

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 : Smartphone

Brand Name : Blackview

Model Name : BV9300 Pro

Family Model : BV9300

Report No. : S23111003002001

FCC ID : 2A7DX-BV9300PRO

Prepared for

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TEST RESULT CERTIFICATION

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Product description

Product name Smartphone
Brand Name Blackview
Model and/or type BV9300 Pro
reference
Family Model BV9300
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 S231110030002

Date of Test

Date (s) of performance of tests... Nov. 17, 2023 ~ Dec. 05, 2023

Date of Issue Dec. 22, 2023

Test Result..... **Pass**

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※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Dec. 22, 2023	Jack Li

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1. General Information

1.1. RF exposure limits

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

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

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

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

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

Occupational/Controlled Environments:

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

General Population/Uncontrolled Environments:

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

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

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for BV9300 Pro are as follows.

RF Exposure Conditions		Max Reported SAR Value(W/kg)
1-g Head		0.288
1-g Body-Worn (Separation distance of 10mm)		0.719
1-g Hotspot (Separation distance of 10mm)		0.719
Max Simultaneous Tx	Head	0.571
	Body-Worn	0.995
	Hotspot	0.995

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	Smartphone
Brand Name	Blackview
Model Name	BV9300 Pro
Family Model	BV9300
Model Difference	The BV9300 Pro has an additional secondary screen, and the main camera has been upgraded from 50M to 64M compared to the BV9300.
FCC ID	2A7DX-BV9300PRO
Device Phase	Identical Prototype
Exposure Category	General population / Uncontrolled environment
Antenna Type	PIFA Antenna
Battery Information	DC 3.85V, 15080mAh
HW Version	TE177_MB_V1.2
SW Version	BV9300 Pro_NEU_TE177_V1.0
Device Operating Configurations	
Supporting Mode(s)	GSM850/1900,WCDMABand2/4/5,LTEBand2/4/5/7/12/13/17/41, WLAN 2.4G/5G, Bluetooth, NFC
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK),

	NFC(ASK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 4	1710-1755	2110-2155
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 13	777-787	746-756
	LTE Band 17	704-716	734-746
	LTE Band 41	2535-2655	
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	NFC	13.56	
	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”(WCDMA Band 2)		
	3, tested with power control —all 1”(WCDMA Band 4)		
	3, tested with power control —all”(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 13)		
	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)

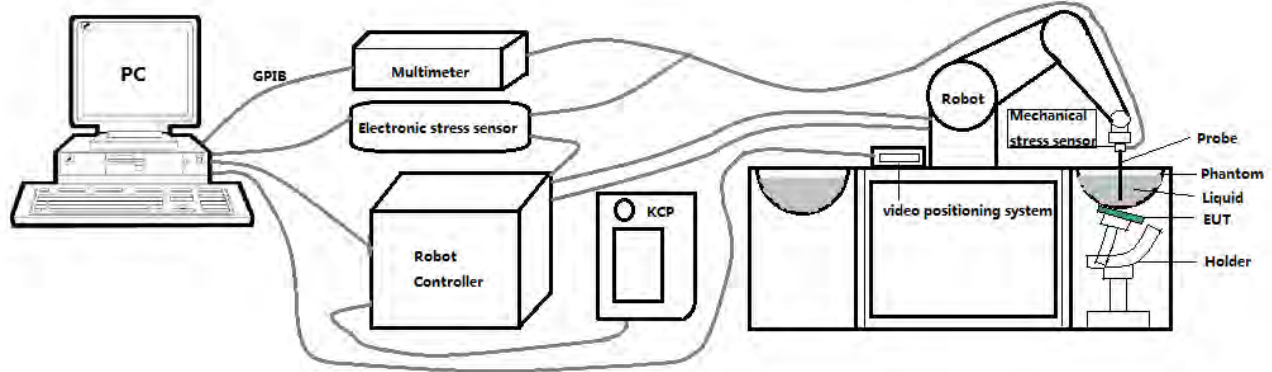
FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 941225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

1.5. Ambient Condition

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

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



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

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

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

2.2. Robot

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



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

2.3. E-Field Probe

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

For the measurements the Specific Dosimetric E-Field Probe 3423-EPGO-426 with following specifications is used



- Dynamic range: 0.01-100 W/kg
 - Tip Diameter : 2.5 mm
 - Distance between probe tip and sensor center: 1 mm
 - Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
 - Probe linearity: ± 0.06 dB
 - Axial isotropy: ± 0.01 dB
 - Hemispherical Isotropy: ± 0.01 dB
 - Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
 - Lower detection limit: 8mW/kg
- Angle between probe axis (evaluation axis) and surface normal line: less than 30° .

2.3.1. E-Field Probe Calibration

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

2.4. SAM phantoms

Photo of SAM phantom SN 16/15 SAM119

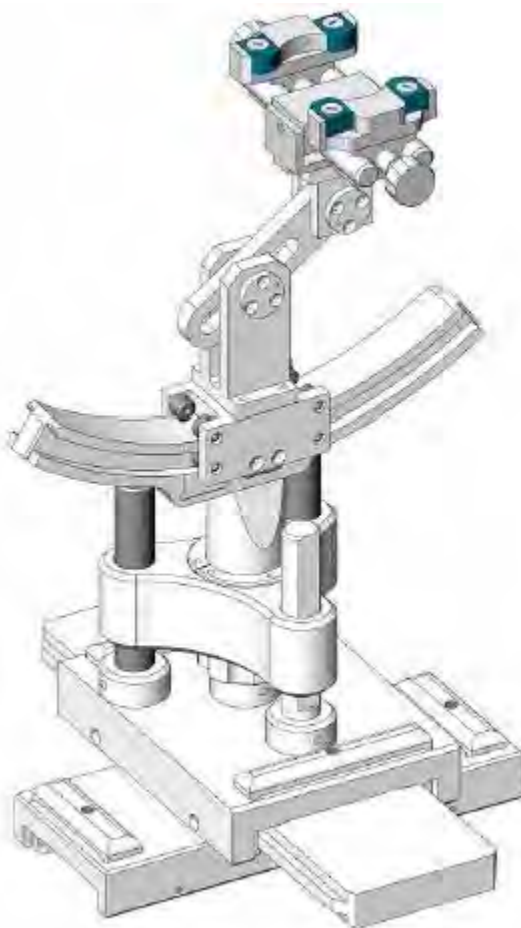


The SAM phantom is used to measure the SAR relative to people exposed to electro-magnetic field radiated by Smart Phones.

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

2.5. Device Holder

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



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

2.6. Test Equipment List

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

Devices used during the test described are marked ☒

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
☒	MVG	E FIELD PROBE	SSE2	3423-EPGO-426	Sep. 18, 2023	Sep. 17, 2024
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	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	3500 MHz Dipole	SID3500	SN 09/12 DIP 3G500-360	Oct. 15, 2022	Oct. 14, 2025
☒	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	May 29, 2023	May 28, 2024
☒	R&S	Wideband radio communication	CMW500	103917	May 29, 2023	May 28, 2024

		tester				
☒	HP	Network Analyzer	8753D	3410J01136	May 29, 2023	May 28, 2024
☒	Agilent	MXG Vector Signal Generator	N5182A	MY47070317	May 29, 2023	May 28, 2024
☒	Agilent	Power meter	E4419B	MY45102538	May 29, 2023	May 28, 2024
☒	Agilent	Power sensor	E9301A	MY41495644	May 29, 2023	May 28, 2024
☒	Agilent	Power sensor	E9301A	US39212148	May 29, 2023	May 28, 2024
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Jul. 04, 2023	Jul. 03, 2024
☒	N/A	Thermometer	N/A	LES-085	Mar. 27, 2023	Mar. 26, 2026
☒	MVG	SAM Phantom	SSM2	SN 16/15 SAM119	NCR	NCR
☒	MVG	Device Holder	SMPPD	SN 16/15 MSH100	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 750	Head 750	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 835	Head 835	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 1800	Head 1800	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 1900	Head 1900	NCR	NCR
☒	Shenzhen Tianxu Communication	Human Simulating Liquid	Head 2450	Head 2450	NCR	NCR

	Technology Co., Ltd.					
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 2600	Head 2600	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 5200	Head 5200	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 5800	Head 5800	NCR	NCR

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

3.1. Power Reference

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

3.2. Area scan & Zoom scan

The area scan is a 2D scan to find the hot spot location on the DUT. The zoom scan is a 3D scan

above the hot spot to calculate the 1g and 10g SAR value.

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

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

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

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

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

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

3.3. Description of interpolation/extrapolation scheme

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

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

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

3.4. Volumetric Scan

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

3.5. Power Drift

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

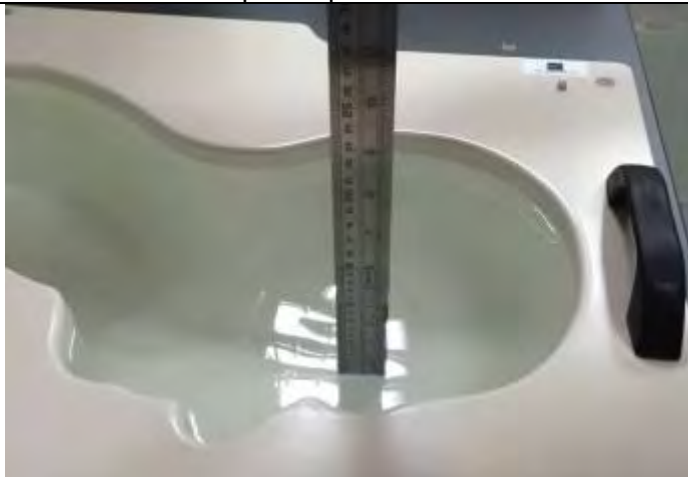
4. System Verification Procedure

4.1. Tissue Verification

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

Ingredients (% of weight)	Head Tissue									
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200	5800
Water	34.40	34.40	34.40	55.36	55.36	57.87	57.87	57.87	65.53	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	24.24	24.24
DGBE	0.00	0.00	0.00	13.84	13.84	22.00	22.00	22.00	10.23	10.23

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

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

4.1.1. Tissue Dielectric Parameter Check Results

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

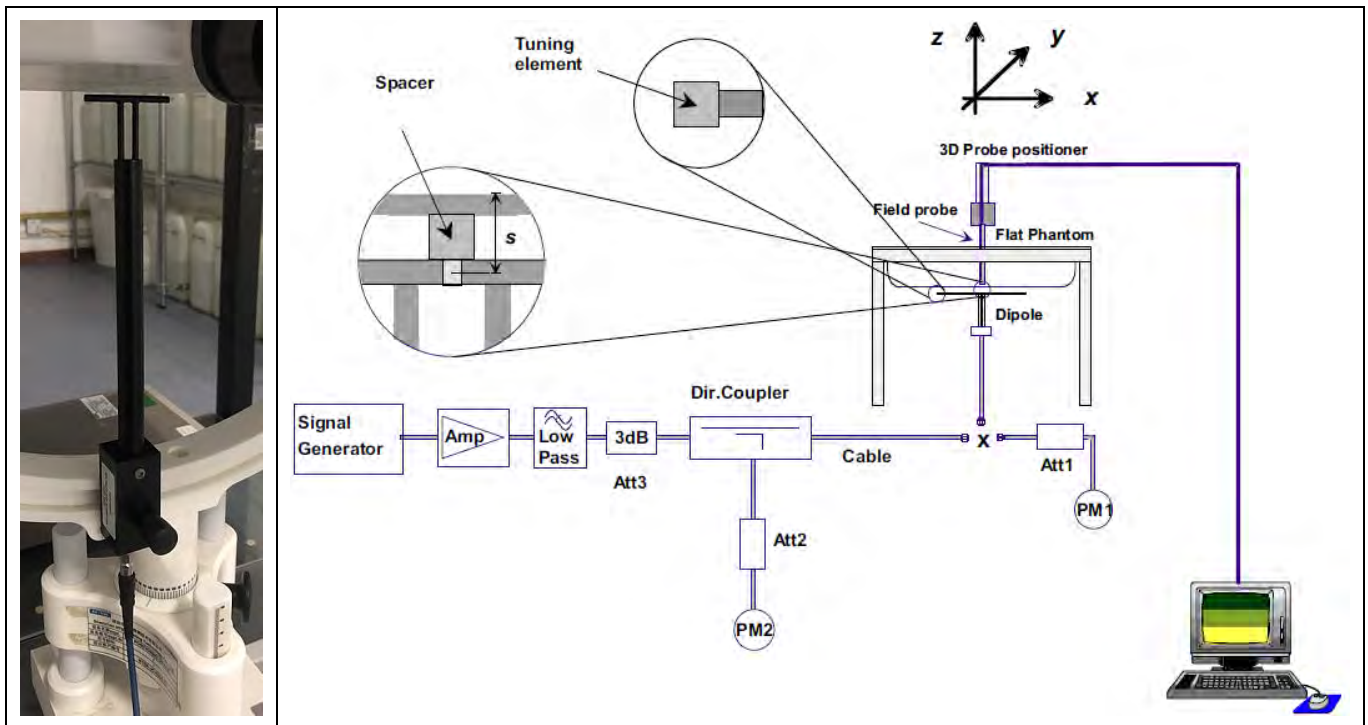
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	$\sigma \text{ (S/m)} (\pm 5\%)$	ϵ_r	$\sigma \text{ (S/m)}$		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	42.03	0.92	21.2 °C	Dec. 05, 2023
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.55	0.90	21.2 °C	Nov. 24, 2023
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.76	1.40	21.7 °C	Nov. 18, 2023
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.13	1.46	21.4 °C	Nov. 23, 2023
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.58	1.78	21.6 °C	Nov. 17, 2023
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	38.48	1.91	21.9 °C	Nov. 22, 2023
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	35.51	4.50	21.7 °C	Nov. 21, 2023
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	35.05	5.33	21.5 °C	Nov. 20, 2023

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

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

System Verification	Target SAR (1W)		Measured SAR		Liquid Temp.	Delta (%)		Test Date
	(±10%)		(Normalized to 1W)					
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		1-g (±10%)	10-g (±10%)	
750MHz	8.53	5.56	8.89	5.49	21.2 °C	4.22%	-1.26%	Dec. 05, 2023
	(7.68~9.38)	(5.01~6.11)						
835MHz	9.84	6.22	9.16	6.64	21.2 °C	-6.91%	6.75%	Nov. 24, 2023
	(8.86~10.82)	(5.60~6.84)						
1800MHz	37.96	19.81	41.44	18.30	21.7 °C	9.17%	-7.62%	Nov. 18, 2023
	(34.17~41.75)	(17.83~21.79)						
1900MHz	40.37	20.48	43.21	20.09	21.4 °C	7.03%	-1.90%	Nov. 23, 2023
	(36.34~44.40)	(18.44~22.52)						
2450MHz	53.69	23.94	54.05	23.01	21.6 °C	0.67%	-2.29%	Nov. 17, 2023
	(48.33~59.05)	(21.55~26.33)						
2600MHz	55.83	24.19	57.45	22.08	21.9 °C	2.90%	-8.72%	Nov. 22, 2023
	(50.25~61.41)	(21.78~26.60)						
5200MHz	162.34	55.42	177.17	51.30	21.7 °C	9.14%	-7.43%	Nov. 21, 2023
	(146.11~178.57)	(49.88~60.96)						
5800MHz	178.89	59.32	183.46	64.22	21.5 °C	2.55%	8.26%	Nov. 20, 2023
	(161.01~196.77)	(53.39~65.25)						

5. SAR Measurement variability and uncertainty

5.1. SAR measurement variability

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

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

5.2. SAR measurement uncertainty

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

6. RF Exposure Positions

6.1. Ear and handset reference point

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



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

6.2. Definition of the cheek position

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

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

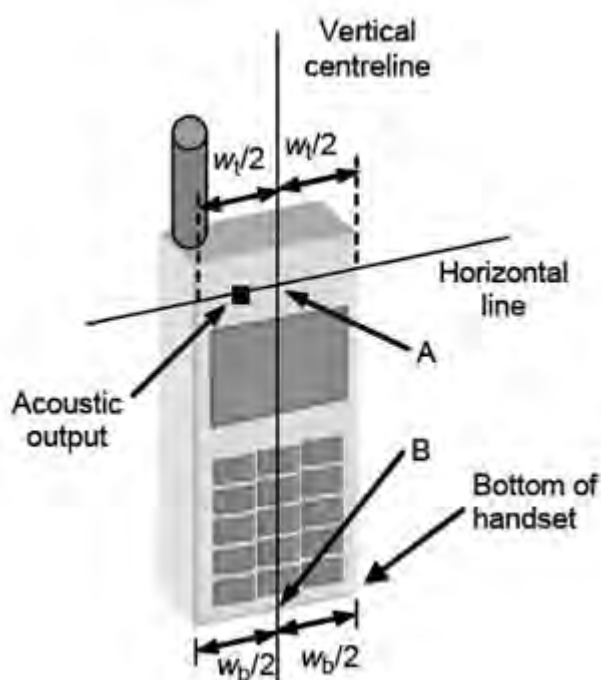


Fig 6.2.1 Handset vertical and horizontal reference lines—fixed case

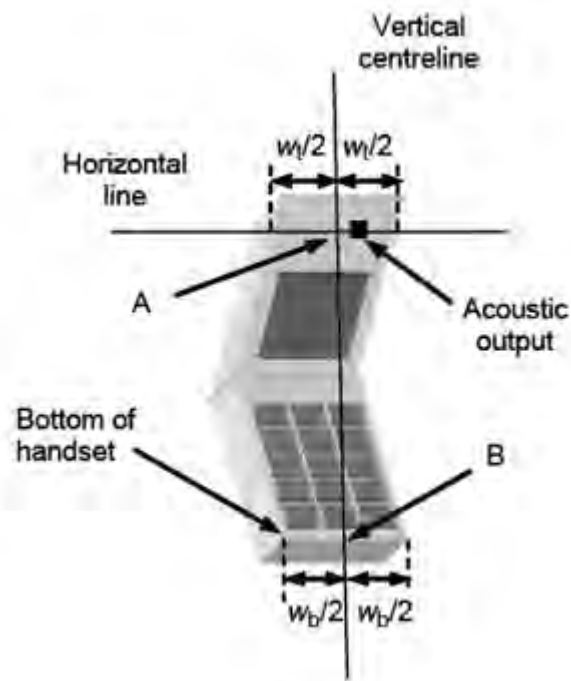


Fig 6.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

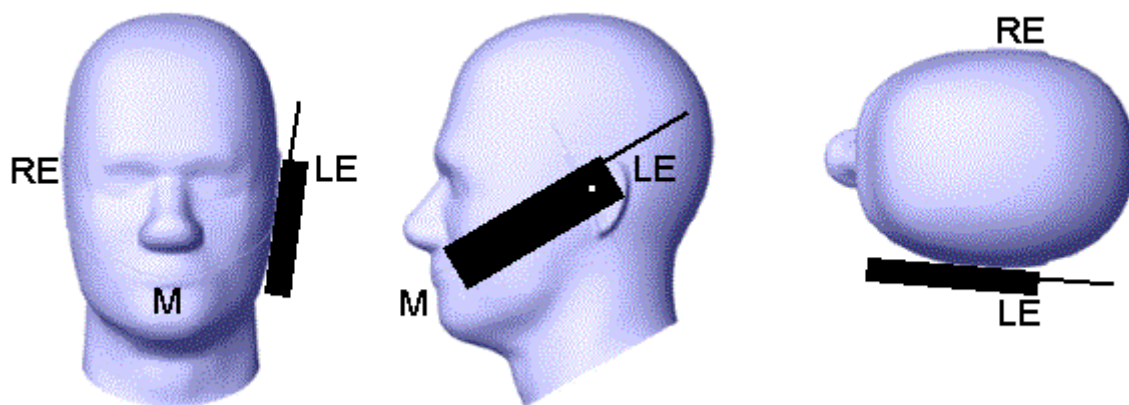


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

6.3. Definition of the tilt position

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

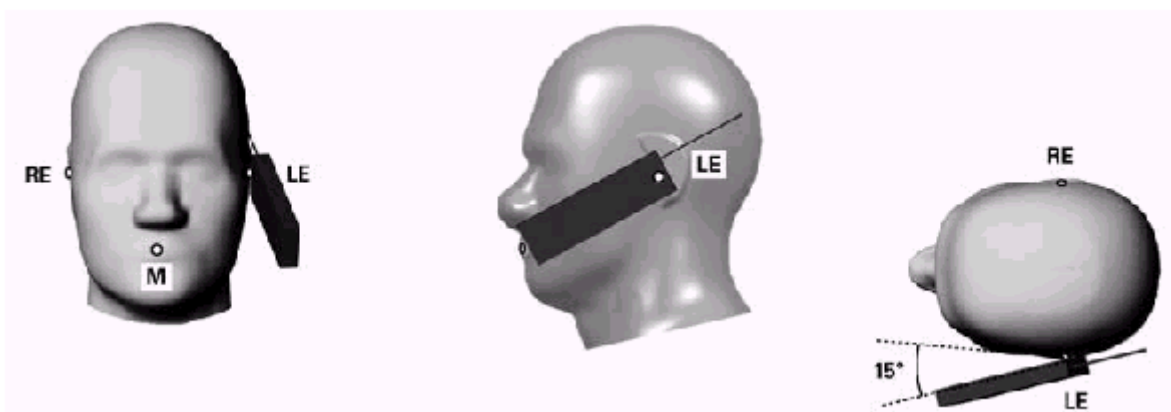


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

6.4. Body Worn Accessory

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

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

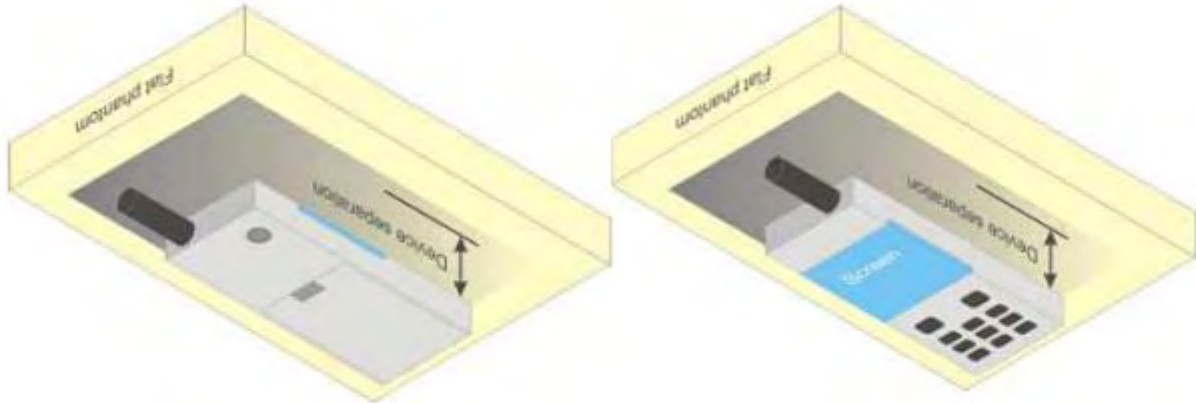


Figure 6.4.1 – Test positions for body-worn devices

6.5. Wireless Router Devices

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

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

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	128	189	251	Tune-up	128	189	251
Frequency (MHz)	(dBm)	824.2	836.4	848.8	(dBm)	824.2	836.4	848.8
GSM (GMSK)	34.00	33.90	33.63	33.89	24.97	24.87	24.60	24.86
GPRS(GMSK,1 Tx slot)	34.00	33.90	33.63	33.88	24.97	24.87	24.60	24.85
GPRS(GMSK,2 Tx slot)	33.00	32.95	32.70	32.86	26.98	26.93	26.68	26.84
GPRS(GMSK,3 Tx slot)	31.00	30.94	30.68	30.84	26.74	26.68	26.42	26.58
GPRS(GMSK,4 Tx slot)	30.00	29.87	29.61	29.77	26.99	26.86	26.60	26.76
EGPRS(8PSK,1 Tx slot)	28.00	27.17	27.71	27.57	18.97	18.14	18.68	18.54
EGPRS(8PSK,2 Tx slot)	27.00	26.98	26.86	26.85	20.98	20.96	20.84	20.83
EGPRS(8PSK,3 Tx slot)	25.00	24.72	24.85	24.47	20.74	20.46	20.59	20.21
EGPRS(8PSK,4 Tx slot)	24.00	23.90	23.78	23.21	20.99	20.89	20.77	20.20
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	512	661	810	Tune-up	512	661	810
Frequency (MHz)	(dBm)	1850.2	1880	1909.8	(dBm)	1850.2	1880	1909.8
GSM (GMSK)	31.00	30.90	30.77	30.77	21.97	21.87	21.74	21.74
GPRS(GMSK,1 Tx slot)	31.00	30.89	30.76	30.77	21.97	21.86	21.73	21.74
GPRS(GMSK,2 Tx slot)	30.50	30.13	29.99	29.96	24.48	24.11	23.97	23.94
GPRS(GMSK,3 Tx slot)	28.50	28.36	28.16	28.11	24.24	24.10	23.90	23.85
GPRS(GMSK,4 Tx slot)	27.50	27.35	27.15	27.06	24.49	24.34	24.14	24.05
EGPRS(8PSK,1 Tx slot)	28.00	27.61	27.42	27.19	18.97	18.58	18.39	18.16
EGPRS(8PSK,2 Tx slot)	27.00	26.53	26.86	26.71	20.98	20.51	20.84	20.69
EGPRS(8PSK,3 Tx slot)	25.00	24.78	24.82	24.63	20.74	20.52	20.56	20.37
EGPRS(8PSK,4 Tx slot)	24.00	23.98	23.55	23.39	20.99	20.97	20.54	20.38

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	24.50	23.93	24.00	24.20
HSDPA Sub 1	23.00	22.68	22.65	22.74
HSDPA Sub 2	22.50	22.20	22.28	22.34

HSDPA Sub 3	21.50	21.11	21.02	21.24
HSDPA Sub 4	21.50	21.27	21.10	21.26
HSUPA Sub 1	23.00	21.86	22.47	22.60
HSUPA Sub 2	23.00	22.69	22.57	22.78
HSUPA Sub 3	21.50	20.89	21.39	21.44
HSUPA Sub 4	23.00	22.68	22.64	22.74
HSUPA Sub 5	22.50	21.27	21.86	22.08
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	24.50	24.12	23.88	23.90
HSDPA Sub 1	23.50	23.10	22.80	22.78
HSDPA Sub 2	23.00	22.52	22.19	22.55
HSDPA Sub 3	21.50	21.34	21.37	21.23
HSDPA Sub 4	21.50	21.24	21.17	21.12
HSUPA Sub 1	23.00	22.01	22.46	22.64
HSUPA Sub 2	23.00	22.87	22.58	22.63
HSUPA Sub 3	22.00	21.06	21.59	21.47
HSUPA Sub 4	23.00	22.90	22.78	22.72
HSUPA Sub 5	22.50	21.40	21.88	22.16
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	24.00	23.74	23.84	23.84
HSDPA Sub 1	23.50	22.93	22.98	23.03
HSDPA Sub 2	23.00	22.52	22.56	22.68
HSDPA Sub 3	22.00	21.43	21.26	21.56
HSDPA Sub 4	22.00	21.56	21.22	21.22
HSUPA Sub 1	23.00	21.76	22.81	22.85
HSUPA Sub 2	23.00	22.70	22.90	22.87
HSUPA Sub 3	22.00	21.21	21.63	21.55
HSUPA Sub 4	23.50	22.92	23.00	23.05
HSUPA Sub 5	22.50	21.41	22.34	22.31

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	23.50	22.84	22.79	23.14
			1	2	23.50	22.90	22.85	23.22
			1	5	23.50	22.84	22.77	23.14
			3	0	23.50	22.97	22.86	23.23
			3	1	23.50	22.94	22.86	23.27
			3	2	23.50	22.92	22.86	23.26
		16QAM	6	0	22.50	22.01	21.91	22.35
			1	0	22.50	22.03	22.09	22.41
			1	2	22.50	22.23	22.08	22.45
			1	5	22.50	21.98	21.94	22.39
			3	0	22.50	21.95	21.82	22.22
			3	1	22.50	21.95	21.93	22.25
			3	2	22.50	21.86	21.84	22.21
			6	0	21.50	21.14	21.01	21.42
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	23.50	22.66	22.59	22.95
			1	7	23.50	22.74	22.72	23.11
			1	14	23.50	22.60	22.58	22.97
			8	0	22.50	21.83	21.79	22.19
			8	4	22.50	21.85	21.89	22.25
			8	7	22.50	21.84	21.83	22.20
			15	0	22.50	21.78	21.78	22.18
		16QAM	1	0	22.50	21.89	21.90	22.20
			1	7	22.50	22.06	21.95	22.41
			1	14	22.50	21.94	21.89	22.28
			8	0	21.50	20.93	20.84	21.19
			8	4	21.50	20.95	20.94	21.30
			8	7	21.50	20.96	20.88	21.25
			15	0	21.50	20.85	20.78	21.17
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	23.50	22.81	22.82	23.08
			1	12	23.50	22.89	22.91	23.03
			1	24	23.50	22.76	22.80	22.85
			12	0	22.50	21.76	21.76	21.93
			12	6	22.50	21.89	21.87	21.94
			12	11	22.50	21.84	21.82	22.02
			25	0	22.00	21.84	21.84	21.88
		16QAM	1	0	22.50	22.12	21.94	21.84
			1	12	22.50	22.15	22.12	22.16
			1	24	22.50	22.10	22.08	21.93
			12	0	21.00	20.81	20.77	20.65
			12	6	21.00	20.93	20.82	20.81
			12	11	21.00	20.91	20.86	20.81
			25	0	21.00	20.87	20.83	20.81
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	23.00	22.47	22.82	22.60
			1	24	23.00	22.34	22.51	22.71
			1	49	23.00	22.29	22.42	22.82
			25	0	22.00	21.33	21.26	21.67
			25	12	22.00	21.39	21.47	21.68
			25	24	22.00	21.58	21.44	21.73
			50	0	22.00	21.60	21.37	21.72
		16QAM	1	0	22.50	21.87	21.52	21.85
			1	24	22.50	21.75	21.64	21.93
			1	49	22.50	21.82	21.64	22.03
			25	0	21.00	20.66	20.33	20.70
			25	12	21.00	20.83	20.48	20.69
			25	24	21.00	20.77	20.48	20.79
			50	0	21.00	20.80	20.48	20.73
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5
LTE Band	15MHz	QPSK	1	0	23.00	22.32	22.60	22.43
			1	37	23.00	22.31	22.46	22.70

2			1	74	23.00	22.15	22.40	22.73
			36	0	22.00	21.22	21.27	21.60
			36	18	22.00	21.29	21.37	21.59
			36	37	22.00	21.21	21.37	21.67
			75	0	22.00	21.51	21.39	21.61
		16QAM	1	0	22.50	21.77	21.54	21.61
			1	37	22.50	21.80	21.69	21.99
			1	74	22.50	21.75	21.61	22.05
			36	0	21.00	20.42	20.28	20.62
			36	18	21.00	20.45	20.43	20.64
			36	37	21.00	20.58	20.48	20.72
			75	0	21.00	20.70	20.43	20.65
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	23.00	22.72	22.62	22.78
			1	49	23.00	22.27	22.48	22.62
			1	99	23.00	22.09	22.20	22.68
			50	0	22.00	21.13	21.32	21.54
			50	24	22.00	21.26	21.42	21.57
			50	49	22.00	21.09	21.49	21.55
			100	0	22.00	21.16	21.37	21.53
		16QAM	1	0	22.50	21.95	21.80	22.04
			1	49	22.50	21.54	21.77	22.01
			1	99	22.50	21.53	21.51	21.96
			50	0	21.00	20.19	20.30	20.59
			50	24	21.00	20.46	20.42	20.60
			50	49	21.00	20.51	20.58	20.60
			100	0	21.00	20.47	20.43	20.55

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	23.26	23.16	23.07
			1	2	23.50	23.33	23.24	23.14
			1	5	23.50	23.28	23.19	23.06
			3	0	23.50	23.39	23.26	23.16
			3	1	23.50	23.42	23.30	23.16

			3	2	23.50	23.40	23.28	23.16
			6	0	22.50	22.49	22.37	22.25
		16QAM	1	0	23.00	22.53	22.49	22.35
			1	2	23.00	22.76	22.57	22.35
			1	5	23.00	22.54	22.47	22.39
			3	0	22.50	22.39	22.33	22.19
			3	1	22.50	22.44	22.35	22.23
			3	2	22.50	22.42	22.31	22.18
			6	0	22.00	21.62	21.46	21.34
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	23.16	23.05	22.91
			1	7	23.50	23.27	23.15	23.06
			1	14	23.50	23.15	23.06	22.94
			8	0	22.50	22.38	22.21	22.10
			8	4	22.50	22.40	22.31	22.17
			8	7	22.50	22.33	22.26	22.16
			15	0	22.50	22.36	22.24	22.13
		16QAM	1	0	22.50	22.38	22.30	22.22
			1	7	22.50	22.48	22.35	22.28
			1	14	22.50	22.38	22.25	22.19
			8	0	21.50	21.47	21.30	21.20
			8	4	21.50	21.49	21.41	21.27
			8	7	21.50	21.45	21.36	21.27
			15	0	21.50	21.41	21.29	21.17
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	24.00	23.42	23.26	23.17
			1	12	24.00	23.50	23.42	23.30
			1	24	24.00	23.34	23.34	23.20
			12	0	22.50	22.43	22.30	22.18
			12	6	22.50	22.46	22.38	22.27
			12	11	22.50	22.39	22.34	22.22
			25	0	22.50	22.42	22.34	22.21
		16QAM	1	0	23.00	22.73	22.55	22.34
			1	12	23.00	22.85	22.68	22.60

			1	24	23.00	22.67	22.60	22.52
			12	0	22.00	21.46	21.34	21.18
			12	6	22.00	21.50	21.40	21.27
			12	11	22.00	21.45	21.36	21.24
			25	0	21.50	21.47	21.39	21.26
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	23.49	23.31	23.32
			1	24	23.50	23.48	23.43	23.31
			1	49	23.50	23.35	23.39	23.32
			25	0	22.50	22.42	22.29	22.21
			25	12	22.50	22.45	22.39	22.26
			25	24	22.50	22.36	22.36	22.25
			50	0	22.50	22.42	22.34	22.23
		16QAM	1	0	23.00	22.77	22.46	22.64
			1	24	23.00	22.68	22.70	22.55
			1	49	23.00	22.55	22.73	22.50
			25	0	22.00	21.49	21.34	21.26
			25	12	22.00	21.53	21.45	21.35
			25	24	22.00	21.41	21.43	21.31
			50	0	21.50	21.46	21.36	21.26
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	23.46	23.23	23.32
			1	37	23.50	23.43	23.42	23.22
			1	74	23.50	23.31	23.36	23.23
			36	0	22.50	22.41	22.16	22.21
			36	18	22.50	22.33	22.24	22.21
			36	37	22.50	22.31	22.30	22.19
			75	0	22.50	22.38	22.27	22.21
		16QAM	1	0	23.00	22.72	22.51	22.53
			1	37	23.00	22.59	22.51	22.53
			1	74	23.00	22.43	22.58	22.44
			36	0	21.50	21.48	21.20	21.27
			36	18	21.50	21.38	21.40	21.28
			36	37	21.50	21.36	21.35	21.25

			75	0	21.50	21.41	21.38	21.32
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	23.34	23.13	23.21
			1	49	23.50	23.31	23.40	23.36
			1	99	23.50	23.26	23.22	23.12
			50	0	22.50	22.33	22.27	22.30
			50	24	22.50	22.34	22.45	22.35
			50	49	22.50	22.29	22.29	22.26
			100	0	22.50	22.35	22.32	22.27
		16QAM	1	0	23.00	22.54	22.34	22.48
			1	49	23.00	22.69	22.62	22.62
			1	99	23.00	22.51	22.45	22.30
			50	0	21.50	21.40	21.20	21.35
			50	24	21.50	21.40	21.44	21.42
			50	49	21.50	21.42	21.38	21.31
			100	0	21.50	21.37	21.33	21.35

