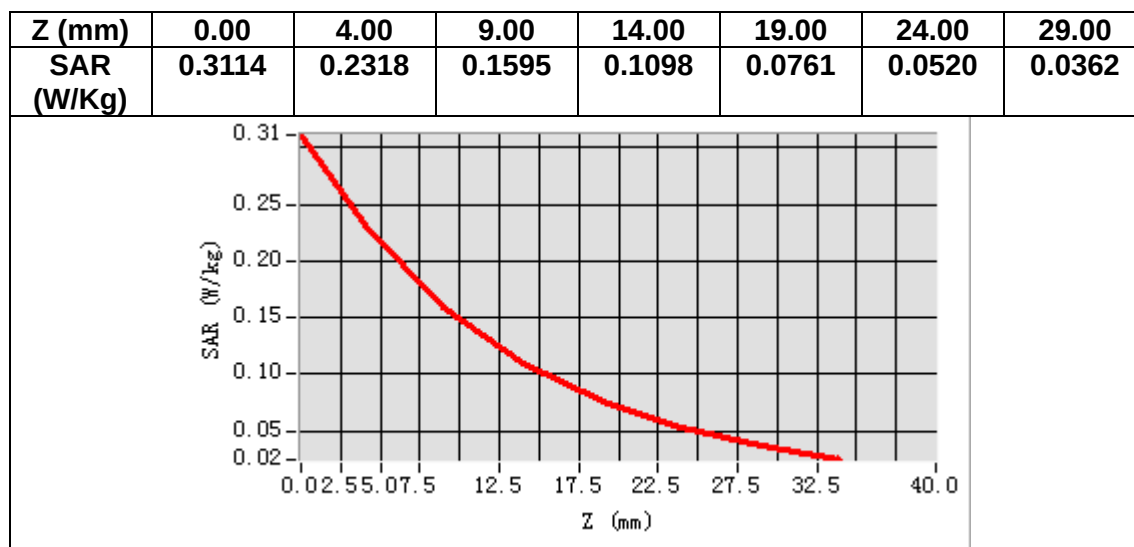
VOLUME SAR



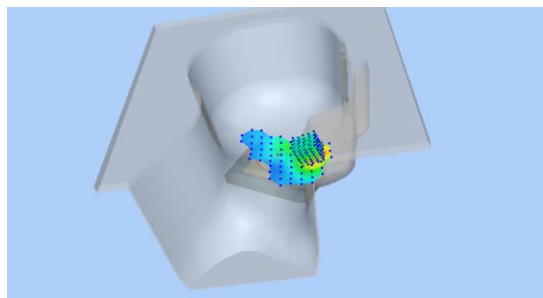
Maximum location: X=-54.00, Y=-17.00

SAR Peak: 0.32 W/kg

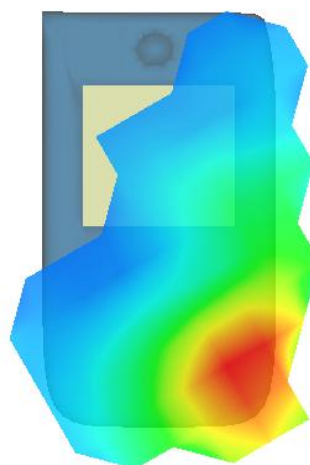
SAR 10g (W/Kg)	0.138738
SAR 1g (W/Kg)	0.222601



3D screen shot



Hot spot position



MEASUREMENT 8

Date of measurement: 16/12/2022

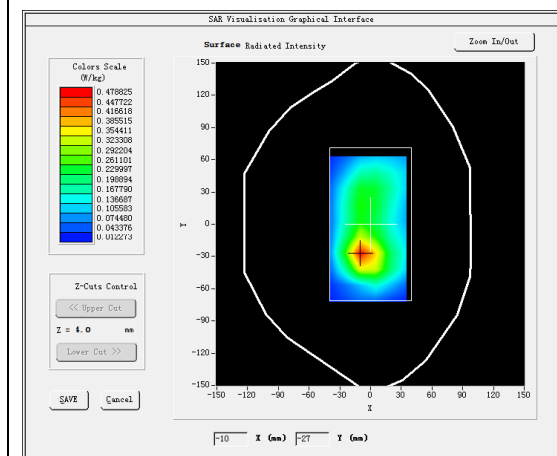
A. Experimental conditions.

<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>1.73</u>

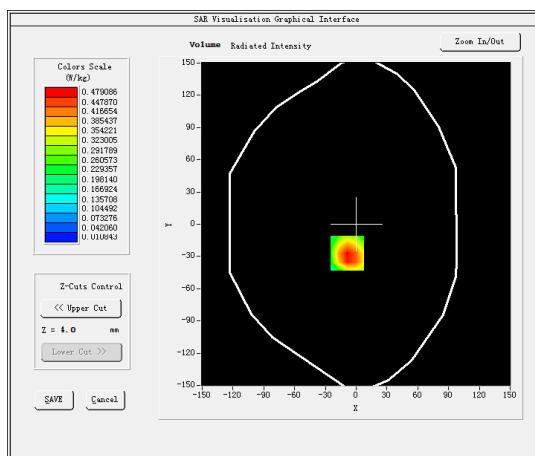
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.503326
Relative permittivity (imaginary part)	13.978372
Conductivity (S/m)	1.345030
Variation (%)	-0.720000

SURFACE SAR



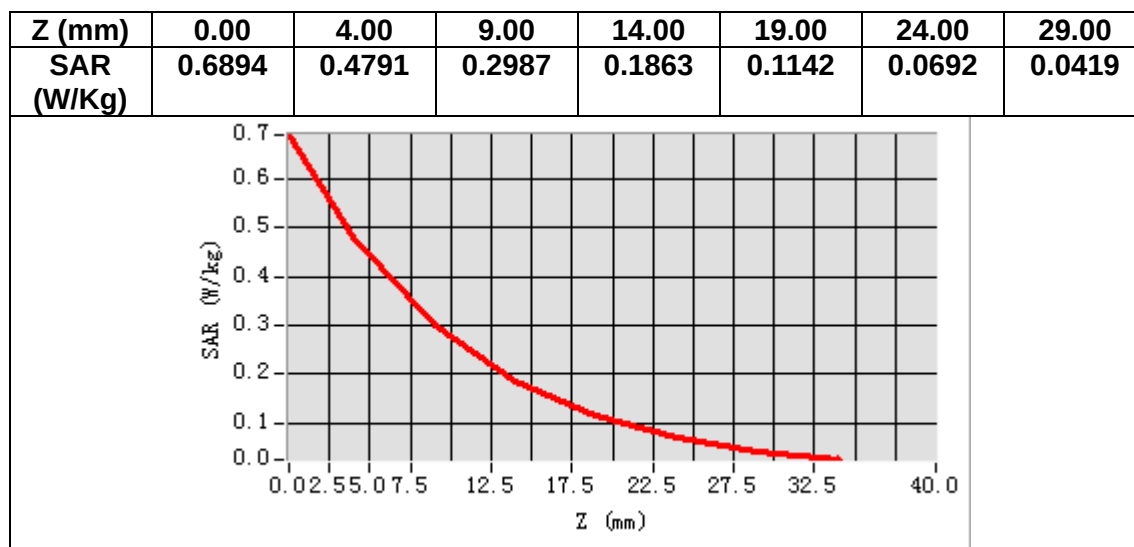
VOLUME SAR



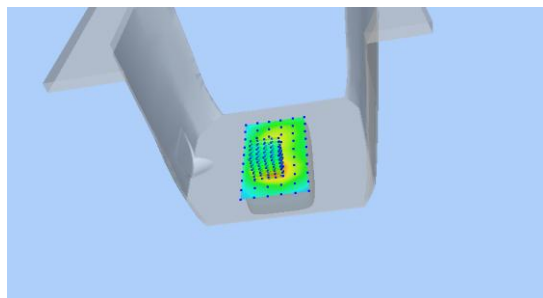
Maximum location: X=-9.00, Y=-27.00

SAR Peak: 0.73 W/kg

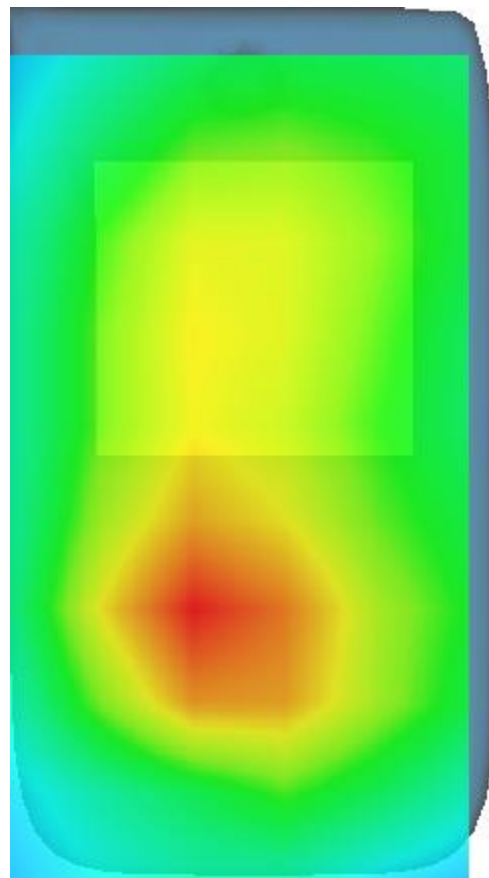
SAR 10g (W/Kg)	0.263794
SAR 1g (W/Kg)	0.466696



3D screen shot



Hot spot position



MEASUREMENT 9

Date of measurement: 12/12/2022

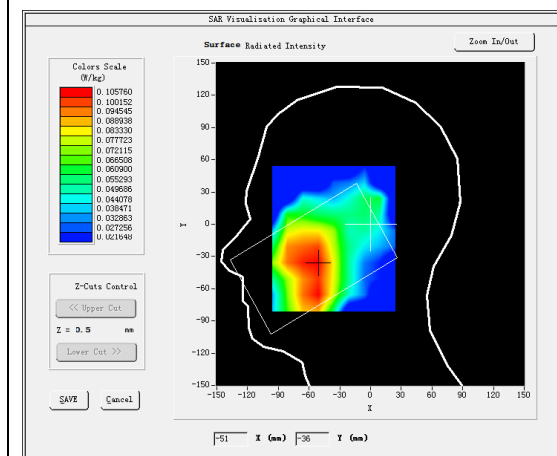
A. Experimental conditions.

<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>1.50</u>

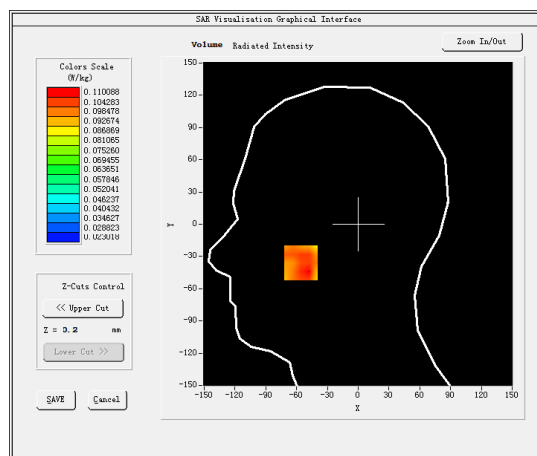
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.290737
Relative permittivity (imaginary part)	20.129421
Conductivity (S/m)	0.935347
Variation (%)	-2.550000

SURFACE SAR



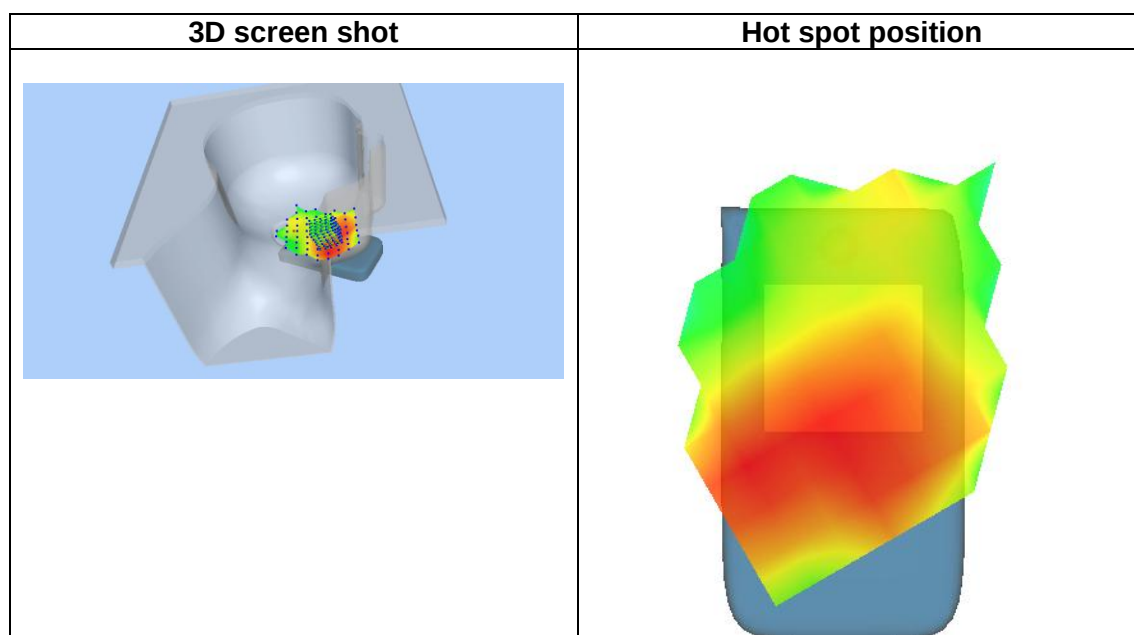
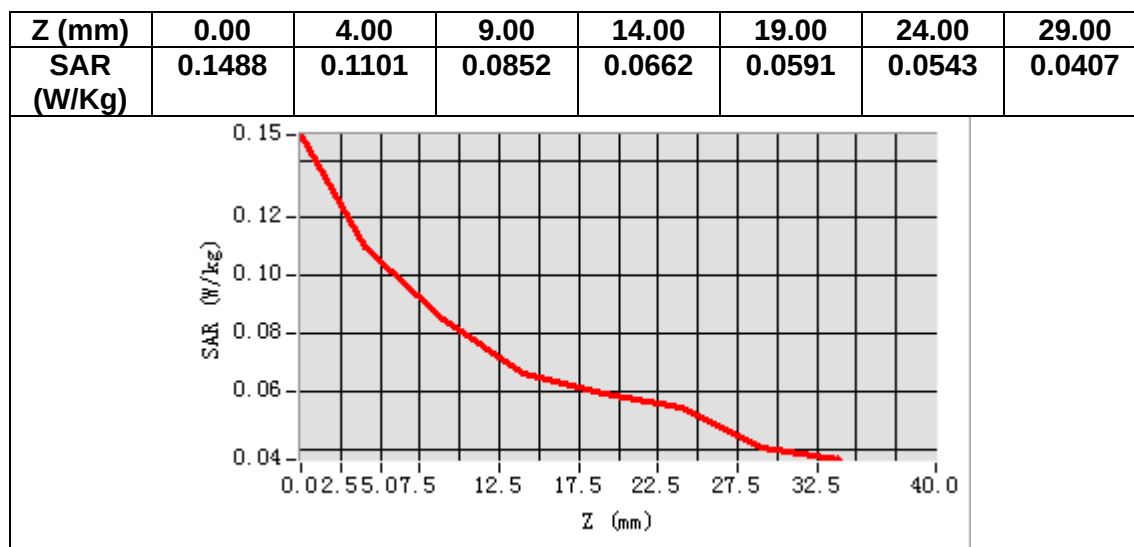
VOLUME SAR



Maximum location: X=-56.00, Y=-36.00

SAR Peak: 0.17 W/kg

SAR 10g (W/Kg)	0.085976
SAR 1g (W/Kg)	0.115315



MEASUREMENT 10

Date of measurement: 12/12/2022

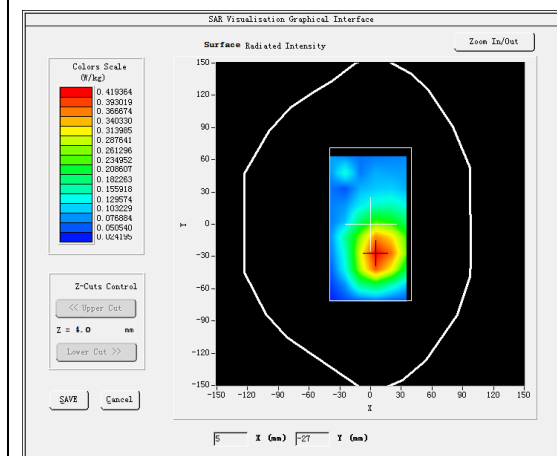
A. Experimental conditions.