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	23.16	23.03	23.07
			1	2	23.50	23.26	23.10	23.09
			1	5	23.50	23.16	22.99	22.79
			3	0	23.50	23.31	23.10	22.80
			3	1	23.50	23.31	23.12	22.68
			3	2	23.50	23.29	23.12	22.67
			6	0	22.50	22.33	22.20	21.87
		16QAM	1	0	22.50	22.31	22.27	21.89
			1	2	22.50	22.44	22.33	21.82
			1	5	22.50	22.34	22.35	21.90
			3	0	22.50	22.20	22.06	21.66
			3	1	22.50	22.26	22.12	21.59
			3	2	22.50	22.20	22.15	21.69
			6	0	21.50	21.49	21.29	21.03
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	22.80	22.93	23.01
			1	7	23.50	22.91	23.01	23.07
			1	14	23.50	22.83	22.89	22.91
			8	0	22.50	22.16	22.10	22.19
			8	4	22.50	22.24	22.18	22.18
			8	7	22.50	22.18	22.13	22.14
			15	0	22.50	22.18	22.13	22.08
		16QAM	1	0	22.50	22.27	22.20	22.07
			1	7	22.50	22.37	22.30	22.05
			1	14	22.50	22.17	22.08	21.84
			8	0	21.50	21.33	21.18	20.89
			8	4	21.50	21.41	21.27	21.05
			8	7	21.50	21.32	21.20	21.01
			15	0	21.50	21.29	21.18	21.16
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	23.18	23.17	23.20
			1	12	23.50	23.31	23.26	23.34
			1	24	23.50	23.24	23.15	23.17
			12	0	22.50	22.33	22.20	22.34
			12	6	22.50	22.31	22.25	22.31
			12	11	22.50	22.28	22.20	22.26
			25	0	22.50	22.31	22.22	22.27
		16QAM	1	0	23.00	22.45	22.47	22.43
			1	12	23.00	22.59	22.45	22.55
			1	24	23.00	22.44	22.38	22.36
			12	0	21.50	21.36	21.25	21.39
			12	6	21.50	21.40	21.29	21.35
			12	11	21.50	21.30	21.22	21.25
			25	0	21.50	21.37	21.27	21.39
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20450/829	20525/836.5	20600/844
LTE Band	10MHz	QPSK	1	0	23.50	23.35	23.28	23.22
			1	24	23.50	23.33	23.29	23.36

5			1	49	23.50	23.22	23.23	23.31
			25	0	22.50	22.25	22.19	22.34
			25	12	22.50	22.37	22.32	22.33
			25	24	22.50	22.22	22.19	22.20
			50	0	22.50	22.28	22.21	22.30
		16QAM	1	0	23.00	22.53	22.57	22.52
			1	24	23.00	22.64	22.54	22.52
			1	49	23.00	22.57	22.39	22.54
			25	0	21.50	21.34	21.26	21.38
			25	12	21.50	21.41	21.34	21.37
			25	24	21.50	21.30	21.26	21.26
			50	0	21.50	21.30	21.25	21.35

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	24.00	23.66	23.65	23.73
			1	12	24.00	23.78	23.81	23.87
			1	24	24.00	23.67	23.68	23.72
			12	0	23.00	22.72	22.75	22.84
			12	6	23.00	22.79	22.82	22.89
			12	11	23.00	22.70	22.78	22.89
			25	0	23.00	22.76	22.80	22.81
		16QAM	1	0	23.50	22.82	22.84	22.87
			1	12	23.50	22.92	23.03	22.95
			1	24	23.50	22.72	22.92	22.73
			12	0	22.00	21.64	21.68	21.59
			12	6	22.00	21.72	21.74	21.65
			12	11	22.00	21.67	21.72	21.71
			25	0	22.00	21.73	21.77	21.76
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	24.00	23.57	23.66	23.45
			1	24	24.00	23.31	23.53	23.36
			1	49	24.00	23.41	23.52	23.32
			25	0	23.00	22.41	22.29	22.36
			25	12	23.00	22.48	22.46	22.44

			25	24	23.00	22.52	22.59	22.45
			50	0	23.00	22.49	22.52	22.43
		16QAM	1	0	23.00	22.62	22.67	22.34
			1	24	23.00	22.68	22.61	22.55
			1	49	23.00	22.58	22.72	22.45
			25	0	22.00	21.43	21.33	21.32
			25	12	22.00	21.79	21.54	21.40
			25	24	22.00	21.68	21.66	21.42
			50	0	22.00	21.70	21.62	21.37
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5
LTE Band 7	15MHz	QPSK	1	0	23.50	23.17	23.18	23.21
			1	37	23.50	23.27	23.36	23.34
			1	74	23.50	23.15	23.29	23.28
			36	0	22.50	22.24	22.23	22.32
			36	18	22.50	22.25	22.33	22.35
			36	37	22.50	22.20	22.30	22.40
			75	0	22.50	22.24	22.31	22.38
		16QAM	1	0	23.00	22.33	22.34	22.36
			1	37	23.00	22.47	22.52	22.50
			1	74	23.00	22.37	22.44	22.43
			36	0	21.50	21.19	21.19	21.26
			36	18	21.50	21.22	21.30	21.30
			36	37	21.50	21.15	21.28	21.35
			75	0	21.50	21.20	21.26	21.29
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20850/2510	21100/2535	21350/2560
LTE Band 7	20MHz	QPSK	1	0	23.50	23.09	23.15	23.16
			1	49	23.50	23.22	23.35	23.31
			1	99	23.50	23.02	23.19	23.18
			50	0	22.50	22.26	22.25	22.42
			50	24	22.50	22.31	22.37	22.43
			50	49	22.50	22.23	22.31	22.40
			100	0	22.50	22.26	22.24	22.39
		16QAM	1	0	22.50	22.23	22.39	22.36
			1	49	22.50	22.36	22.48	22.44

			1	99	22.50	22.18	22.34	22.29
			50	0	21.50	21.21	21.18	21.33
			50	24	21.50	21.26	21.32	21.36
			50	49	21.50	21.19	21.27	21.32
			100	0	21.50	21.19	21.19	21.33

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	23.50	23.39	23.40	23.19
			1	2	23.50	23.46	23.43	23.28
			1	5	23.50	23.35	23.35	23.16
			3	0	24.00	23.49	23.46	23.28
			3	1	24.00	23.49	23.46	23.30
			3	2	24.00	23.50	23.43	23.27
			6	0	23.00	22.56	22.53	22.41
		16QAM	1	0	23.00	22.63	22.71	22.41
			1	2	23.00	22.65	22.61	22.62
			1	5	23.00	22.62	22.48	22.54
			3	0	23.00	22.39	22.52	22.33
			3	1	23.00	22.52	22.50	22.31
			3	2	23.00	22.45	22.46	22.37
			6	0	22.00	21.67	21.65	21.50

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	23.50	23.27	23.26	23.06
			1	7	23.50	23.35	23.29	23.19
			1	14	23.50	23.21	23.13	23.04
			8	0	22.50	22.47	22.35	22.36
			8	4	22.50	22.48	22.47	22.40
			8	7	22.50	22.39	22.43	22.34
			15	0	22.50	22.43	22.37	22.34
		16QAM	1	0	23.00	22.58	22.58	22.41
			1	7	23.00	22.67	22.56	22.41
			1	14	23.00	22.48	22.39	22.39
			8	0	22.00	21.53	21.38	21.41
			8	4	22.00	21.51	21.52	21.44

			8	7	22.00	21.43	21.49	21.35
			15	0	21.50	21.45	21.39	21.35
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	24.00	23.49	23.55	23.31
			1	12	24.00	23.56	23.54	23.43
			1	24	24.00	23.48	23.36	23.31
			12	0	23.00	22.64	22.32	22.59
			12	6	23.00	22.53	22.56	22.52
			12	11	23.00	22.46	22.54	22.39
			25	0	23.00	22.59	22.46	22.52
		16QAM	1	0	23.00	22.87	22.79	22.53
			1	12	23.00	22.90	22.85	22.80
			1	24	23.00	22.77	22.68	22.65
			12	0	22.00	21.63	21.32	21.55
			12	6	22.00	21.59	21.58	21.54
			12	11	22.00	21.51	21.53	21.41
			25	0	22.00	21.60	21.47	21.53
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	24.00	23.60	23.60	23.58
			1	24	24.00	23.62	23.59	23.47
			1	49	24.00	23.48	23.44	23.43
			25	0	23.00	22.72	22.30	22.40
			25	12	23.00	22.59	22.57	22.51
			25	24	23.00	22.83	22.41	22.29
			50	0	23.00	22.81	22.38	22.37
		16QAM	1	0	23.00	22.90	22.96	22.94
			1	24	23.00	22.93	22.76	22.71
			1	49	23.00	22.64	22.70	22.65
			25	0	22.00	21.75	21.33	21.40
			25	12	22.00	21.67	21.59	21.51
			25	24	22.00	21.89	21.42	21.30
			50	0	22.00	21.79	21.35	21.34

Band	Band	Modulation	RB	Tune-up	Channel/Frequency(MHz)
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	Width		Configuration		(dBm)			
			RB Size	RB Offset		23205/779.5	23230/782	23255/784.5
LTE Band 13	5MHz	QPSK	1	0	23.50	23.28	23.19	23.23
			1	12	23.50	23.33	23.37	23.41
			1	24	23.50	23.22	23.29	23.33
			12	0	22.50	22.14	22.24	22.38
			12	6	22.50	22.35	22.34	22.41
			12	11	22.50	22.29	22.27	22.35
			25	0	22.50	22.22	22.27	22.38
		16QAM	1	0	23.00	22.54	22.45	22.33
			1	12	23.00	22.55	22.43	22.58
			1	24	23.00	22.34	22.54	22.62
			12	0	21.50	21.15	21.25	21.36
			12	6	21.50	21.35	21.33	21.44
			12	11	21.50	21.27	21.25	21.39
			25	0	21.50	21.28	21.28	21.40
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		N/A	23230/782	N/A
LTE Band 13	10MHz	QPSK	1	0	23.50	N/A	23.42	N/A
			1	24	23.50	N/A	23.34	N/A
			1	49	23.50	N/A	23.38	N/A
			25	0	22.50	N/A	22.11	N/A
			25	12	22.50	N/A	22.35	N/A
			25	24	22.50	N/A	22.25	N/A
			50	0	22.50	N/A	22.18	N/A
		16QAM	1	0	23.00	N/A	22.68	N/A
			1	24	23.00	N/A	22.40	N/A
			1	49	23.00	N/A	22.62	N/A
			25	0	21.50	N/A	21.15	N/A
			25	12	21.50	N/A	21.36	N/A
			25	24	21.50	N/A	21.25	N/A
			50	0	21.50	N/A	21.19	N/A

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	23.27	23.35	23.16
			1	12	23.50	23.47	23.30	23.31
			1	24	23.50	23.26	23.16	23.14
			12	0	23.00	22.26	22.10	22.36
			12	6	23.00	22.42	22.33	22.26
			12	11	23.00	22.50	22.17	22.19
			25	0	22.50	22.40	22.16	22.28
		16QAM	1	0	23.00	22.57	22.64	22.37
			1	12	23.00	22.76	22.49	22.46
			1	24	23.00	22.51	22.39	22.47
			12	0	21.50	21.29	21.13	21.35
			12	6	21.50	21.40	21.32	21.24
			12	11	21.50	21.49	21.16	21.17
			25	0	21.50	21.44	21.18	21.30
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	23.36	23.44	23.42
			1	24	23.50	23.35	23.29	23.26
			1	49	23.50	23.21	23.25	23.25
			25	0	22.50	21.97	21.90	21.97
			25	12	22.50	22.30	22.29	22.24
			25	24	22.50	22.08	21.96	21.95
			50	0	22.50	22.05	21.97	21.98
		16QAM	1	0	23.00	22.57	22.67	22.63
			1	24	23.00	22.58	22.63	22.46
			1	49	23.00	22.42	22.48	22.39
			25	0	21.50	21.00	20.92	20.97
			25	12	21.50	21.31	21.30	21.25
			25	24	21.50	21.10	20.99	20.97
			50	0	21.50	21.03	20.96	20.97

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40065/2537.5	40640/2595	41215/2652.5
LTE Band 41	5MHz	QPSK	1	0	24.50	23.80	23.94	23.67
			1	12	24.50	23.99	24.03	23.77
			1	24	24.50	23.85	23.91	23.66

			12	0	23.50	22.86	23.04	22.83
			12	6	23.50	22.90	23.05	22.85
			12	11	23.50	22.87	22.99	22.74
			25	0	23.00	22.83	22.99	22.79
		16QAM	1	0	23.50	22.89	23.07	22.86
			1	12	23.50	23.05	23.18	22.99
			1	24	23.50	22.94	23.07	22.84
			12	0	22.50	21.81	22.02	21.88
			12	6	22.50	21.84	22.05	21.89
			12	11	22.50	21.80	21.97	21.80
			25	0	22.50	21.80	22.03	21.90
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40090/2540	40640/2595	41190/2650
LTE Band 41	10MHz	QPSK	1	0	24.50	23.90	24.02	23.79
			1	24	24.50	23.97	24.03	23.80
			1	49	24.50	23.93	23.96	23.73
			25	0	23.50	22.89	23.05	22.85
			25	12	23.50	22.93	23.08	22.88
			25	24	23.50	22.93	22.98	22.75
			50	0	23.50	22.94	23.06	22.84
		16QAM	1	0	23.50	23.00	23.15	23.01
			1	24	23.50	23.07	23.21	23.01
			1	49	23.50	23.04	23.12	22.93
			25	0	22.50	21.87	22.08	21.93
			25	12	22.50	21.91	22.08	21.96
			25	24	22.50	21.88	22.01	21.84
			50	0	22.50	21.92	22.06	21.89
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	15MHz	QPSK	1	0	24.50	23.84	23.96	23.76
			1	37	24.50	23.99	24.06	23.81
			1	74	24.50	23.89	23.88	23.68
			36	0	23.50	22.90	23.04	22.83
			36	18	23.50	22.96	23.08	22.85
			36	37	23.50	22.92	22.99	22.76
			75	0	23.50	22.93	23.06	22.81

		16QAM	1	0	23.50	22.94	23.10	22.96
			1	37	23.50	23.11	23.21	23.01
			1	74	23.50	23.01	23.04	22.86
			36	0	22.50	21.86	22.01	21.83
			36	18	22.50	21.89	22.05	21.87
			36	37	22.50	21.86	21.97	21.78
			75	0	22.50	21.88	22.04	21.87
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	20MHz	QPSK	1	0	24.50	23.77	23.90	23.77
			1	49	24.50	24.00	24.05	23.82
			1	99	24.50	23.76	23.75	23.61
			50	0	23.50	22.93	23.11	22.86
			50	24	23.50	22.98	23.10	22.91
			50	49	23.50	22.92	22.94	22.77
			100	0	23.50	22.93	23.02	22.80
		16QAM	1	0	23.50	22.88	23.04	22.96
			1	49	23.50	23.11	23.21	23.04
			1	99	23.50	22.88	22.91	22.80
			50	0	22.50	21.88	22.10	21.91
			50	24	22.50	21.95	22.10	21.96
			50	49	22.50	21.89	21.95	21.80
			100	0	22.50	21.90	22.01	21.82

7.4. WLAN & Bluetooth Output Power

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11b	1	2412	16.50	15.74
	6	2437	16.50	16.01
	11	2462	16.50	15.24
802.11g	1	2412	14.50	13.41
	6	2437	14.50	14.25
	11	2462	14.50	13.29
802.11n HT20	1	2412	13.00	12.68
	6	2437	13.00	12.23
	11	2462	13.00	12.29

802.11n HT40	3	2422	12.50	12.16
	6	2437	12.50	12.32
	9	2452	12.50	11.81

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	36	5180	12.00	11.21
	40	5200	12.00	10.97
	48	5240	12.00	11.60
802.11n HT20	36	5180	11.50	10.65
	40	5200	11.50	10.79
	48	5240	11.50	11.44
802.11n HT40	38	5190	11.50	10.81
	46	5230	11.50	11.28
802.11ac VHT20	36	5180	11.50	10.68
	40	5200	11.50	10.75
	48	5240	11.50	11.47
802.11ac VHT40	38	5190	11.50	10.73
	46	5230	11.50	11.30
802.11ac VHT80	42	5210	11.00	10.95

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	149	5745	13.00	11.66
	157	5785	13.00	12.10
	165	5825	13.00	12.70
802.11n HT20	149	5745	13.00	11.47
	157	5785	13.00	12.04
	165	5825	13.00	12.52
802.11n HT40	151	5755	12.50	11.51
	159	5795	12.50	12.25
802.11ac VHT20	149	5745	13.00	11.46
	157	5785	13.00	12.09
	165	5825	13.00	12.55
802.11ac VHT40	151	5755	12.50	11.57
	159	5795	12.50	12.22
802.11ac VHT80	155	5775	12.00	11.86

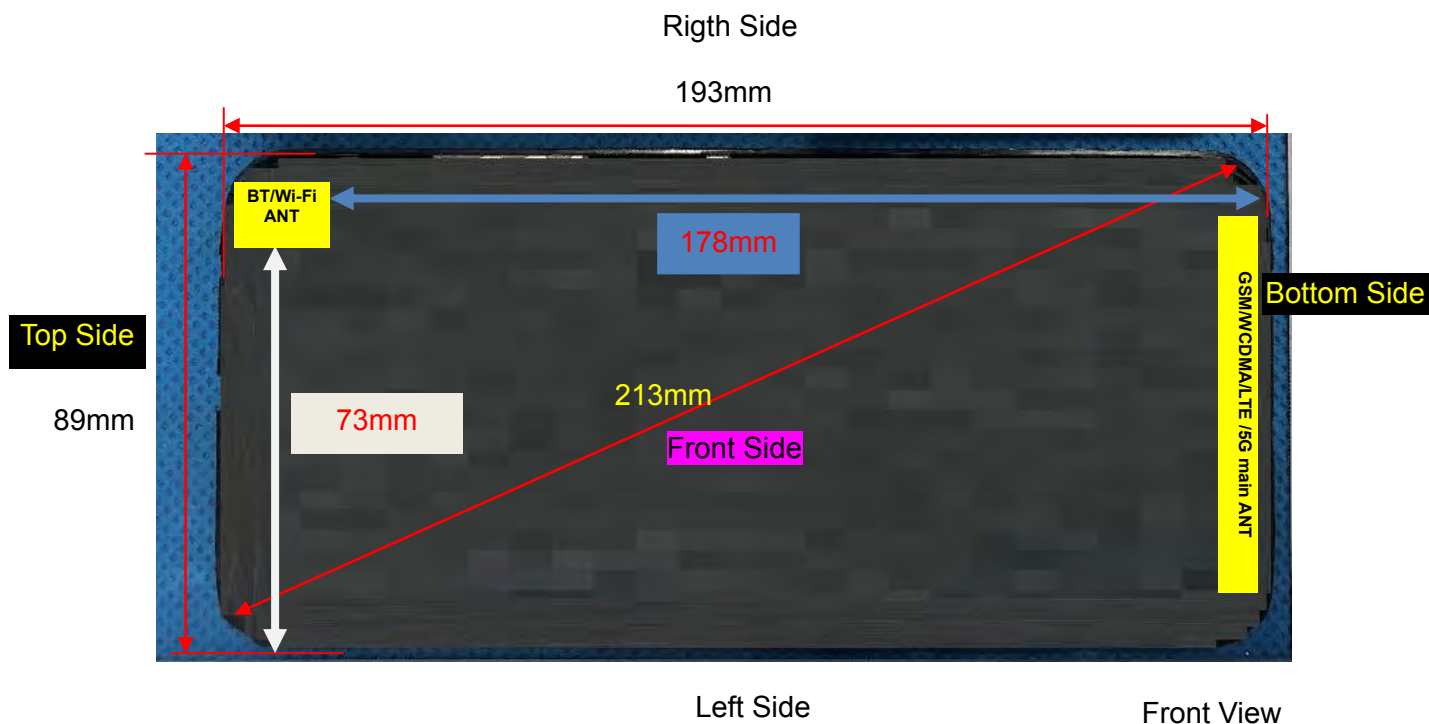
NOTE: Power measurement results of WLAN 5.8G.

BR+EDR	Output Power (dBm)				
	Channel	Tune-up (dBm)	Data Rates		
			1M	2M	3M
	0CH	10.00	9.81	9.08	8.99
	39CH	10.00	9.27	8.81	8.74
	78CH	9.00	8.06	7.62	7.53

BLE	Channel	Tune-up (dBm)	Output Power (dBm)
			1M
	0CH	-5.00	-5.01
	19CH	-4.00	-4.21
	39CH	-4.00	-4.03

NOTE: Power measurement results of Bluetooth.

8. Antenna Location



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

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

9. Stand-alone SAR test exclusion

Refer to FCC KDB 447498D01, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}]$
 ≤ 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}	P _{max}	Distance	f	Calculation	SAR Exclusion	SAR test
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	(dBm)	(mW)	(mm)	(GHz)	Result	threshold	exclusion
Bluetooth	10.00	10.00	5	2.480	3.14	3	NO

NOTE: Standalone SAR test exclusion for Blueto oth.

10. SAR Results

10.1. SAR measurement Result

10.1.1. SAR measurement Result of GSM850

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	189/836.4	GPRS(GMSK 4TS)	0.129	0.097	1.47	29.61	30.00	0.141	2023/11/24	1#
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.075	0.056	-0.65	29.61	30.00	0.082	2023/11/24	
Right Cheek	189/836.4	GPRS(GMSK 4TS)	0.113	0.082	-1.61	29.61	30.00	0.124	2023/11/24	
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 4TS)	0.057	0.042	1.98	29.61	30.00	0.062	2023/11/24	

NOTE: Head SAR test results of GSM850.

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	189/836.4	GPRS(GMSK 4TS)	0.270	0.177	-0.37	29.61	30.00	0.295	2023/11/24	
Back Side	189/836.4	GPRS(GMSK 4TS)	0.405	0.276	-1.40	29.61	30.00	0.443	2023/11/24	2#

NOTE: Body-Worn SAR test results of GSM850

[illegible]

Front Side	189/836.4	GPRS(GMSK 4TS)	0.270	0.177	-0.37	29.61	30.00	0.295	2023/11/24	
Back Side	189/836.4	GPRS(GMSK 4TS)	0.405	0.276	-1.40	29.61	30.00	0.443	2023/11/24	2#
Left Side	189/836.4	GPRS(GMSK 4TS)	0.132	0.090	0.46	29.61	30.00	0.144	2023/11/24	
Right Side	189/836.4	GPRS(GMSK 4TS)	0.135	0.094	-2.73	29.61	30.00	0.148	2023/11/24	
Bottom Side	189/836.4	GPRS(GMSK 4TS)	0.220	0.142	3.16	29.61	30.00	0.241	2023/11/24	

NOTE: Hotspot 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)	0.130	0.081	0.91	27.15	27.50	0.141	2023/11/23	3#
Left Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.075	0.046	-0.63	27.15	27.50	0.081	2023/11/23	
Right Cheek	661/1880	GPRS(GMSK 4TS)	0.122	0.073	-1.81	27.15	27.50	0.132	2023/11/23	
Right Tilt 15 Degree	661/1880	GPRS(GMSK 4TS)	0.059	0.035	2.18	27.15	27.50	0.064	2023/11/23	

NOTE: Head SAR test results of GSM1900

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	661/1880	GPRS(GMSK 4TS)	0.288	0.158	2.62	27.15	27.50	0.312	2023/11/23	
Back Side	661/1880	GPRS(GMSK 4TS)	0.453	0.248	1.64	27.15	27.50	0.491	2023/11/23	4#

NOTE: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Pi ot
			1-g	10-g						
Front Side	661/1880	GPRS(GMSK	0.288	0.158	2.62	27.15	27.50	0.312	2023/11/23	

		4TS)								
Back Side	661/1880	GPRS(GMSK 4TS)	0.453	0.248	1.64	27.15	27.50	0.491	2023/11/23	4#
Left Side	661/1880	GPRS(GMSK 4TS)	0.150	0.078	2.37	27.15	27.50	0.163	2023/11/23	
Right Side	661/1880	GPRS(GMSK 4TS)	0.147	0.080	3.11	27.15	27.50	0.159	2023/11/23	
Bottom Side	661/1880	GPRS(GMSK 4TS)	0.235	0.122	0.76	27.15	27.50	0.255	2023/11/23	

NOTE: Hotspot 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	0.192	0.111	2.14	24.00	24.50	0.215	2023/11/23	5#
Left Tilt 15 Degree	9400/1880	RMC12.2K	0.103	0.059	1.10	24.00	24.50	0.116	2023/11/23	
Right Cheek	9400/1880	RMC12.2K	0.179	0.099	-0.67	24.00	24.50	0.201	2023/11/23	
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.097	0.055	-1.79	24.00	24.50	0.109	2023/11/23	

NOTE: Head SAR test results of WCDMA Band 2

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	9400/1880	RMC12.2K	0.330	0.172	1.22	24.00	24.50	0.370	2023/11/23	
Back Side	9400/1880	RMC12.2K	0.516	0.283	-1.04	24.00	24.50	0.579	2023/11/23	6#

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducte d Power (dBm)	Tune-u p Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	9400/1880	RMC12.2K	0.330	0.172	1.22	24.00	24.50	0.370	2023/11/23	
Back Side	9400/1880	RMC12.2K	0.516	0.283	-1.04	24.00	24.50	0.579	2023/11/23	6#

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA Band 4

Test Position of Head	Test channel /Freq	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	0.189	0.119	2.50	23.88	24.50	0.218	2023/11/18	7#
Left Tilt 15 Degree	1413/1732.6	RMC12.2K	0.100	0.060	0.68	23.88	24.50	0.115	2023/11/18	
Right Cheek	1413/1732.6	RMC12.2K	0.174	0.105	-0.23	23.88	24.50	0.201	2023/11/18	
Right Tilt 15 Degree	1413/1732.6	RMC12.2K	0.083	0.051	-3.53	23.88	24.50	0.096	2023/11/18	

NOTE: Head SAR test results of WCDMA Band 4

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	1413/1732.6	RMC12.2K	0.372	0.198	-3.44	23.88	24.50	0.429	2023/11/18	
Back Side	1413/1732.6	RMC12.2K	0.606	0.336	-1.81	23.88	24.50	0.699	2023/11/18	8#

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

[illegible]

Front Side	1413/1732.6	RMC12.2K	0.372	0.198	-3.44	23.88	24.50	0.429	2023/11/18	
Back Side	1413/1732.6	RMC12.2K	0.606	0.336	-1.81	23.88	24.50	0.699	2023/11/18	8#
Left Side	1413/1732.6	RMC12.2K	0.192	0.106	0.88	23.88	24.50	0.221	2023/11/18	
Right Side	1413/1732.6	RMC12.2K	0.189	0.102	3.21	23.88	24.50	0.218	2023/11/18	
Bottom Side	1413/1732.6	RMC12.2K	0.315	0.171	2.02	23.88	24.50	0.363	2023/11/18	

NOTE: Hotspot SAR test results of WCDMA Band 4

10.1.5. SAR measurement Result of WCDMA Band 5

Test Position of Head	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Left Cheek	4182/836.4	RMC12.2K	0.105	0.081	4.25	23.84	24.00	0.109	2023/11/24	9#
Left Tilt 15 Degree	4182/836.4	RMC12.2K	0.059	0.044	0.48	23.84	24.00	0.061	2023/11/24	
Right Cheek	4182/836.4	RMC12.2K	0.090	0.069	-2.34	23.84	24.00	0.093	2023/11/24	
Right Tilt 15 Degree	4182/836.4	RMC12.2K	0.042	0.031	2.02	23.84	24.00	0.044	2023/11/24	

NOTE: Head SAR test results of WCDMA Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	4182/836.4	RMC12.2K	0.156	0.105	-0.84	23.84	24.00	0.162	2023/11/24	
Back Side	4182/836.4	RMC12.2K	0.232	0.161	-0.57	23.84	24.00	0.241	2023/11/24	10#

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

Test Position of Hotspot with	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						

10mm										
Front Side	4182/836.4	RMC12.2K	0.156	0.105	-0.84	23.84	24.00	0.162	2023/11/24	
Back Side	4182/836.4	RMC12.2K	0.232	0.161	-0.57	23.84	24.00	0.241	2023/11/24	10#
Left Side	4182/836.4	RMC12.2K	0.072	0.048	3.74	23.84	24.00	0.075	2023/11/24	
Right Side	4182/836.4	RMC12.2K	0.078	0.054	2.70	23.84	24.00	0.081	2023/11/24	
Bottom Side	4182/836.4	RMC12.2K	0.120	0.081	-3.57	23.84	24.00	0.125	2023/11/24	

NOTE: Hotspot SAR test results of WCDMA Band 5

10.1.6. SAR measurement Result of LTE Band 2

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	18900/1880	20M QPSK(1,0)	0.171	0.097	1.78	22.62	23.00	0.187	2023/11/23	17#
Left Tilt 15 Degree	18900/1880	20M QPSK(1,0)	0.095	0.053	2.64	22.62	23.00	0.104	2023/11/23	
Right Cheek	18900/1880	20M QPSK(1,0)	0.148	0.081	2.10	22.62	23.00	0.162	2023/11/23	
Right Tilt 15 Degree	18900/1880	20M QPSK(1,0)	0.076	0.041	-0.53	22.62	23.00	0.083	2023/11/23	
50%RB										
Left Cheek	18900/1880	20M QPSK(50,24)	0.096	0.049	-4.90	21.42	22.00	0.110	2023/11/23	
Left Tilt 15 Degree	18900/1880	20M QPSK(50,24)	0.056	0.027	-4.85	21.42	22.00	0.064	2023/11/23	
Right Cheek	18900/1880	20M QPSK(50,24)	0.076	0.041	4.44	21.42	22.00	0.087	2023/11/23	
Right	18900/1880	20M QPSK(50,24)	0.040	0.023	-0.57	21.42	22.00	0.046	2023/11/23	

Tilt 15 Degree										
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NOTE: Head SAR test results of LTE Band 2

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	18900/1880	20M QPSK(1,0)	0.282	0.149	-3.86	22.62	23.00	0.308	2023/11/23	
Back Side	18900/1880	20M QPSK(1,0)	0.456	0.251	-1.87	22.62	23.00	0.498	2023/11/23	18#
50%RB										
Front Side	18900/1880	20M QPSK(50,24)	0.154	0.079	-2.06	21.42	22.00	0.176	2023/11/23	
Back Side	18900/1880	20M QPSK(50,24)	0.267	0.147	2.75	21.42	22.00	0.305	2023/11/23	

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducte d Power (dBm)	Tune-u p Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	18900/1880	20M QPSK(1,0)	0.282	0.149	-3.86	22.62	23.00	0.308	2023/11/23	
Back Side	18900/1880	20M QPSK(1,0)	0.456	0.251	-1.87	22.62	23.00	0.498	2023/11/23	18#
Left Side	18900/1880	20M QPSK(1,0)	0.138	0.074	3.41	22.62	23.00	0.151	2023/11/23	
Right Side	18900/1880	20M QPSK(1,0)	0.144	0.077	-2.12	22.62	23.00	0.157	2023/11/23	
Bottom Side	18900/1880	20M QPSK(1,0)	0.250	0.132	0.60	22.62	23.00	0.273	2023/11/23	
50%RB										
Front Side	18900/1880	20M QPSK(50,24)	0.154	0.079	-2.06	21.42	22.00	0.176	2023/11/23	
Back Side	18900/1880	20M QPSK(50,24)	0.267	0.147	2.75	21.42	22.00	0.305	2023/11/23	
Left Side	18900/1880	20M QPSK(50,24)	0.076	0.038	0.70	21.42	22.00	0.087	2023/11/23	
Right Side	18900/1880	20M QPSK(50,24)	0.085	0.042	-3.56	21.42	22.00	0.097	2023/11/23	
Bottom Side	18900/1880	20M QPSK(50,24)	0.134	0.066	0.46	21.42	22.00	0.153	2023/11/23	

NOTE: Hotspot SAR test results of LTE Band 2

10.1.7. SAR measurement Result of LTE Band 4

Test Position of Head	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Left Cheek	20175/1732.5	20M QPSK(1,49)	0.184	0.116	-3.42	23.40	23.50	0.188	2023/11/18	19#
Left Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.109	0.066	-3.96	23.40	23.50	0.112	2023/11/18	
Right Cheek	20175/1732.5	20M QPSK(1,49)	0.171	0.105	3.69	23.40	23.50	0.175	2023/11/18	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,49)	0.086	0.052	1.87	23.40	23.50	0.088	2023/11/18	
50%RB										
Left Cheek	20175/1732.5	20M QPSK(50,24)	0.110	0.064	-0.17	22.45	22.50	0.111	2023/11/18	
Left Tilt 15 Degree	20175/1732.5	20M QPSK(50,24)	0.055	0.038	-2.35	22.45	22.50	0.056	2023/11/18	
Right Cheek	20175/1732.5	20M QPSK(50,24)	0.100	0.055	2.80	22.45	22.50	0.101	2023/11/18	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(50,24)	0.047	0.031	4.64	22.45	22.50	0.048	2023/11/18	

NOTE: Head SAR test results of LTE Band 4

Test Position of Body- Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,49)	0.390	0.204	0.23	23.40	23.50	0.399	2023/11/18	

Back Side	20175/1732.5	20M QPSK(1,49)	0.606	0.334	-0.93	23.40	23.50	0.620	2023/11/18	20#
50%RB										
Front Side	20175/1732.5	20M QPSK(50,24)	0.199	0.120	0.90	22.45	22.50	0.201	2023/11/18	
Back Side	20175/1732.5	20M QPSK(50,24)	0.327	0.181	2.54	22.45	22.50	0.331	2023/11/18	

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,49)	0.390	0.204	0.23	23.40	23.50	0.399	2023/11/18	
Back Side	20175/1732.5	20M QPSK(1,49)	0.606	0.334	-0.93	23.40	23.50	0.620	2023/11/18	20#
Left Side	20175/1732.5	20M QPSK(1,49)	0.183	0.100	1.86	23.40	23.50	0.187	2023/11/18	
Right Side	20175/1732.5	20M QPSK(1,49)	0.186	0.097	0.56	23.40	23.50	0.190	2023/11/18	
Bottom Side	20175/1732.5	20M QPSK(1,49)	0.325	0.172	1.31	23.40	23.50	0.333	2023/11/18	
50%RB										
Front Side	20175/1732.5	20M QPSK(50,24)	0.199	0.120	0.90	22.45	22.50	0.201	2023/11/18	
Back Side	20175/1732.5	20M QPSK(50,24)	0.327	0.181	2.54	22.45	22.50	0.331	2023/11/18	
Left Side	20175/1732.5	20M QPSK(50,24)	0.109	0.059	-4.62	22.45	22.50	0.110	2023/11/18	
Right Side	20175/1732.5	20M QPSK(50,24)	0.098	0.050	0.15	22.45	22.50	0.099	2023/11/18	
Bottom Side	20175/1732.5	20M QPSK(50,24)	0.190	0.097	-1.36	22.45	22.50	0.192	2023/11/18	

NOTE: Hotspot SAR test results of LTE Band 4

10.1.8. SAR measurement Result of LTE Band 5

Test Position of Head	Test channel /Freq.	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)	0.118	0.091	-0.42	23.29	23.50	0.124	2023/11/24	21#
Left Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.063	0.048	-1.82	23.29	23.50	0.066	2023/11/24	
Right Cheek	20525/836.5	10M QPSK(1,24)	0.105	0.077	-2.61	23.29	23.50	0.110	2023/11/24	
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.055	0.042	-0.58	23.29	23.50	0.058	2023/11/24	
50%RB										
Left Cheek	20525/836.5	10M QPSK(25,12)	0.065	0.053	-0.03	22.32	22.50	0.068	2023/11/24	
Left Tilt 15 Degree	20525/836.5	10M QPSK(25,12)	0.035	0.025	4.86	22.32	22.50	0.036	2023/11/24	
Right Cheek	20525/836.5	10M QPSK(25,12)	0.053	0.040	-1.07	22.32	22.50	0.055	2023/11/24	
Right Tilt 15 Degree	20525/836.5	10M QPSK(25,12)	0.030	0.024	-0.67	22.32	22.50	0.031	2023/11/24	

NOTE: Head SAR test results of LTE Band 5

Test Position of Body-Worn with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	20525/836.5	10M QPSK(1,24)	0.138	0.096	-3.04	23.29	23.50	0.145	2023/11/24	

Back Side	20525/836.5	10M QPSK(1,24)	0.227	0.159	-0.74	23.29	23.50	0.238	2023/11/24	22#
50%RB										
Front Side	20525/836.5	10M QPSK(25,12)	0.074	0.055	4.24	22.32	22.50	0.077	2023/11/24	
Back Side	20525/836.5	10M QPSK(25,12)	0.129	0.083	1.52	22.32	22.50	0.134	2023/11/24	

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	20525/836.5	10M QPSK(1,24)	0.138	0.096	-3.04	23.29	23.50	0.145	2023/11/24	
Back Side	20525/836.5	10M QPSK(1,24)	0.227	0.159	-0.74	23.29	23.50	0.238	2023/11/24	22#
Left Side	20525/836.5	10M QPSK(1,24)	0.075	0.051	-3.38	23.29	23.50	0.079	2023/11/24	
Right Side	20525/836.5	10M QPSK(1,24)	0.069	0.047	0.88	23.29	23.50	0.072	2023/11/24	
Bottom Side	20525/836.5	10M QPSK(1,24)	0.125	0.087	3.53	23.29	23.50	0.131	2023/11/24	
50%RB										
Front Side	20525/836.5	10M QPSK(25,12)	0.074	0.055	4.24	22.32	22.50	0.077	2023/11/24	
Back Side	20525/836.5	10M QPSK(25,12)	0.129	0.083	1.52	22.32	22.50	0.134	2023/11/24	
Left Side	20525/836.5	10M QPSK(25,12)	0.044	0.029	2.53	22.32	22.50	0.046	2023/11/24	
Right Side	20525/836.5	10M QPSK(25,12)	0.040	0.024	0.75	22.32	22.50	0.042	2023/11/24	
Bottom Side	20525/836.5	10M QPSK(25,12)	0.073	0.049	1.75	22.32	22.50	0.076	2023/11/24	

NOTE: Hotspot SAR test results of LTE Band 5

10.1.9. SAR measurement Result of LTE Band 7

Test Position of Head	Test channel /Freq.	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)	0.273	0.145	2.38	23.35	23.50	0.283	2023/11/22	23#
Left Tilt 15 Degree	21100/2535	20M QPSK(1,49)	0.140	0.074	-1.90	23.35	23.50	0.145	2023/11/22	
Right Cheek	21100/2535	20M QPSK(1,49)	0.236	0.123	3.19	23.35	23.50	0.244	2023/11/22	
Right Tilt 15 Degree	21100/2535	20M QPSK(1,49)	0.108	0.057	0.88	23.35	23.50	0.112	2023/11/22	
50%RB										
Left Cheek	21100/2535	20M QPSK(50,24)	0.160	0.077	1.02	22.37	22.50	0.165	2023/11/22	
Left Tilt 15 Degree	21100/2535	20M QPSK(50,24)	0.072	0.043	3.02	22.37	22.50	0.074	2023/11/22	
Right Cheek	21100/2535	20M QPSK(50,24)	0.130	0.065	3.58	22.37	22.50	0.134	2023/11/22	
Right Tilt 15 Degree	21100/2535	20M QPSK(50,24)	0.060	0.031	-3.41	22.37	22.50	0.062	2023/11/22	

NOTE: Head SAR test results of LTE Band 7

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	21100/2535	20M QPSK(1,49)	0.438	0.210	-3.18	23.35	23.50	0.453	2023/11/22	
Back Side	21100/2535	20M QPSK(1,49)	0.695	0.336	0.05	23.35	23.50	0.719	2023/11/22	24#
50%RB										
Front Side	21100/2535	20M QPSK(50,24)	0.255	0.121	-2.06	22.37	22.50	0.263	2023/11/22	
Back Side	21100/2535	20M QPSK(50,24)	0.353	0.180	-4.24	22.37	22.50	0.364	2023/11/22	

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	21100/2535	20M QPSK(1,49)	0.438	0.210	-3.18	23.35	23.50	0.453	2023/11/22	
Back Side	21100/2535	20M QPSK(1,49)	0.695	0.336	0.05	23.35	23.50	0.719	2023/11/22	24#
Left Side	21100/2535	20M QPSK(1,49)	0.219	0.106	0.70	23.35	23.50	0.227	2023/11/22	
Right Side	21100/2535	20M QPSK(1,49)	0.222	0.108	-2.95	23.35	23.50	0.230	2023/11/22	
Bottom Side	21100/2535	20M QPSK(1,49)	0.365	0.169	-0.18	23.35	23.50	0.378	2023/11/22	
50%RB										
Front Side	21100/2535	20M QPSK(50,24)	0.255	0.121	-2.06	22.37	22.50	0.263	2023/11/22	
Back Side	21100/2535	20M QPSK(50,24)	0.353	0.180	-4.24	22.37	22.50	0.364	2023/11/22	
Left Side	21100/2535	20M QPSK(50,24)	0.127	0.057	-0.26	22.37	22.50	0.131	2023/11/22	
Right Side	21100/2535	20M QPSK(50,24)	0.130	0.061	2.92	22.37	22.50	0.134	2023/11/22	
Bottom Side	21100/2535	20M QPSK(50,24)	0.189	0.091	1.51	22.37	22.50	0.195	2023/11/22	

NOTE: Hotspot 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	23095/707.5	10M QPSK(1,24)	0.100	0.082	4.36	23.59	24.00	0.110	2023/12/05	25#

NOTE: Head SAR test results of LTE Band 12

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

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

1RB										
Front Side	23095/707.5	10M QPSK(1,24)	0.126	0.100	-3.26	23.59	24.00	0.138	2023/12/05	
Back Side	23095/707.5	10M QPSK(1,24)	0.189	0.154	-0.39	23.59	24.00	0.208	2023/12/05	26#
Left Side	23095/707.5	10M QPSK(1,24)	0.057	0.044	0.86	23.59	24.00	0.063	2023/12/05	
Right Side	23095/707.5	10M QPSK(1,24)	0.063	0.050	-0.06	23.59	24.00	0.069	2023/12/05	
Bottom Side	23095/707.5	10M QPSK(1,24)	0.110	0.090	-3.40	23.59	24.00	0.121	2023/12/05	
50%RB										
Front Side	23095/707.5	10M QPSK(25,24)	0.072	0.053	0.52	22.41	23.00	0.082	2023/12/05	
Back Side	23095/707.5	10M QPSK(25,24)	0.106	0.090	2.12	22.41	23.00	0.121	2023/12/05	
Left Side	23095/707.5	10M QPSK(25,24)	0.030	0.023	1.46	22.41	23.00	0.034	2023/12/05	
Right Side	23095/707.5	10M QPSK(25,24)	0.036	0.027	-2.35	22.41	23.00	0.041	2023/12/05	
Bottom Side	23095/707.5	10M QPSK(25,24)	0.055	0.046	-0.75	22.41	23.00	0.063	2023/12/05	

NOTE: Hotspot SAR test results of LTE Band 12

10.1.11. SAR measurement Result of LTE Band 13

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	23230/782	10M QPSK(1,0)	0.130	0.103	1.87	23.42	23.50	0.132	2023/12/05	27#
Left Tilt 15 Degree	23230/782	10M QPSK(1,0)	0.067	0.051	1.95	23.42	23.50	0.068	2023/12/05	
Right Cheek	23230/782	10M QPSK(1,0)	0.113	0.087	-0.40	23.42	23.50	0.115	2023/12/05	
Right	23230/782	10M QPSK(1,0)	0.053	0.042	-0.48	23.42	23.50	0.054	2023/12/05	

Tilt 15 Degree										
50%RB										
Left Cheek	23230/782	10M QPSK(25,12)	0.077	0.054	-3.97	22.35	22.50	0.080	2023/12/05	
Left Tilt 15 Degree	23230/782	10M QPSK(25,12)	0.038	0.027	-2.25	22.35	22.50	0.039	2023/12/05	
Right Cheek	23230/782	10M QPSK(25,12)	0.063	0.047	-3.15	22.35	22.50	0.065	2023/12/05	
Right Tilt 15 Degree	23230/782	10M QPSK(25,12)	0.032	0.022	-2.34	22.35	22.50	0.033	2023/12/05	

NOTE: Head SAR test results of LTE Band 13

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	23230/782	10M QPSK(1,0)	0.150	0.111	2.76	23.42	23.50	0.153	2023/12/05	
Back Side	23230/782	10M QPSK(1,0)	0.209	0.163	-0.98	23.42	23.50	0.213	2023/12/05	28#
50%RB										
Front Side	23230/782	10M QPSK(25,12)	0.090	0.066	3.04	22.35	22.50	0.093	2023/12/05	
Back Side	23230/782	10M QPSK(25,12)	0.124	0.095	3.43	22.35	22.50	0.128	2023/12/05	

NOTE: Body-Worn SAR test results of LTE Band 13

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	23230/782	10M QPSK(1,0)	0.150	0.111	2.76	23.42	23.50	0.153	2023/12/05	
Back Side	23230/782	10M QPSK(1,0)	0.209	0.163	-0.98	23.42	23.50	0.213	2023/12/05	28#
Left Side	23230/782	10M QPSK(1,0)	0.063	0.047	-0.89	23.42	23.50	0.064	2023/12/05	

Right Side	23230/782	10M QPSK(1,0)	0.066	0.049	-0.71	23.42	23.50	0.067	2023/12/05	
Bottom Side	23230/782	10M QPSK(1,0)	0.110	0.084	0.06	23.42	23.50	0.112	2023/12/05	
50%RB										
Front Side	23230/782	10M QPSK(25,12)	0.090	0.066	3.04	22.35	22.50	0.093	2023/12/05	
Back Side	23230/782	10M QPSK(25,12)	0.124	0.095	3.43	22.35	22.50	0.128	2023/12/05	
Left Side	23230/782	10M QPSK(25,12)	0.033	0.025	4.63	22.35	22.50	0.034	2023/12/05	
Right Side	23230/782	10M QPSK(25,12)	0.037	0.027	4.95	22.35	22.50	0.038	2023/12/05	
Bottom Side	23230/782	10M QPSK(25,12)	0.057	0.047	3.56	22.35	22.50	0.059	2023/12/05	

NOTE: Hotspot SAR test results of LTE Band 13

10.1.12. 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(1,0)	0.106	0.087	0.85	23.44	23.50	0.107	2023/12/05	29#
Left Tilt 15 Degree	23790/710	10M QPSK(1,0)	0.054	0.043	-1.26	23.44	23.50	0.055	2023/12/05	
Right Cheek	23790/710	10M QPSK(1,0)	0.096	0.078	2.03	23.44	23.50	0.097	2023/12/05	
Right Tilt 15 Degree	23790/710	10M QPSK(1,0)	0.052	0.043	-1.91	23.44	23.50	0.053	2023/12/05	
50%RB										
Left Cheek	23790/710	10M QPSK(25,12)	0.060	0.046	-3.96	22.29	22.50	0.063	2023/12/05	
Left Tilt 15	23790/710	10M QPSK(25,12)	0.029	0.022	1.91	22.29	22.50	0.030	2023/12/05	

Degree										
Right Cheek	23790/710	10M QPSK(25,12)	0.055	0.041	0.50	22.29	22.50	0.058	2023/12/05	
Right Tilt 15 Degree	23790/710	10M QPSK(25,12)	0.027	0.022	1.48	22.29	22.50	0.028	2023/12/05	

NOTE: Head SAR test results of LTE Band 17

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	23790/710	10M QPSK(1,0)	0.120	0.095	-2.66	23.44	23.50	0.122	2023/12/05	
Back Side	23790/710	10M QPSK(1,0)	0.196	0.161	-0.52	23.44	23.50	0.199	2023/12/05	30#
50%RB										
Front Side	23790/710	10M QPSK(25,12)	0.072	0.055	-3.29	22.29	22.50	0.076	2023/12/05	
Back Side	23790/710	10M QPSK(25,12)	0.111	0.093	-2.00	22.29	22.50	0.116	2023/12/05	

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

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	23790/710	10M QPSK(1,0)	0.120	0.095	-2.66	23.44	23.50	0.122	2023/12/05	
Back Side	23790/710	10M QPSK(1,0)	0.196	0.161	-0.52	23.44	23.50	0.199	2023/12/05	30#
Left Side	23790/710	10M QPSK(1,0)	0.072	0.058	-2.47	23.44	23.50	0.073	2023/12/05	
Right Side	23790/710	10M QPSK(1,0)	0.074	0.059	3.07	23.44	23.50	0.075	2023/12/05	
Bottom Side	23790/710	10M QPSK(1,0)	0.100	0.082	-1.33	23.44	23.50	0.101	2023/12/05	
50%RB										
Front Side	23790/710	10M QPSK(25,12)	0.072	0.055	-3.29	22.29	22.50	0.076	2023/12/05	

Back Side	23790/710	10M QPSK(25,12)	0.111	0.093	-2.00	22.29	22.50	0.116	2023/12/05	
Left Side	23790/710	10M QPSK(25,12)	0.038	0.030	2.12	22.29	22.50	0.040	2023/12/05	
Right Side	23790/710	10M QPSK(25,12)	0.043	0.030	-0.48	22.29	22.50	0.045	2023/12/05	
Bottom Side	23790/710	10M QPSK(25,12)	0.058	0.043	-3.81	22.29	22.50	0.061	2023/12/05	

NOTE: Hotspot SAR test results of LTE Band 17

10.1.13. 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)	0.151	0.079	-1.69	24.05	24.50	0.167	2023/11/22	31#
Left Tilt 15 Degree	40640/2595	20M QPSK(1,49)	0.085	0.044	0.81	24.05	24.50	0.094	2023/11/22	
Right Cheek	40640/2595	20M QPSK(1,49)	0.142	0.071	3.04	24.05	24.50	0.158	2023/11/22	
Right Tilt 15 Degree	40640/2595	20M QPSK(1,49)	0.076	0.038	1.01	24.05	24.50	0.084	2023/11/22	
50%RB										
Left Cheek	40640/2595	20M QPSK(50,0)	0.079	0.043	-2.34	23.11	23.50	0.086	2023/11/22	
Left Tilt 15 Degree	40640/2595	20M QPSK(50,0)	0.050	0.023	3.70	23.11	23.50	0.055	2023/11/22	
Right Cheek	40640/2595	20M QPSK(50,0)	0.074	0.042	0.70	23.11	23.50	0.081	2023/11/22	
Right Tilt 15 Degree	40640/2595	20M QPSK(50,0)	0.040	0.020	-4.84	23.11	23.50	0.044	2023/11/22	

NOTE: Head SAR test results of LTE Band 41

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	40640/2595	20M QPSK(1,49)	0.366	0.170	3.76	24.05	24.50	0.406	2023/11/22	
Back Side	40640/2595	20M QPSK(1,49)	0.576	0.279	1.36	24.05	24.50	0.639	2023/11/22	32#
50%RB										
Front Side	40640/2595	20M QPSK(50,0)	0.194	0.088	-3.48	23.11	23.50	0.212	2023/11/22	
Back Side	40640/2595	20M QPSK(50,0)	0.289	0.156	-0.58	23.11	23.50	0.316	2023/11/22	

NOTE: Body-Worn SAR test results of LTE Band 41

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	40640/2595	20M QPSK(1,49)	0.366	0.170	3.76	24.05	24.50	0.406	2023/11/22	
Back Side	40640/2595	20M QPSK(1,49)	0.576	0.279	1.36	24.05	24.50	0.639	2023/11/22	32#
Left Side	40640/2595	20M QPSK(1,49)	0.183	0.086	-0.34	24.05	24.50	0.203	2023/11/22	
Right Side	40640/2595	20M QPSK(1,49)	0.185	0.087	0.69	24.05	24.50	0.205	2023/11/22	
Bottom Side	40640/2595	20M QPSK(1,49)	0.290	0.133	1.52	24.05	24.50	0.322	2023/11/22	
50%RB										
Front Side	40640/2595	20M QPSK(50,0)	0.194	0.088	-3.48	23.11	23.50	0.212	2023/11/22	
Back Side	40640/2595	20M QPSK(50,0)	0.289	0.156	-0.58	23.11	23.50	0.316	2023/11/22	
Left Side	40640/2595	20M QPSK(50,0)	0.110	0.051	-3.82	23.11	23.50	0.120	2023/11/22	
Right Side	40640/2595	20M QPSK(50,0)	0.093	0.046	-1.67	23.11	23.50	0.102	2023/11/22	
Bottom Side	40640/2595	20M QPSK(50,0)	0.155	0.078	-1.00	23.11	23.50	0.170	2023/11/22	

NOTE: Hotspot SAR test results of LTE Band 41

10.1.14. SAR measurement Result of WLAN2.4G

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	0.257	0.137	-3.10	16.01	16.50	0.288	2023/11/17	15#
Left Tilt 15 Degree	6/2437	802.11b	0.146	0.075	-3.10	16.01	16.50	0.163	2023/11/17	
Right Cheek	6/2437	802.11b	0.222	0.112	0.84	16.01	16.50	0.249	2023/11/17	
Right Tilt 15 Degree	6/2437	802.11b	0.107	0.056	4.00	16.01	16.50	0.120	2023/11/17	

NOTE: Head SAR test results of WLAN2.4G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	6/2437	802.11b	0.144	0.078	-0.25	16.01	16.50	0.161	2023/11/17	
Back Side	6/2437	802.11b	0.213	0.117	3.94	16.01	16.50	0.238	2023/11/17	16#

NOTE: Body-worn SAR test results of WLAN2.4G

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	6/2437	802.11b	0.144	0.078	-0.25	16.01	16.50	0.161	2023/11/17	
Back Side	6/2437	802.11b	0.213	0.117	3.94	16.01	16.50	0.238	2023/11/17	16#
Right	6/2437	802.11b	0.069	0.037	3.62	16.01	16.50	0.077	2023/11/17	

Side										
Top Side	6/2437	802.11b	0.078	0.041	-0.95	16.01	16.50	0.087	2023/11/17	

NOTE: Hotspot SAR test results of WLAN2.4G

10.1.15. SAR measurement Result of WLAN5.2G

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	48/5240	802.11a	0.247	0.121	2.40	11.60	12.00	0.271	2023/11/21	11#
Left Tilt 15 Degree	48/5240	802.11a	0.142	0.068	0.98	11.60	12.00	0.156	2023/11/21	
Right Cheek	48/5240	802.11a	0.219	0.104	3.17	11.60	12.00	0.240	2023/11/21	
Right Tilt 15 Degree	48/5240	802.11a	0.115	0.056	-1.48	11.60	12.00	0.126	2023/11/21	

NOTE: Head SAR test results of WLAN5.2G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	48/5240	802.11a	0.180	0.091	0.37	11.60	12.00	0.197	2023/11/21	
Back Side	48/5240	802.11a	0.252	0.132	-2.20	11.60	12.00	0.276	2023/11/21	14#

NOTE: Body-worn SAR test results of WLAN5.2G

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	48/5240	802.11a	0.180	0.091	0.37	11.60	12.00	0.197	2023/11/21	
Back Side	48/5240	802.11a	0.252	0.132	-2.20	11.60	12.00	0.276	2023/11/21	14#

Right Side	48/5240	802.11a	0.090	0.045	-2.31	11.60	12.00	0.099	2023/11/21	
Top Side	48/5240	802.11a	0.081	0.041	-3.66	11.60	12.00	0.089	2023/11/21	

NOTE: Hotspot SAR test results of WLAN5.2G

10.1.16. SAR measurement Result of WLAN5.8G

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	0.213	0.112	-1.07	12.70	13.00	0.228	2023/11/20	12#
Left Tilt 15 Degree	165/5825	802.11a	0.119	0.060	0.63	12.70	13.00	0.128	2023/11/20	
Right Cheek	165/5825	802.11a	0.198	0.102	1.56	12.70	13.00	0.212	2023/11/20	
Right Tilt 15 Degree	165/5825	802.11a	0.106	0.055	0.50	12.70	13.00	0.114	2023/11/20	

NOTE: Head SAR test results of WLAN5.8G

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	165/5825	802.11a	0.108	0.062	-2.62	12.70	13.00	0.116	2023/11/20	
Back Side	165/5825	802.11a	0.164	0.099	0.92	12.70	13.00	0.176	2023/11/20	13#

NOTE: Body-worn SAR test results of WLAN5.8G

Test Position of Hotspot with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front	165/5825	802.11a	0.108	0.062	-2.62	12.70	13.00	0.116	2023/11/20	

Side										
Back Side	165/5825	802.11a	0.164	0.099	0.92	12.70	13.00	0.176	2023/11/20	13#
Right Side	165/5825	802.11a	0.060	0.035	-2.78	12.70	13.00	0.064	2023/11/20	
Top Side	165/5825	802.11a	0.063	0.036	-1.20	12.70	13.00	0.068	2023/11/20	

NOTE: Hotspot SAR test results of WLAN5.8G

10.1.17. SAR measurement Result of Bluetooth

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	39/2441	1DH5	0.063	0.043	0.23	9.27	10.00	0.075	2023/11/17	33#
Left Tilt 15 Degree	39/2441	1DH5	0.033	0.021	3.70	9.27	10.00	0.039	2023/11/17	
Right Cheek	39/2441	1DH5	0.056	0.037	-2.24	9.27	10.00	0.066	2023/11/17	
Right Tilt 15 Degree	39/2441	1DH5	0.030	0.019	0.02	9.27	10.00	0.035	2023/11/17	

NOTE: Head SAR test results of Bluetooth

Test Position of Body-Worn with 10mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	39/2441	1DH5	0.028	0.018	3.55	9.27	10.00	0.033	2023/11/17	
Back Side	39/2441	1DH5	0.033	0.022	2.13	9.27	10.00	0.039	2023/11/17	34#

NOTE: Body-worn SAR test results of Bluetooth

Test Position of Hotspot	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						

with 10mm										
Front Side	39/2441	1DH5	0.028	0.018	3.55	9.27	10.00	0.033	2023/11/17	
Back Side	39/2441	1DH5	0.033	0.022	2.13	9.27	10.00	0.039	2023/11/17	34#
Right Side	39/2441	1DH5	0.018	0.014	1.22	9.27	10.00	0.021	2023/11/17	
Top Side	39/2441	1DH5	0.015	0.013	-2.45	9.27	10.00	0.018	2023/11/17	

NOTE: Hotspot SAR test results of Bluetooth

10.2. Simultaneous Transmission Analysis

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	0.283	0.288	0.571	N/A	N/A
	Left Tilt 15 Degree	0.145	0.163	0.308	N/A	N/A
	Right Cheek	0.244	0.249	0.493	N/A	N/A
	Right Tilt 15 Degree	0.112	0.120	0.232	N/A	N/A
Body-Worn	Front Side	0.453	0.161	0.614	N/A	N/A
	Back Side	0.719	0.238	0.957	N/A	N/A
Hotspot	Front Side	0.453	0.161	0.614	N/A	N/A
	Back Side	0.719	0.238	0.957	N/A	N/A
	Left Side	0.227	N/A	0.227	N/A	N/A
	Right Side	0.230	0.077	0.307	N/A	N/A
	Top Side	N/A	0.087	0.087	N/A	N/A
	Bottom Side	0.378	N/A	0.378	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	NII			
Head	Left Cheek	0.283	0.271	0.554	N/A	N/A
	Left Tilt 15 Degree	0.145	0.156	0.301	N/A	N/A
	Right Cheek	0.244	0.240	0.484	N/A	N/A
	Right Tilt 15 Degree	0.112	0.126	0.238	N/A	N/A
Body-Worn	Front Side	0.453	0.197	0.650	N/A	N/A
	Back Side	0.719	0.276	0.995	N/A	N/A
Hotspot	Front Side	0.453	0.197	0.650	N/A	N/A
	Back Side	0.719	0.276	0.995	N/A	N/A
	Left Side	0.227	N/A	0.227	N/A	N/A
	Right Side	0.230	0.099	0.329	N/A	N/A
	Top Side	N/A	0.089	0.089	N/A	N/A
	Bottom Side	0.378	N/A	0.378	N/A	N/A

Test Position		Scaled SAR _{MAX}		Σ 1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Head	Left Cheek	0.283	0.075	0.358	N/A	N/A
	Left Tilt 15 Degree	0.145	0.039	0.184	N/A	N/A
	Right Cheek	0.244	0.066	0.310	N/A	N/A
	Right Tilt 15 Degree	0.112	0.035	0.147	N/A	N/A
Body-Worn	Front Side	0.453	0.033	0.486	N/A	N/A
	Back Side	0.719	0.039	0.758	N/A	N/A
Hotspot	Front Side	0.453	0.033	0.486	N/A	N/A
	Back Side	0.719	0.039	0.758	N/A	N/A
	Left Side	0.227	N/A	0.227	N/A	N/A
	Right Side	0.230	0.021	0.251	N/A	N/A
	Top Side	N/A	0.018	0.018	N/A	N/A
	Bottom Side	0.378	N/A	0.378	N/A	N/A

1. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

2. Appendix B. System Check Plots

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MEASUREMENT 8 System Performance Check - 5800MHz

MEASUREMENT 1

Date of measurement: 5/12/2023

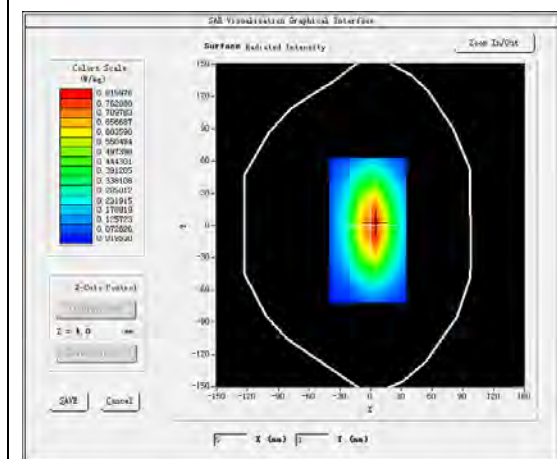
A. Experimental conditions.

<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>

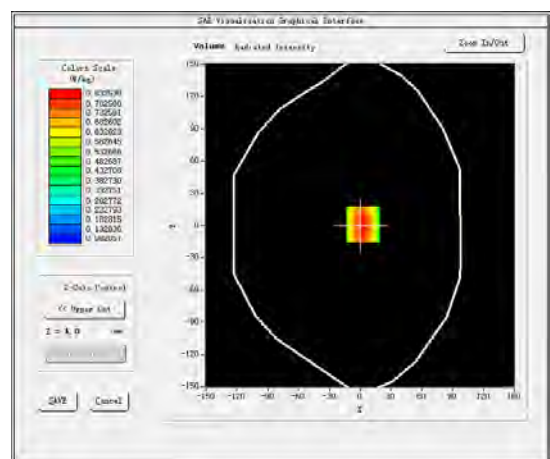
B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative permittivity (real part)	42.032105
Relative permittivity (imaginary part)	21.999511
Conductivity (S/m)	0.916646
Variation (%)	2.730000

SURFACE SAR



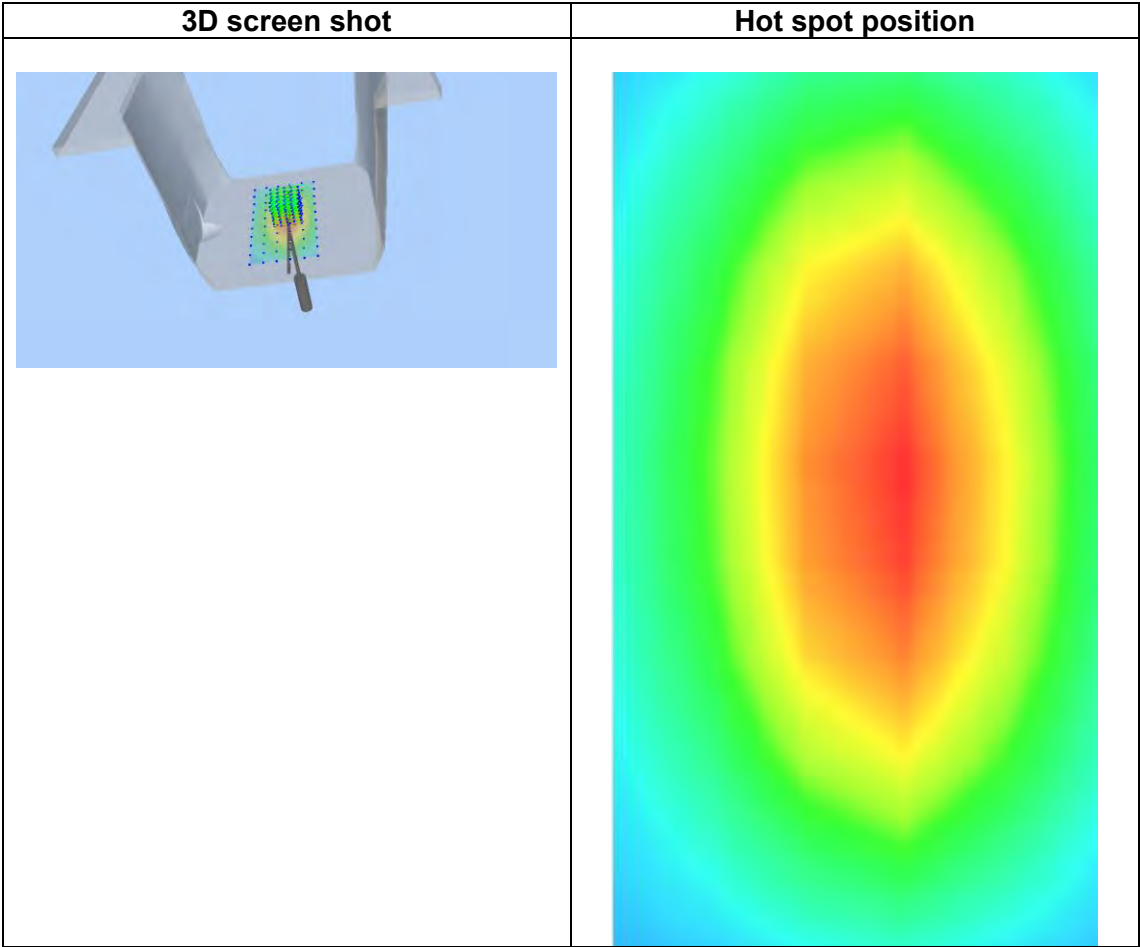
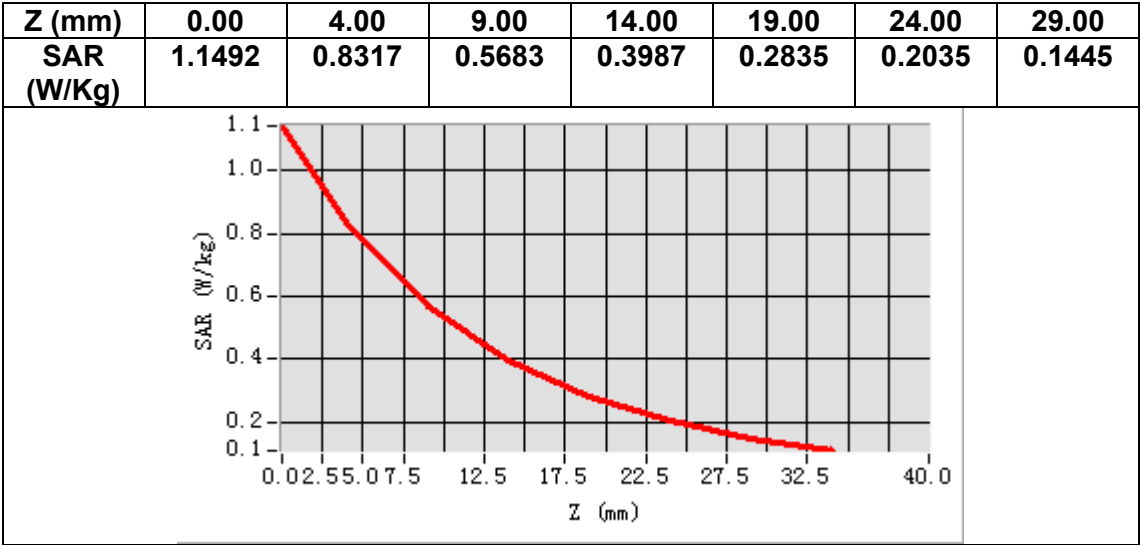
VOLUME SAR



Maximum location: X=3.00, Y=1.00

SAR Peak: 1.14 W/kg

SAR 10g (W/Kg)	0.549332
SAR 1g (W/Kg)	0.889321



MEASUREMENT 2

Date of measurement: 24/11/2023

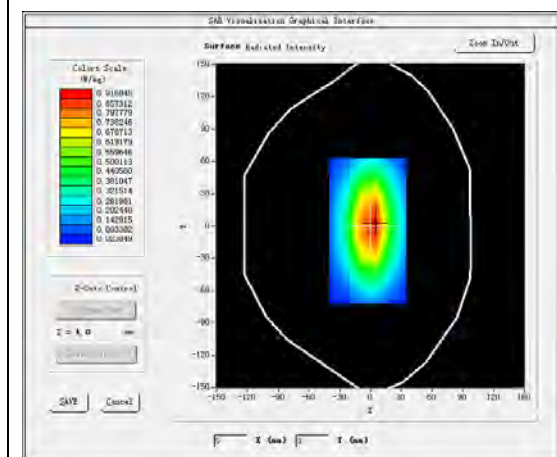
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW835</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

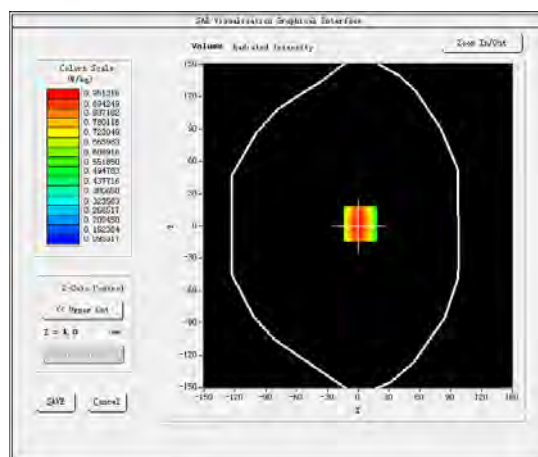
B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.553681
Relative permittivity (imaginary part)	19.433996
Conductivity (S/m)	0.901521
Variation (%)	-2.720000