<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>1.50</u>

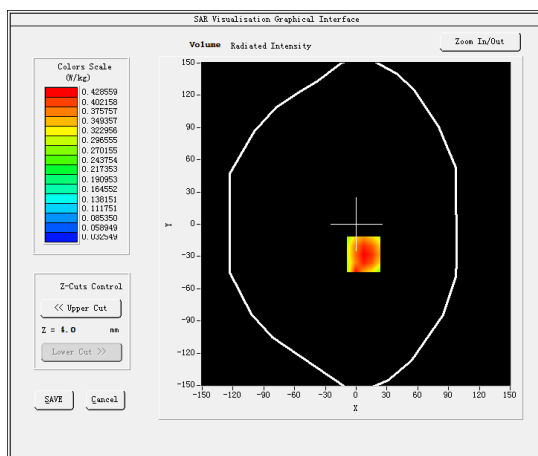
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.290737
Relative permittivity (imaginary part)	20.129421
Conductivity (S/m)	0.935347
Variation (%)	-2.580000

SURFACE SAR



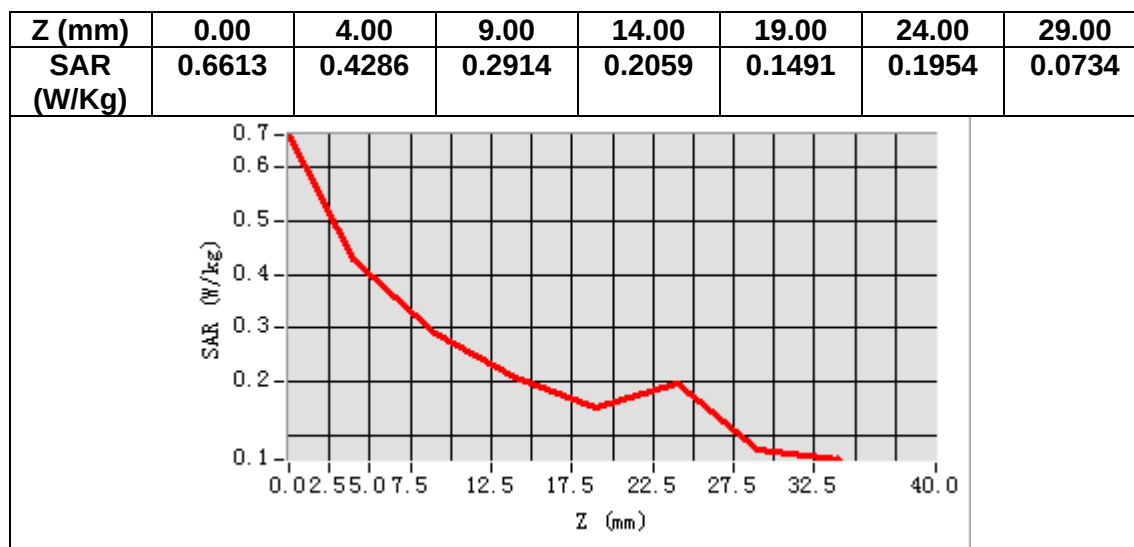
VOLUME SAR



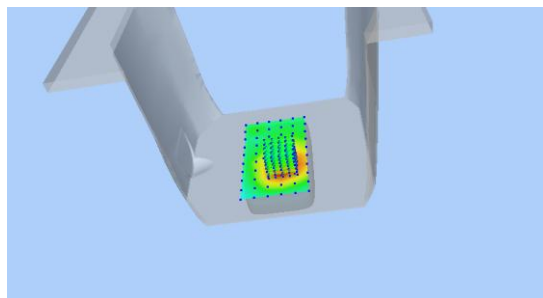
Maximum location: X=7.00, Y=-28.00

SAR Peak: 0.74 W/kg

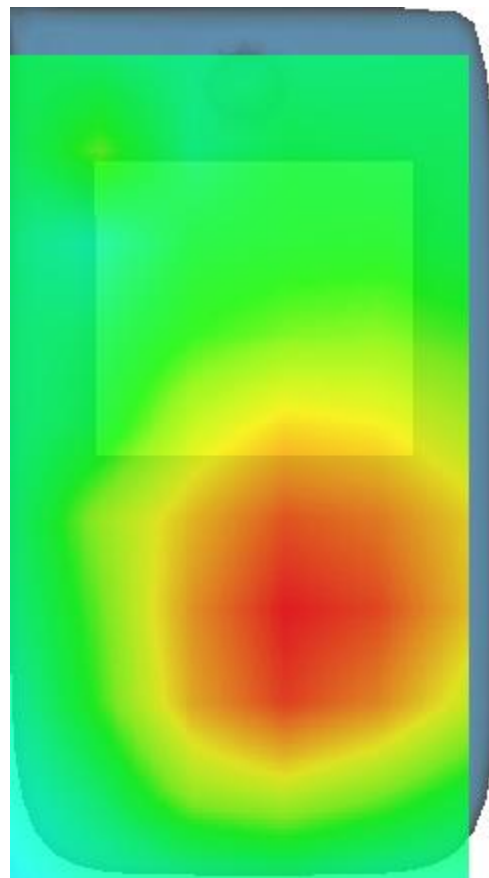
SAR 10g (W/Kg)	0.277842
SAR 1g (W/Kg)	0.415002



3D screen shot



Hot spot position



MEASUREMENT 11

Date of measurement: 22/12/2022

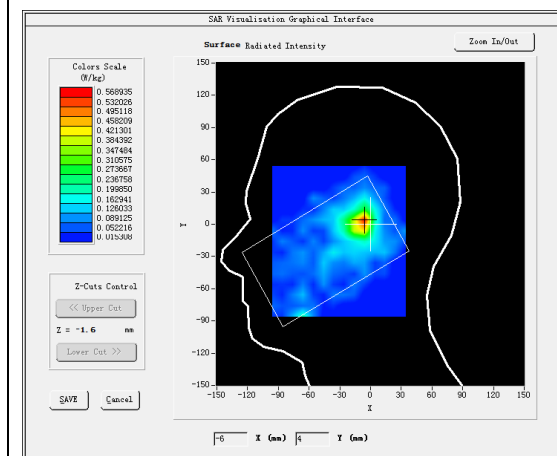
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.80</u>

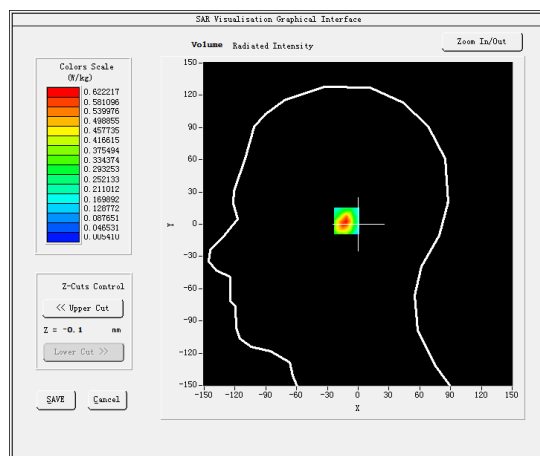
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	36.032204
Relative permittivity (imaginary part)	16.390739
Conductivity (S/m)	4.735102
Variation (%)	-4.850000

SURFACE SAR



VOLUME SAR

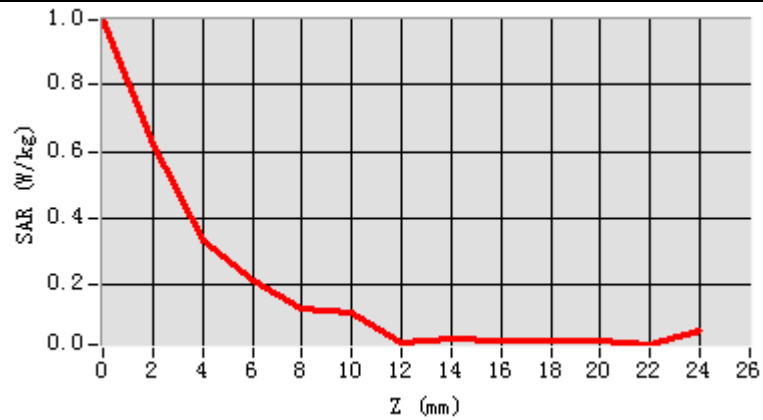


Maximum location: X=-7.00, Y=3.00

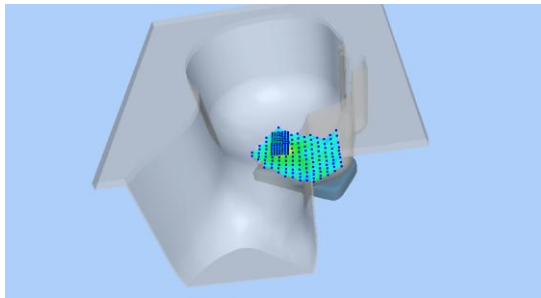
SAR Peak: 1.64 W/kg

SAR 10g (W/Kg)	0.228483
SAR 1g (W/Kg)	0.585865

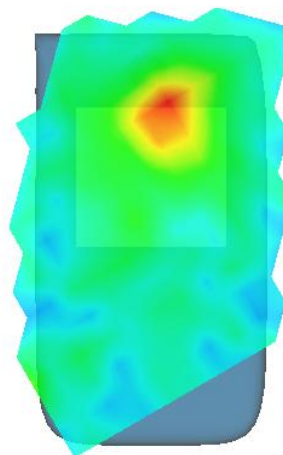
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0
SAR (W/ Kg)	0.99 50	0.62 22	0.33 17	0.21 12	0.12 49	0.11 42	0.02 22	0.03 94	0.03 35	0.03 09	0.03 20	0.01 87



3D screen shot



Hot spot position



MEASUREMENT 12

Date of measurement: 21/12/2022

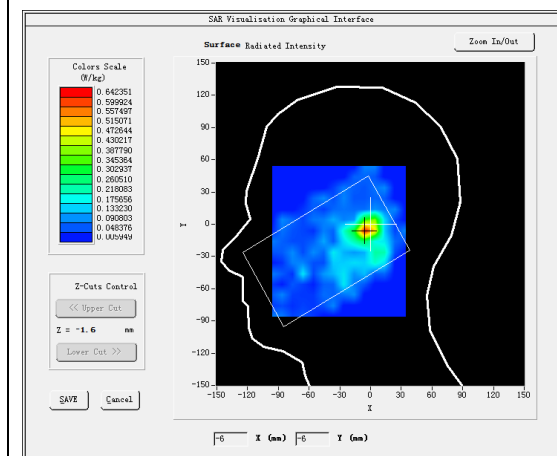
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>High</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.07</u>

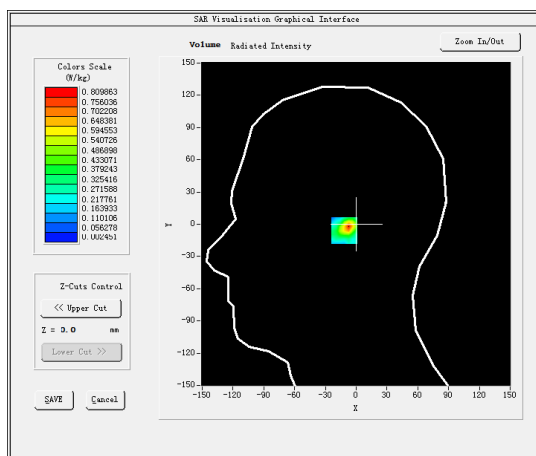
B. SAR Measurement Results

Frequency (MHz)	5825.000000
Relative permittivity (real part)	34.542332
Relative permittivity (imaginary part)	16.293131
Conductivity (S/m)	5.272638
Variation (%)	1.530000

SURFACE SAR



VOLUME SAR

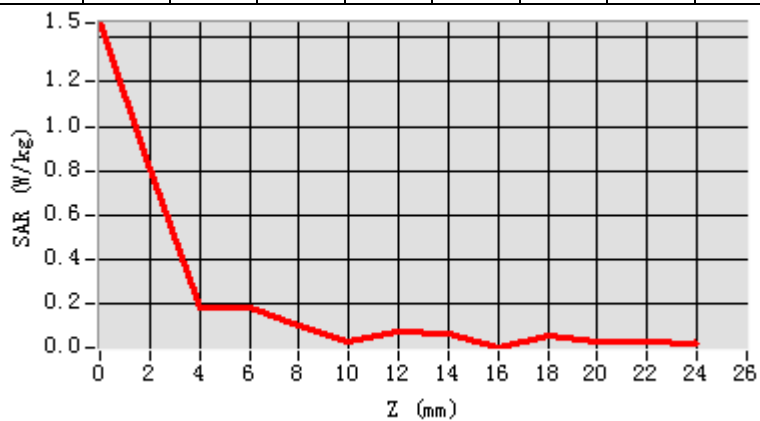


Maximum location: X=-5.00, Y=-6.00

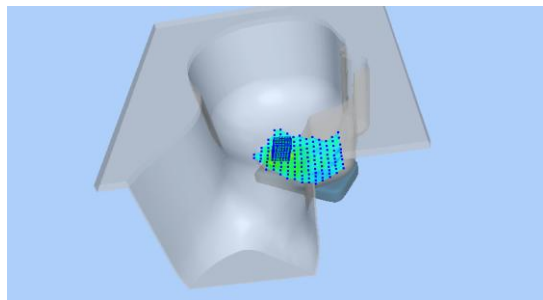
SAR Peak: 2.07 W/kg

SAR 10g (W/Kg)	0.241461
SAR 1g (W/Kg)	0.687140

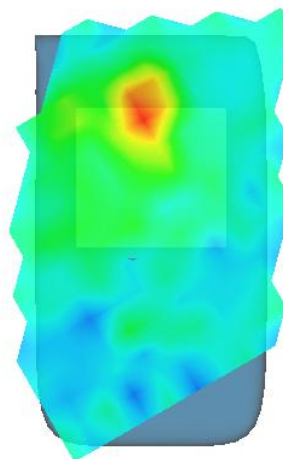
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0
SAR (W/ Kg)	1.46 43	0.80 99	0.18 28	0.18 28	0.10 94	0.03 50	0.08 25	0.07 12	0.00 61	0.06 03	0.03 59	0.03 51



3D screen shot



Hot spot position



MEASUREMENT 13

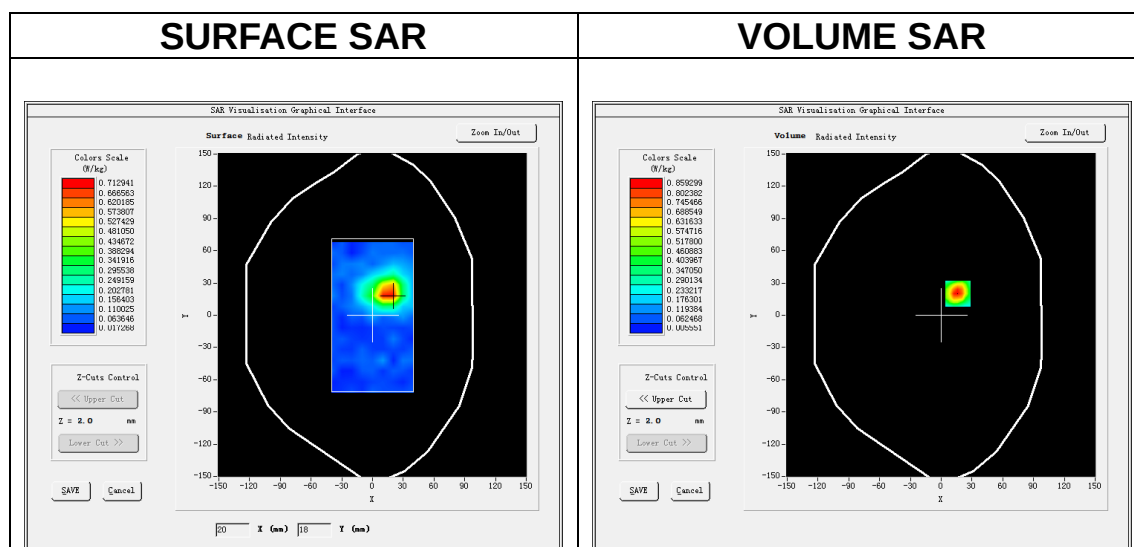
Date of measurement: 22/12/2022

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.80</u>

B. SAR Measurement Results

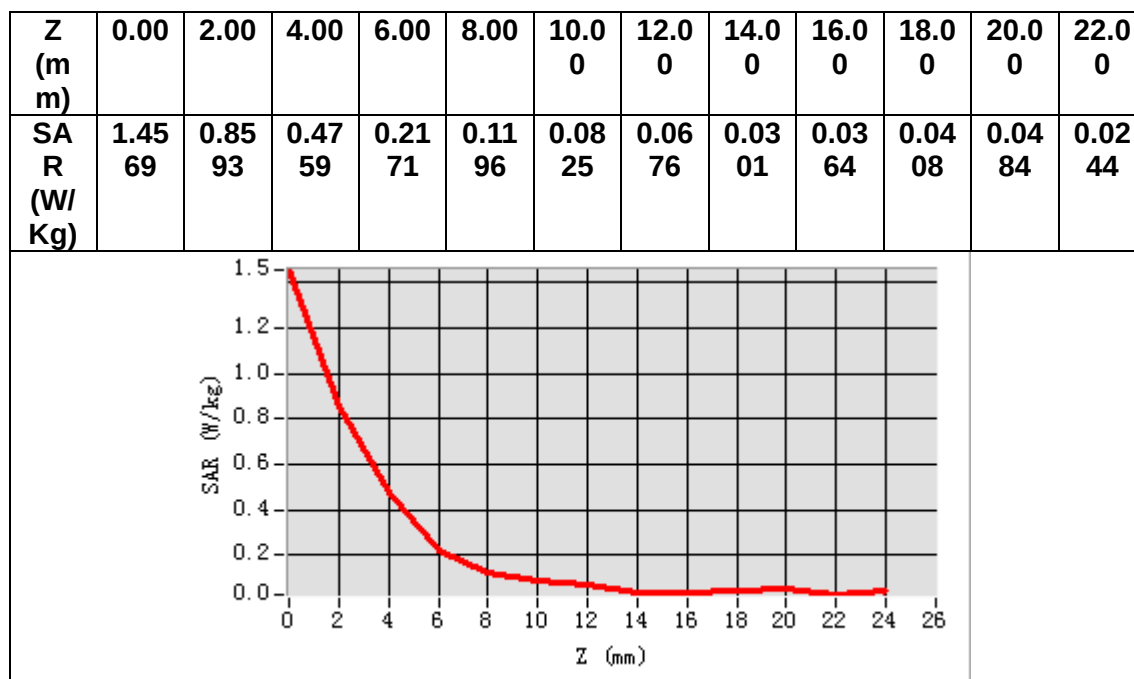
Frequency (MHz)	5200.000000
Relative permittivity (real part)	36.032204
Relative permittivity (imaginary part)	16.390739
Conductivity (S/m)	4.735102
Variation (%)	-3.150000



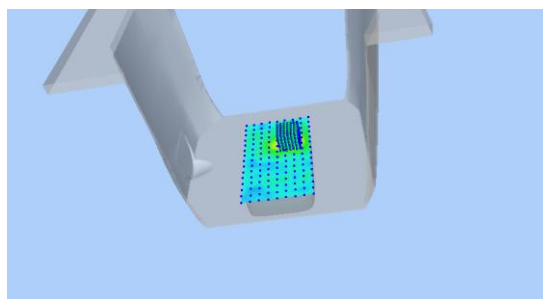
Maximum location: X=16.00, Y=20.00

SAR Peak: 1.57 W/kg

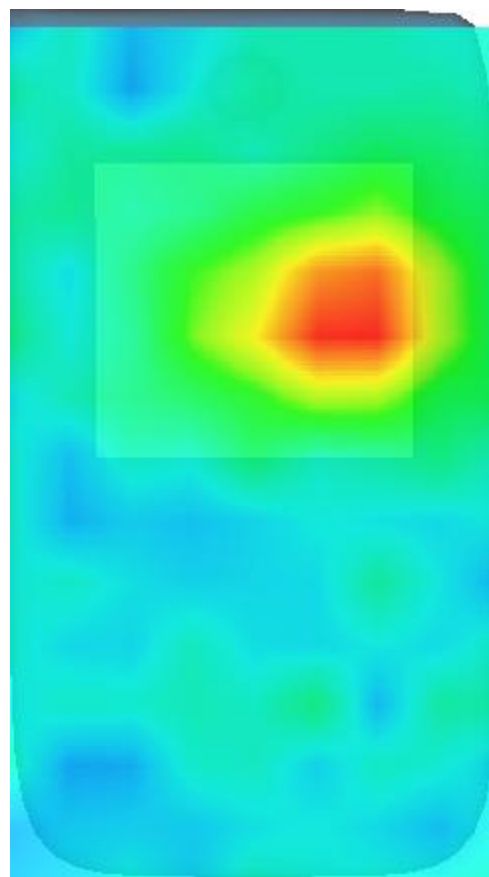
SAR 10g (W/Kg)	0.206212
SAR 1g (W/Kg)	0.504200