SURFACE SAR



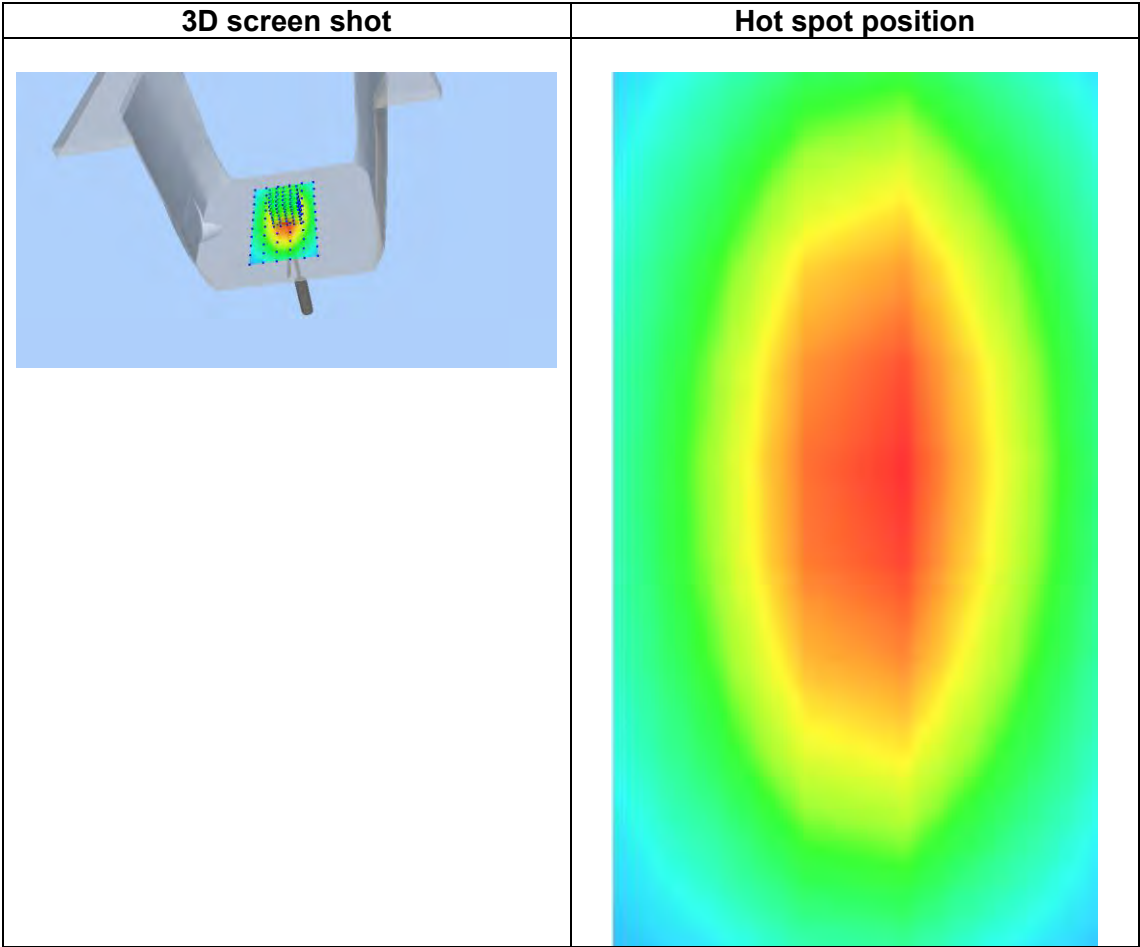
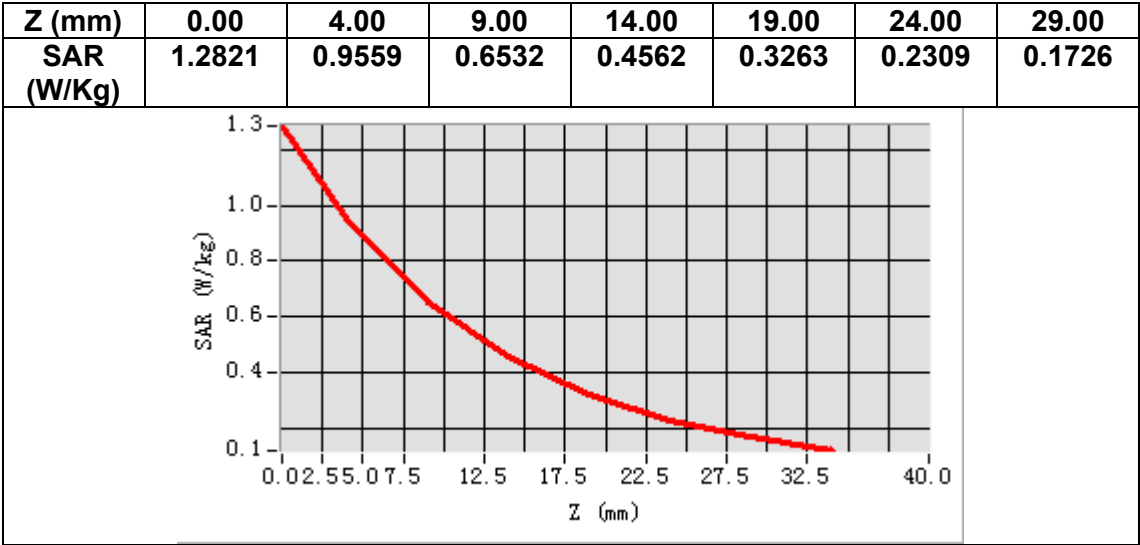
VOLUME SAR



Maximum location: X=2.00, Y=2.00

SAR Peak: 1.29 W/kg

SAR 10g (W/Kg)	0.664333
SAR 1g (W/Kg)	0.916172



MEASUREMENT 3

Date of measurement: 18/11/2023

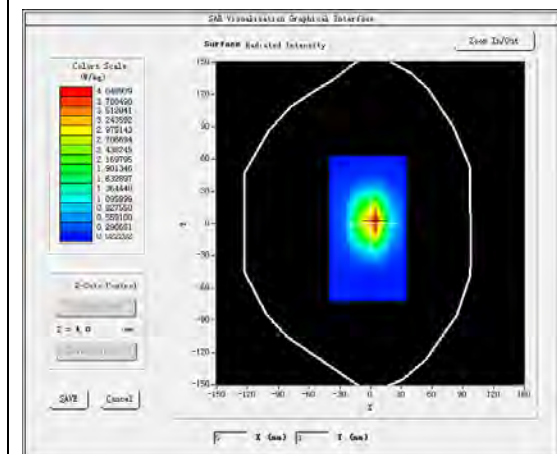
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW1800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

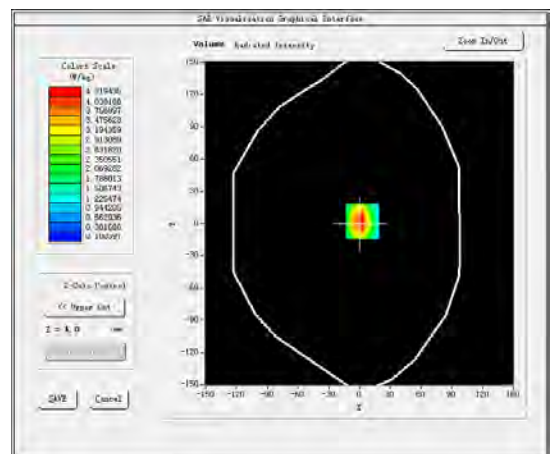
B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.760980
Relative permittivity (imaginary part)	14.043729
Conductivity (S/m)	1.404373
Variation (%)	2.980000

SURFACE SAR



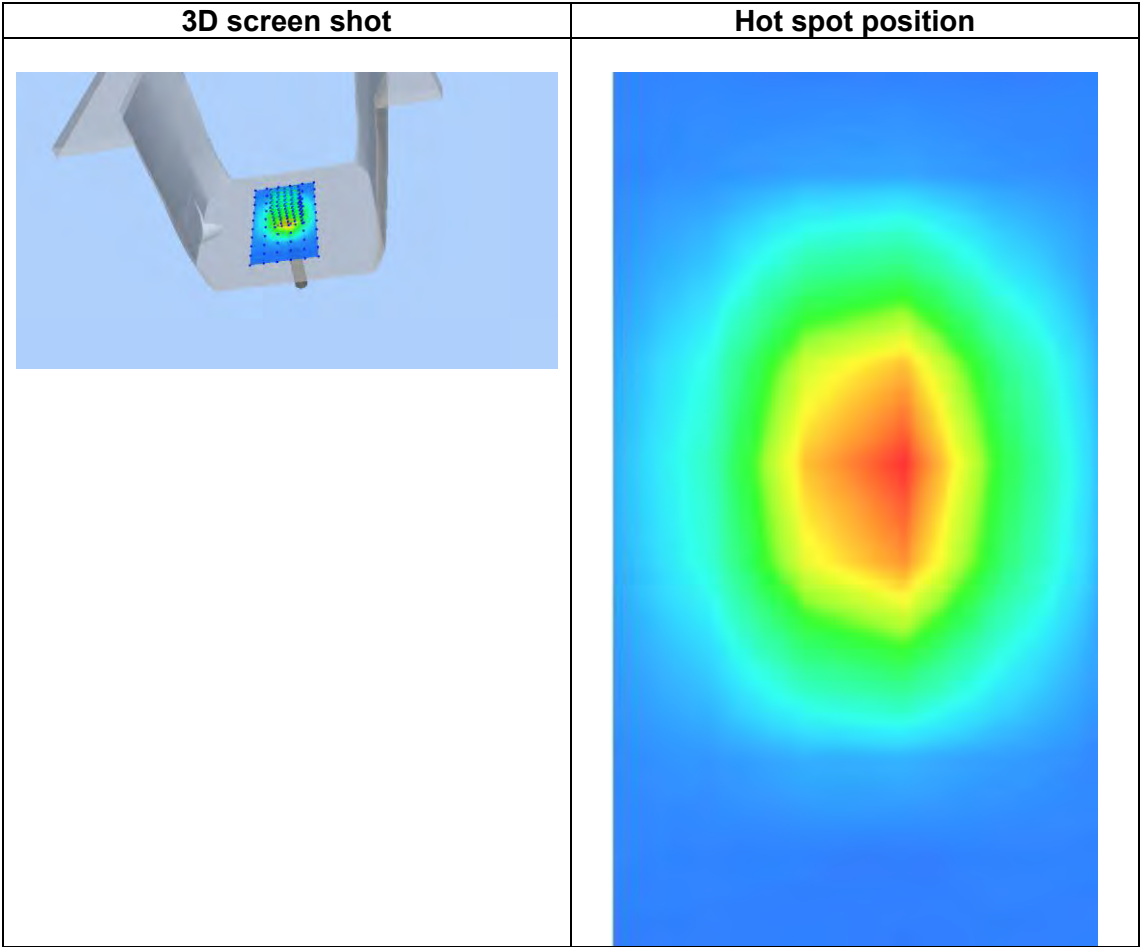
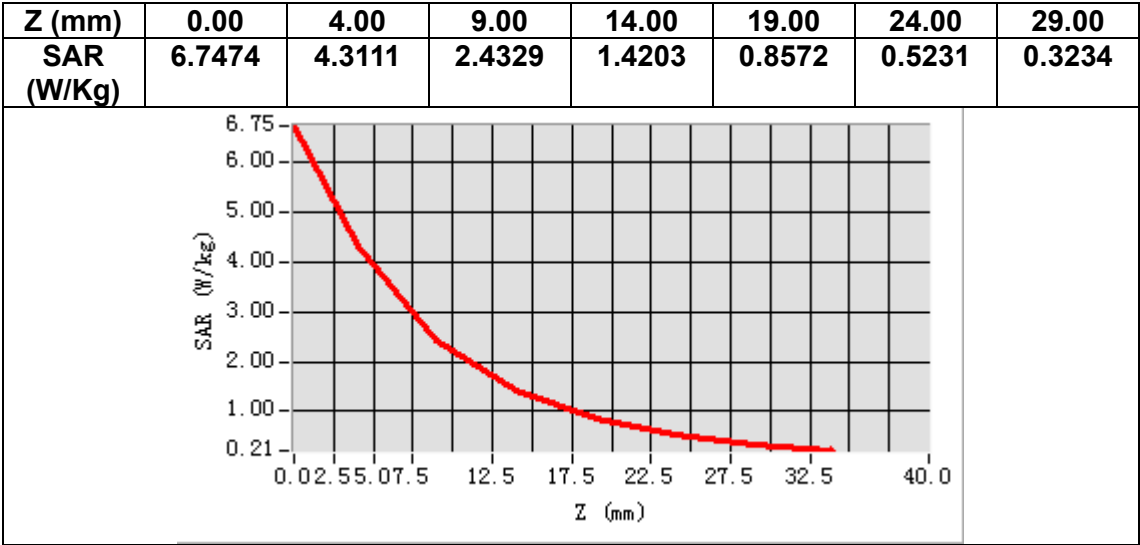
VOLUME SAR



Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	1.830307
SAR 1g (W/Kg)	4.144066



MEASUREMENT 4

Date of measurement: 23/11/2023

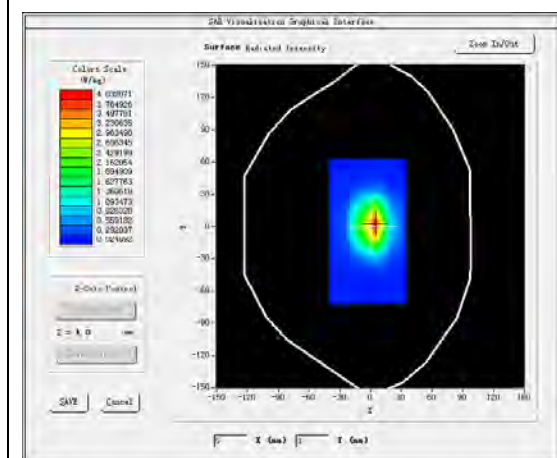
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1900</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>2.63</u>

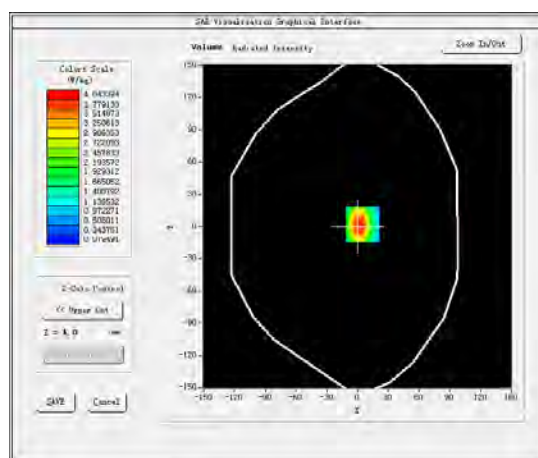
B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.125400
Relative permittivity (imaginary part)	13.791900
Conductivity (S/m)	1.455812
Variation (%)	2.220000

SURFACE SAR



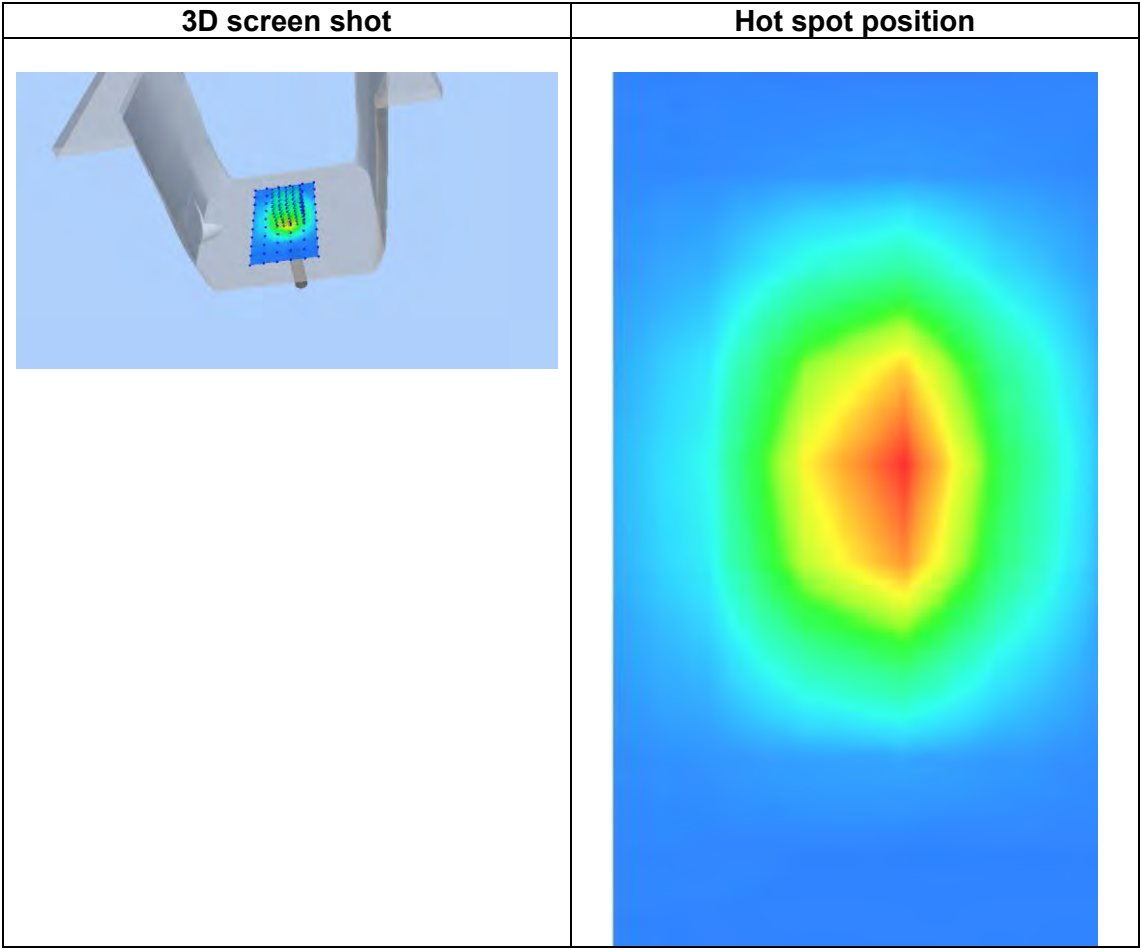
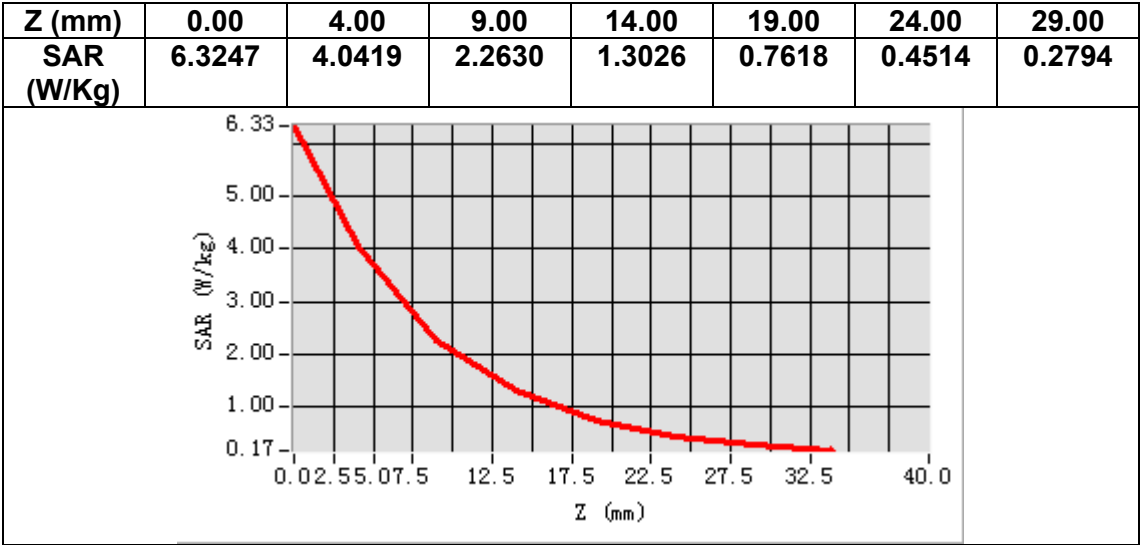
VOLUME SAR



Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	2.009347
SAR 1g (W/Kg)	4.321221



MEASUREMENT 5

Date of measurement: 17/11/2023

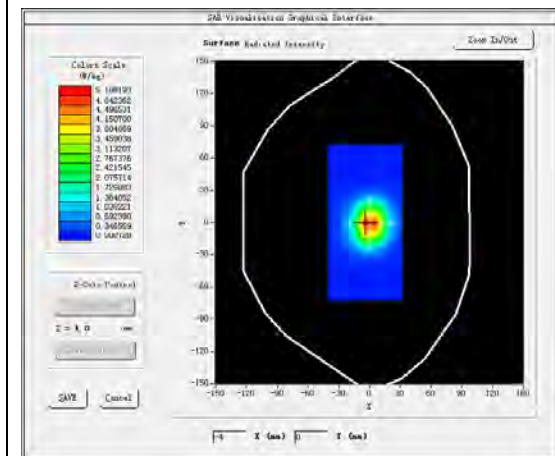
A. Experimental conditions.

<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>

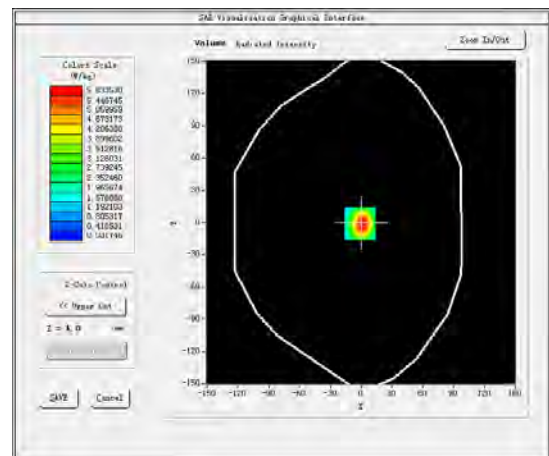
B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	38.581112
Relative permittivity (imaginary part)	13.098152
Conductivity (S/m)	1.782804
Variation (%)	1.290000

SURFACE SAR



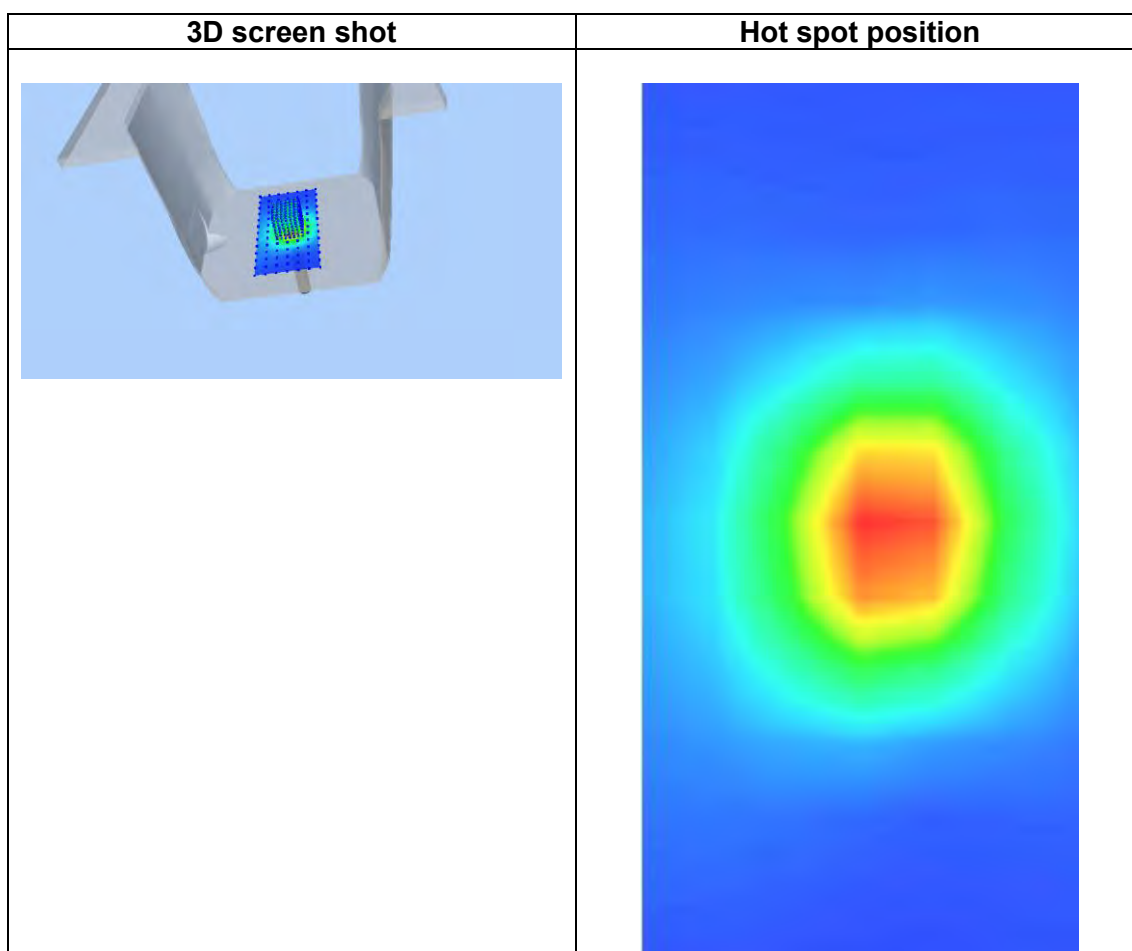
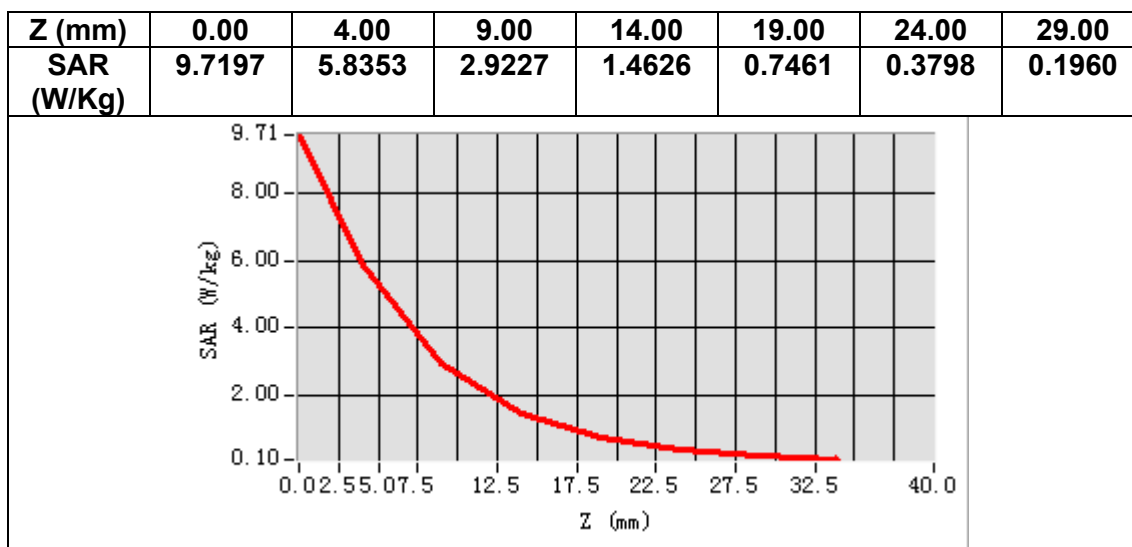
VOLUME SAR



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

SAR Peak: 9.83 W/kg

SAR 10g (W/Kg)	2.301106
SAR 1g (W/Kg)	5.405340



MEASUREMENT 6

Date of measurement: 22/11/2023

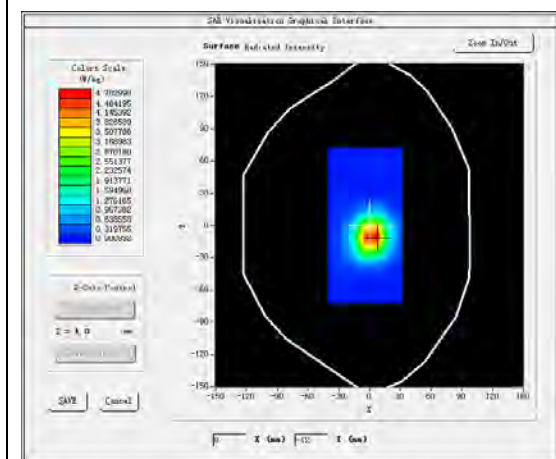
A. Experimental conditions.

<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>

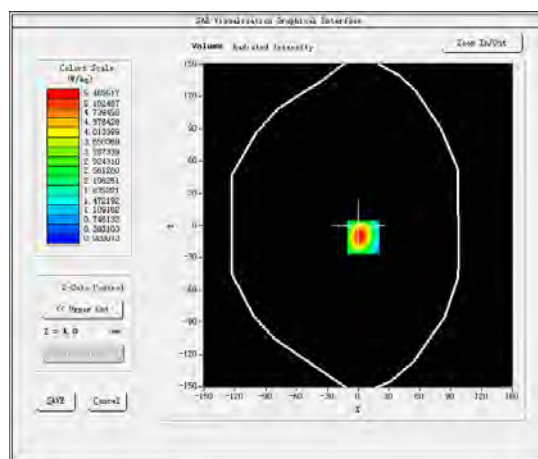
B. SAR Measurement Results

Frequency (MHz)	2600.000000
Relative permittivity (real part)	38.476551
Relative permittivity (imaginary part)	13.220156
Conductivity (S/m)	1.909578
Variation (%)	0.250000

SURFACE SAR



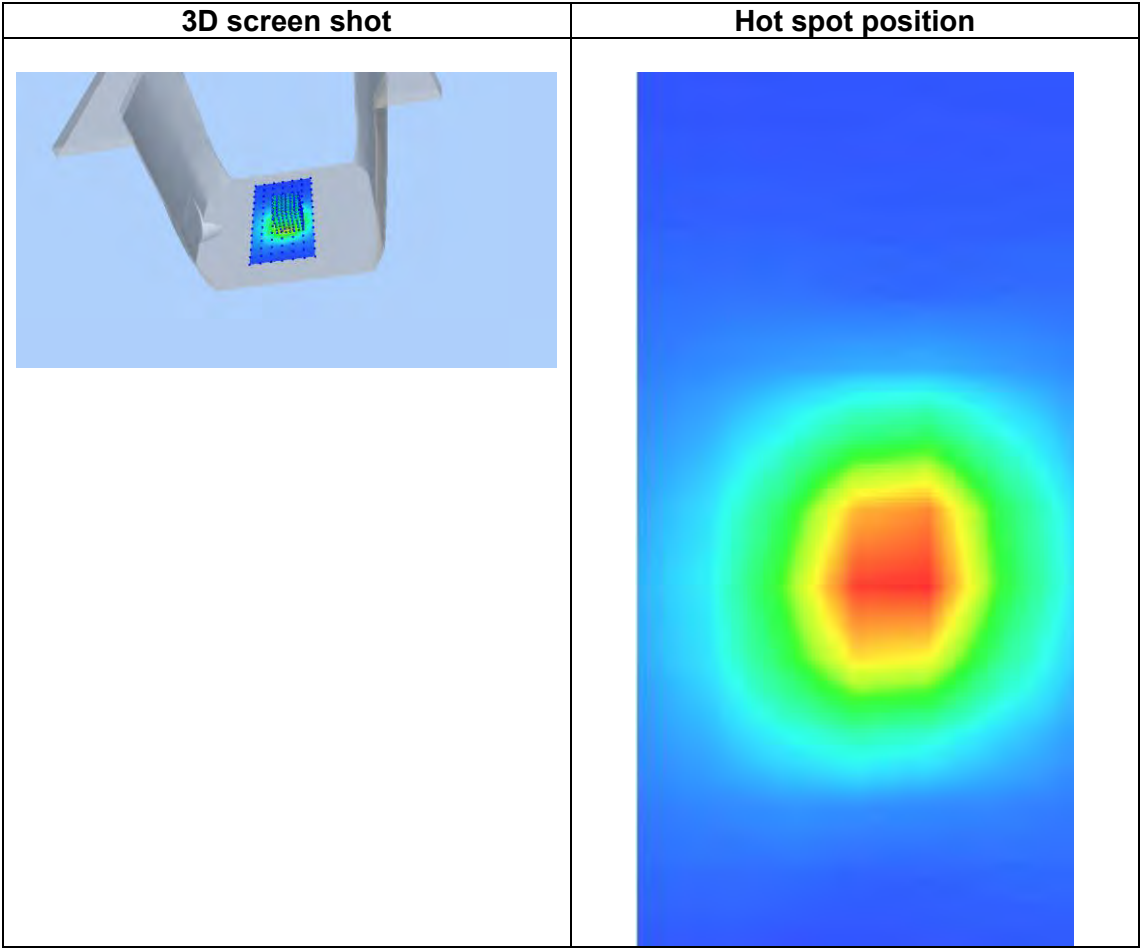
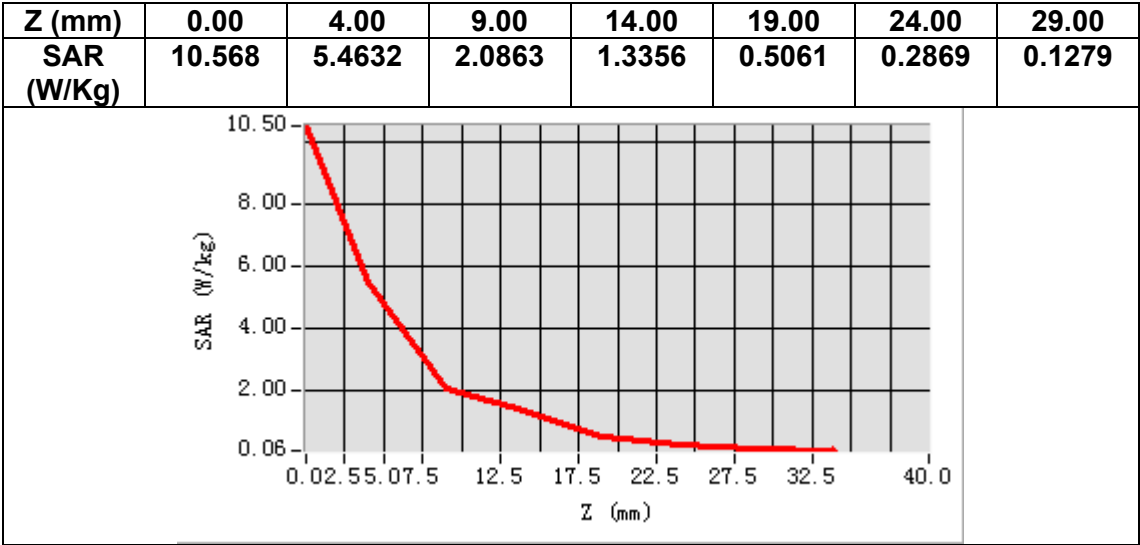
VOLUME SAR



Maximum location: X=5.00, Y=-11.00

SAR Peak: 9.43 W/kg

SAR 10g (W/Kg)	2.208037
SAR 1g (W/Kg)	5.745199



MEASUREMENT 7

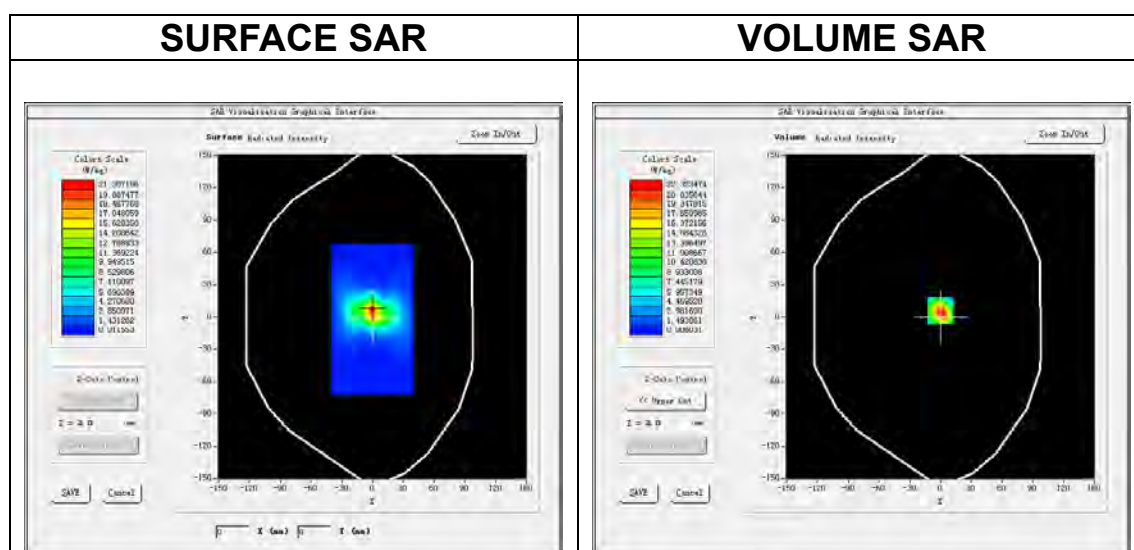
Date of measurement: 21/11/2023

A. Experimental conditions.

Area Scan	<u>dx=10mm dy=10mm, h= 2.00 mm</u>
ZoomScan	<u>7x7x12,dx=4mm dy=4mm dz=2mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW5200</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>2.07</u>

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	35.511032
Relative permittivity (imaginary part)	15.578512
Conductivity (S/m)	4.500459
Variation (%)	2.800000

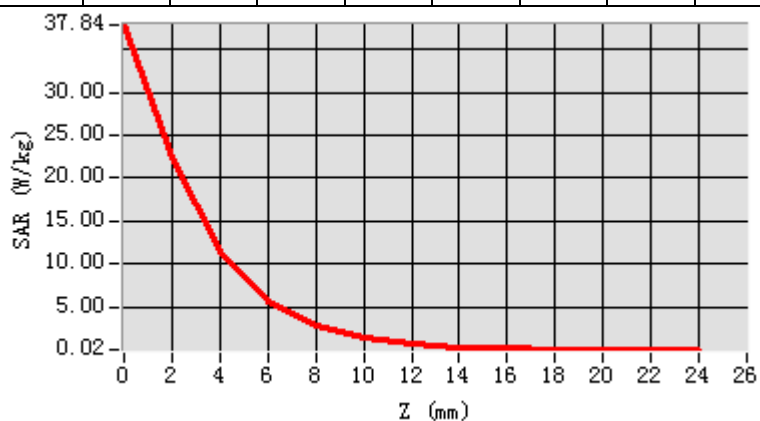


Maximum location: X=0.00, Y=6.00

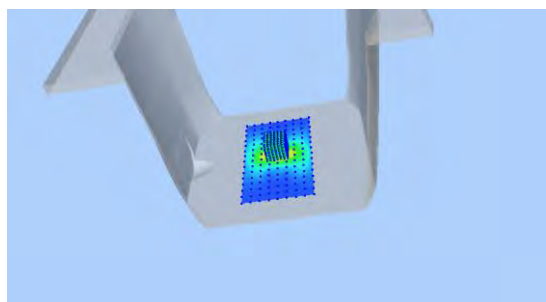
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.130162
SAR 1g (W/Kg)	17.717032

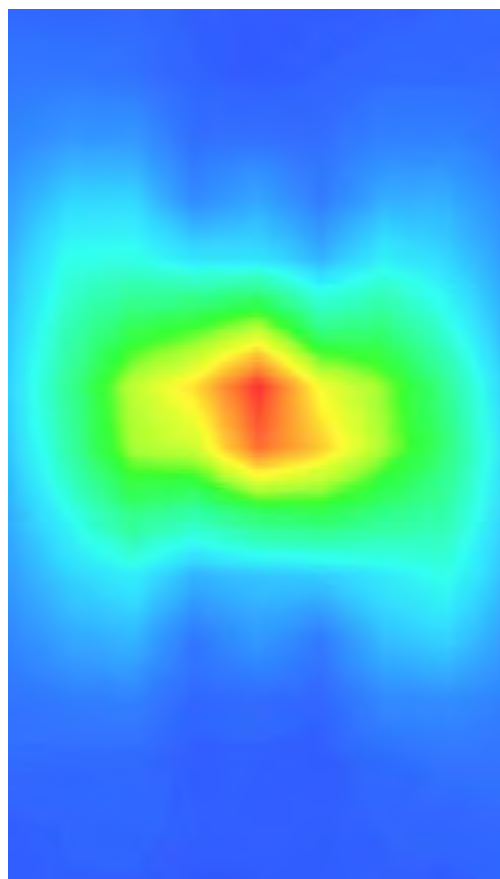
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	37.8 91	22.3 91	11.3 77	5.66 94	2.82 91	1.40 43	0.71 50	0.36 37	0.18 02	0.10 08	0.05 27	0.03 97



3D screen shot



Hot spot position



MEASUREMENT 8

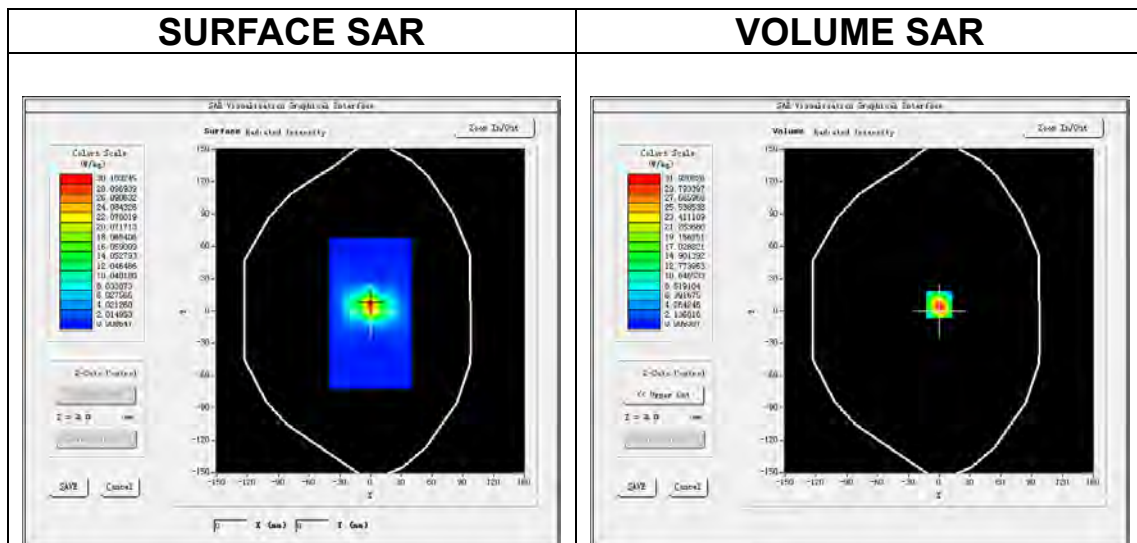
Date of measurement: 20/11/2023

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>2.04</u>

B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	35.048533
Relative permittivity (imaginary part)	16.525915
Conductivity (S/m)	5.325017
Variation (%)	-0.500000

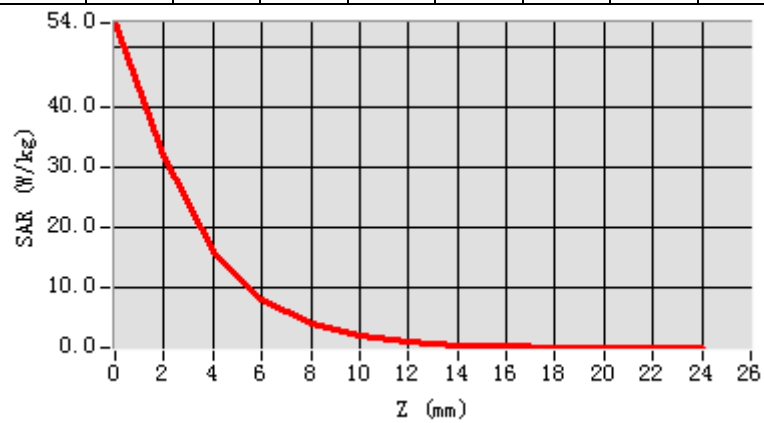


Maximum location: X=0.00, Y=6.00

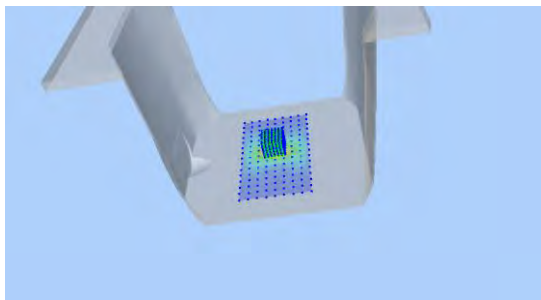
SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.422228
SAR 1g (W/Kg)	18.346190

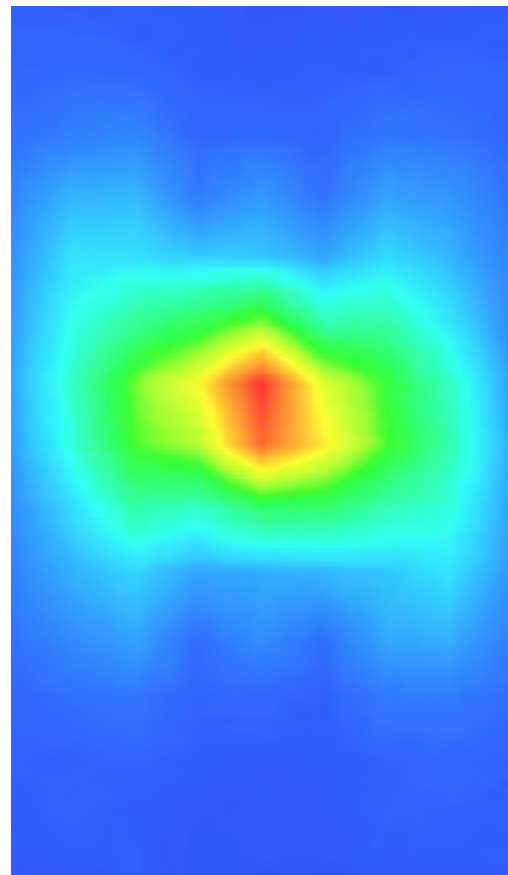
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	54.0 36	31.9 48	16.1 44	8.17 66	4.08 90	2.05 50	1.03 61	0.51 44	0.27 95	0.15 72	0.07 88	0.04 38



3D screen shot



Hot spot position



1. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 23 LTE Band 7 Head
MEASUREMENT 24 LTE Band 7 Body
MEASUREMENT 25 LTE Band 12 Head
MEASUREMENT 26 LTE Band 12 Body
MEASUREMENT 27 LTE Band 13 Head
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MEASUREMENT 32 LTE Band 41 Body
MEASUREMENT 33 Bluetooth Head
MEASUREMENT 34 Bluetooth Body

MEASUREMENT 1

Date of measurement: 24/11/2023

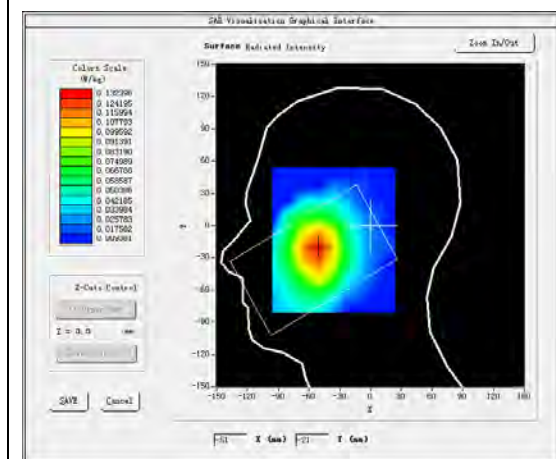
A. Experimental conditions.

<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>2.32</u>

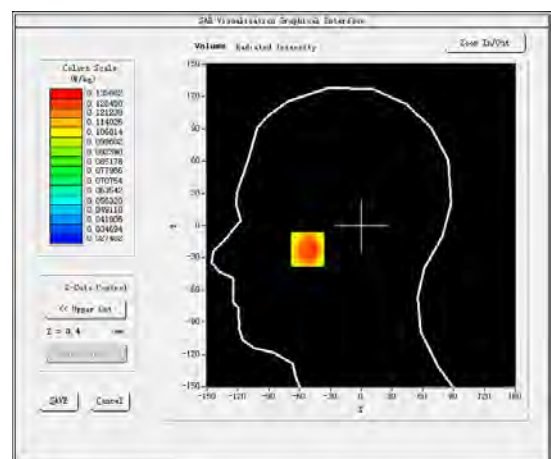
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.562759
Relative permittivity (imaginary part)	19.441196
Conductivity (S/m)	0.903368
Variation (%)	1.470000

SURFACE SAR



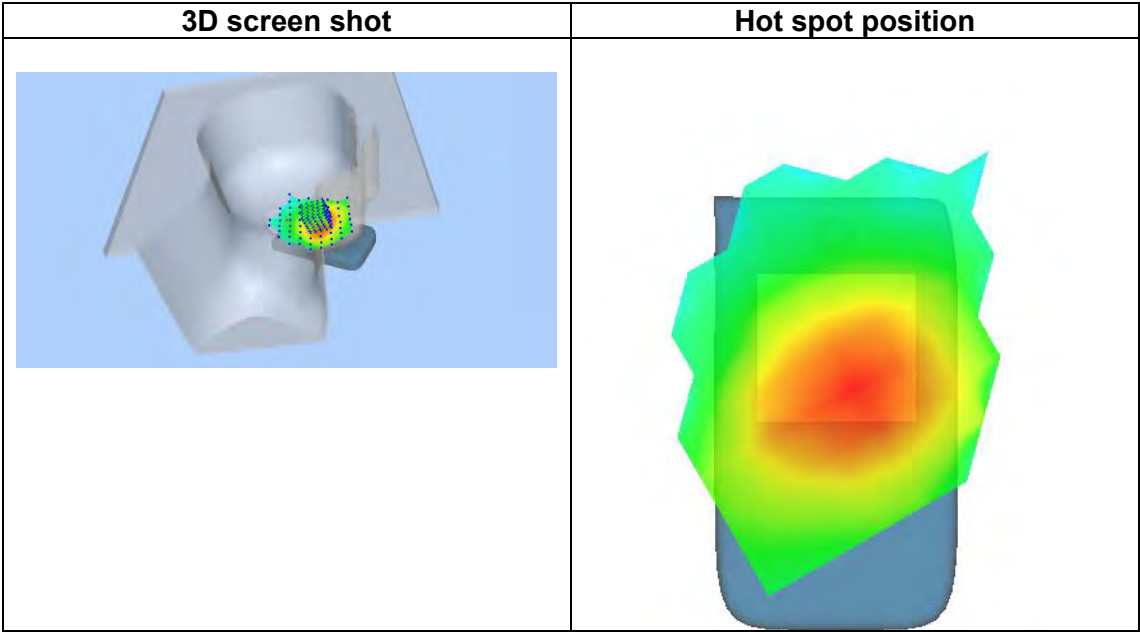
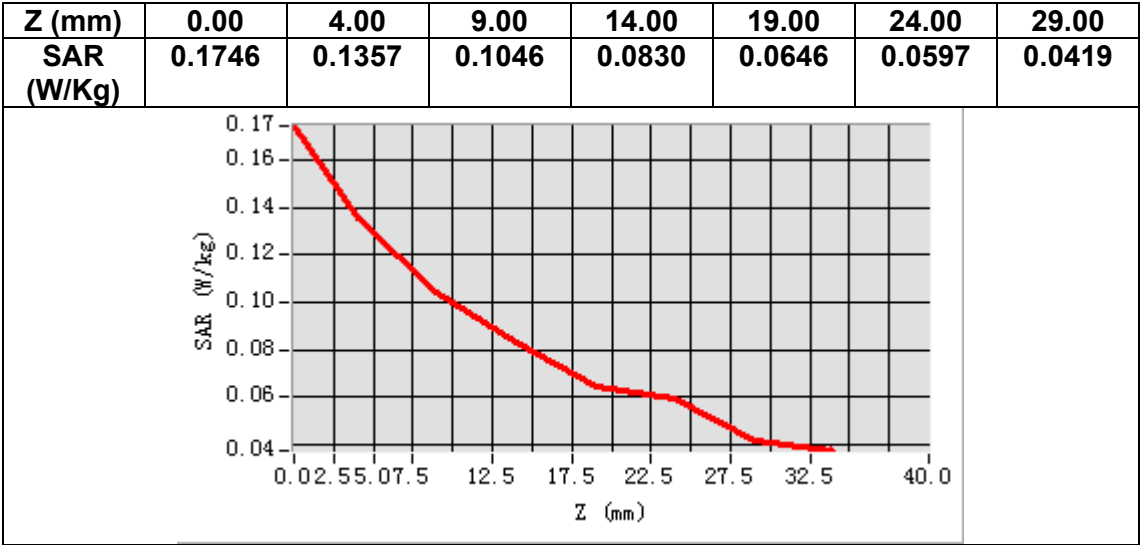
VOLUME SAR



Maximum location: X=-52.00, Y=-22.00

SAR Peak: 0.18 W/kg

SAR 10g (W/Kg)	0.097173
SAR 1g (W/Kg)	0.129271



MEASUREMENT 2

Date of measurement: 24/11/2023

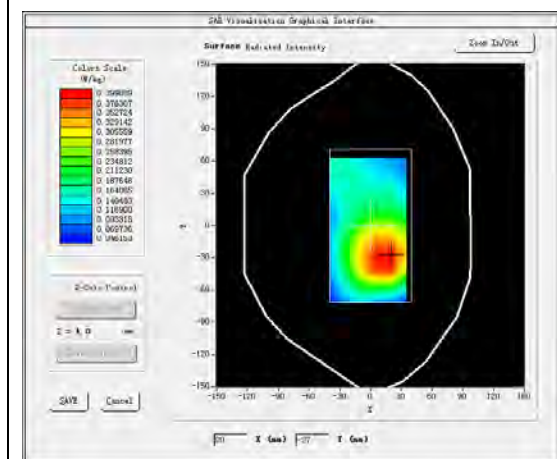
A. Experimental conditions.

<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>2.32</u>

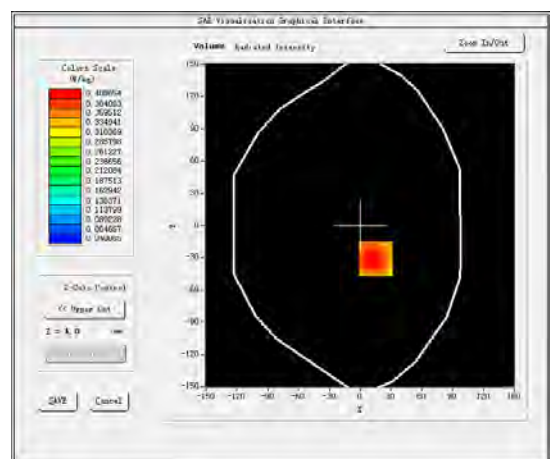
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.562759
Relative permittivity (imaginary part)	19.441196
Conductivity (S/m)	0.903368
Variation (%)	-1.400000

SURFACE SAR



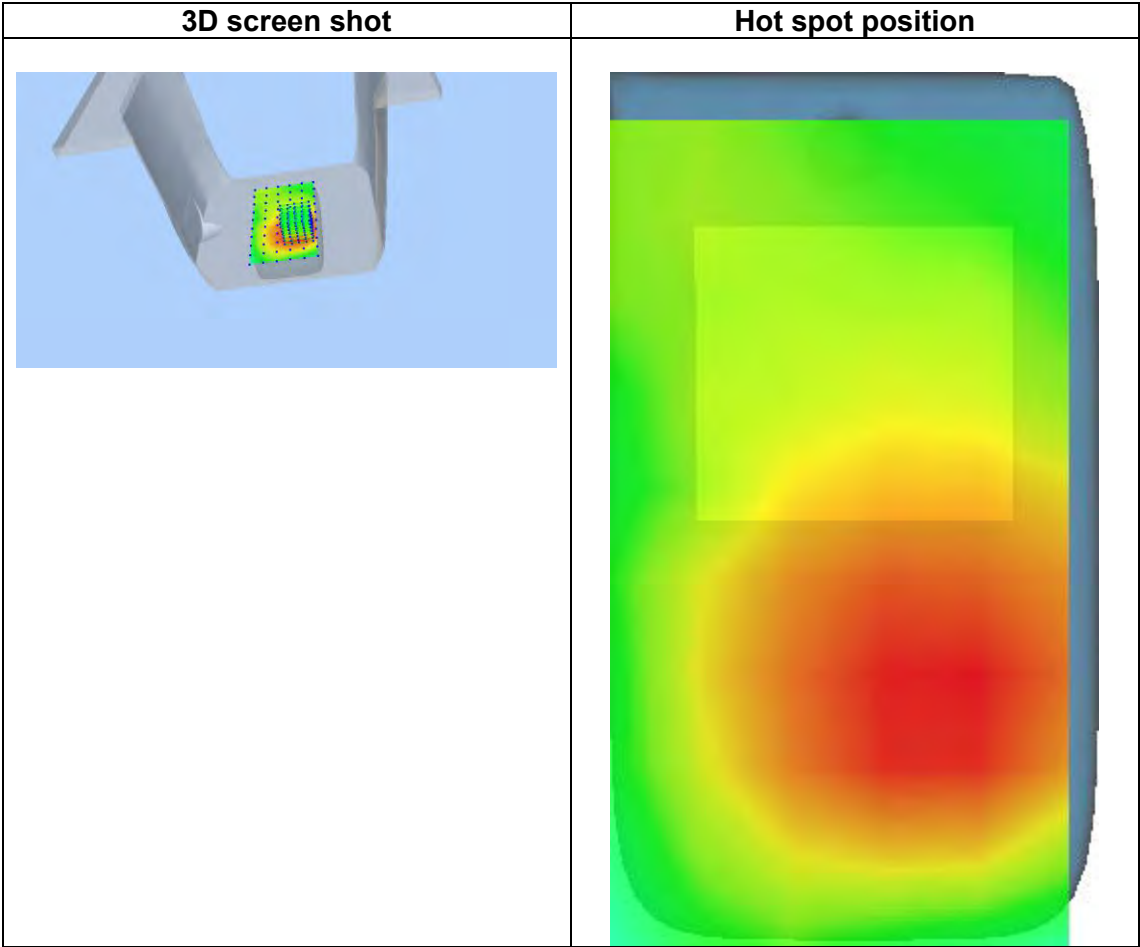
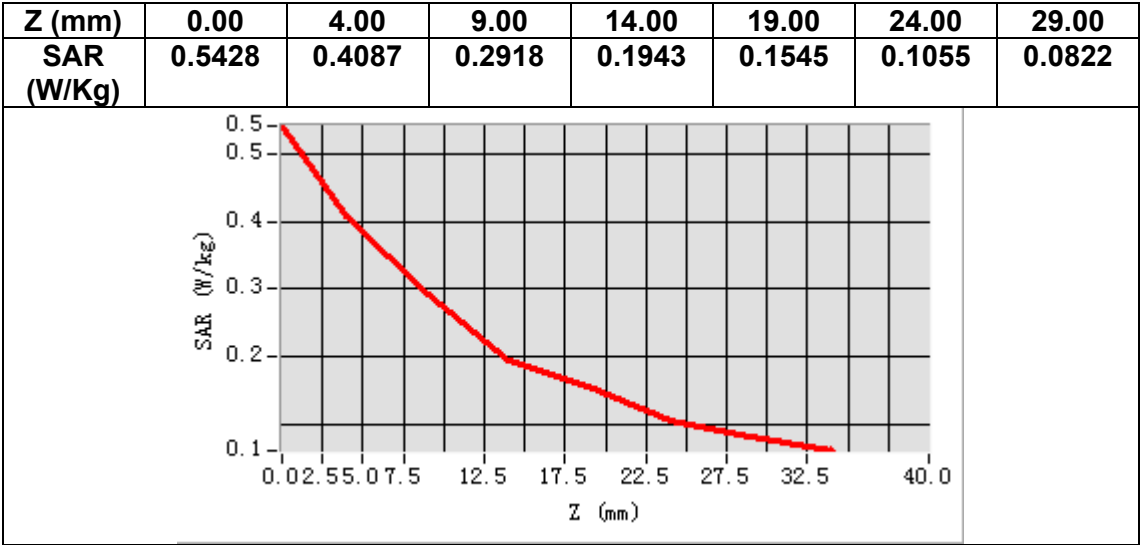
VOLUME SAR



Maximum location: X=15.00, Y=-31.00

SAR Peak: 0.58 W/kg

SAR 10g (W/Kg)	0.276229
SAR 1g (W/Kg)	0.404681



MEASUREMENT 3

Date of measurement: 23/11/2023

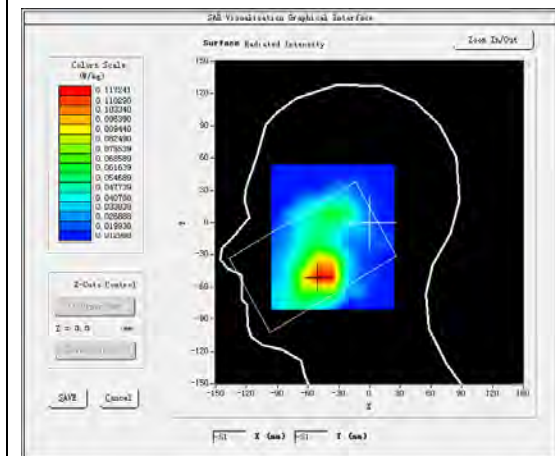
A. Experimental conditions.

<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>2.63</u>

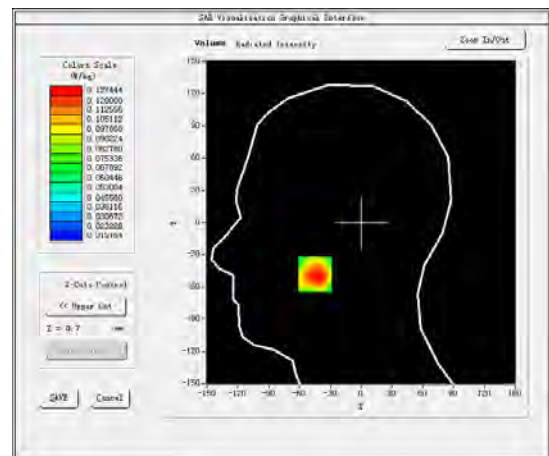
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	0.910000

SURFACE SAR



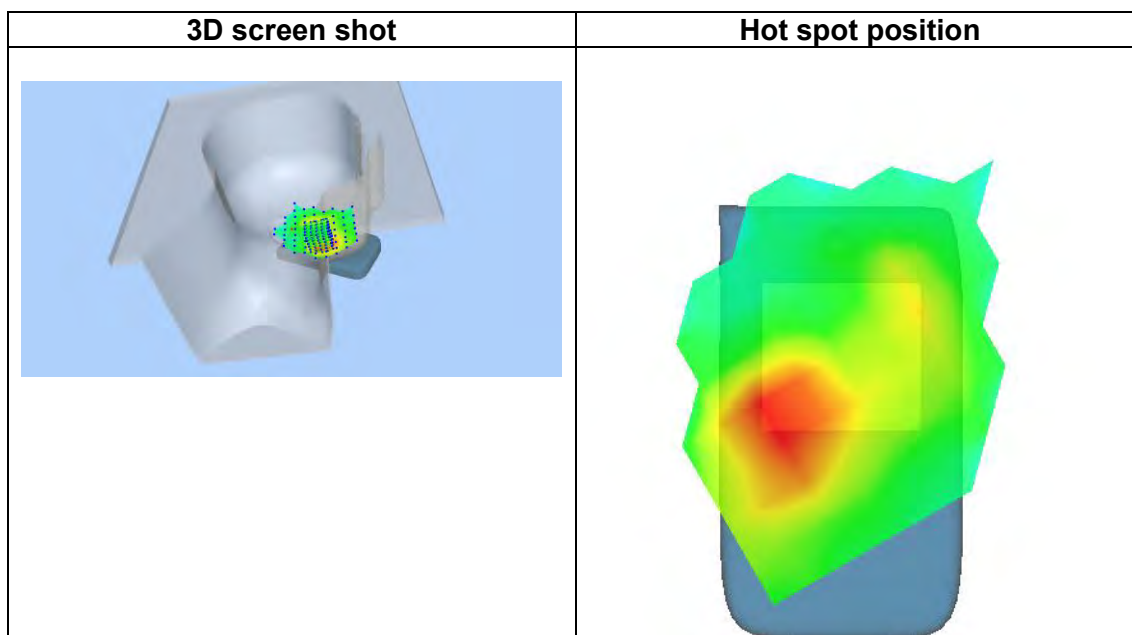
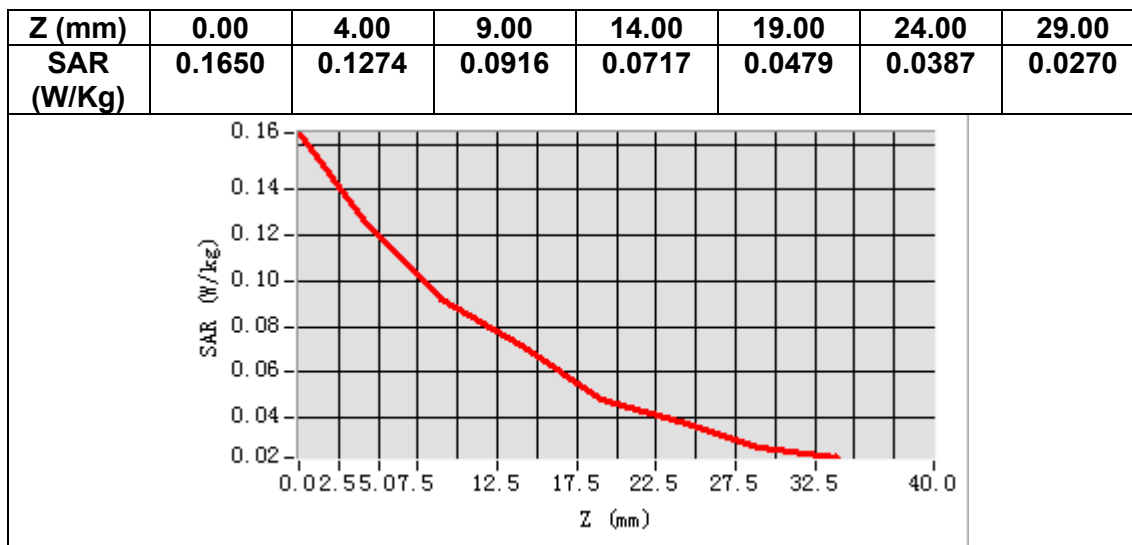
VOLUME SAR



Maximum location: X=-45.00, Y=-48.00

SAR Peak: 0.19 W/kg

SAR 10g (W/Kg)	0.080926
SAR 1g (W/Kg)	0.129692



MEASUREMENT 4

Date of measurement: 23/11/2023

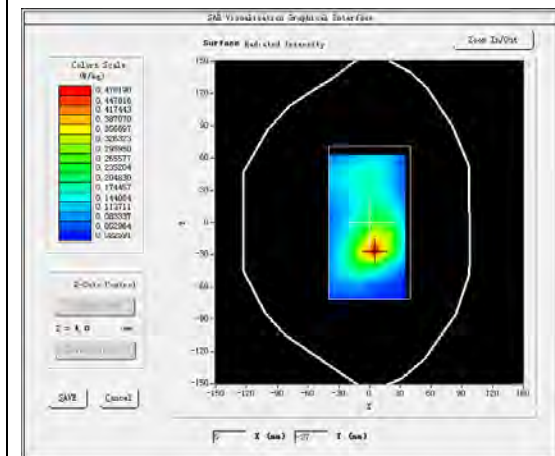
A. Experimental conditions.