3D screen shot



Hot spot position



MEASUREMENT 14

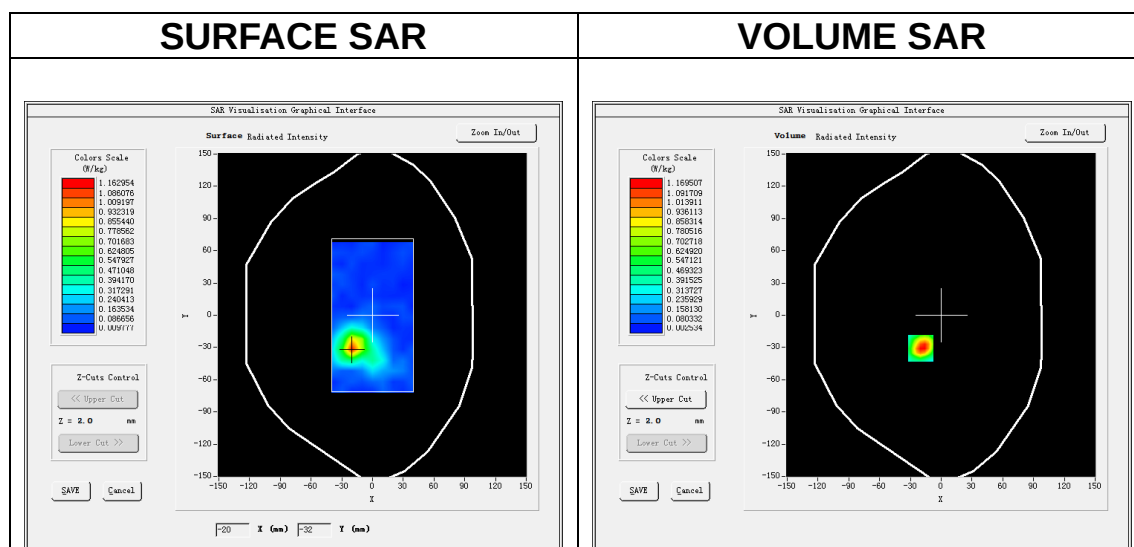
Date of measurement: 21/12/2022

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
<u>ZoomScan</u>	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11a U-NII</u>
<u>Channels</u>	<u>High</u>
<u>Signal</u>	<u>IEEE802.11a (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.07</u>

B. SAR Measurement Results

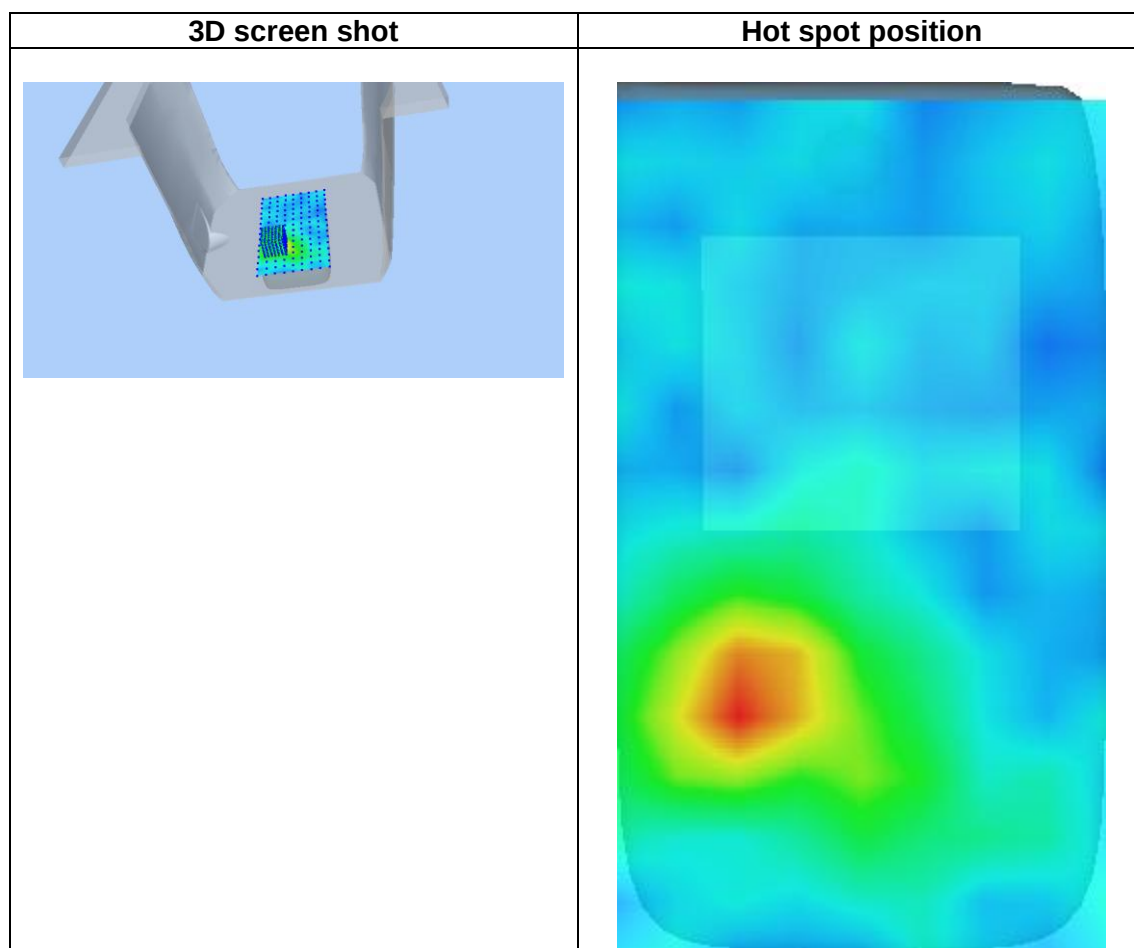
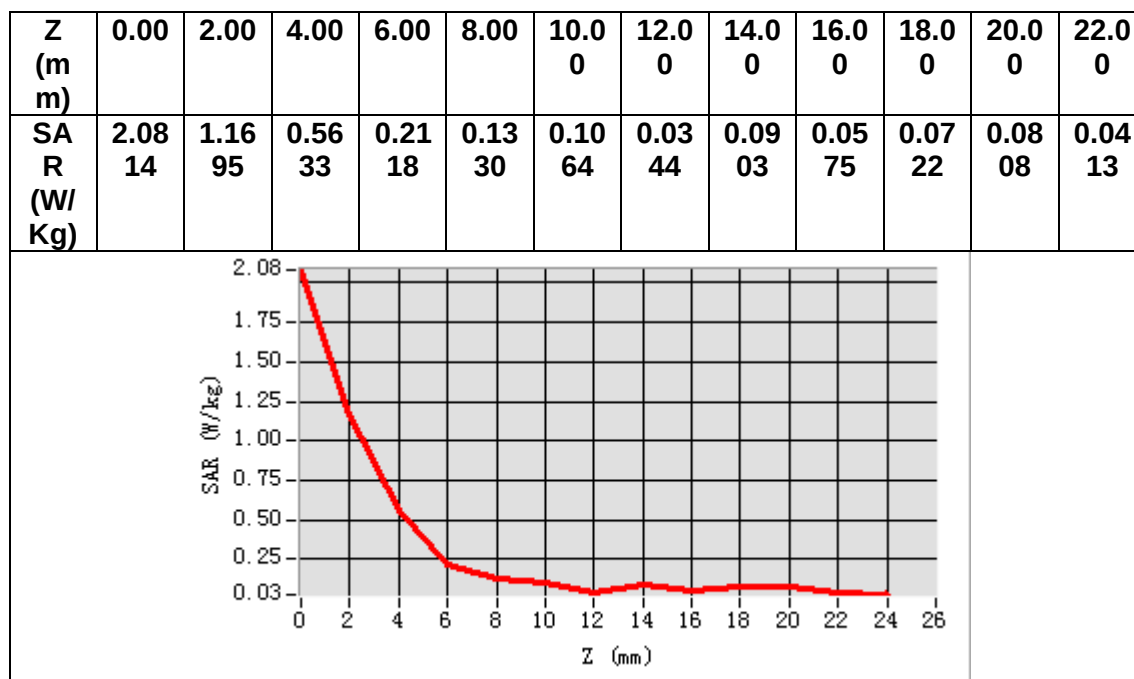
Frequency (MHz)	5825.000000
Relative permittivity (real part)	34.542332
Relative permittivity (imaginary part)	16.293131
Conductivity (S/m)	5.272638
Variation (%)	-4.400000



Maximum location: X=-20.00, Y=-31.00

SAR Peak: 2.27 W/kg

SAR 10g (W/Kg)	0.262040
SAR 1g (W/Kg)	0.673449



MEASUREMENT 15

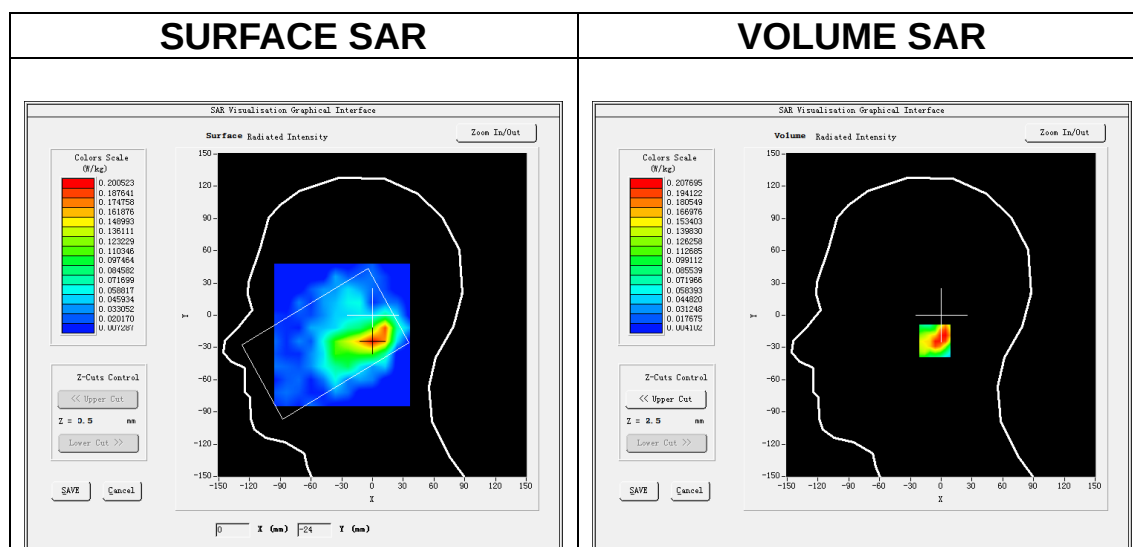
Date of measurement: 15/12/2022

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>IEEE 802.11b ISM</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11b (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.98</u>

B. SAR Measurement Results

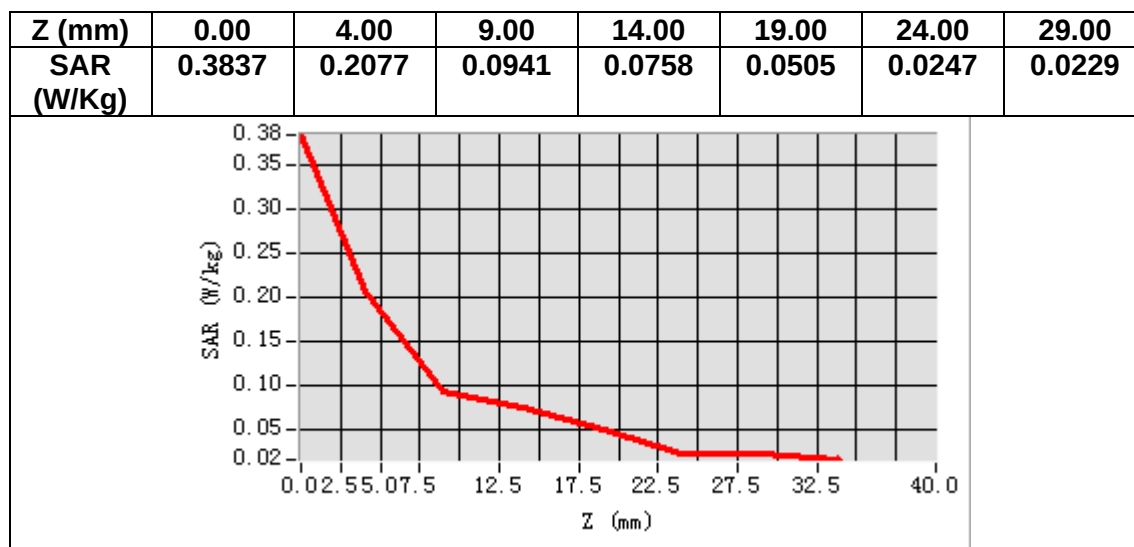
Frequency (MHz)	2437.000000
Relative permittivity (real part)	38.174095
Relative permittivity (imaginary part)	13.469573
Conductivity (S/m)	1.823631
Variation (%)	0.770000



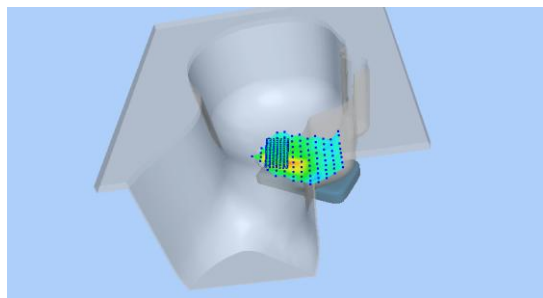
Maximum location: X=0.00, Y=-24.00

SAR Peak: 0.37 W/kg

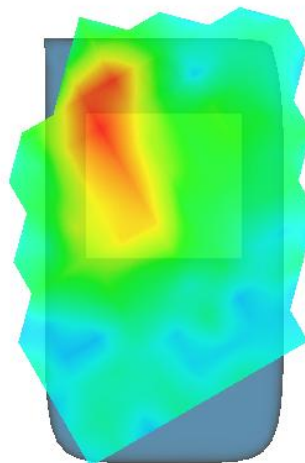
SAR 10g (W/Kg)	0.100826
SAR 1g (W/Kg)	0.199992



3D screen shot



Hot spot position



MEASUREMENT 16

Date of measurement: 15/12/2022

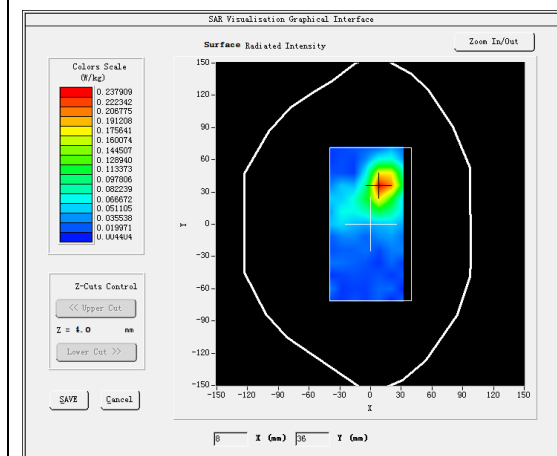
A. Experimental conditions.

<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>IEEE 802.11b ISM</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11b (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.98</u>

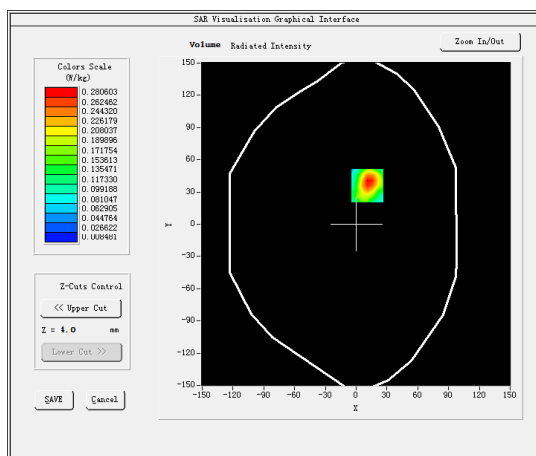
B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	38.174095
Relative permittivity (imaginary part)	13.469573
Conductivity (S/m)	1.823631
Variation (%)	2.720000

SURFACE SAR



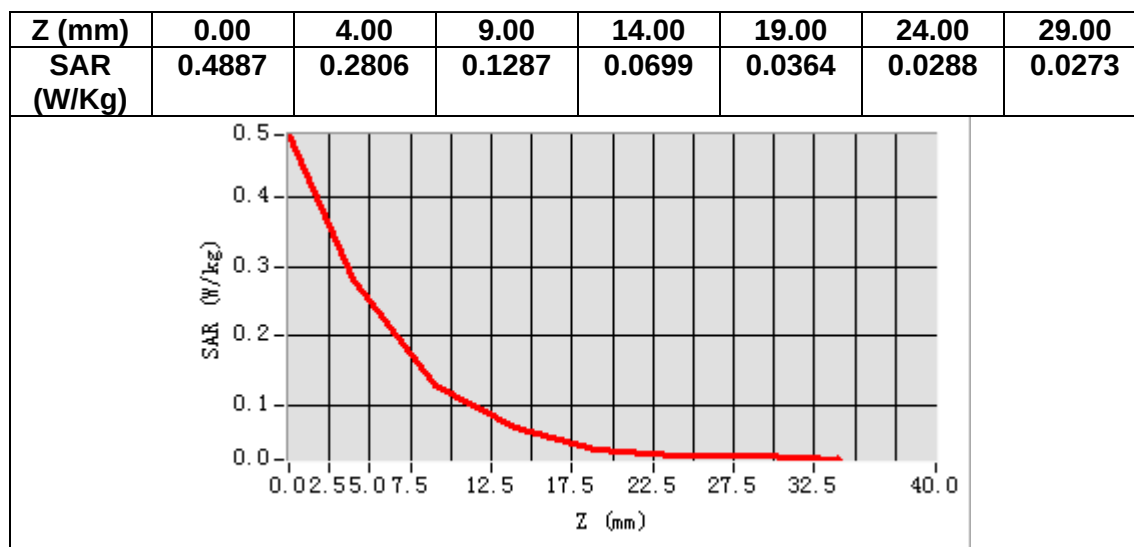
VOLUME SAR



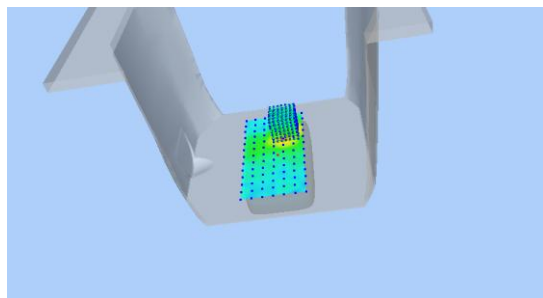
Maximum location: X=11.00, Y=36.00

SAR Peak: 0.51 W/kg

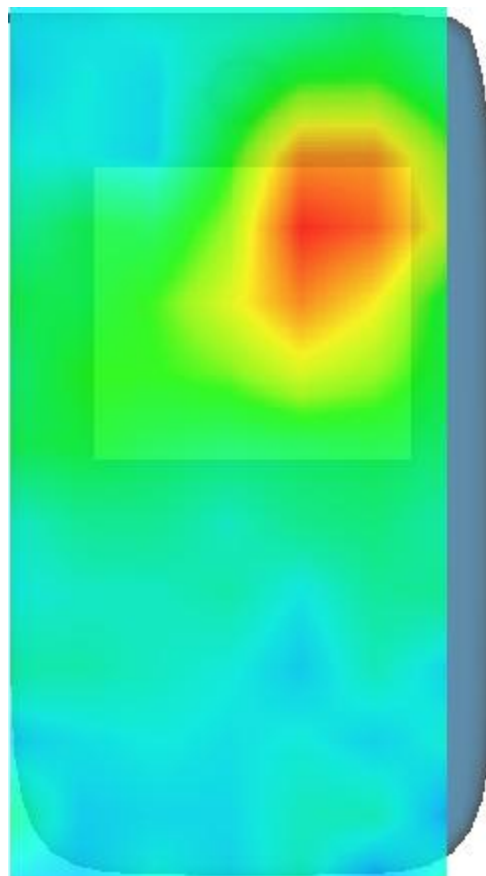
SAR 10g (W/Kg)	0.128377
SAR 1g (W/Kg)	0.269265