<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>2.63</u>

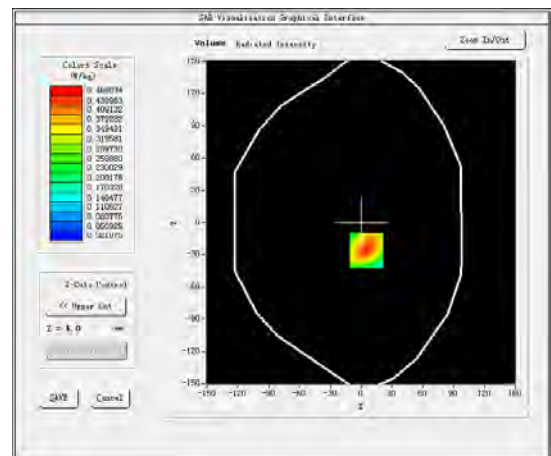
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	1.640000

SURFACE SAR



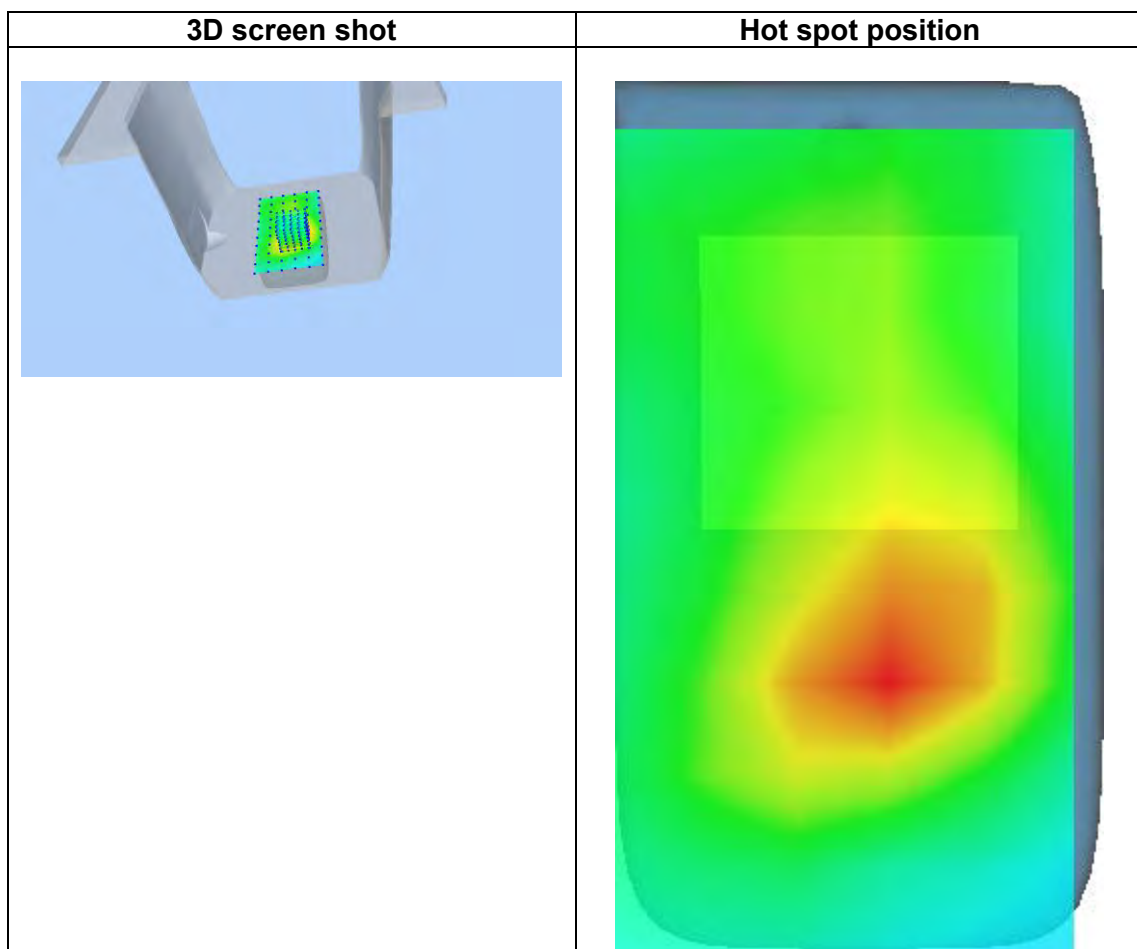
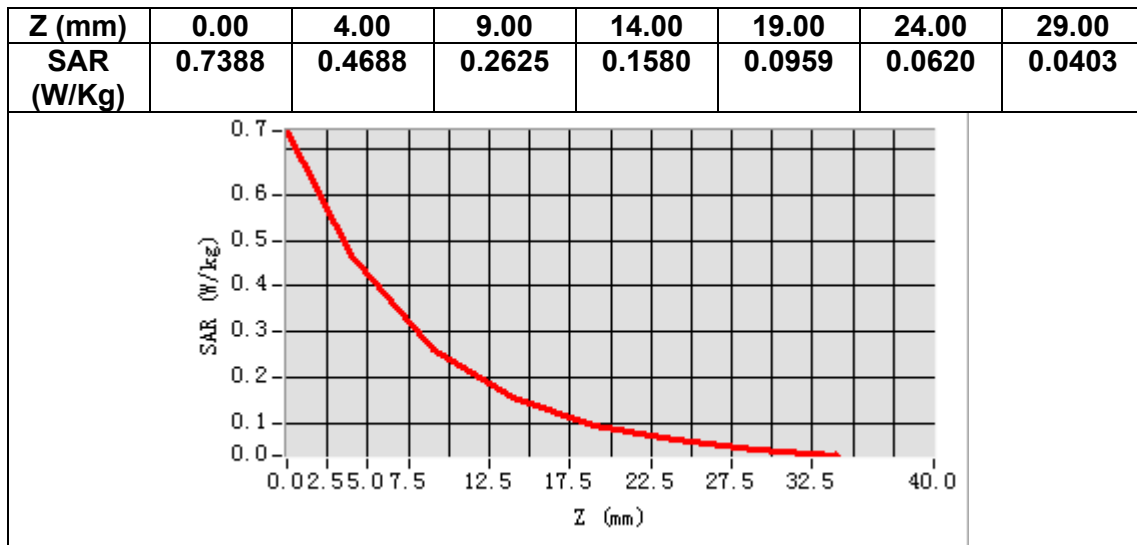
VOLUME SAR



Maximum location: X=5.00, Y=-26.00

SAR Peak: 0.73 W/kg

SAR 10g (W/Kg)	0.247835
SAR 1g (W/Kg)	0.452767



MEASUREMENT 5

Date of measurement: 23/11/2023

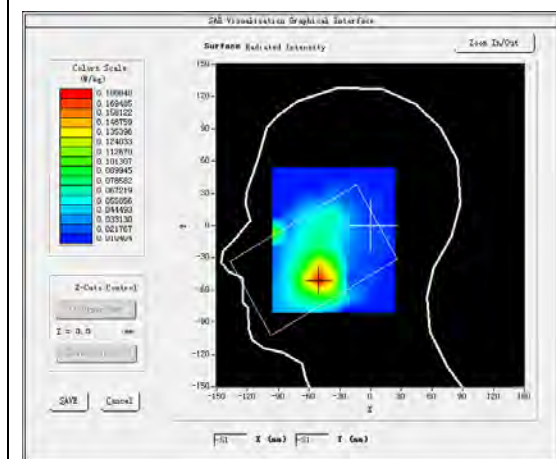
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

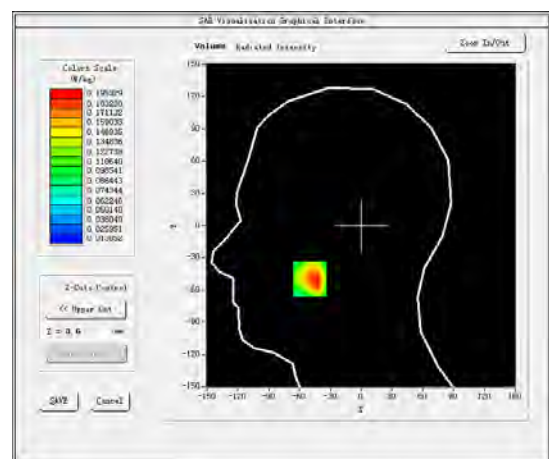
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	2.140000

SURFACE SAR



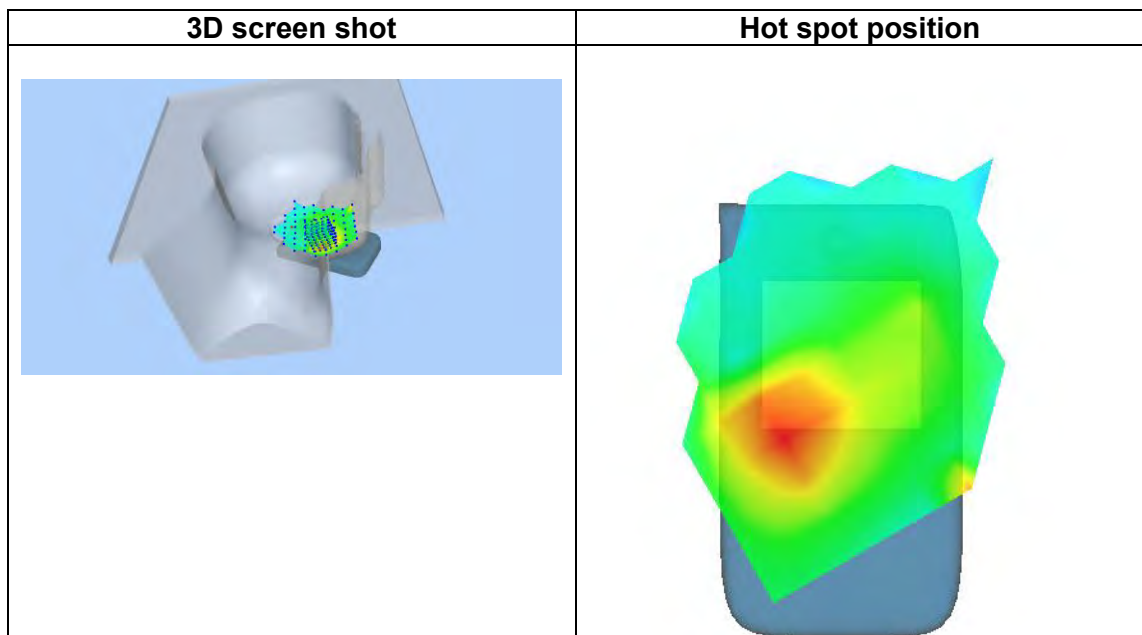
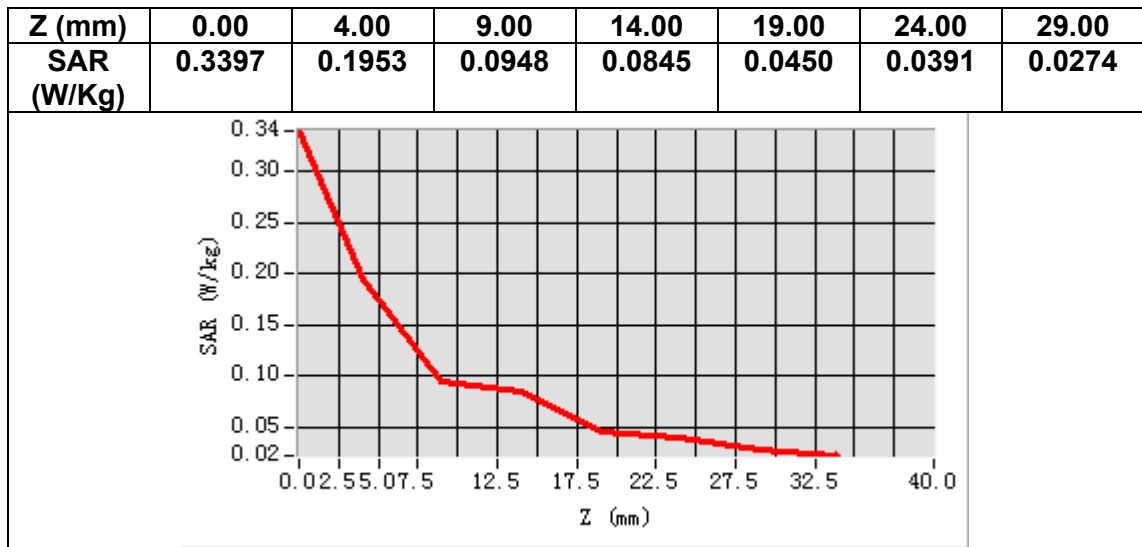
VOLUME SAR



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

SAR Peak: 0.28 W/kg

SAR 10g (W/Kg)	0.111322
SAR 1g (W/Kg)	0.191531



MEASUREMENT 6

Date of measurement: 23/11/2023

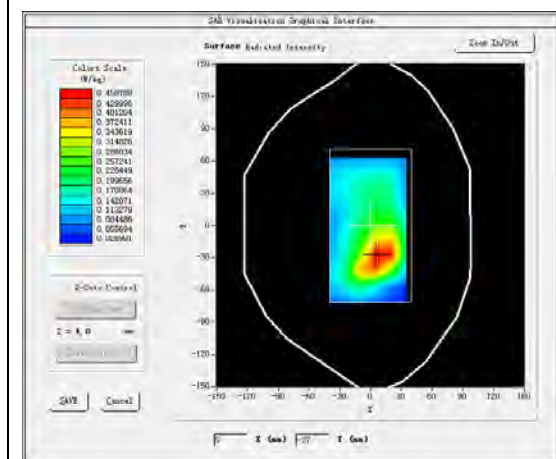
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

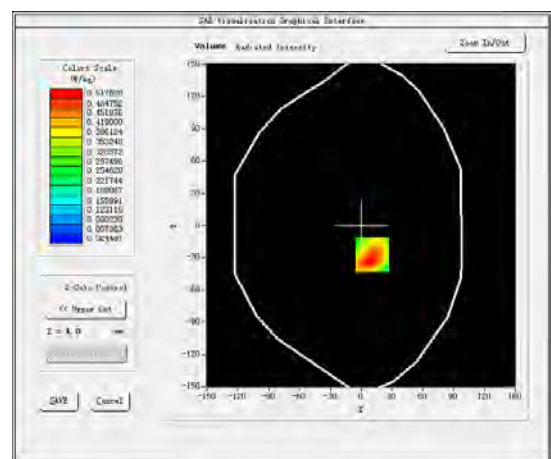
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	-1.040000

SURFACE SAR



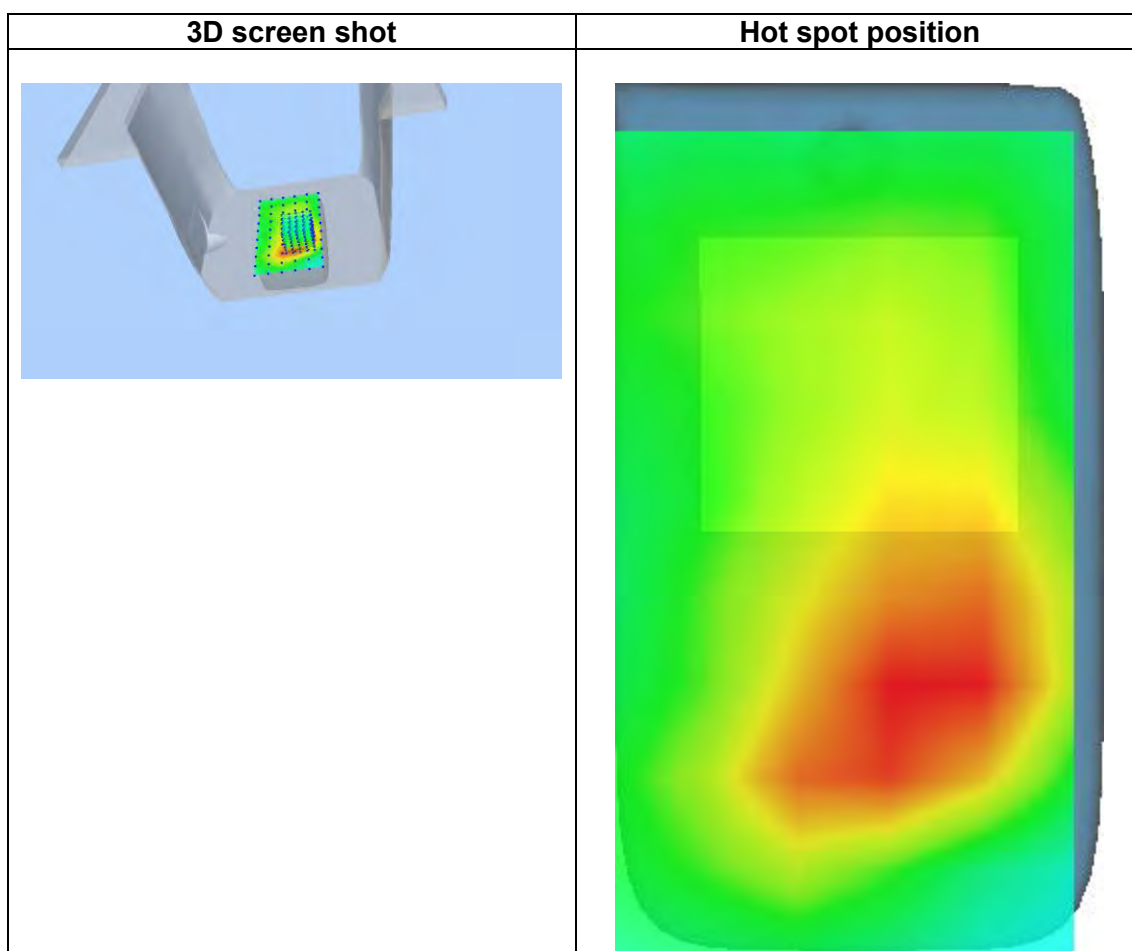
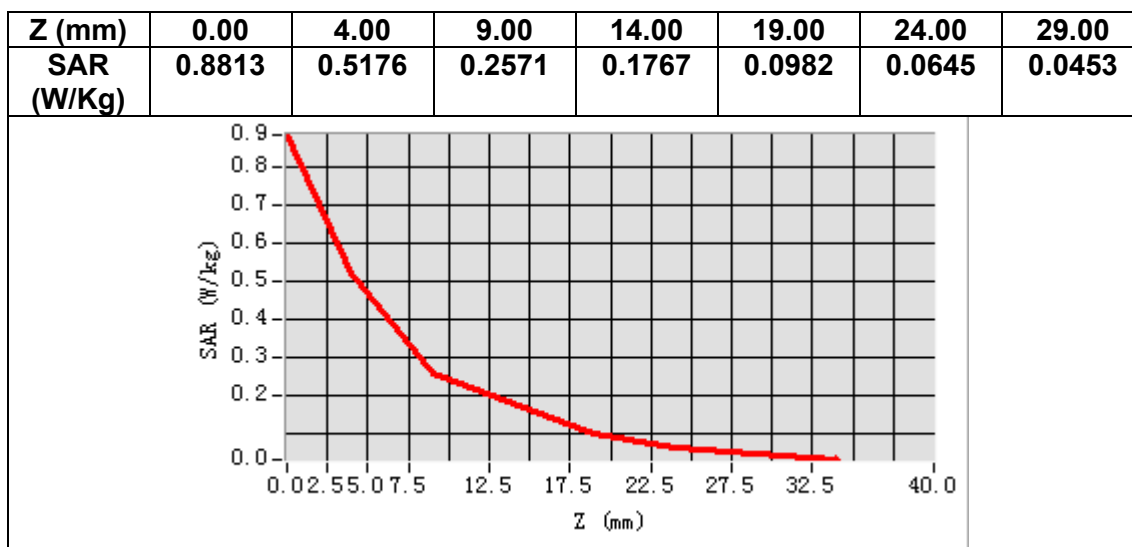
VOLUME SAR



Maximum location: X=11.00, Y=-27.00

SAR Peak: 0.82 W/kg

SAR 10g (W/Kg)	0.283305
SAR 1g (W/Kg)	0.515622



MEASUREMENT 7

Date of measurement: 18/11/2023

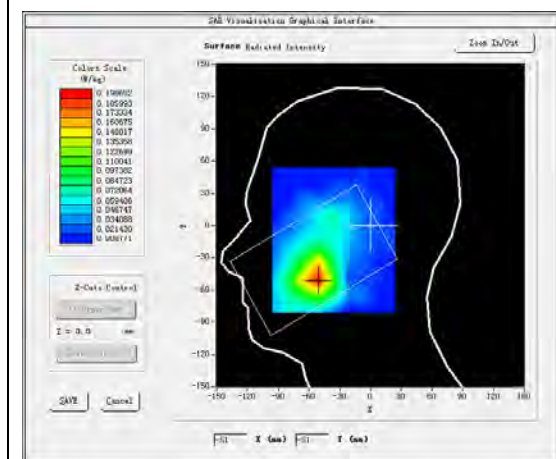
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

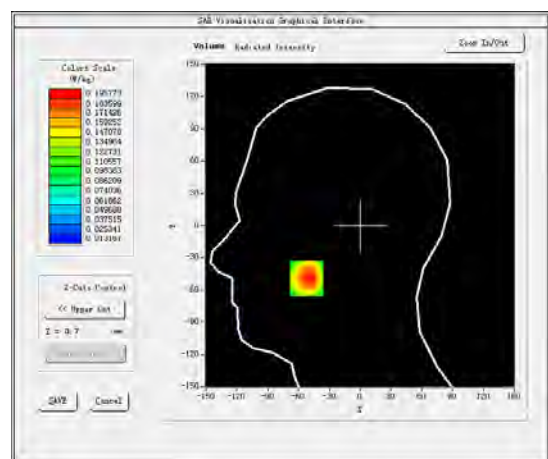
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.220680
Relative permittivity (imaginary part)	13.996029
Conductivity (S/m)	1.346729
Variation (%)	2.500000

SURFACE SAR



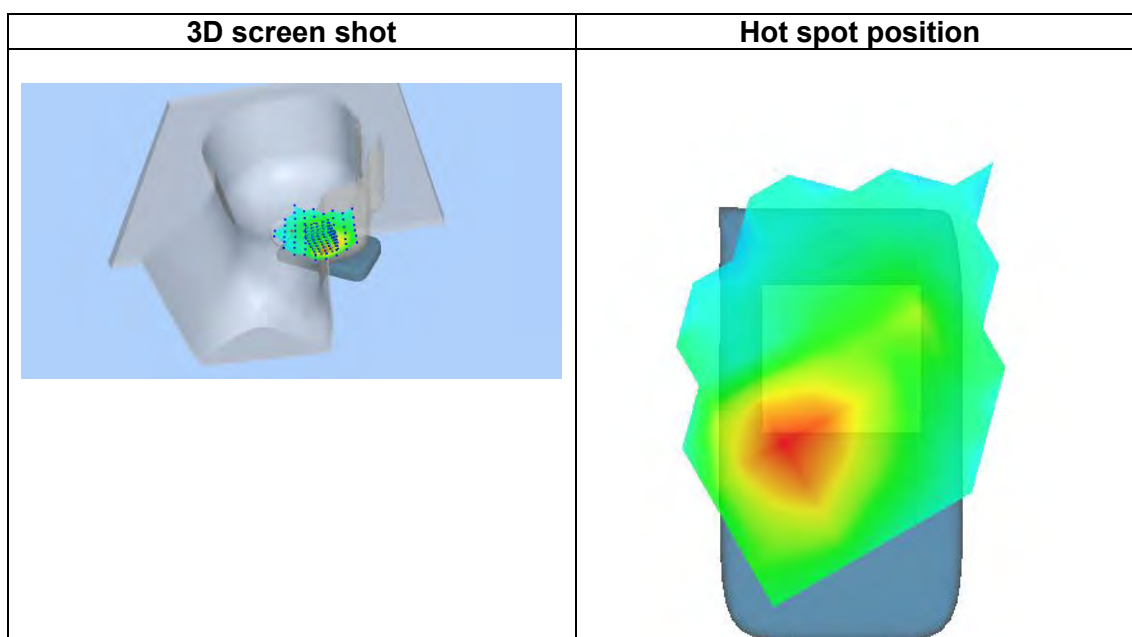
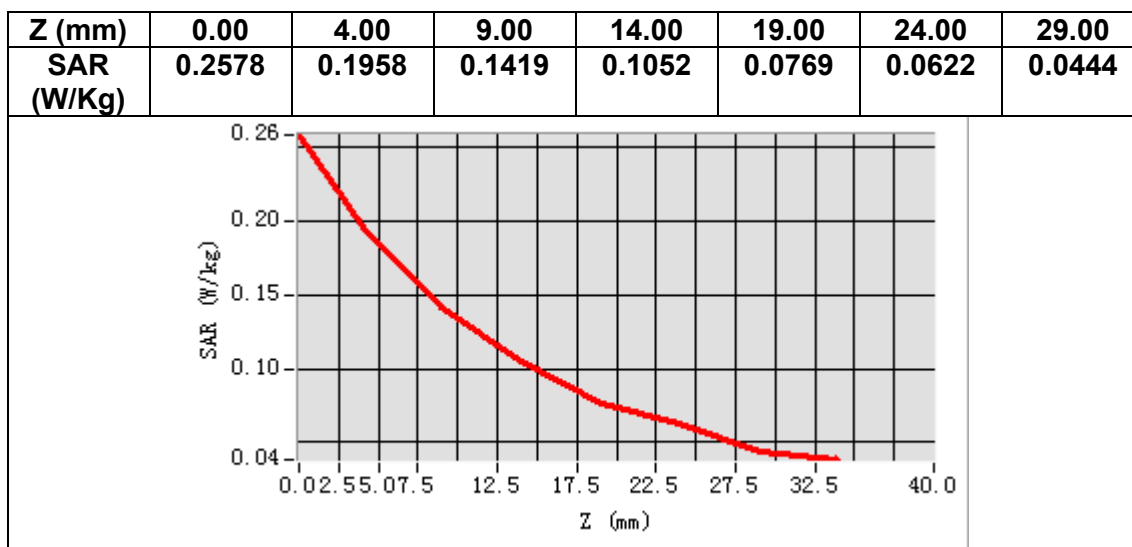
VOLUME SAR



Maximum location: X=-52.00, Y=-49.00

SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)	0.119242
SAR 1g (W/Kg)	0.189224



MEASUREMENT 8

Date of measurement: 18/11/2023

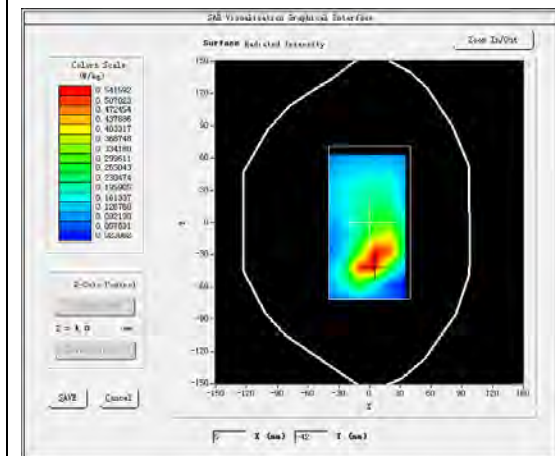
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band4 WCDMA1700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

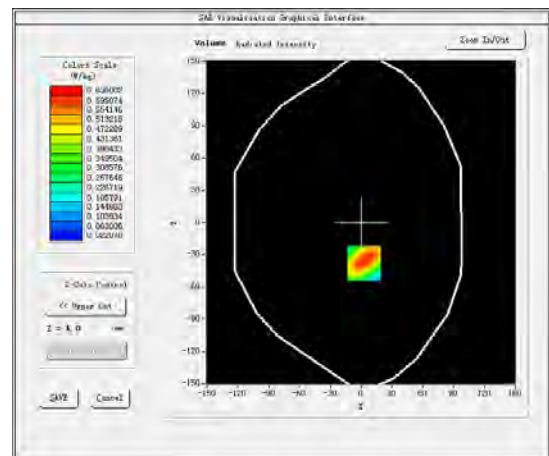
B. SAR Measurement Results

Frequency (MHz)	1732.600000
Relative permittivity (real part)	40.220680
Relative permittivity (imaginary part)	13.996029
Conductivity (S/m)	1.346729
Variation (%)	-1.810000

SURFACE SAR



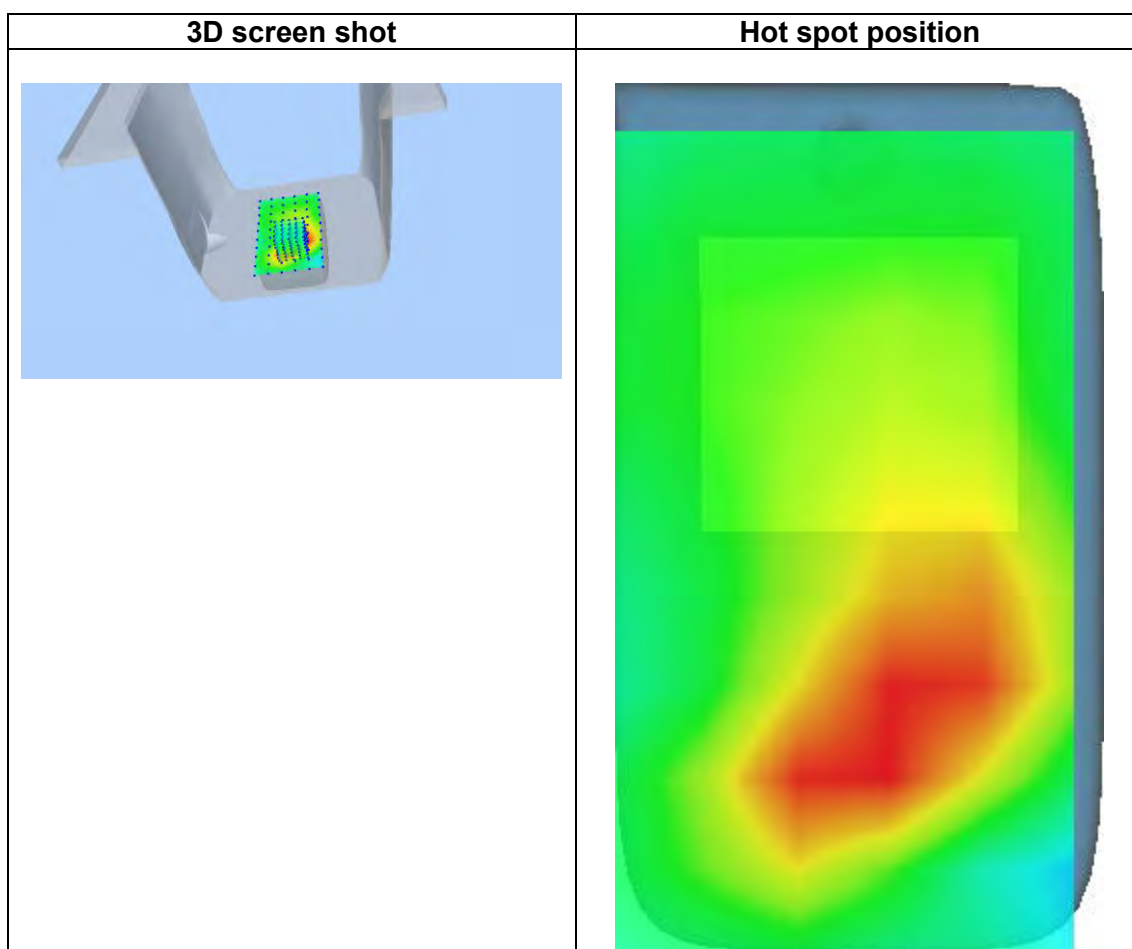
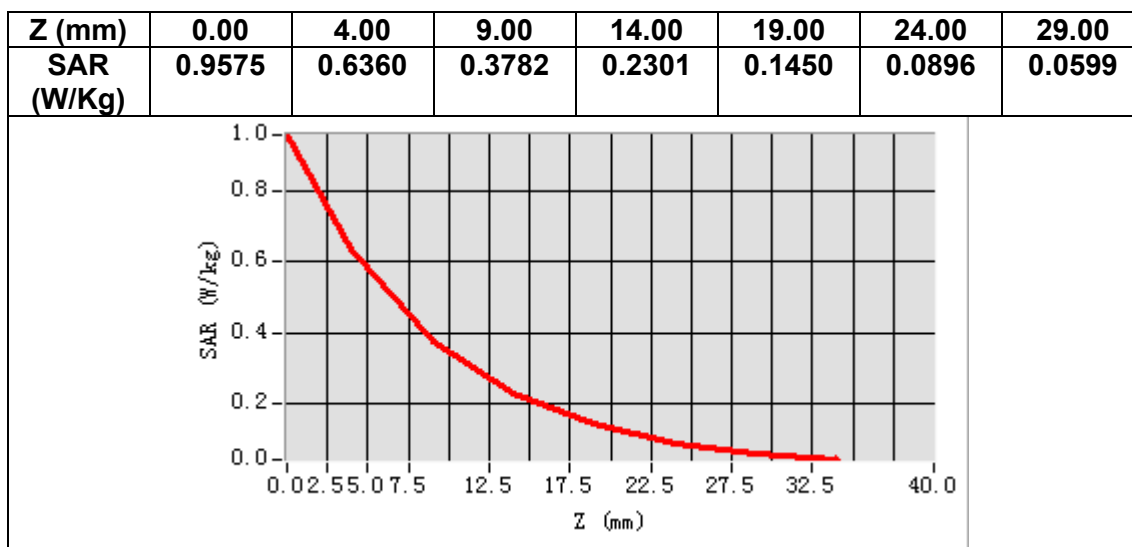
VOLUME SAR



Maximum location: X=3.00, Y=-38.00

SAR Peak: 0.98 W/kg

SAR 10g (W/Kg)	0.335836
SAR 1g (W/Kg)	0.606054



MEASUREMENT 9

Date of measurement: 24/11/2023

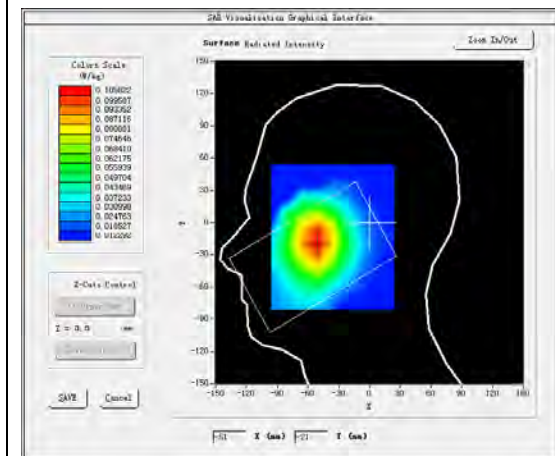
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

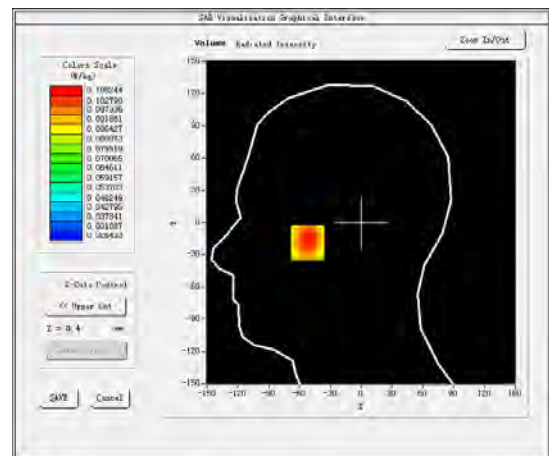
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.562759
Relative permittivity (imaginary part)	19.441196
Conductivity (S/m)	0.903368
Variation (%)	4.250000

SURFACE SAR



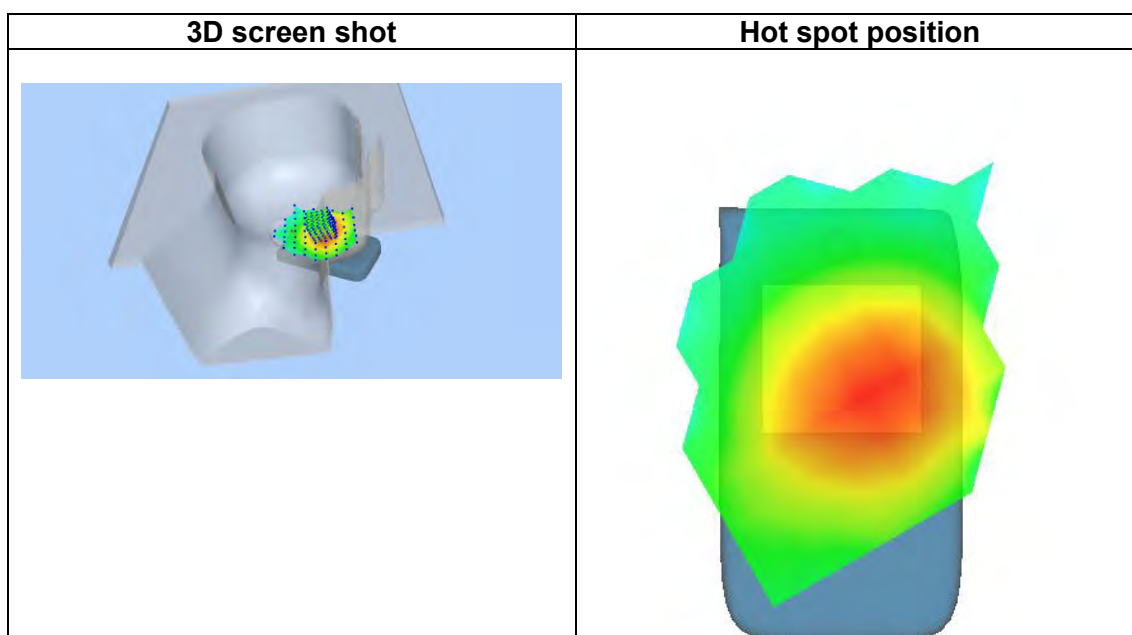
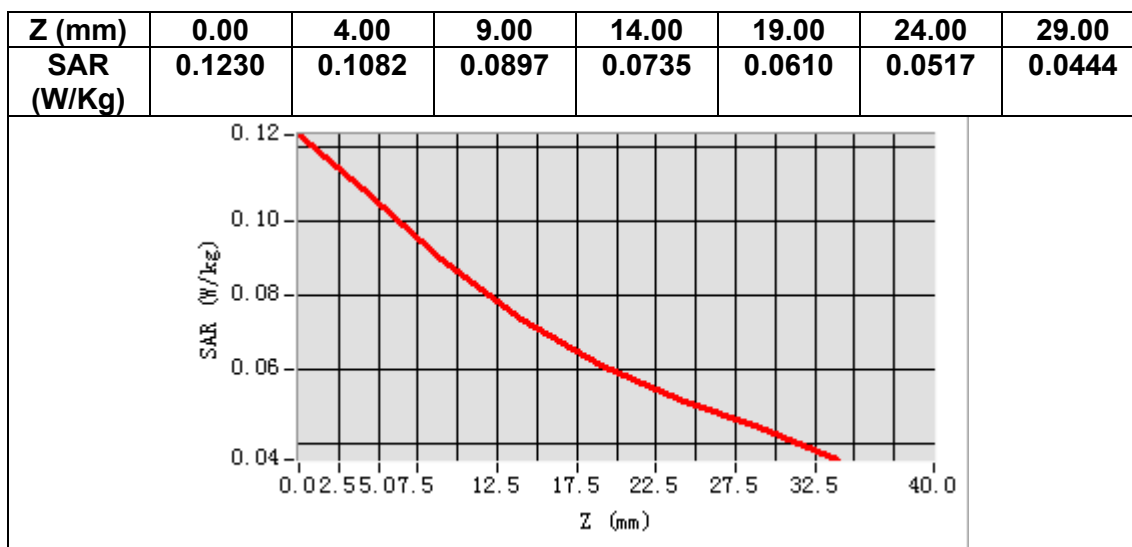
VOLUME SAR



Maximum location: X=-52.00, Y=-18.00

SAR Peak: 0.13 W/kg

SAR 10g (W/Kg)	0.081401
SAR 1g (W/Kg)	0.104751



MEASUREMENT 10

Date of measurement: 24/11/2023

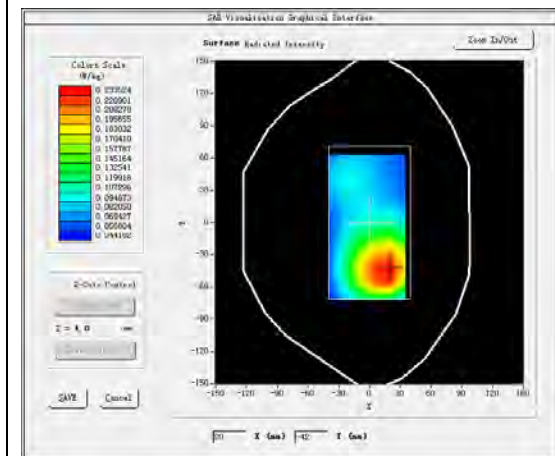
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

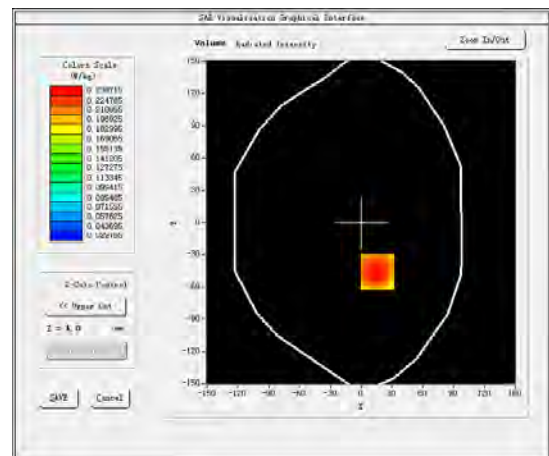
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.562759
Relative permittivity (imaginary part)	19.441196
Conductivity (S/m)	0.903368
Variation (%)	-0.570000

SURFACE SAR



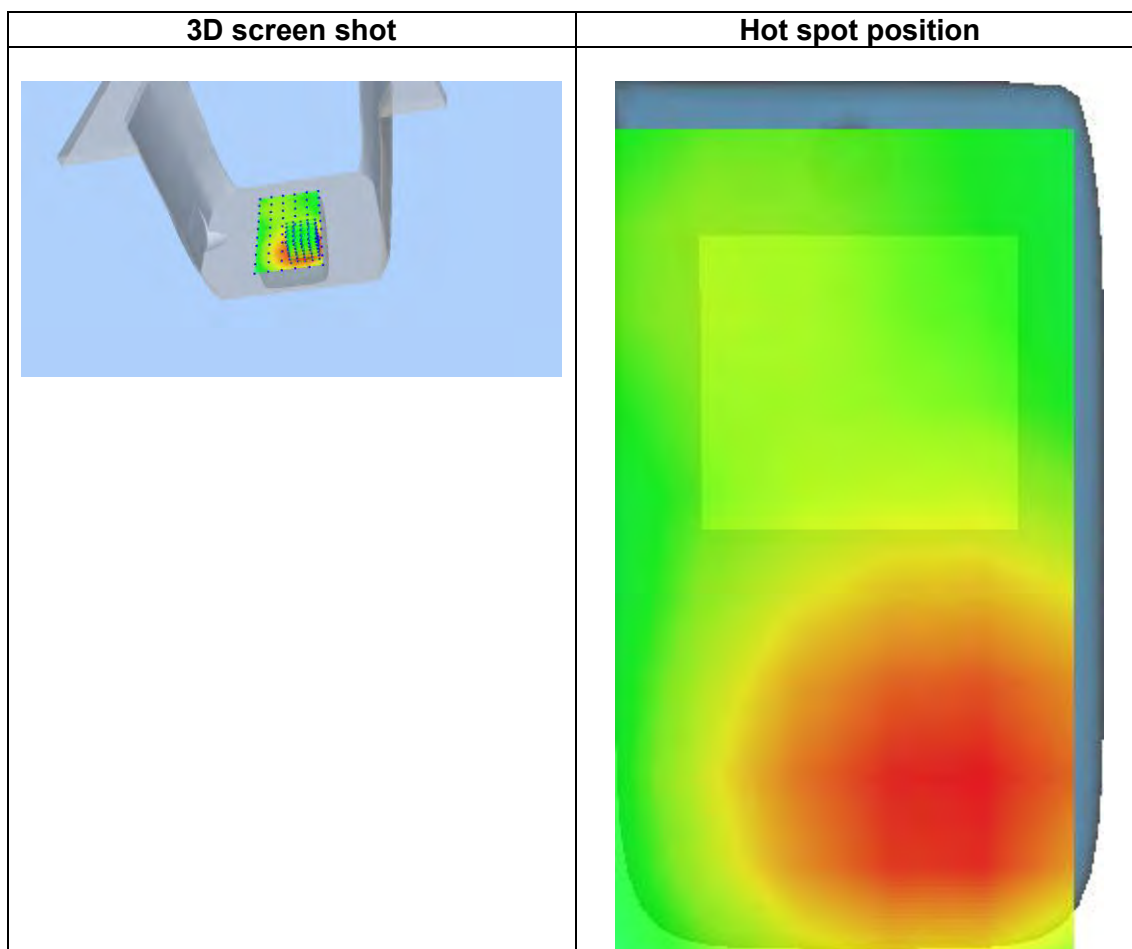
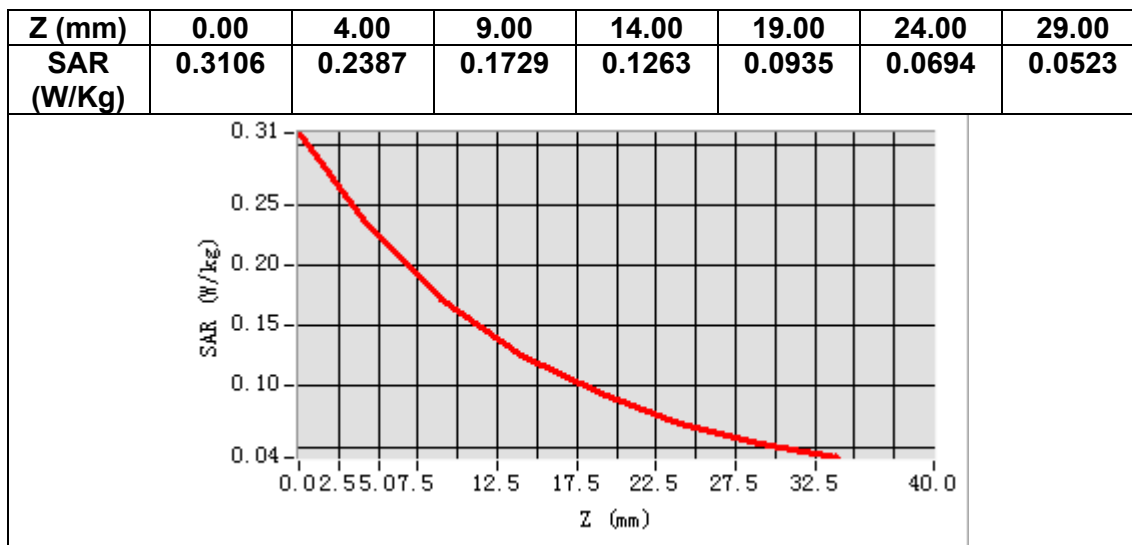
VOLUME SAR



Maximum location: X=16.00, Y=-46.00

SAR Peak: 0.32 W/kg

SAR 10g (W/Kg)	0.161422
SAR 1g (W/Kg)	0.232242



MEASUREMENT 11

Date of measurement: 21/11/2023

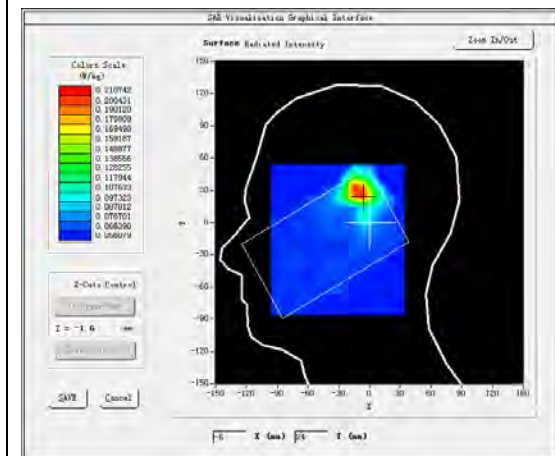
A. Experimental conditions.

<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>

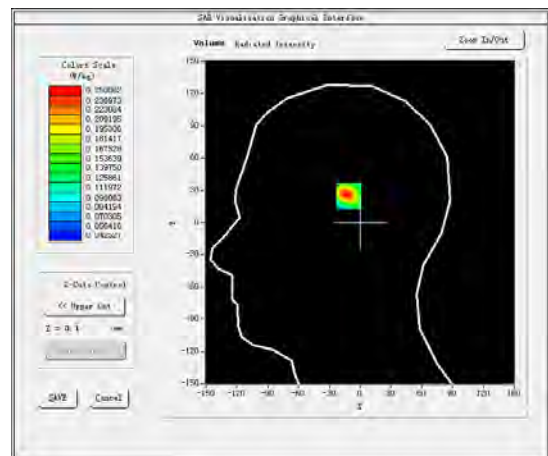
B. SAR Measurement Results

Frequency (MHz)	5240.000000
Relative permittivity (real part)	35.356508
Relative permittivity (imaginary part)	15.589897
Conductivity (S/m)	4.538392
Variation (%)	2.400000

SURFACE SAR



VOLUME SAR

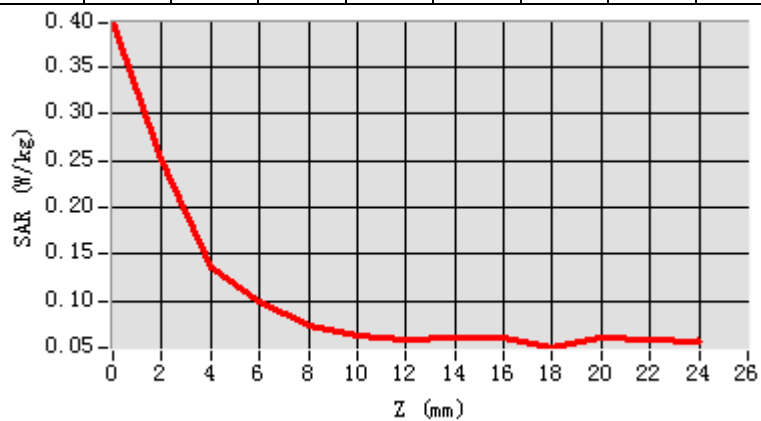


Maximum location: X=-9.00, Y=27.00

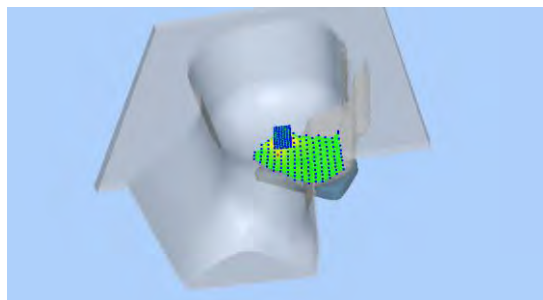
SAR Peak: 0.61 W/kg

SAR 10g (W/Kg)	0.120653
SAR 1g (W/Kg)	0.247217

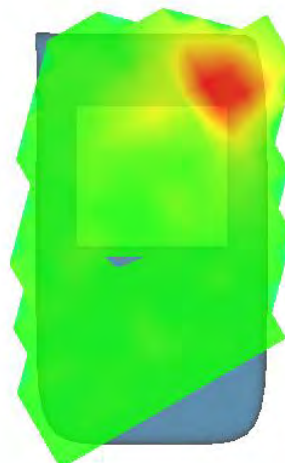
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	0.39 72	0.25 09	0.13 66	0.10 03	0.07 48	0.06 42	0.05 81	0.06 21	0.06 12	0.05 04	0.06 21	0.05 82



3D screen shot



Hot spot position



MEASUREMENT 12

Date of measurement: 20/11/2023

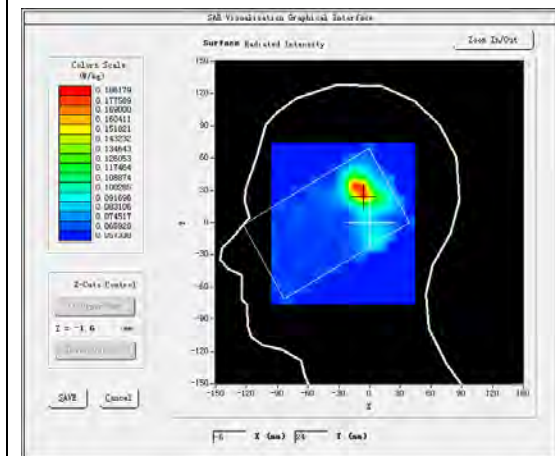
A. Experimental conditions.

<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>2.04</u>

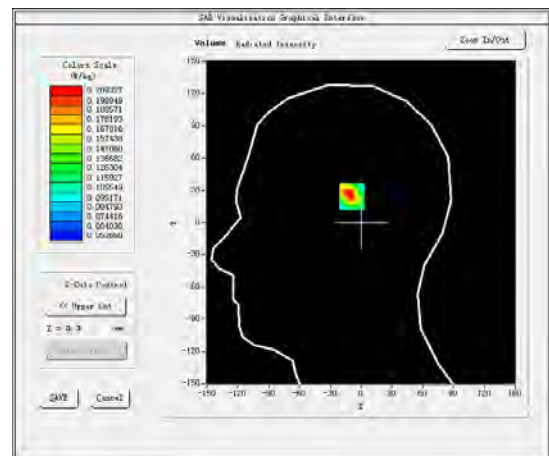
B. SAR Measurement Results

Frequency (MHz)	5825.000000
Relative permittivity (real part)	34.982444
Relative permittivity (imaginary part)	16.506846
Conductivity (S/m)	5.341799
Variation (%)	-1.070000

SURFACE SAR



VOLUME SAR

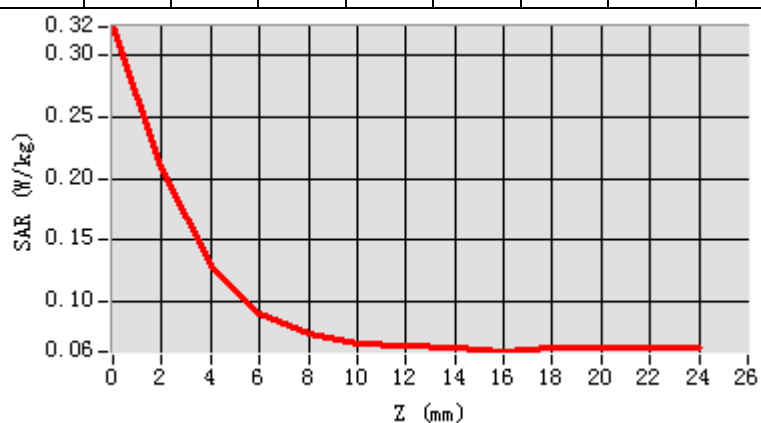


Maximum location: X=-7.00, Y=28.00

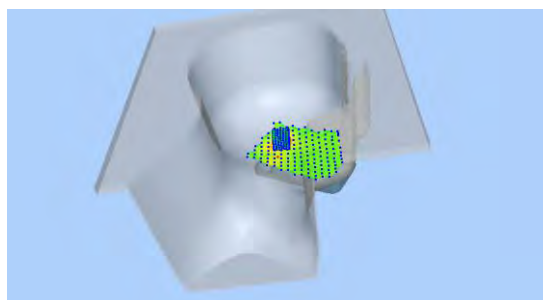
SAR Peak: 0.50 W/kg

SAR 10g (W/Kg)	0.112198
SAR 1g (W/Kg)	0.213240

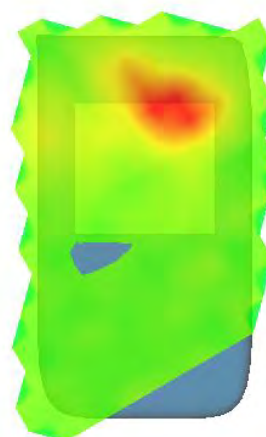
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	0.32 30	0.20 93	0.12 91	0.09 06	0.07 36	0.06 57	0.06 36	0.06 30	0.05 93	0.06 28	0.06 29	0.06 19



3D screen shot



Hot spot position



MEASUREMENT 13

Date of measurement: 20/11/2023

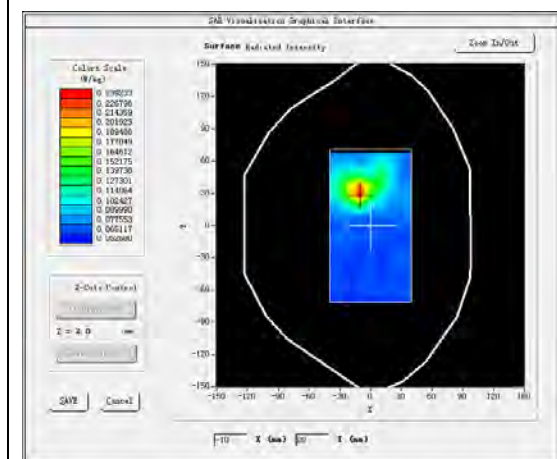
A. Experimental conditions.

<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>2.04</u>

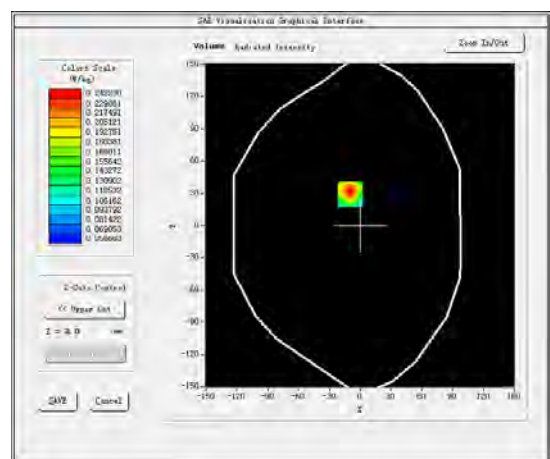
B. SAR Measurement Results

Frequency (MHz)	5825.000000
Relative permittivity (real part)	34.982444
Relative permittivity (imaginary part)	16.506846
Conductivity (S/m)	5.341799
Variation (%)	0.920000

SURFACE SAR



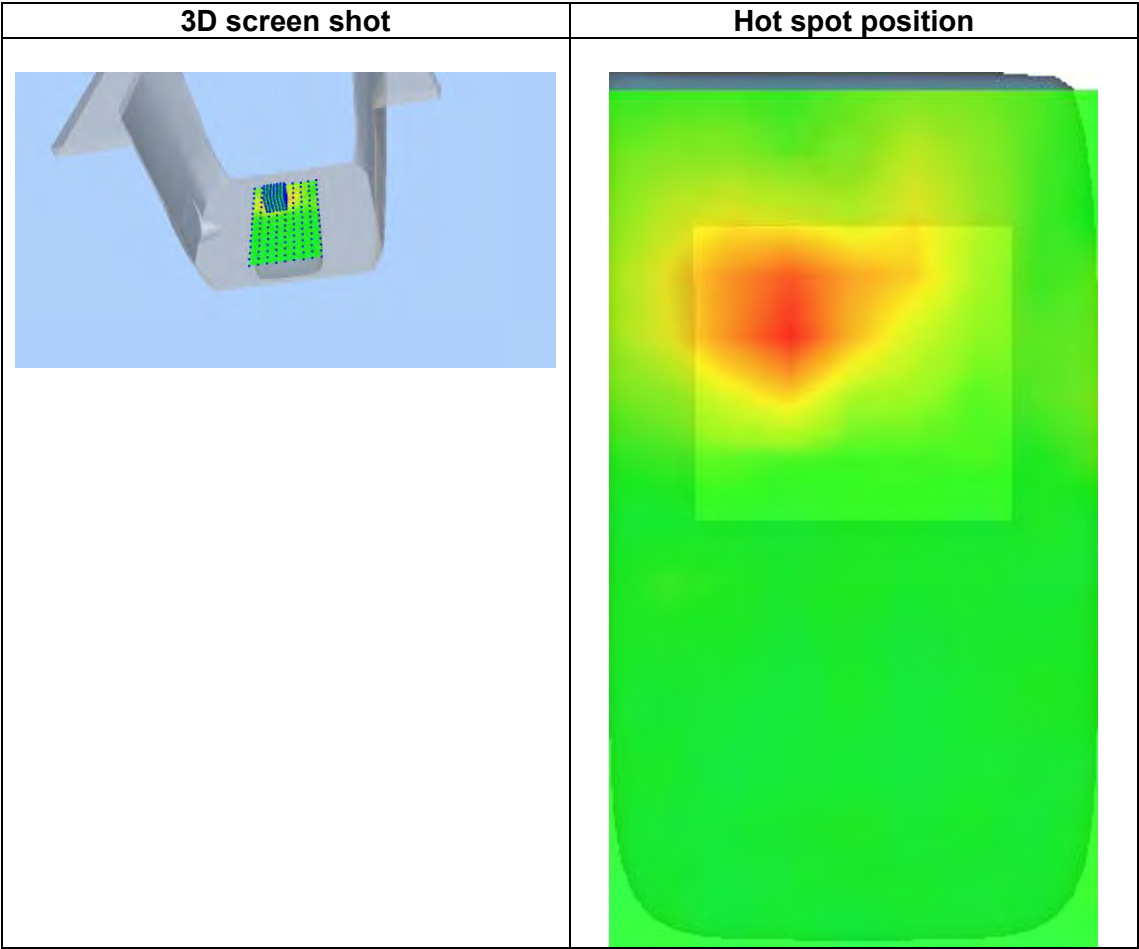
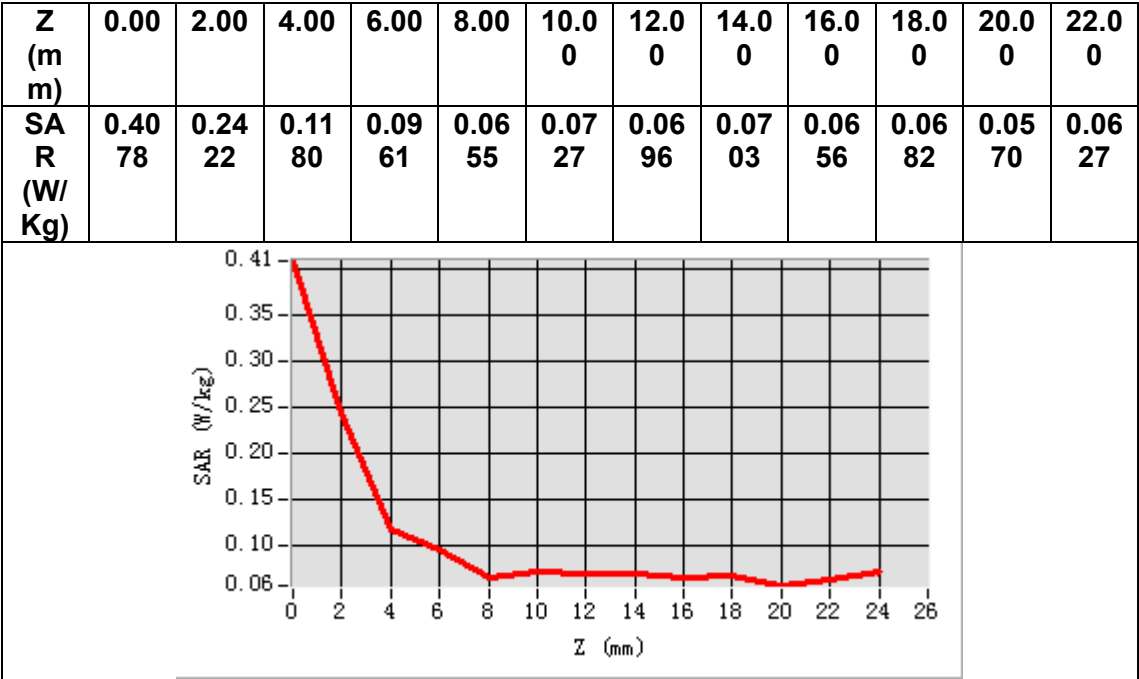
VOLUME SAR



Maximum location: X=-10.00, Y=29.00

SAR Peak: 0.42 W/kg

SAR 10g (W/Kg)	0.099431
SAR 1g (W/Kg)	0.163573



MEASUREMENT 14

Date of measurement: 21/11/2023

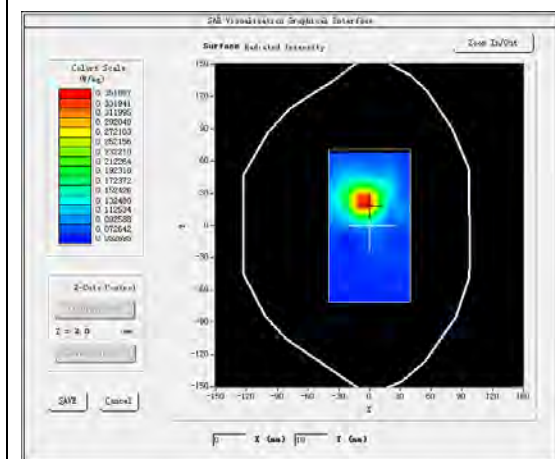
A. Experimental conditions.

<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>

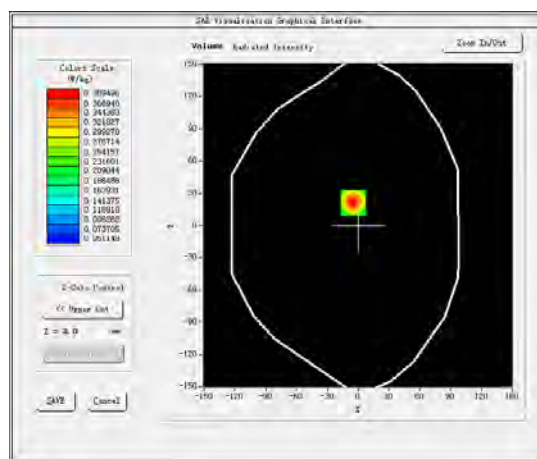
B. SAR Measurement Results

Frequency (MHz)	5240.000000
Relative permittivity (real part)	35.356508
Relative permittivity (imaginary part)	15.589897
Conductivity (S/m)	4.538392
Variation (%)	-2.200000

SURFACE SAR



VOLUME SAR

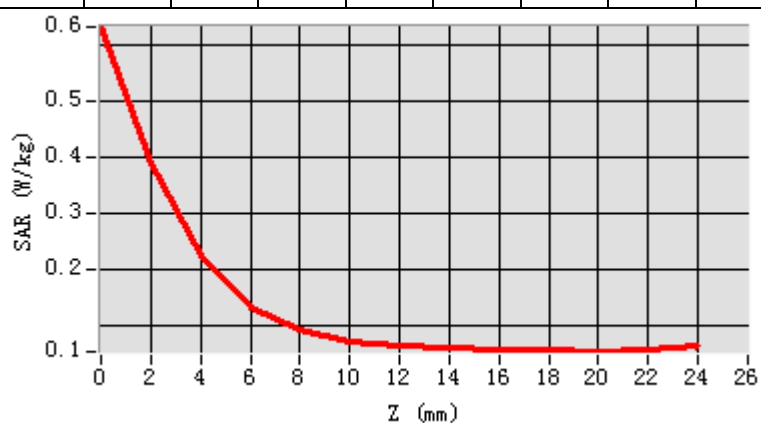


Maximum location: X=-5.00, Y=21.00

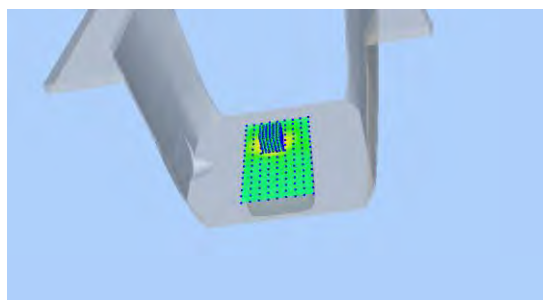
SAR Peak: 0.66 W/kg

SAR 10g (W/Kg)	0.132493
SAR 1g (W/Kg)	0.252145

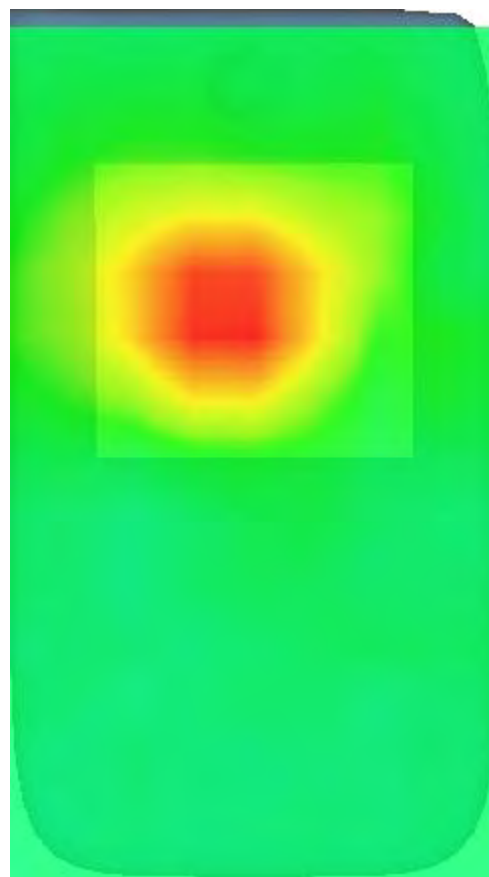
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	0.63 19	0.38 95	0.22 67	0.13 41	0.09 47	0.07 26	0.06 51	0.06 06	0.05 94	0.05 90	0.05 42	0.05 87



3D screen shot



Hot spot position



MEASUREMENT 15

Date of measurement: 17/11/2023

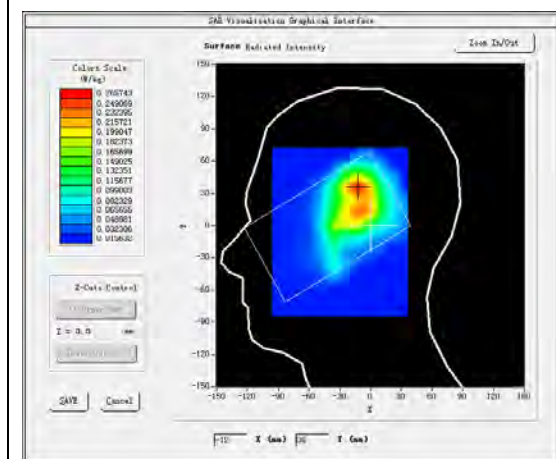
A. Experimental conditions.

<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>2.85</u>

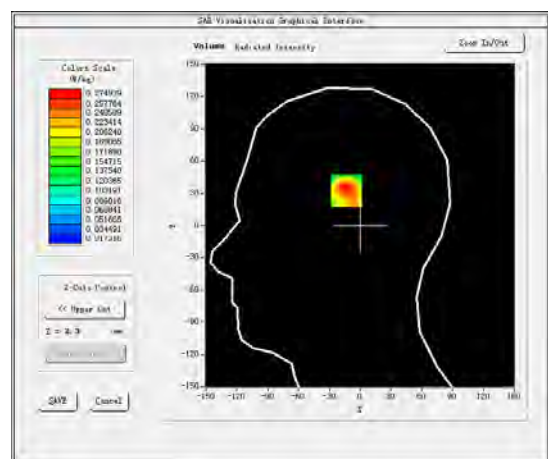
B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	38.633213
Relative permittivity (imaginary part)	13.016652
Conductivity (S/m)	1.762310
Variation (%)	-3.100000

SURFACE SAR



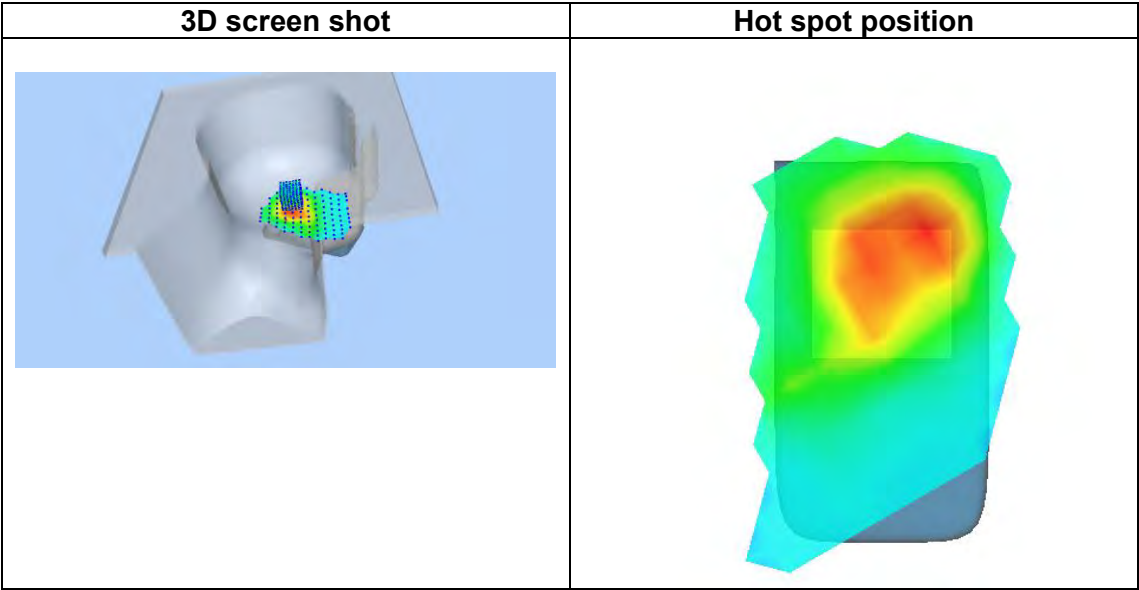
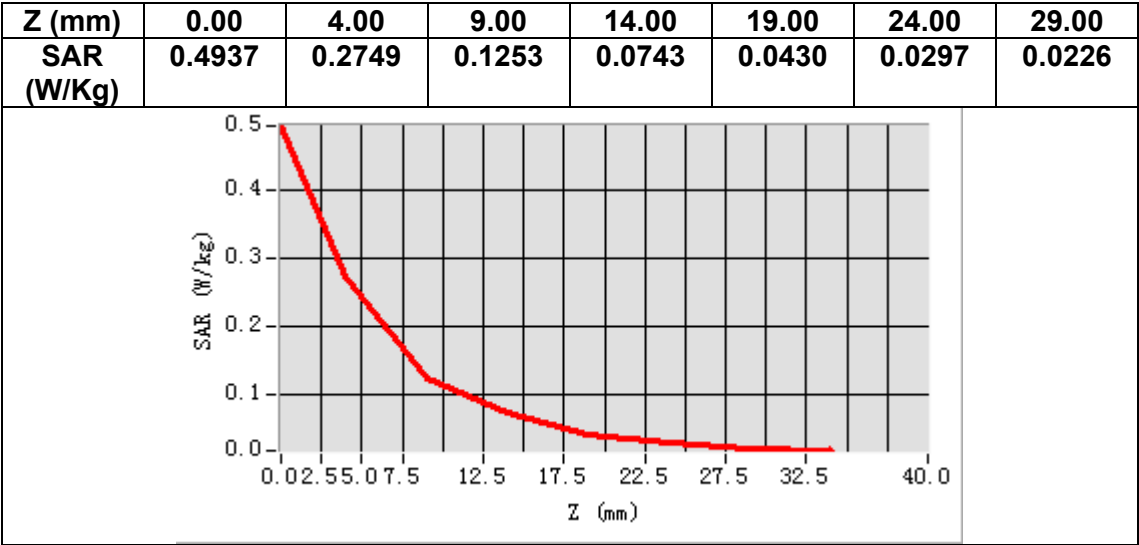
VOLUME SAR



Maximum location: X=-12.00, Y=35.00

SAR Peak: 0.46 W/kg

SAR 10g (W/Kg)	0.137047
SAR 1g (W/Kg)	0.256664



MEASUREMENT 16

Date of measurement: 17/11/2023

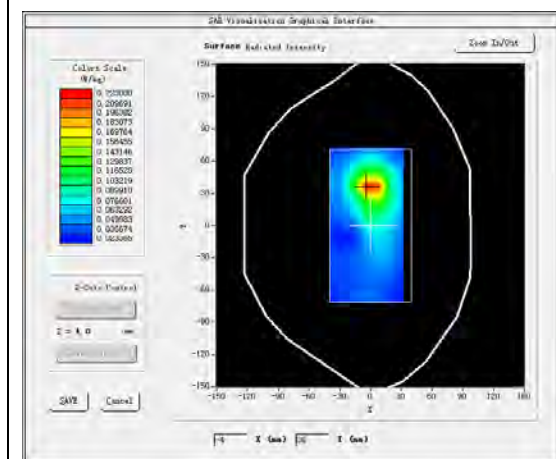
A. Experimental conditions.