3D screen shot



Hot spot position



MEASUREMENT 17

Date of measurement: 9/12/2022

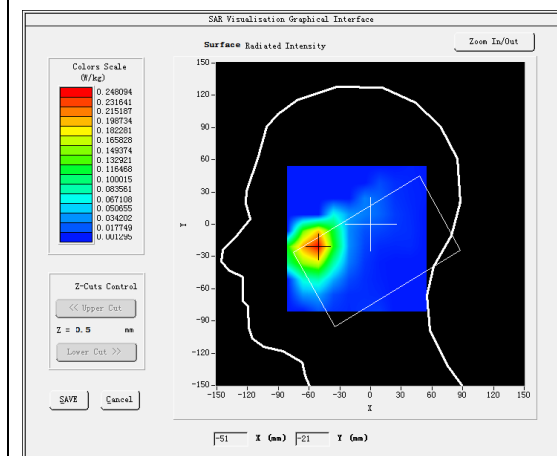
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 2</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>1.91</u>

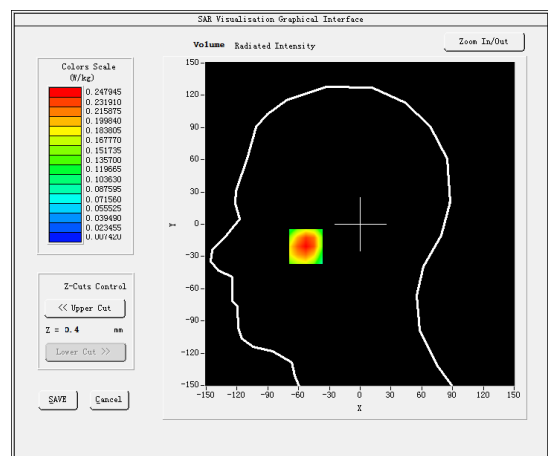
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.874592
Relative permittivity (imaginary part)	13.766348
Conductivity (S/m)	1.437436
Variation (%)	-1.020000

SURFACE SAR



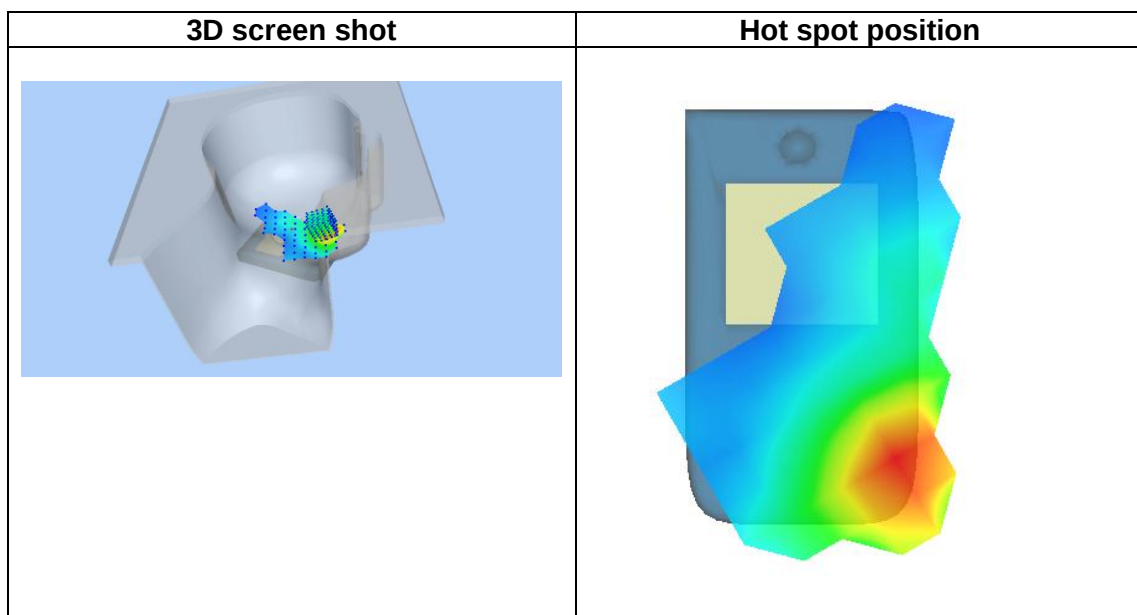
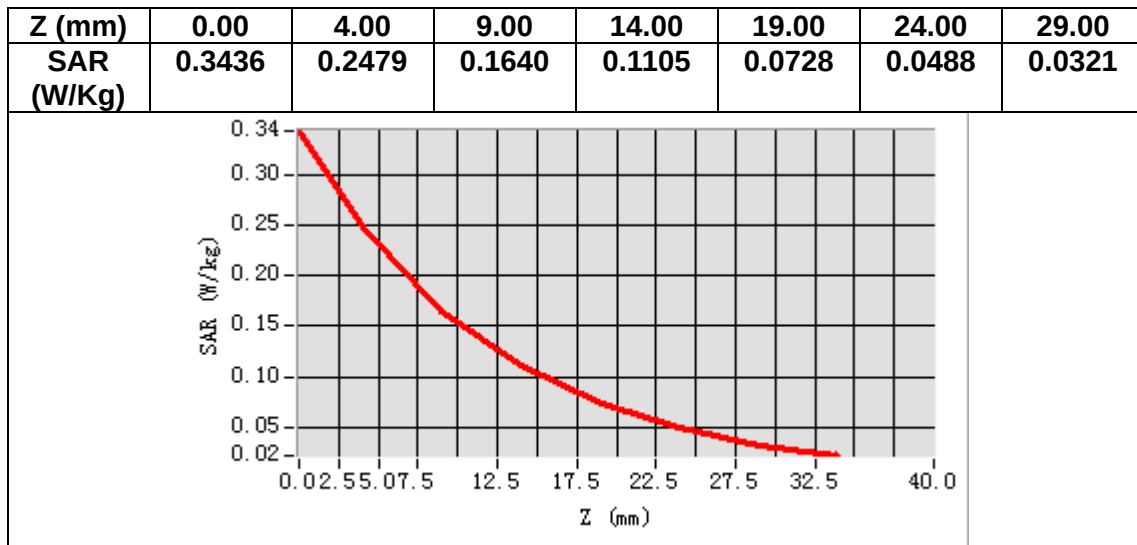
VOLUME SAR



Maximum location: X=-53.00, Y=-20.00

SAR Peak: 0.35 W/kg

SAR 10g (W/Kg)	0.145169
SAR 1g (W/Kg)	0.241910



MEASUREMENT 18

Date of measurement: 9/12/2022

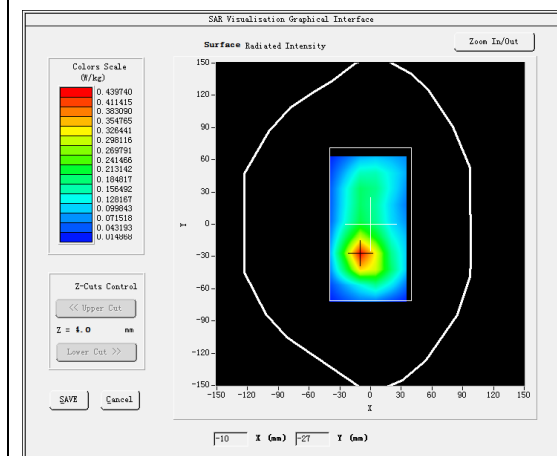
A. Experimental conditions.

<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>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.91</u>

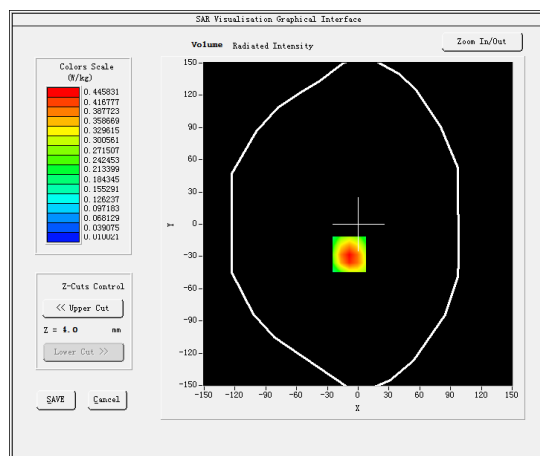
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	38.874592
Relative permittivity (imaginary part)	13.766348
Conductivity (S/m)	1.437436
Variation (%)	0.010000

SURFACE SAR



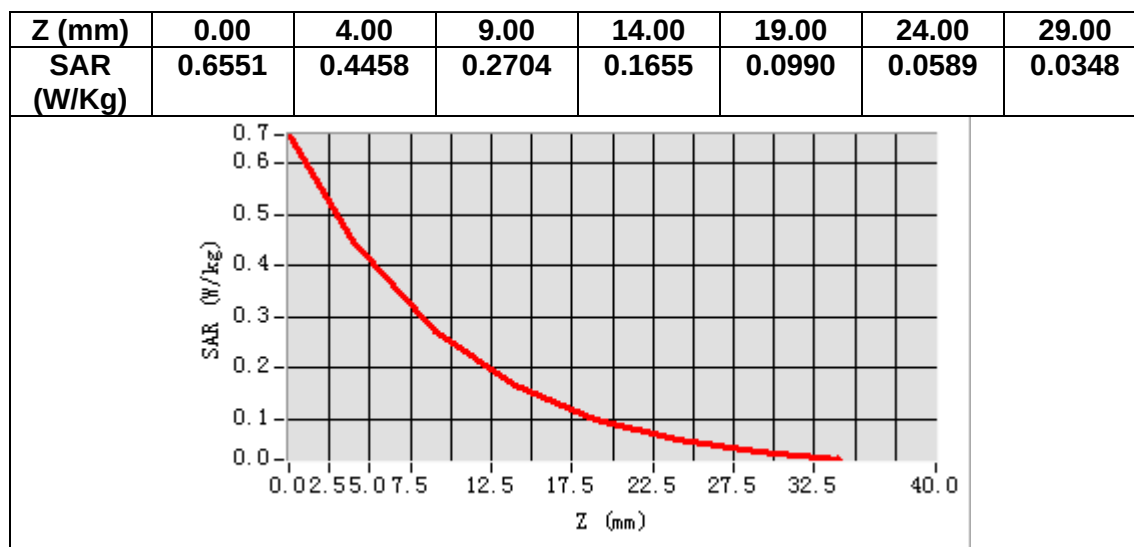
VOLUME SAR



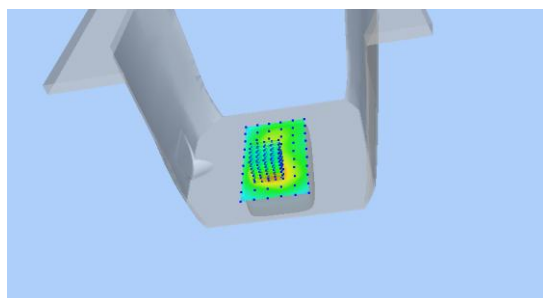
Maximum location: X=-9.00, Y=-28.00

SAR Peak: 0.68 W/kg

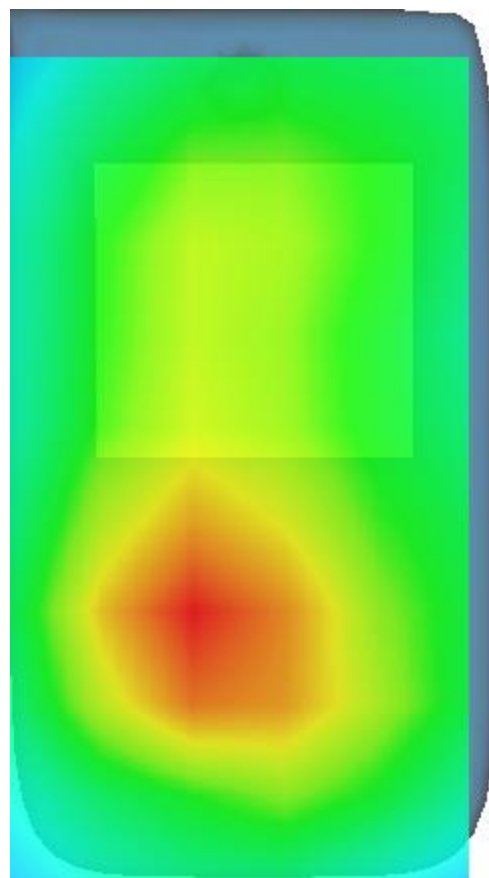
SAR 10g (W/Kg)	0.245560
SAR 1g (W/Kg)	0.439483



3D screen shot



Hot spot position



MEASUREMENT 19

Date of measurement: 16/12/2022

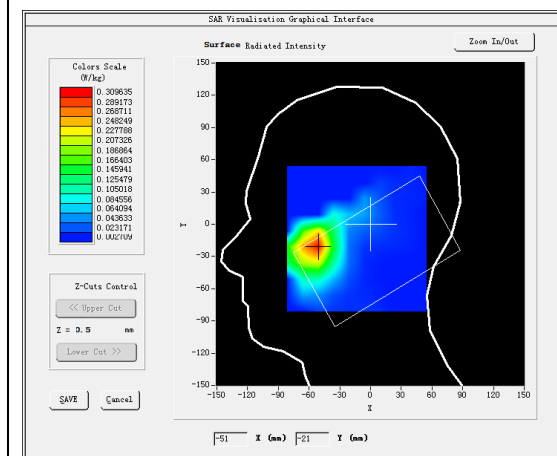
A. Experimental conditions.

<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>1.73</u>

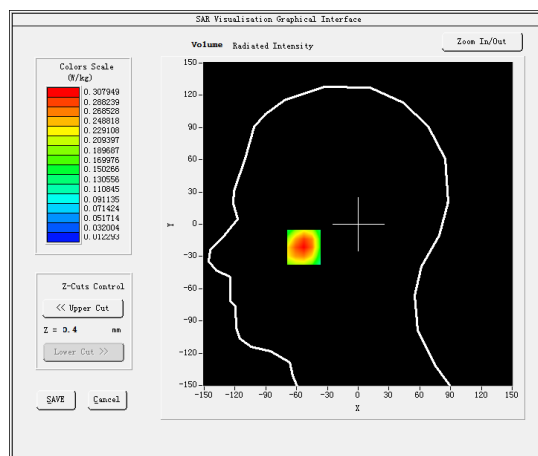
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.511227
Relative permittivity (imaginary part)	13.963222
Conductivity (S/m)	1.343960
Variation (%)	-0.430000

SURFACE SAR



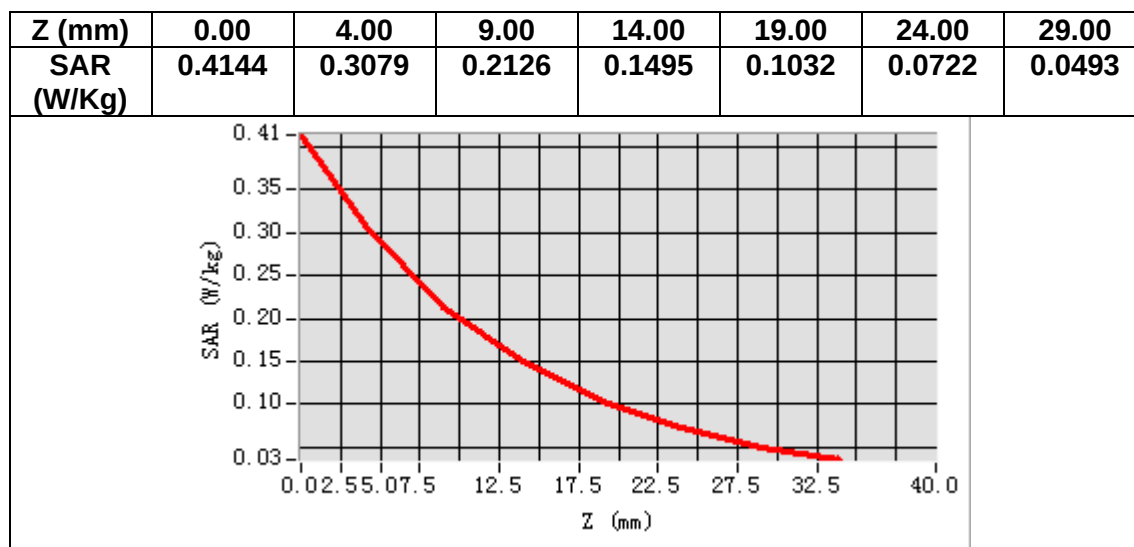
VOLUME SAR



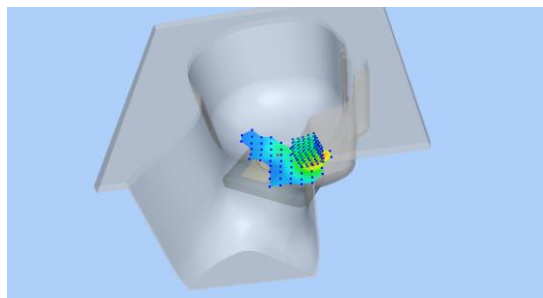
Maximum location: X=-53.00, Y=-21.00

SAR Peak: 0.42 W/kg

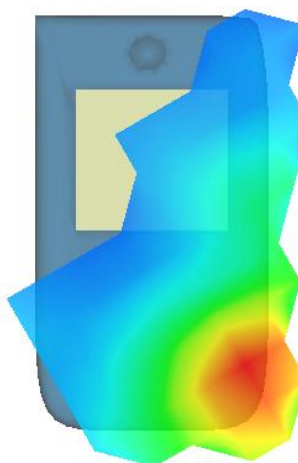
SAR 10g (W/Kg)	0.184768
SAR 1g (W/Kg)	0.293779



3D screen shot



Hot spot position



MEASUREMENT 20

Date of measurement: 16/12/2022

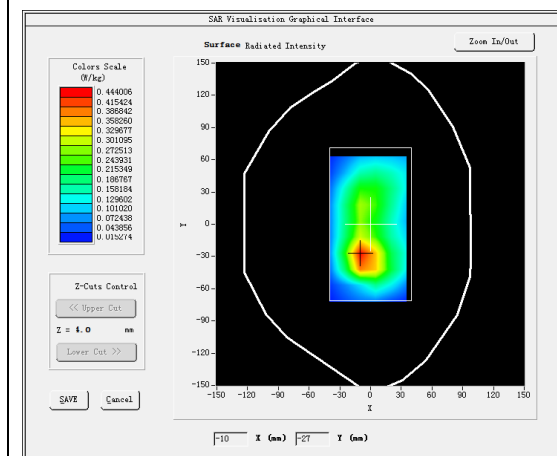
A. Experimental conditions.

<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>1.73</u>

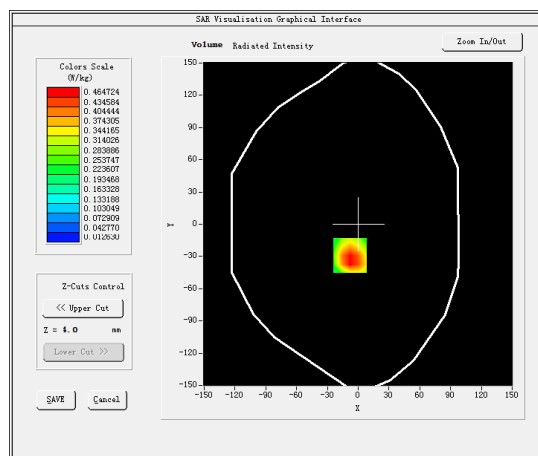
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.511227
Relative permittivity (imaginary part)	13.963222
Conductivity (S/m)	1.343960
Variation (%)	-0.350000

SURFACE SAR



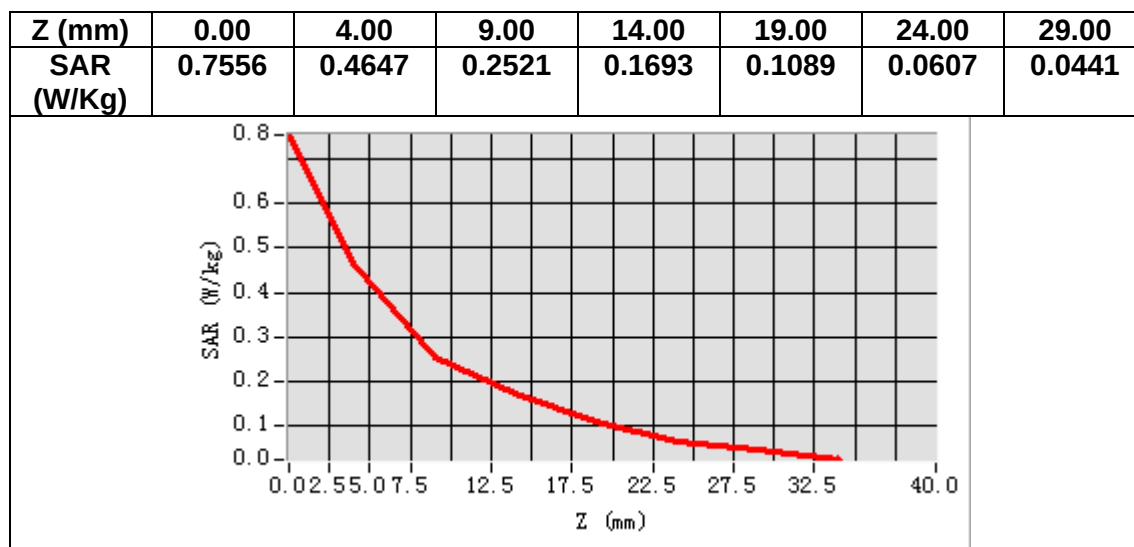
VOLUME SAR



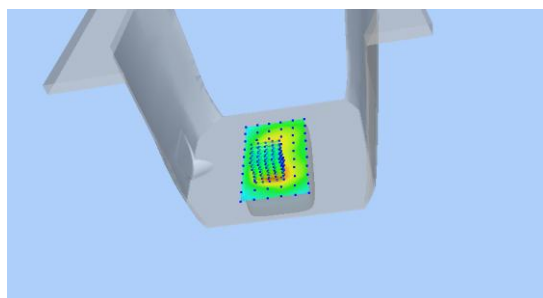
Maximum location: X=-8.00, Y=-29.00

SAR Peak: 0.71 W/kg

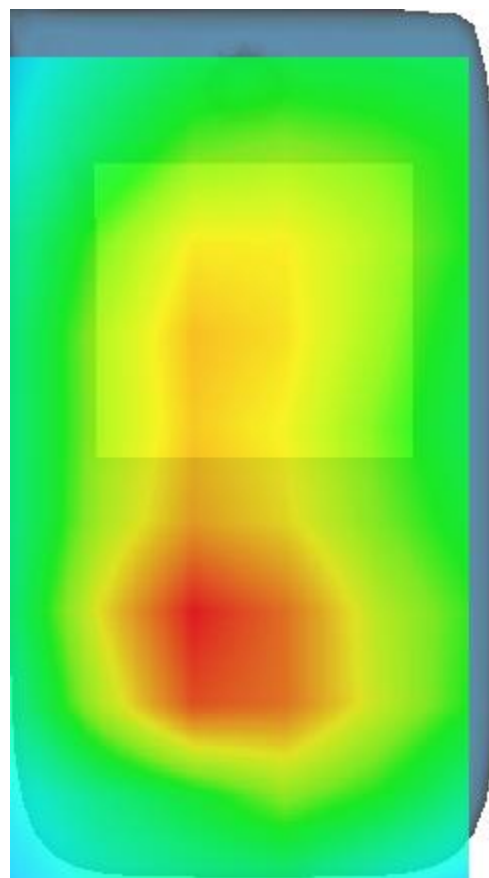
SAR 10g (W/Kg)	0.260516
SAR 1g (W/Kg)	0.456112



3D screen shot



Hot spot position



MEASUREMENT 21

Date of measurement: 12/12/2022

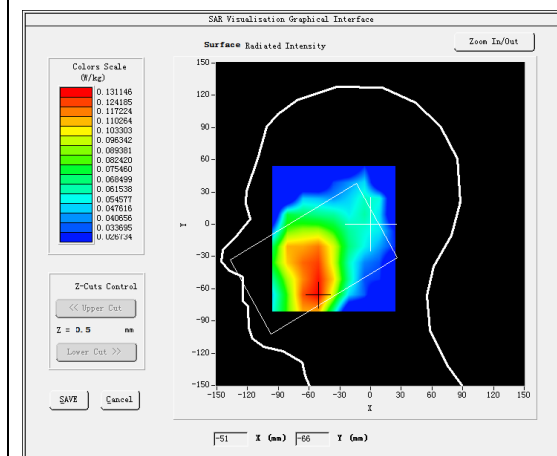
A. Experimental conditions.

<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>1.50</u>

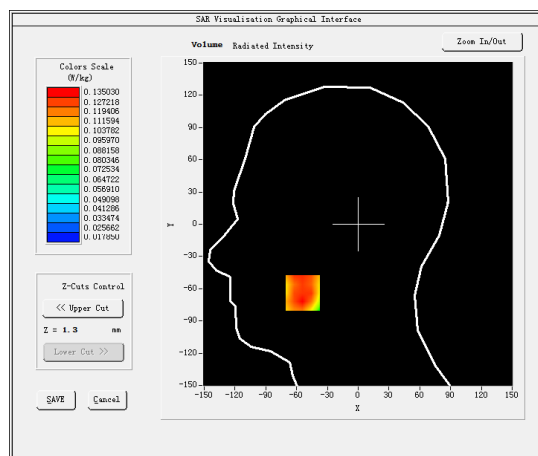
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.293327
Relative permittivity (imaginary part)	20.128082
Conductivity (S/m)	0.935397
Variation (%)	-2.450000

SURFACE SAR



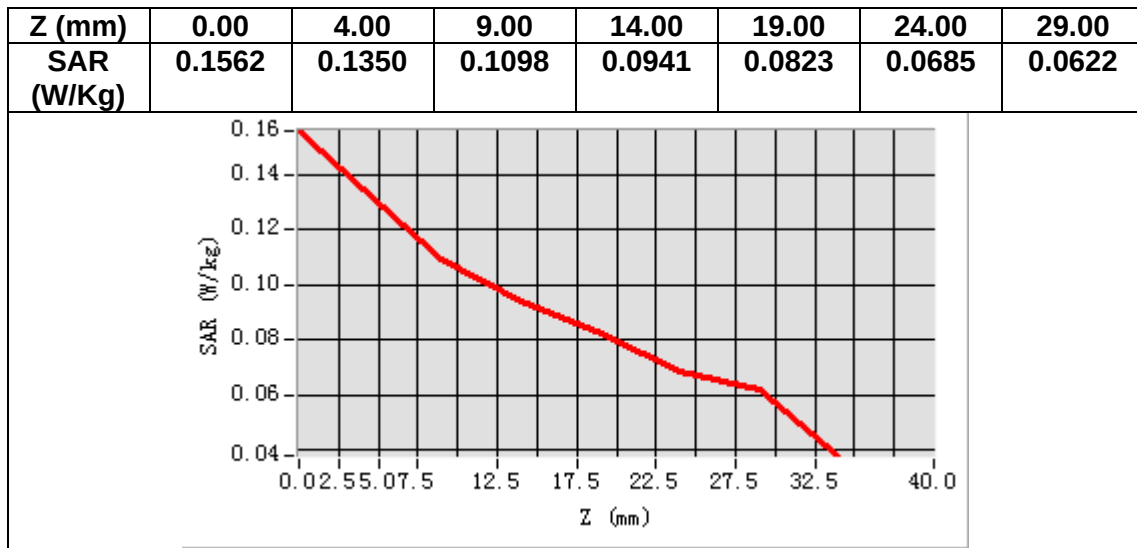
VOLUME SAR



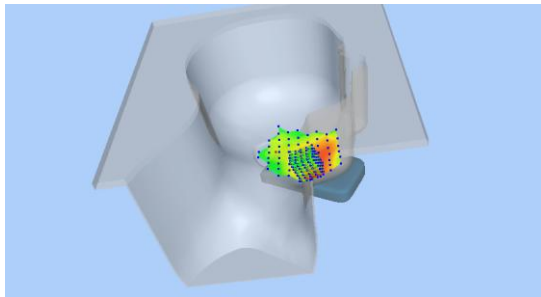
Maximum location: X=-54.00, Y=-64.00

SAR Peak: 0.17 W/kg

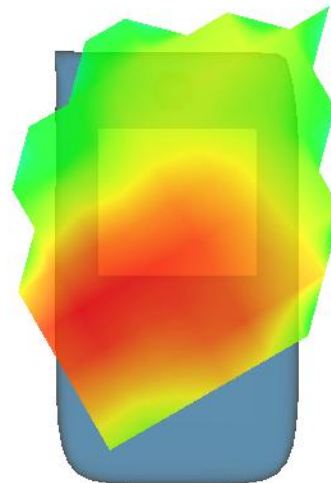
SAR 10g (W/Kg)	0.105800
SAR 1g (W/Kg)	0.135541



3D screen shot



Hot spot position



MEASUREMENT 22

Date of measurement: 12/12/2022

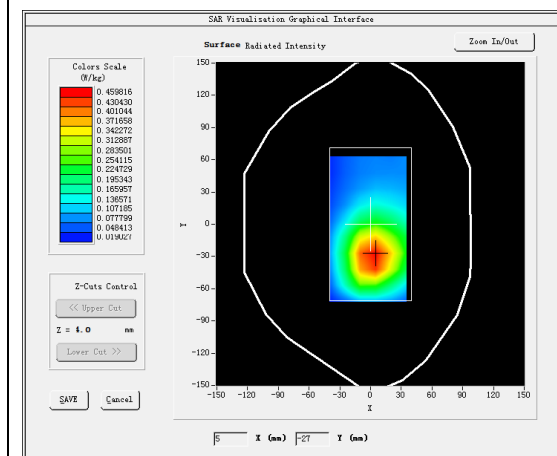
A. Experimental conditions.

<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>1.50</u>

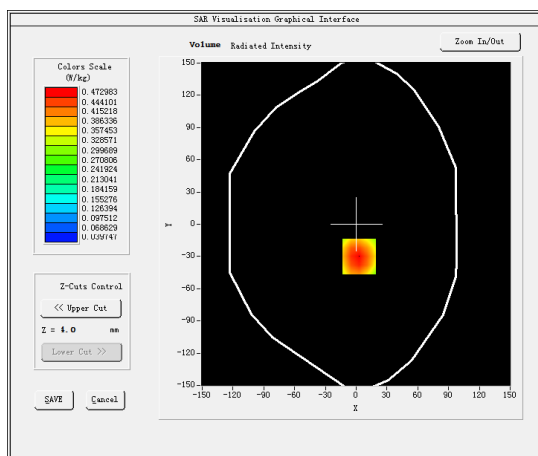
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.293327
Relative permittivity (imaginary part)	20.128082
Conductivity (S/m)	0.935397
Variation (%)	3.330000

SURFACE SAR



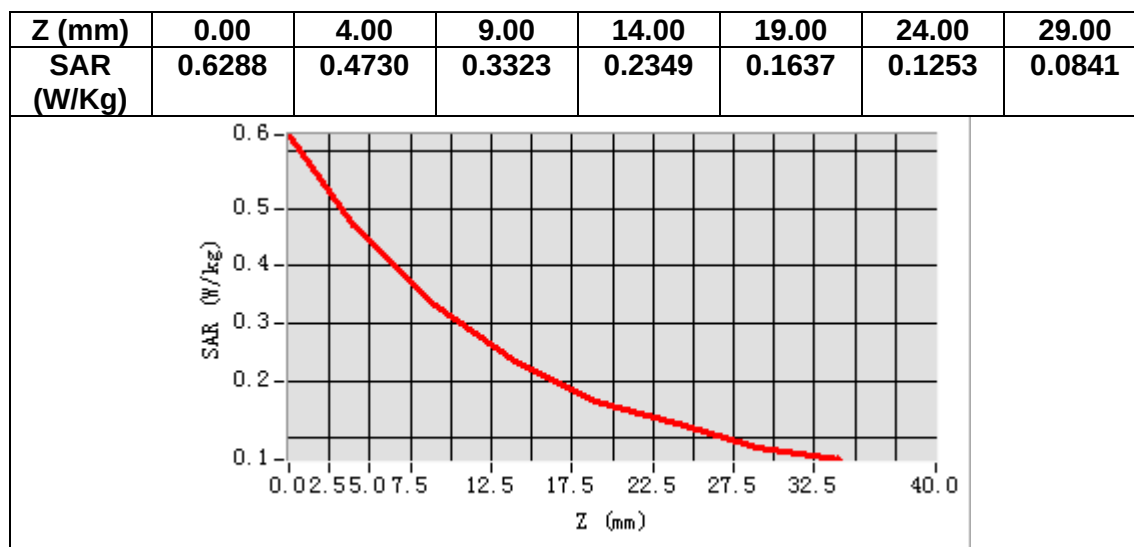
VOLUME SAR



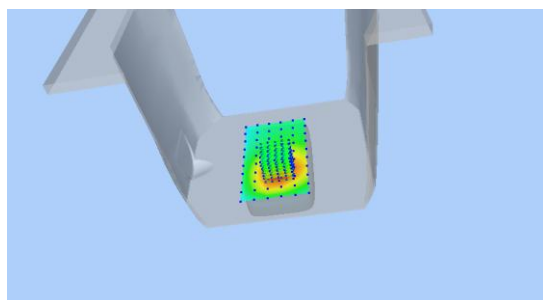
Maximum location: X=3.00, Y=-30.00

SAR Peak: 0.64 W/kg

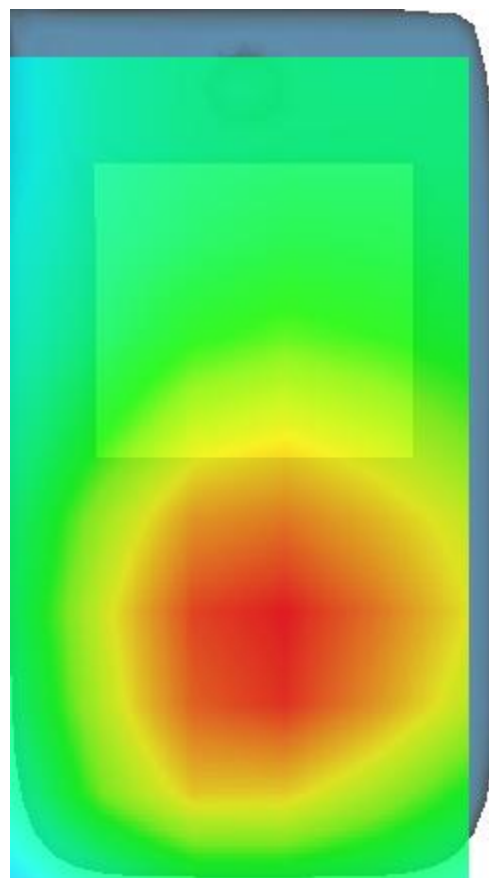
SAR 10g (W/Kg)	0.315435
SAR 1g (W/Kg)	0.469495



3D screen shot



Hot spot position



MEASUREMENT 23

Date of measurement: 8/12/2022

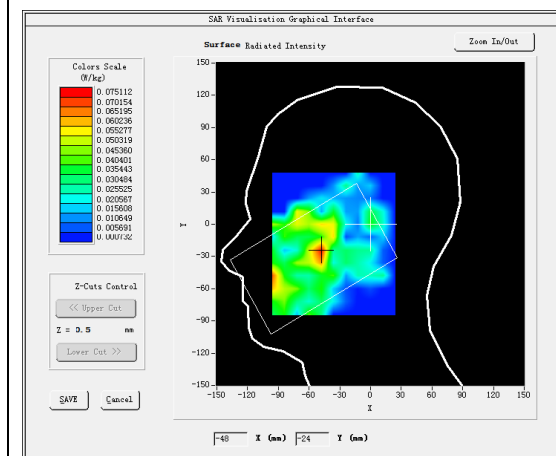
A. Experimental conditions.

<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>1.87</u>

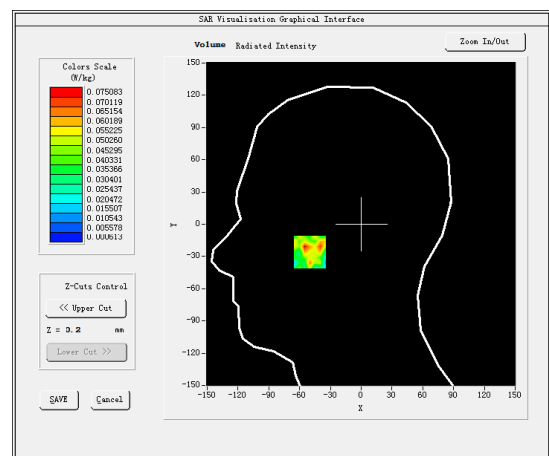
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.417107
Relative permittivity (imaginary part)	13.579822
Conductivity (S/m)	1.912492
Variation (%)	4.270000

SURFACE SAR



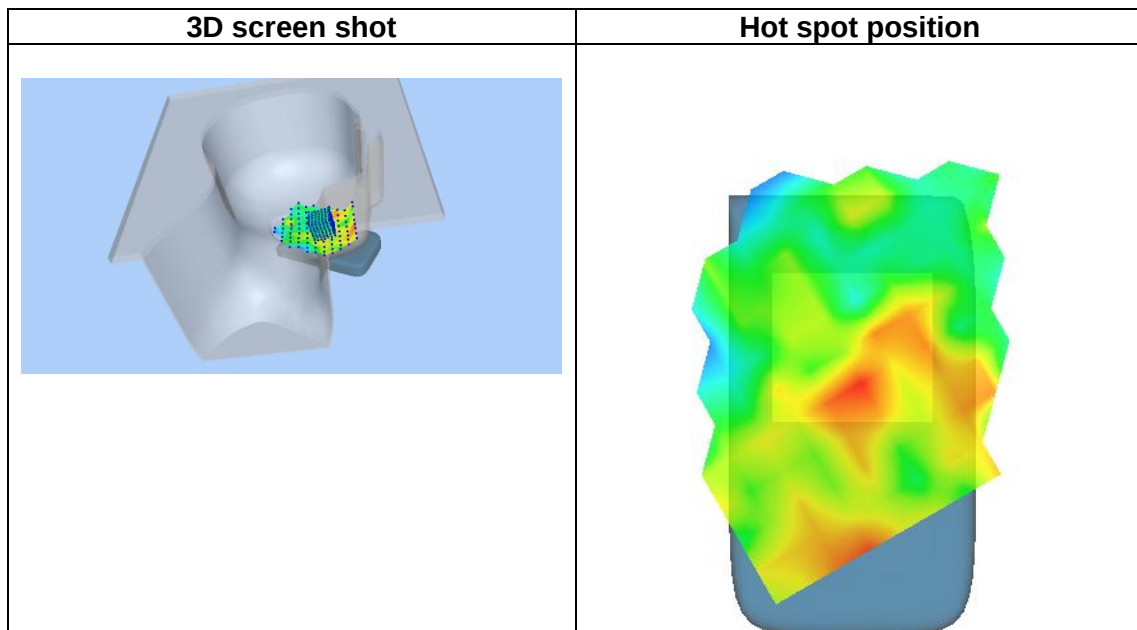
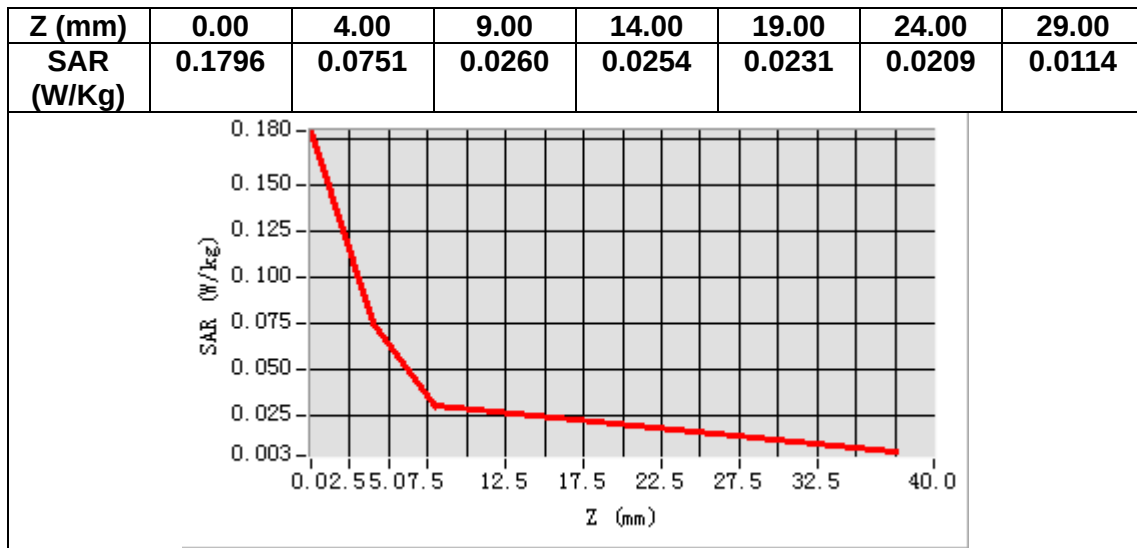
VOLUME SAR



Maximum location: X=-50.00, Y=-26.00

SAR Peak: 0.16 W/kg

SAR 10g (W/Kg)	0.035849
SAR 1g (W/Kg)	0.064815



MEASUREMENT 24

Date of measurement: 8/12/2022

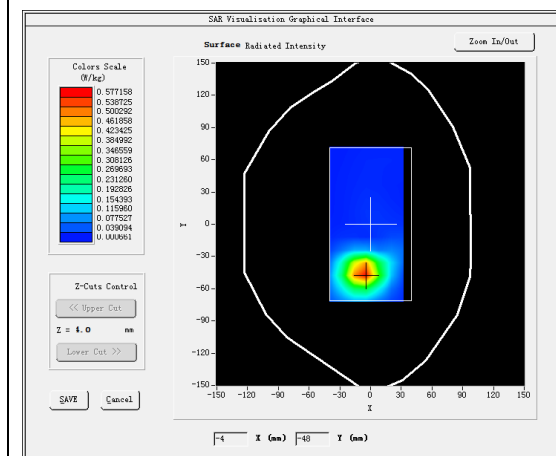
A. Experimental conditions.

<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>1.87</u>

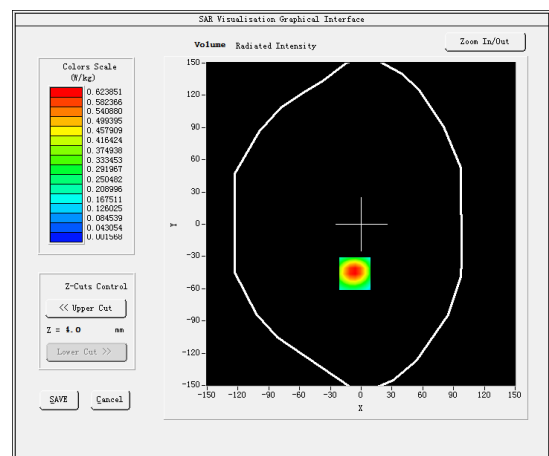
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.417107
Relative permittivity (imaginary part)	13.579822
Conductivity (S/m)	1.912492
Variation (%)	-3.510000

SURFACE SAR



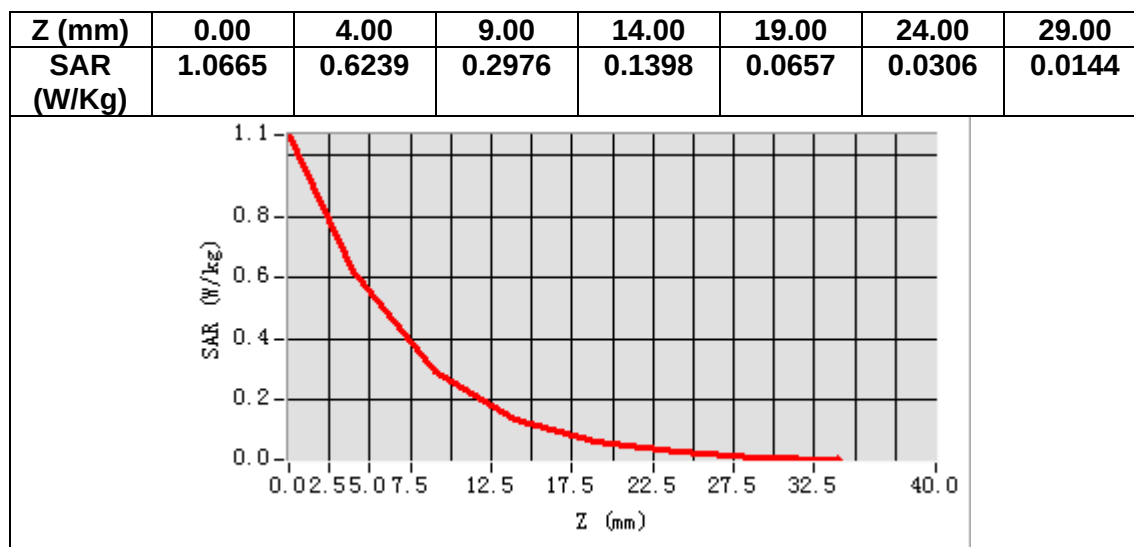
VOLUME SAR



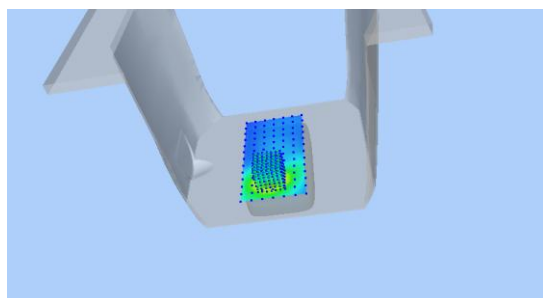
Maximum location: X=-6.00, Y=-46.00

SAR Peak: 1.08 W/kg

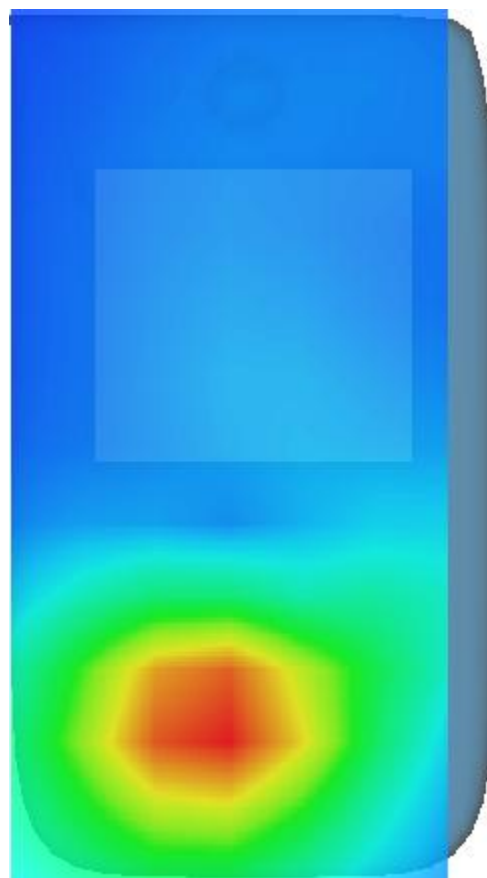
SAR 10g (W/Kg)	0.277561
SAR 1g (W/Kg)	0.598611



3D screen shot



Hot spot position



MEASUREMENT 25

Date of measurement: 13/12/2022

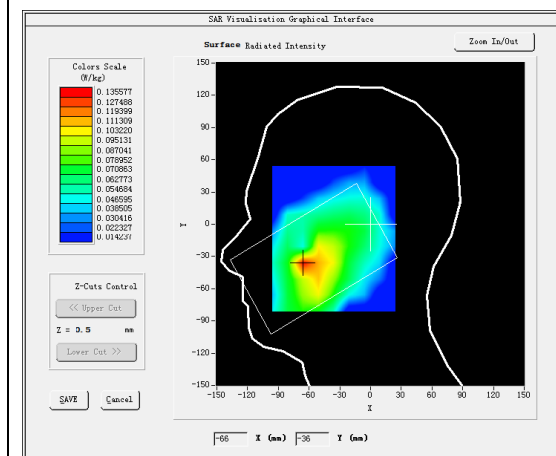
A. Experimental conditions.

<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 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

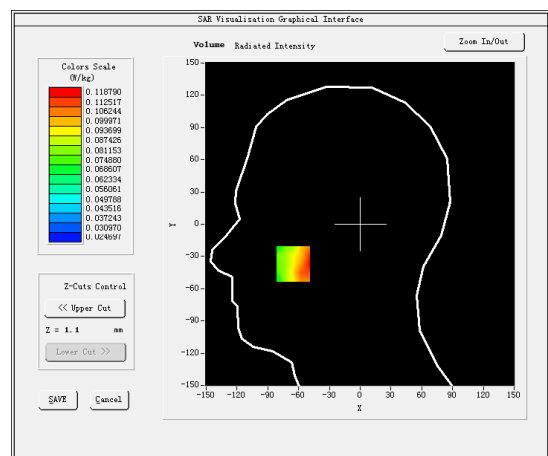
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	41.181168
Relative permittivity (imaginary part)	21.794666
Conductivity (S/m)	0.856651
Variation (%)	-2.630000

SURFACE SAR



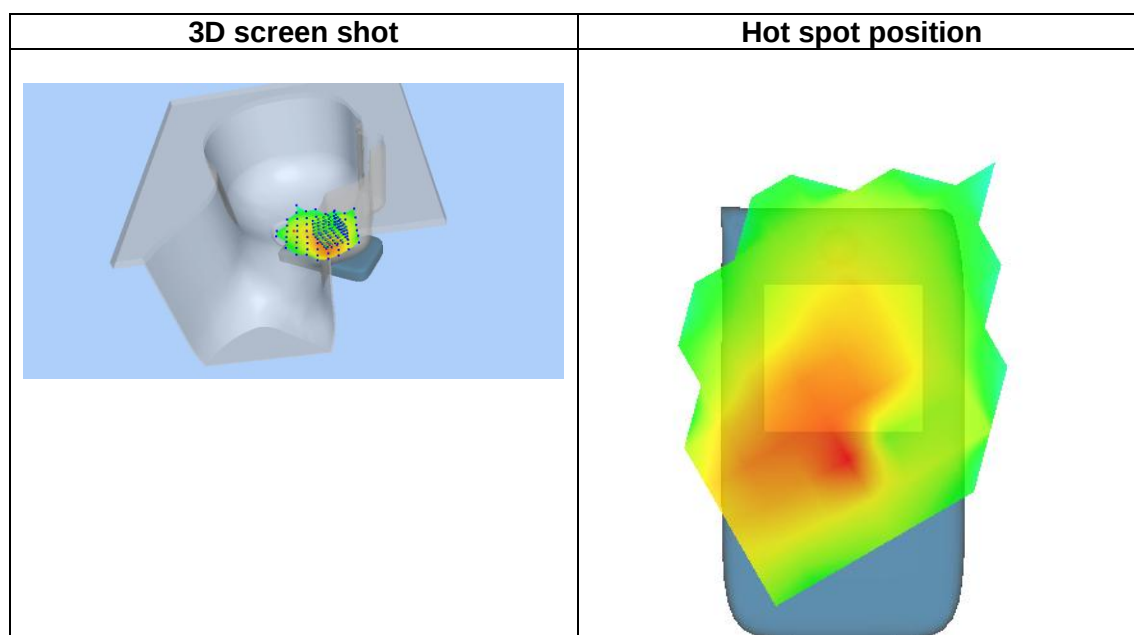
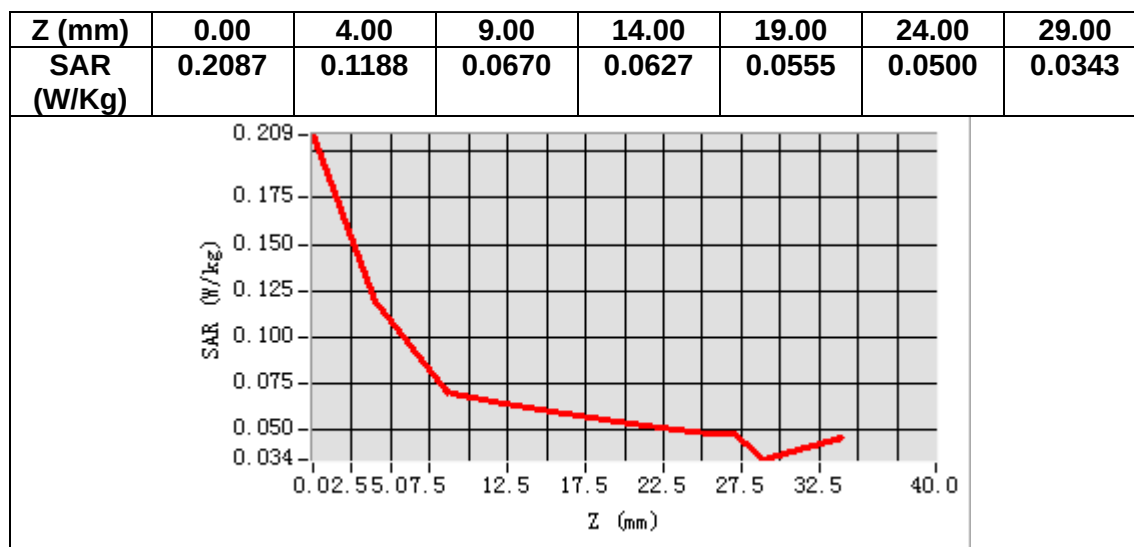
VOLUME SAR



Maximum location: X=-65.00, Y=-37.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.090052
SAR 1g (W/Kg)	0.112729



MEASUREMENT 26

Date of measurement: 13/12/2022

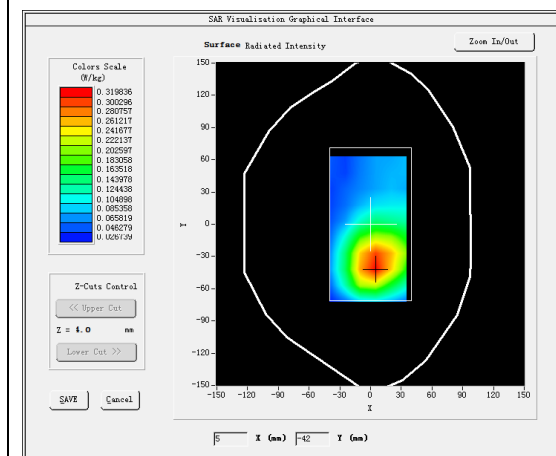
A. Experimental conditions.

<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 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

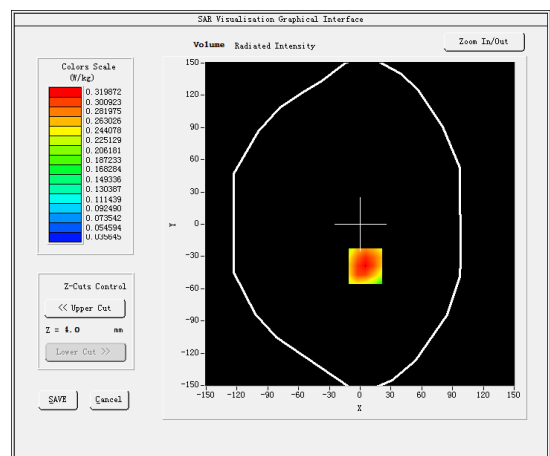
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	41.181168
Relative permittivity (imaginary part)	21.794666
Conductivity (S/m)	0.856651
Variation (%)	-0.740000

SURFACE SAR



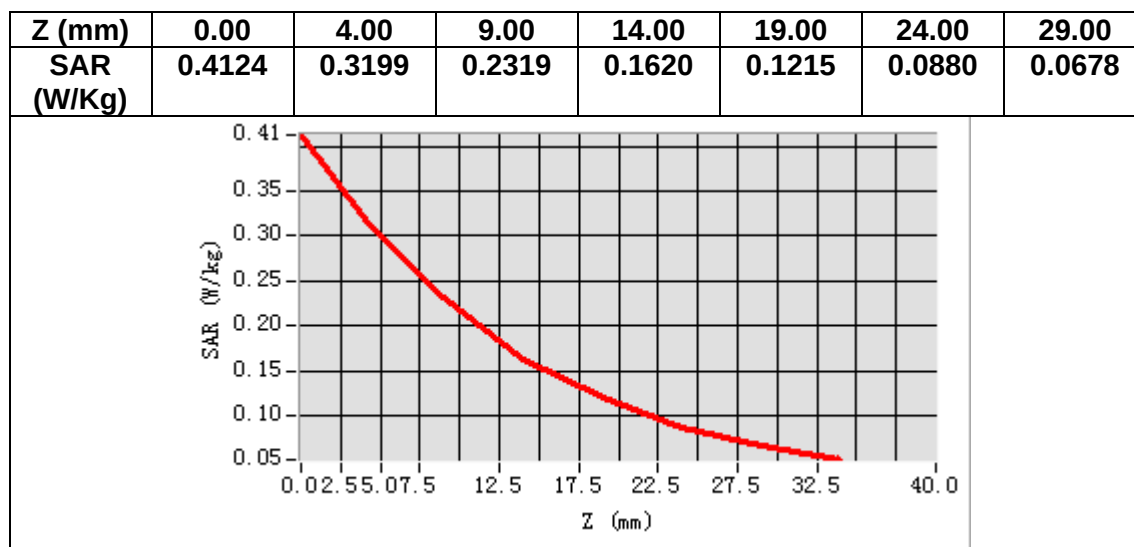
VOLUME SAR



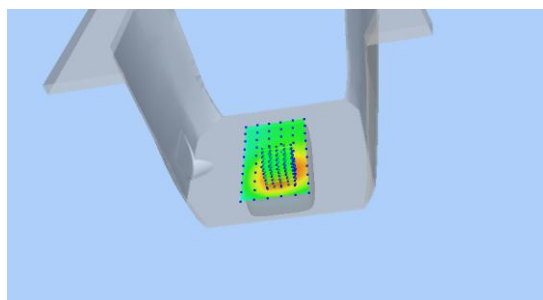
Maximum location: X=5.00, Y=-39.00

SAR Peak: 0.43 W/kg

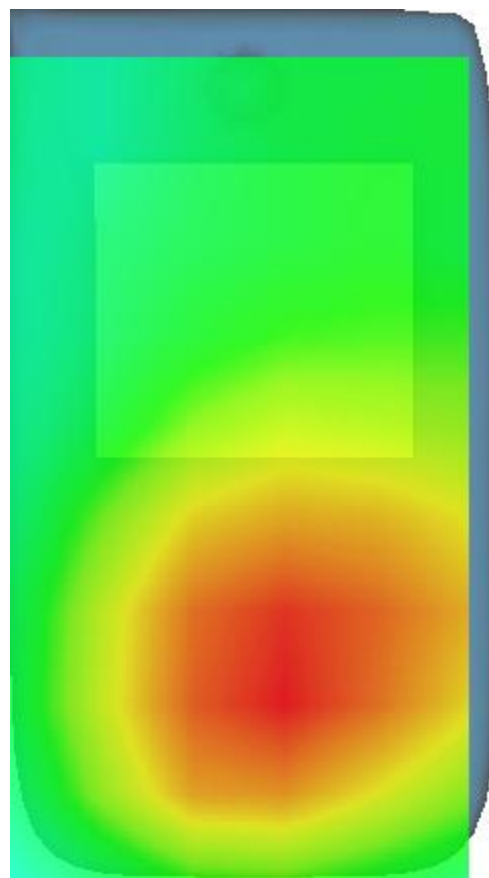
SAR 10g (W/Kg)	0.212158
SAR 1g (W/Kg)	0.308772



3D screen shot



Hot spot position



MEASUREMENT 27

Date of measurement: 13/12/2022

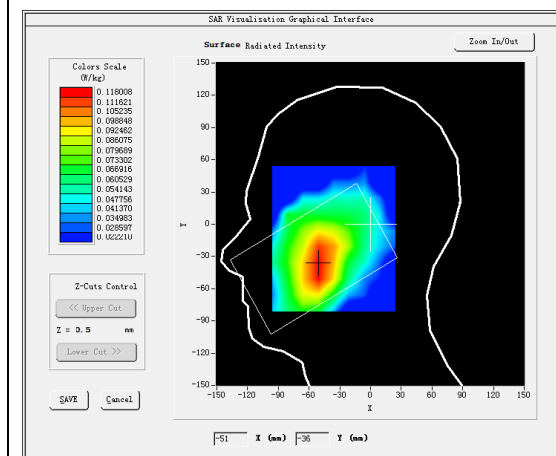
A. Experimental conditions.

<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 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

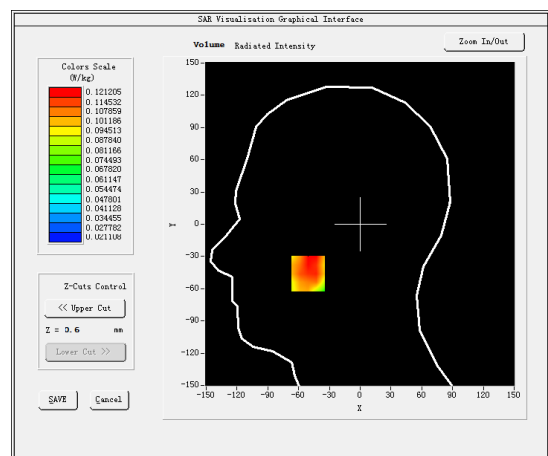
B. SAR Measurement Results

Frequency (MHz)	710.000000
Relative permittivity (real part)	41.165817
Relative permittivity (imaginary part)	21.735117
Conductivity (S/m)	0.857330
Variation (%)	-1.880000

SURFACE SAR



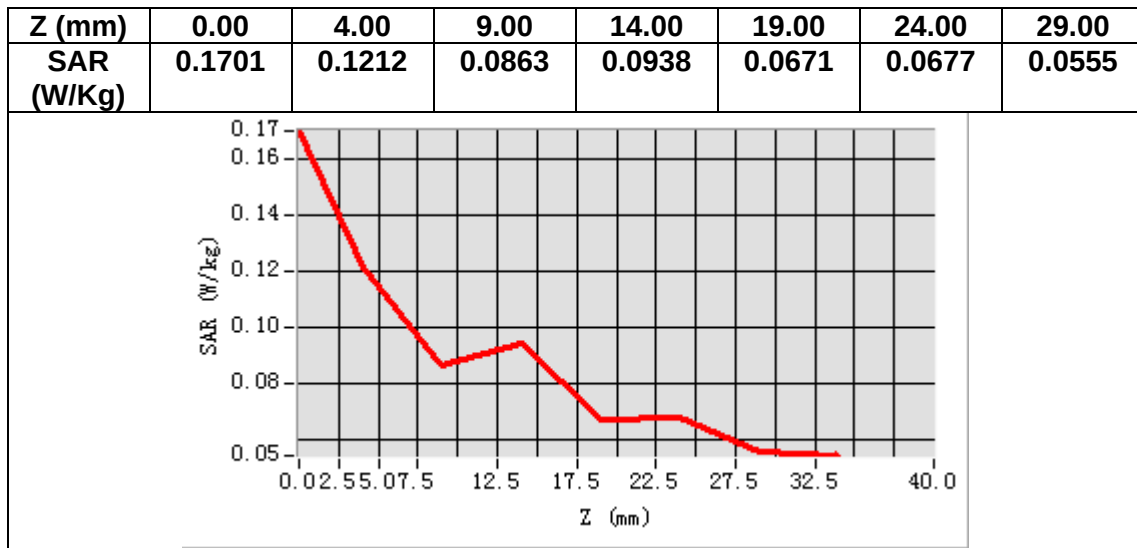
VOLUME SAR



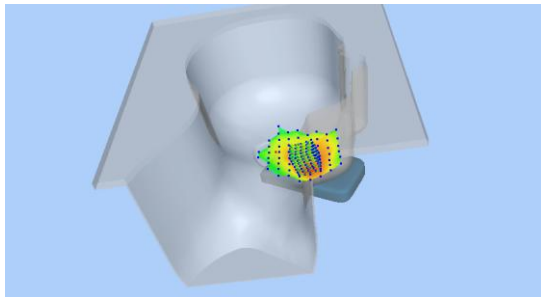
Maximum location: X=-51.00, Y=-46.00

SAR Peak: 0.15 W/kg

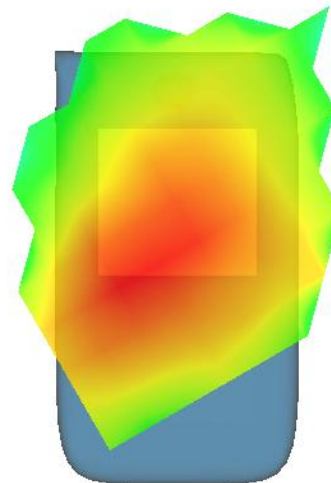
SAR 10g (W/Kg)	0.097883
SAR 1g (W/Kg)	0.121474



3D screen shot



Hot spot position



MEASUREMENT 28

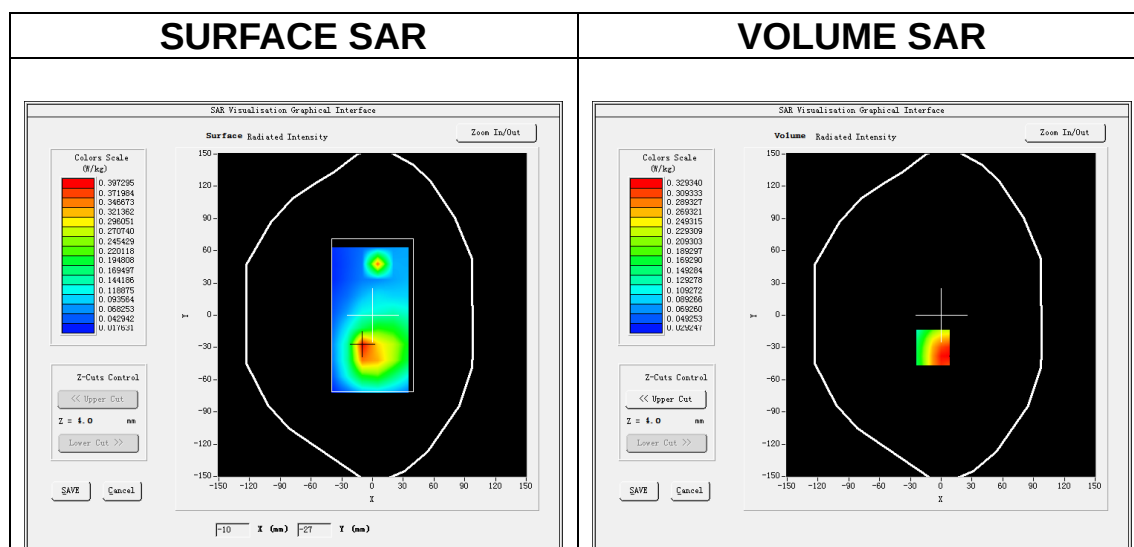
Date of measurement: 13/12/2022

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 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

B. SAR Measurement Results

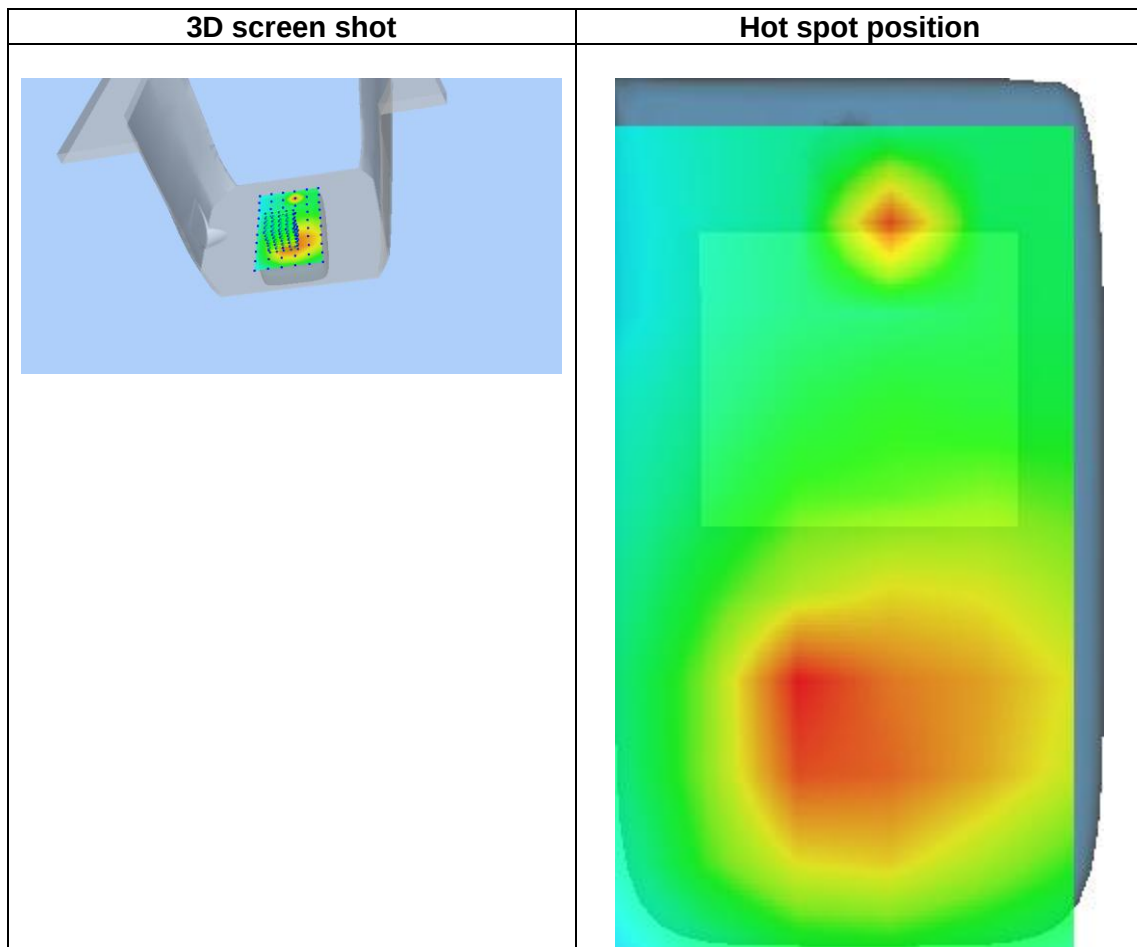
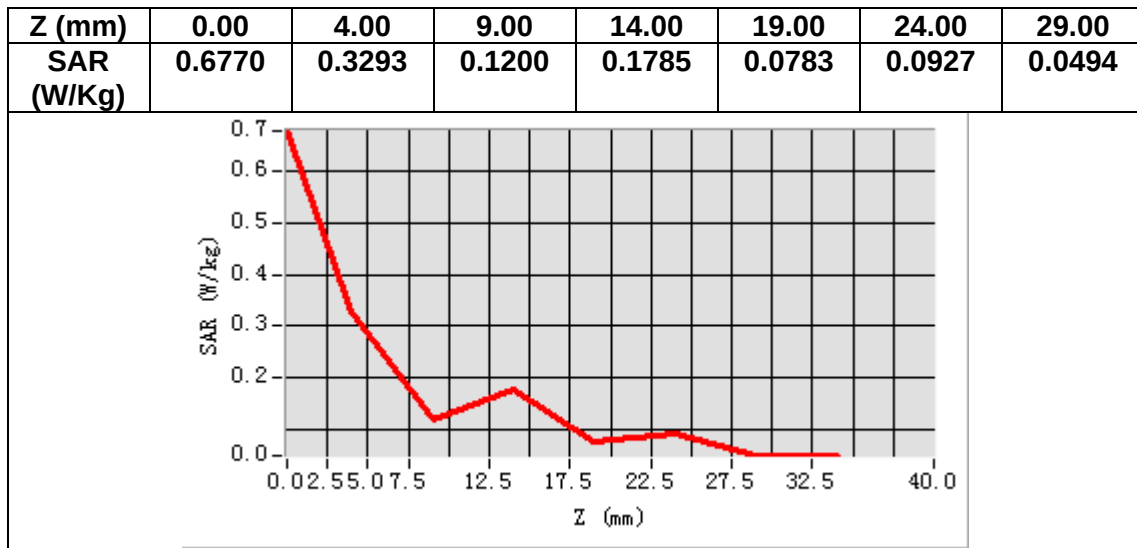
Frequency (MHz)	710.000000
Relative permittivity (real part)	41.165817
Relative permittivity (imaginary part)	21.735117
Conductivity (S/m)	0.857330
Variation (%)	2.970000



Maximum location: X=-8.00, Y=-30.00

SAR Peak: 0.44 W/kg

SAR 10g (W/Kg)	0.214334
SAR 1g (W/Kg)	0.317710



MEASUREMENT 29

Date of measurement: 8/12/2022

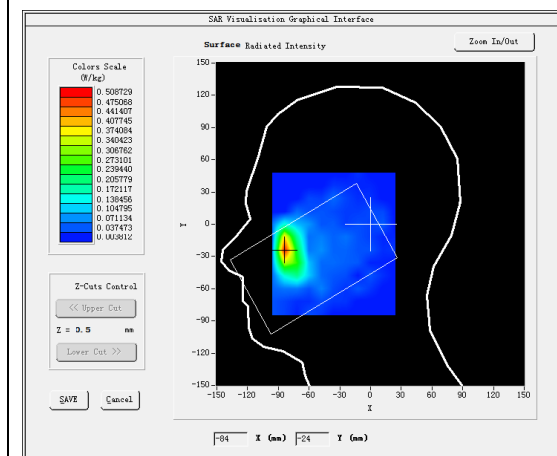
A. Experimental conditions.

<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 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>1.87</u>

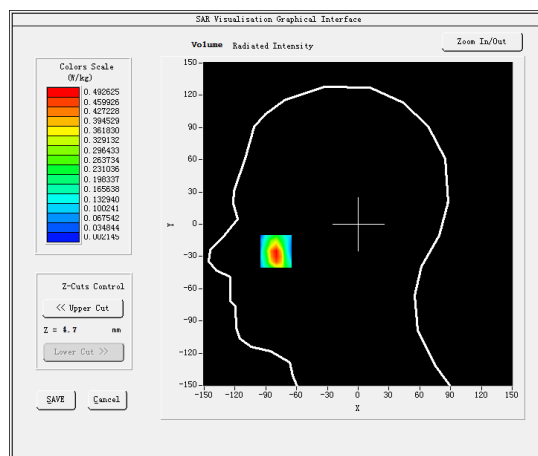
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	38.049205
Relative permittivity (imaginary part)	13.793622
Conductivity (S/m)	1.988581
Variation (%)	-2.930000

SURFACE SAR



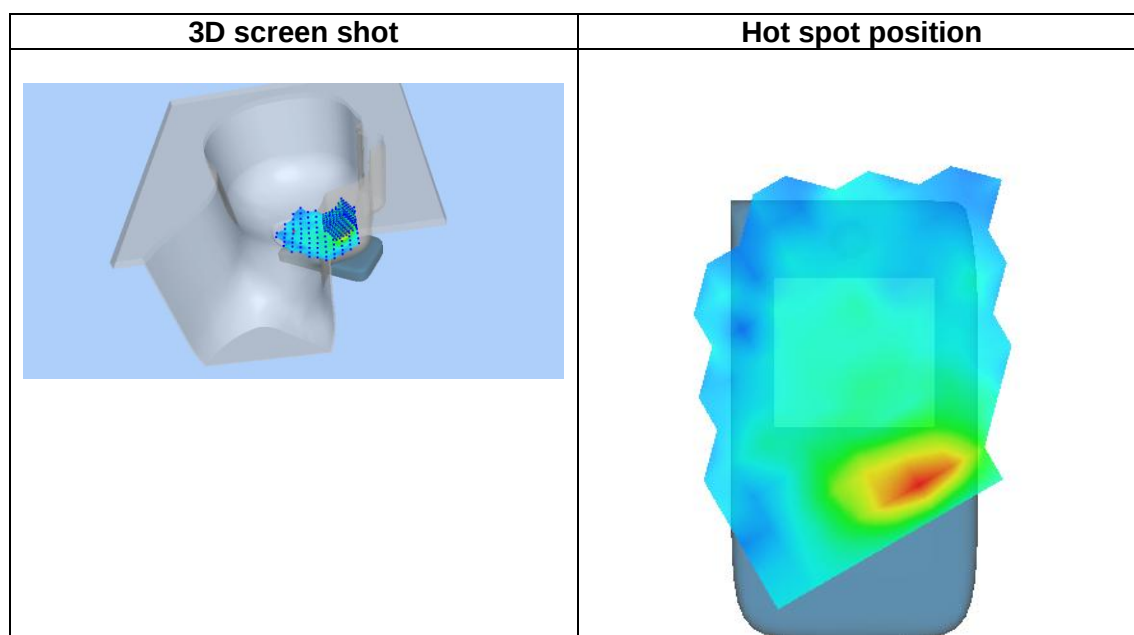
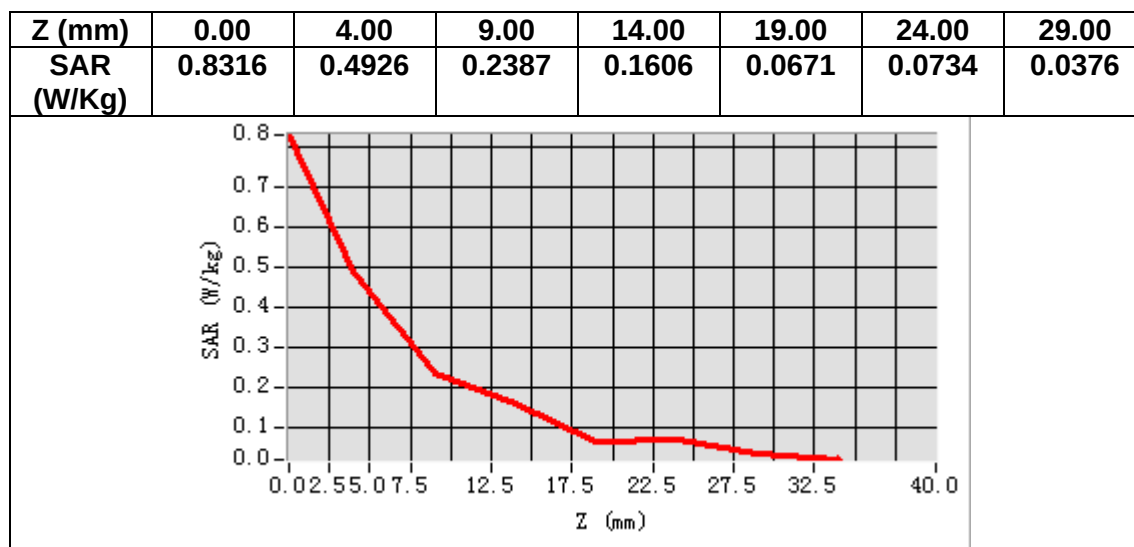
VOLUME SAR



Maximum location: X=-80.00, Y=-24.00

SAR Peak: 0.82 W/kg

SAR 10g (W/Kg)	0.212339
SAR 1g (W/Kg)	0.452093



MEASUREMENT 30

Date of measurement: 8/12/2022

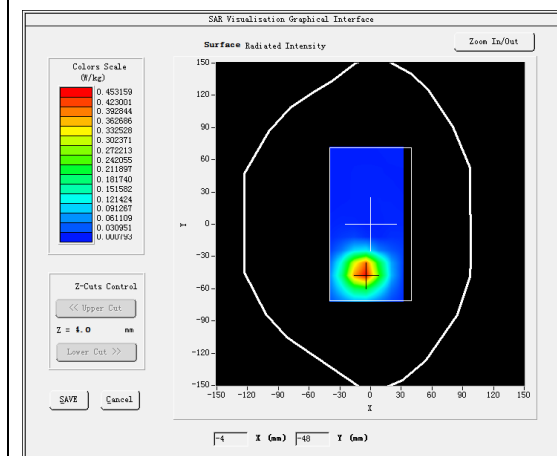
A. Experimental conditions.

<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 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>1.87</u>

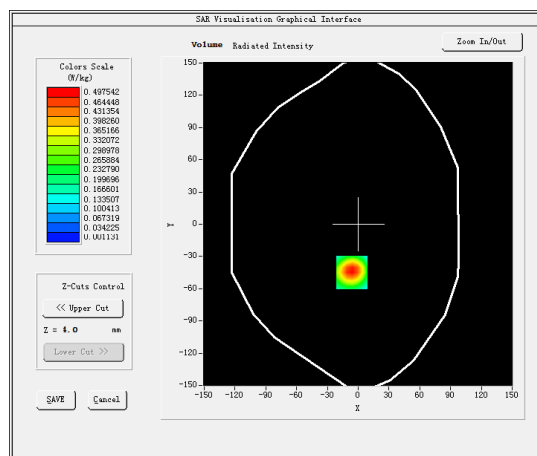
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	38.049205
Relative permittivity (imaginary part)	13.793622
Conductivity (S/m)	1.988581
Variation (%)	-0.280000

SURFACE SAR



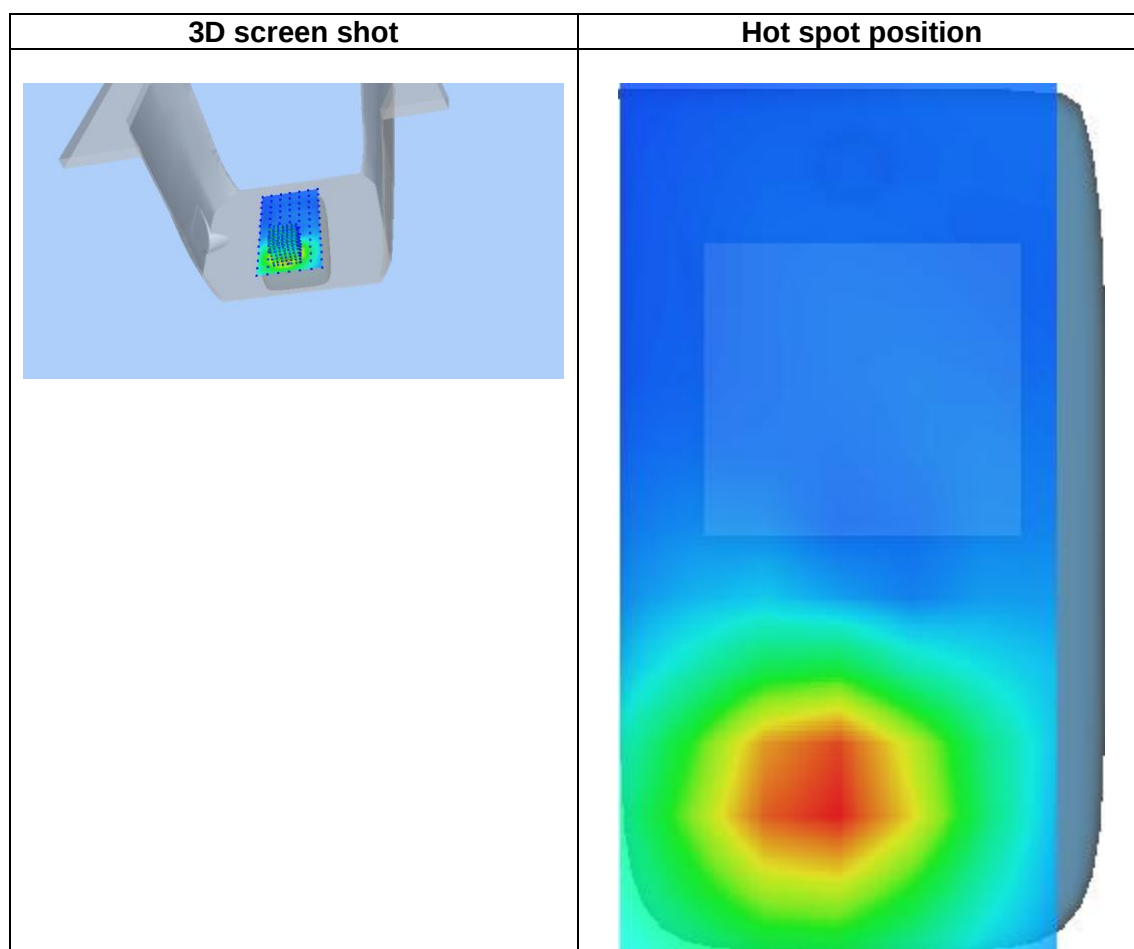
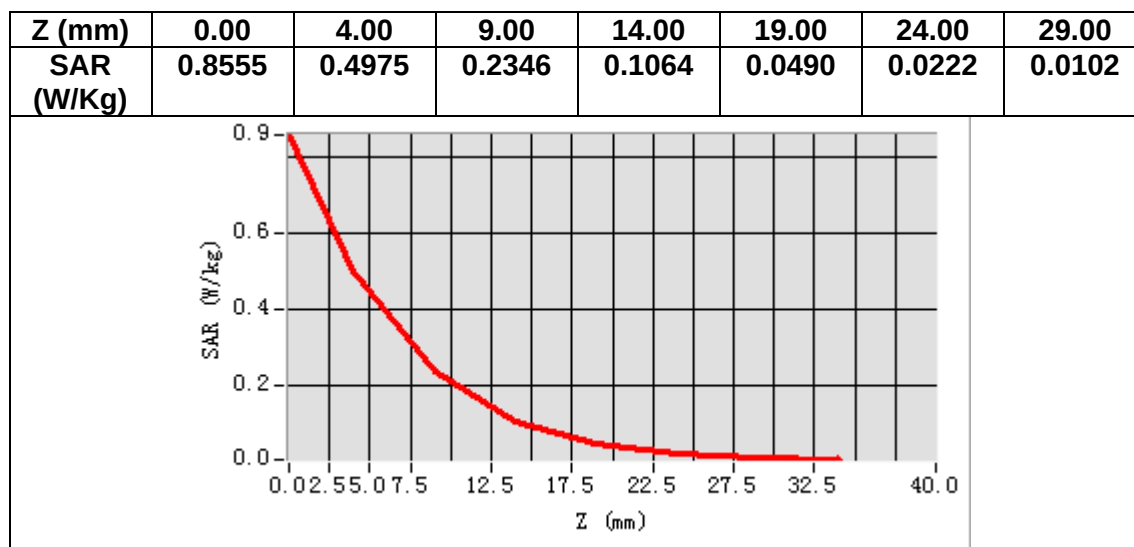
VOLUME SAR



Maximum location: X=-6.00, Y=-45.00

SAR Peak: 0.86 W/kg

SAR 10g (W/Kg)	0.219025
SAR 1g (W/Kg)	0.472833



14. Appendix D. Calibration Certificate

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



COMOSAR E-Field Probe Calibration Report

Ref : ACR.60.1.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 08/16 EPG0287

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/01/2022



Accreditations #2-6789 and #2-6814
Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited COMOSAR 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.60.1.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	2/1/2022	<i>JS</i>
Checked by :	Jérôme Luc	Technical Manager	2/1/2022	<i>JS</i>
Approved by :	Yann Toutain	Laboratory Director	2/1/2022	<i>Yann Toutain</i>

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 PHILIPS

	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Jérôme Luc	2/1/2022	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 08/16 EPGO287
Product Condition (new / used)	Used
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: $R1=0.211\text{ M}\Omega$ Dipole 2: $R2=0.199\text{ M}\Omega$ Dipole 3: $R3=0.199\text{ M}\Omega$

2 PRODUCT DESCRIPTION**2.1 GENERAL INFORMATION**

MVG's COMOSAR E field Probes are built in accordance to the IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 standards.



Figure 1 – MVG COMOSAR Dosimetric E field Dipole

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

3 MEASUREMENT METHOD

The IEEE 1528, FCC KDB865664 D01, CENELEC EN62209 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

3.2 SENSITIVITY

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

3.3 LOWER DETECTION LIMIT

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

3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 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°).

3.1 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:

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

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.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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

4 MEASUREMENT UNCERTAINTY

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

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Expanded uncertainty 95 % confidence level k = 2					14 %

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normy dipole 2 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normz dipole 3 ($\mu\text{V}/(\text{V}/\text{m})^2$)
0.72	0.66	0.77

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
107	110	110

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

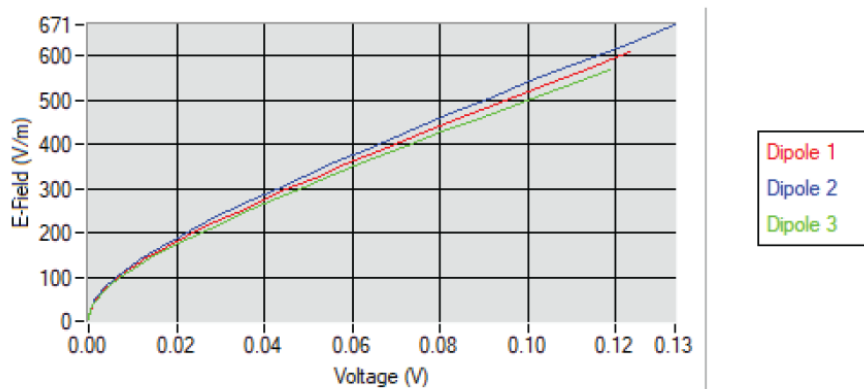
$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

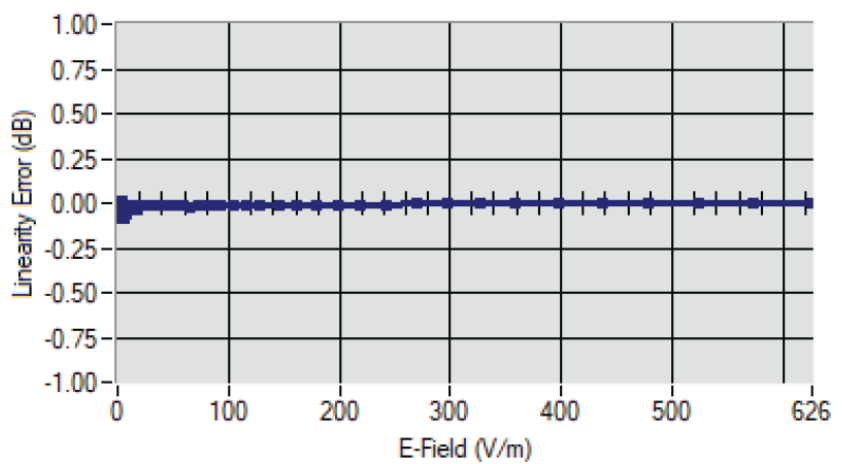
Ref: ACR.60.1.21.MVGB.A

Calibration curves



5.2 LINEARITY

Linearity



Linearity: $\pm 1.90\%$ ($\pm 0.08\text{dB}$)