<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>2.85</u>

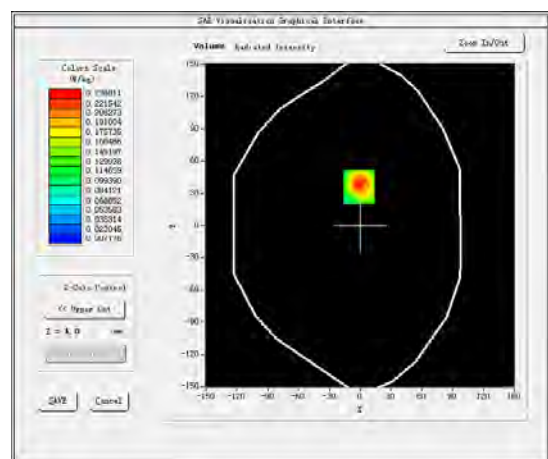
B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	38.633213
Relative permittivity (imaginary part)	13.016652
Conductivity (S/m)	1.762310
Variation (%)	3.940000

SURFACE SAR



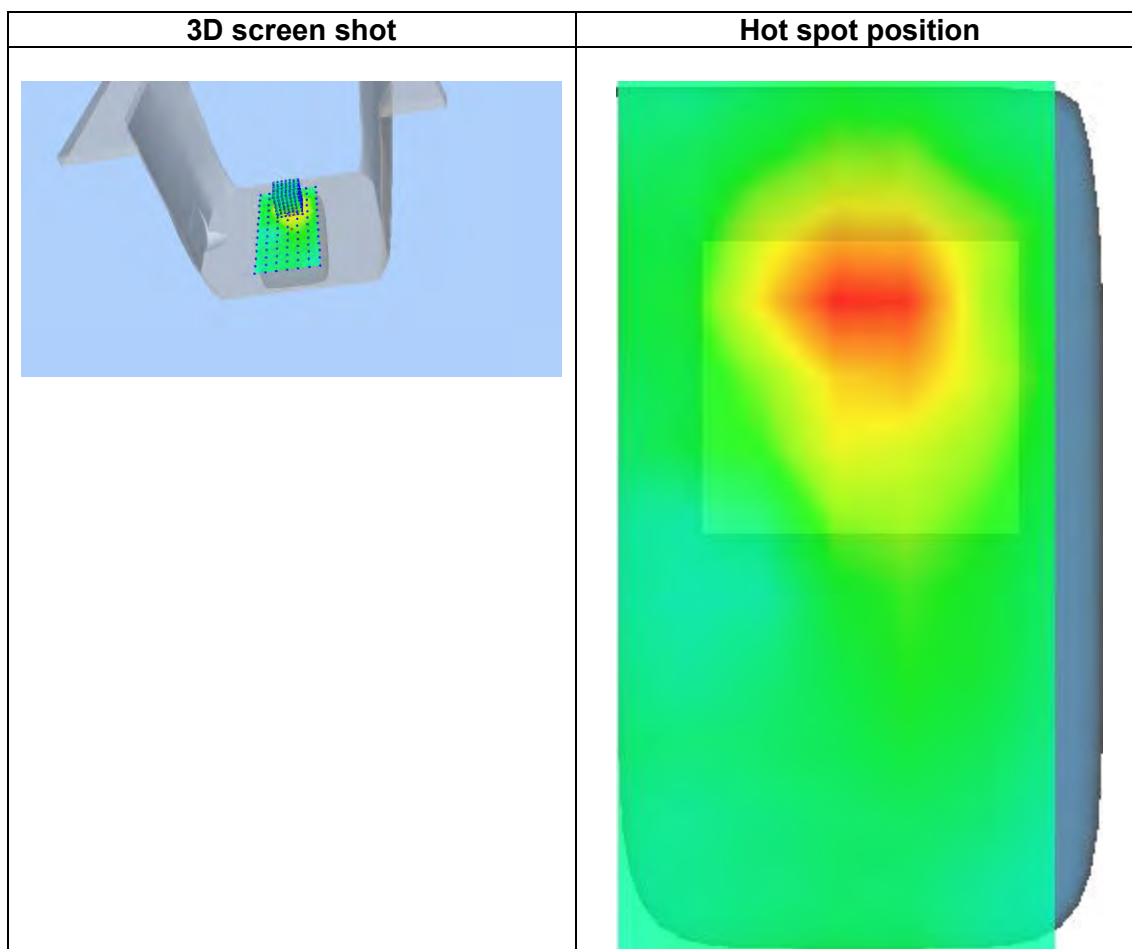
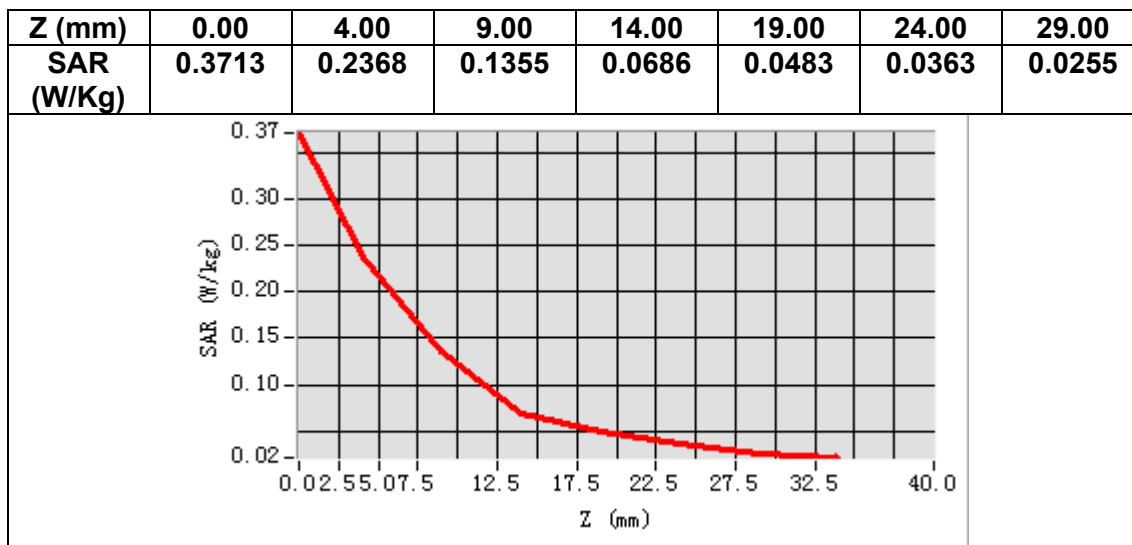
VOLUME SAR



Maximum location: X=-1.00, Y=36.00

SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.117241
SAR 1g (W/Kg)	0.213133



MEASUREMENT 17

Date of measurement: 23/11/2023

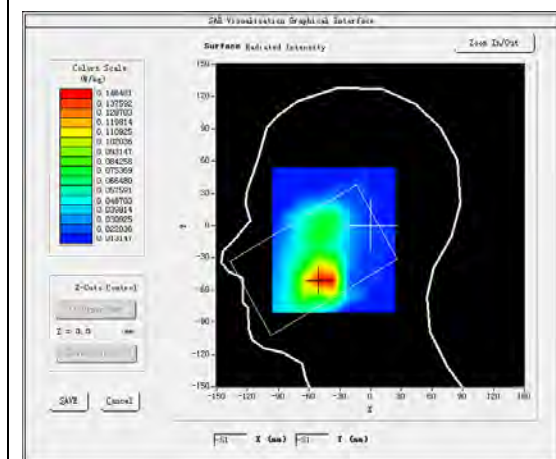
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.63</u>

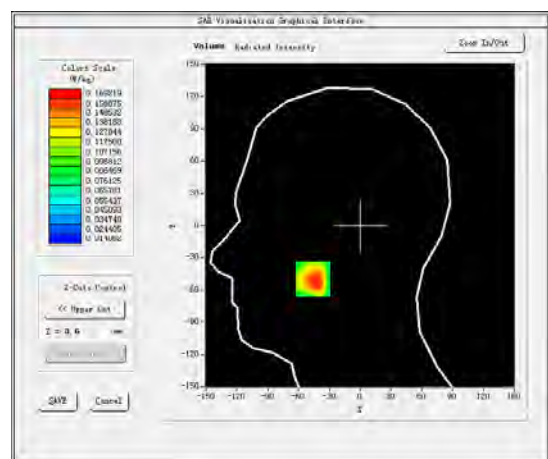
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	1.780000

SURFACE SAR



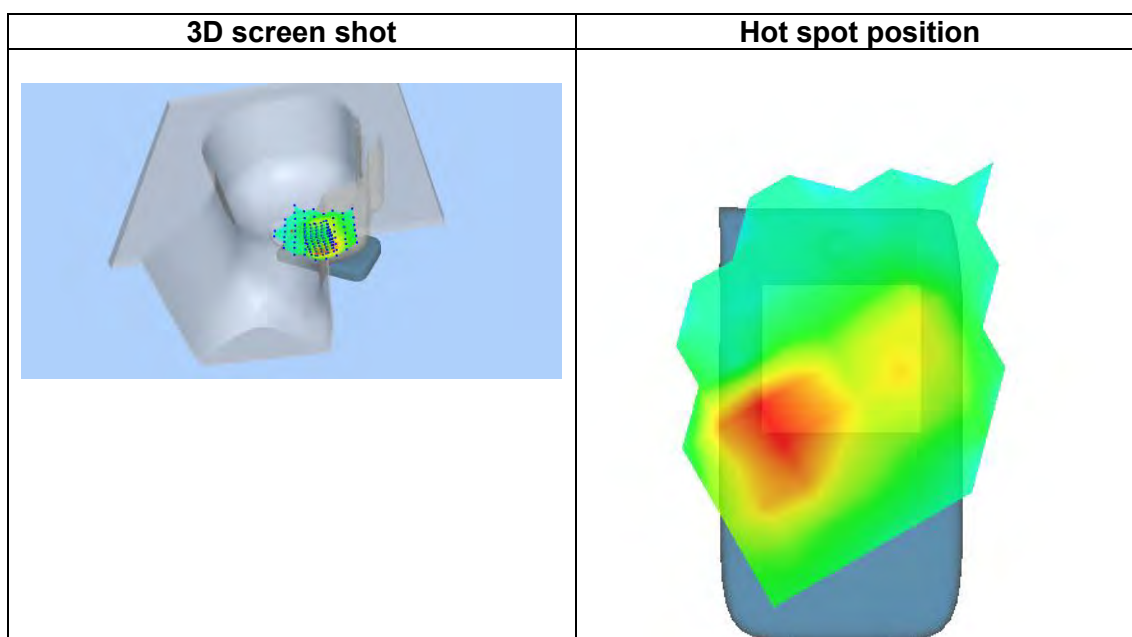
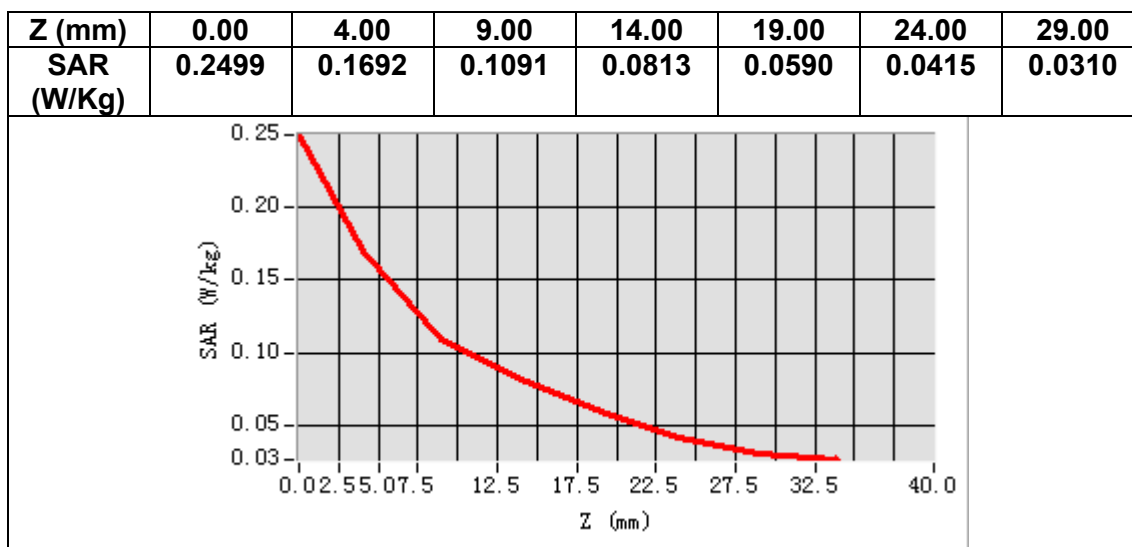
VOLUME SAR



Maximum location: X=-46.00, Y=-50.00

SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.097389
SAR 1g (W/Kg)	0.170764



MEASUREMENT 18

Date of measurement: 23/11/2023

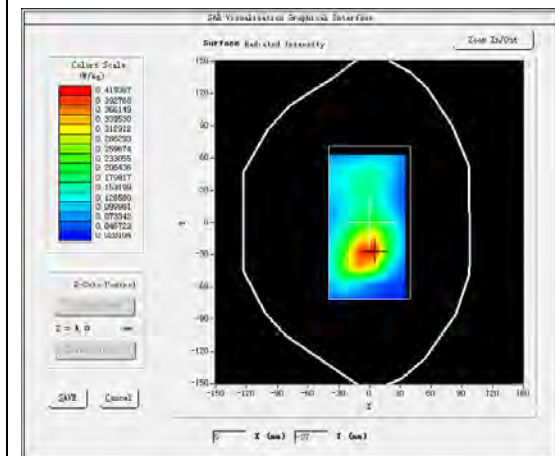
A. Experimental conditions.

<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>2.63</u>

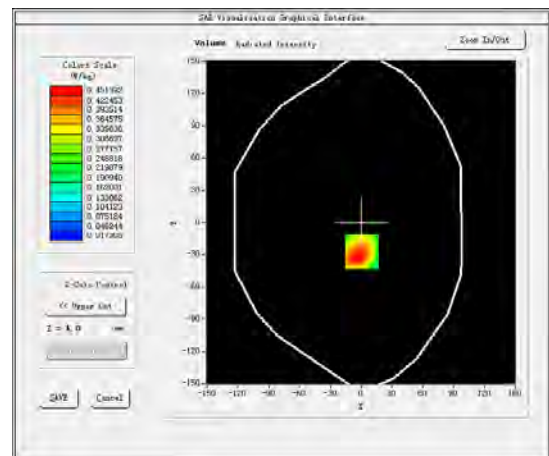
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.200699
Relative permittivity (imaginary part)	13.839800
Conductivity (S/m)	1.445490
Variation (%)	-1.870000

SURFACE SAR



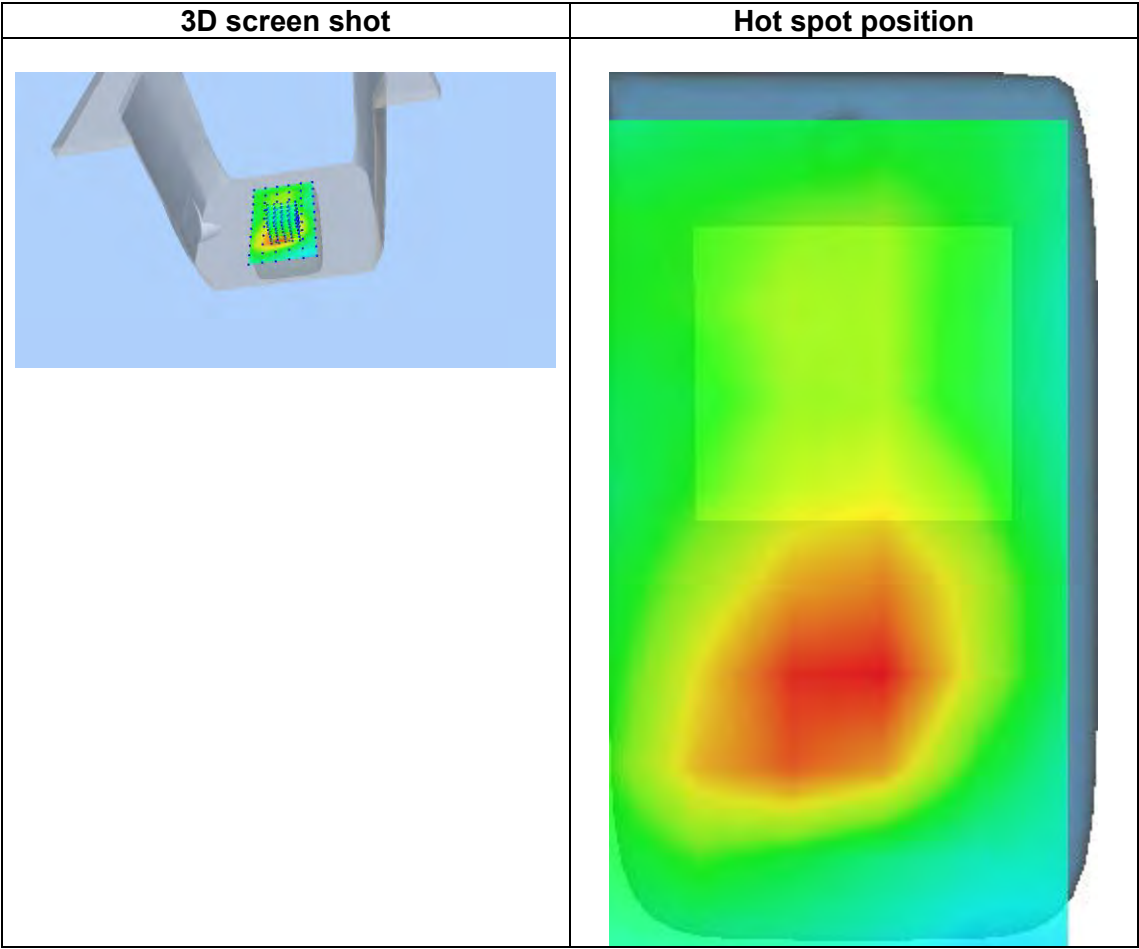
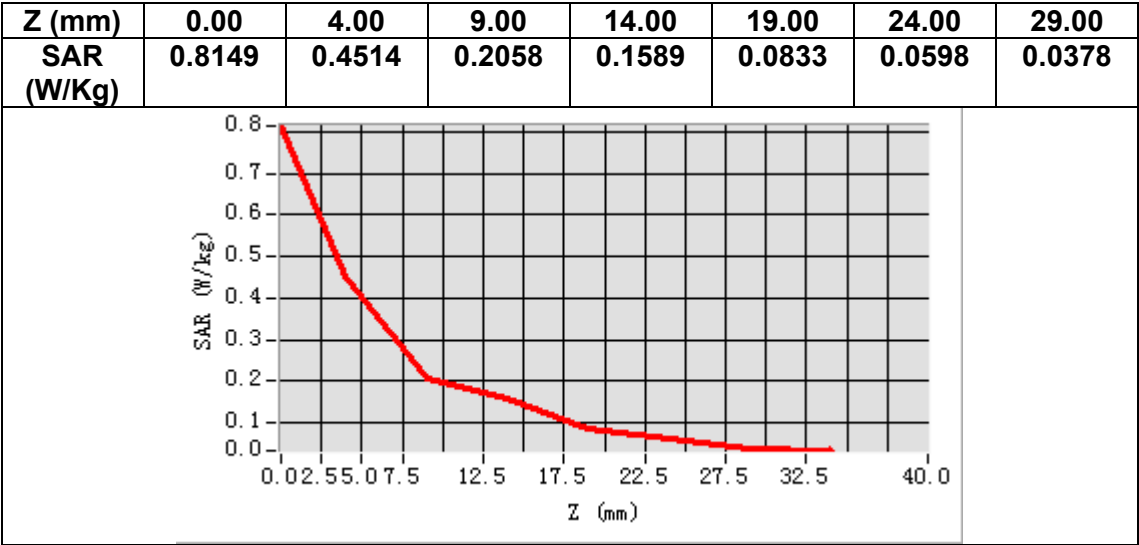
VOLUME SAR



Maximum location: X=1.00, Y=-27.00

SAR Peak: 0.73 W/kg

SAR 10g (W/Kg)	0.250829
SAR 1g (W/Kg)	0.456117



MEASUREMENT 19

Date of measurement: 18/11/2023

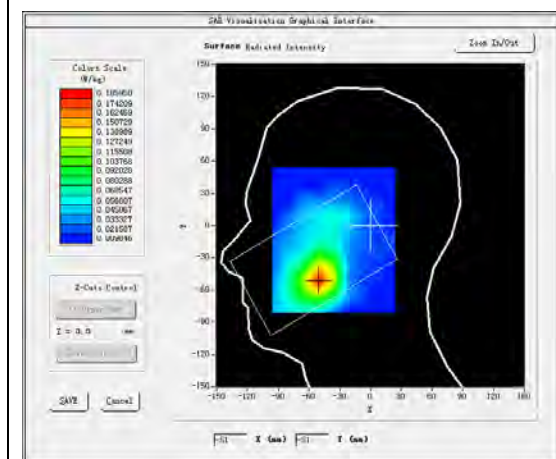
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

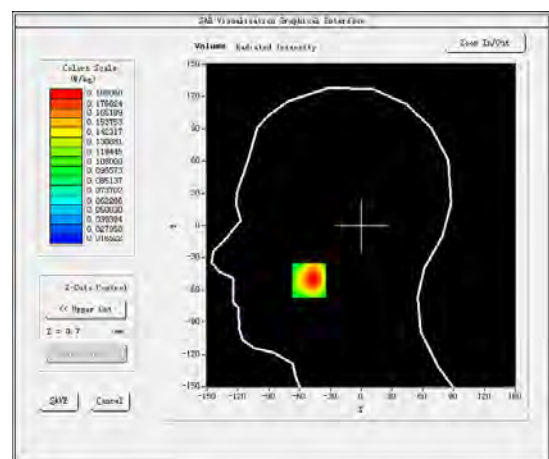
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	40.228580
Relative permittivity (imaginary part)	13.980879
Conductivity (S/m)	1.345660
Variation (%)	-3.420000

SURFACE SAR



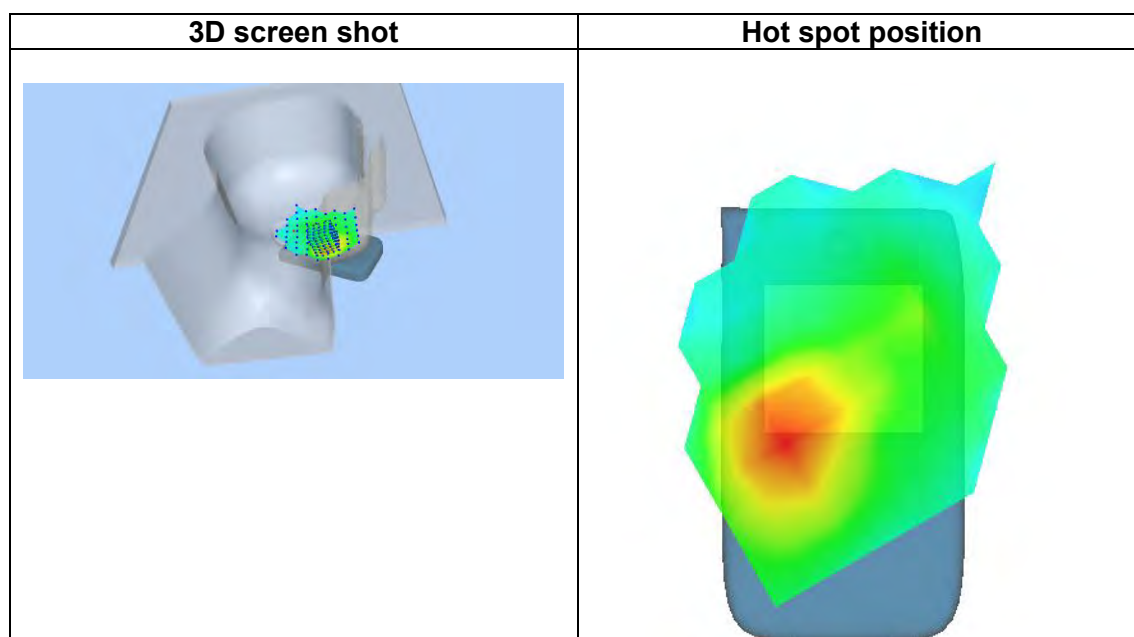
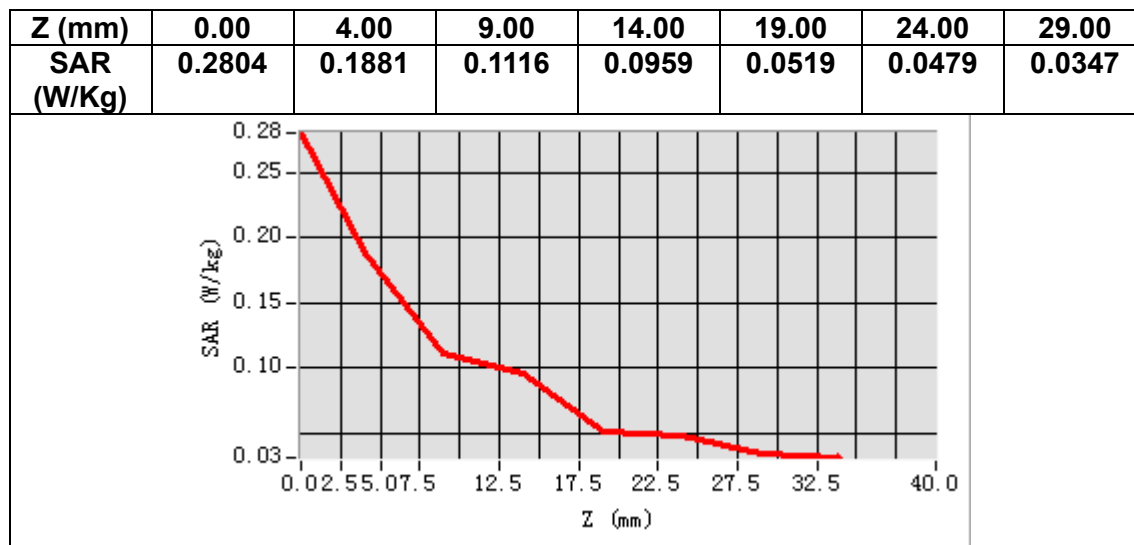
VOLUME SAR



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

SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)	0.116402
SAR 1g (W/Kg)	0.184462



MEASUREMENT 20

Date of measurement: 18/11/2023

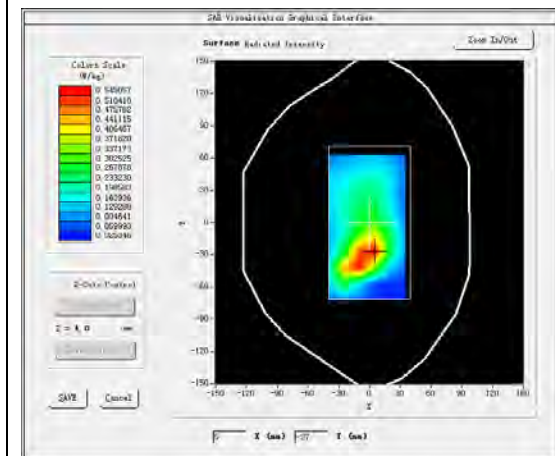
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

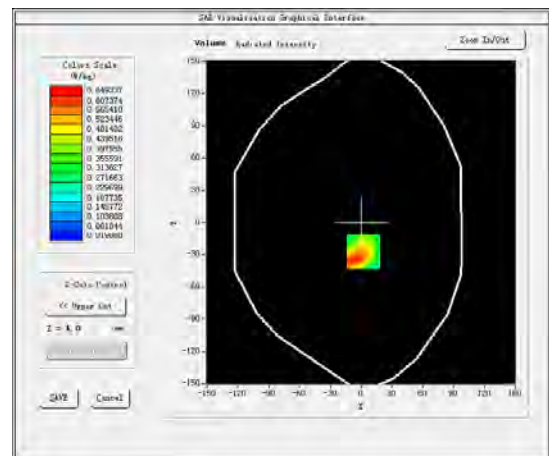
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	40.228580
Relative permittivity (imaginary part)	13.980879
Conductivity (S/m)	1.345660
Variation (%)	-0.930000

SURFACE SAR



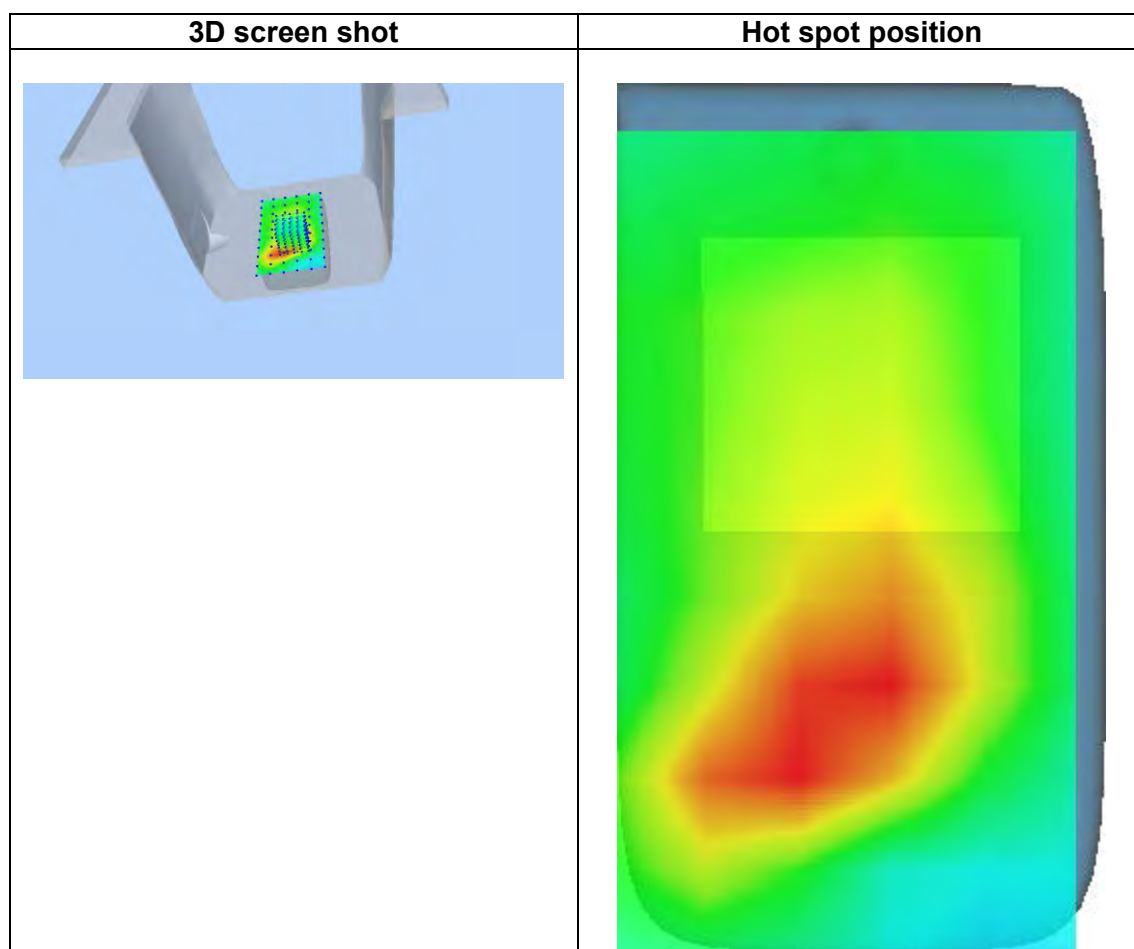
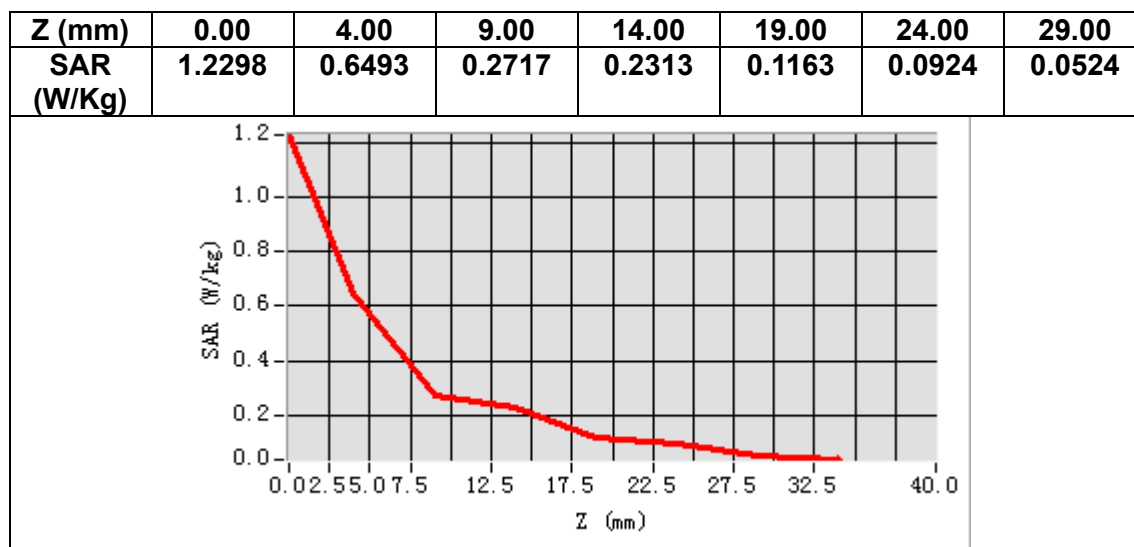
VOLUME SAR



Maximum location: X=2.00, Y=-27.00

SAR Peak: 1.00 W/kg

SAR 10g (W/Kg)	0.334439
SAR 1g (W/Kg)	0.606295



MEASUREMENT 21

Date of measurement: 24/11/2023

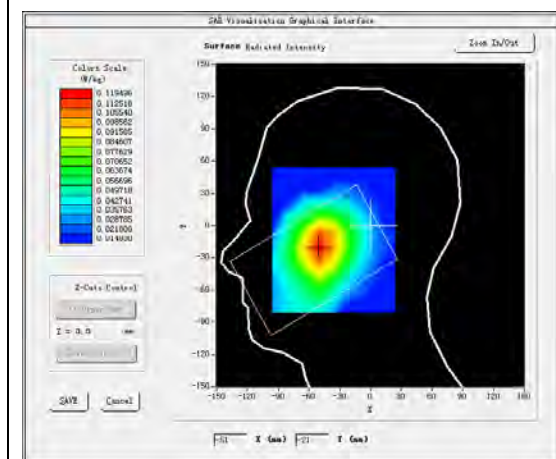
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

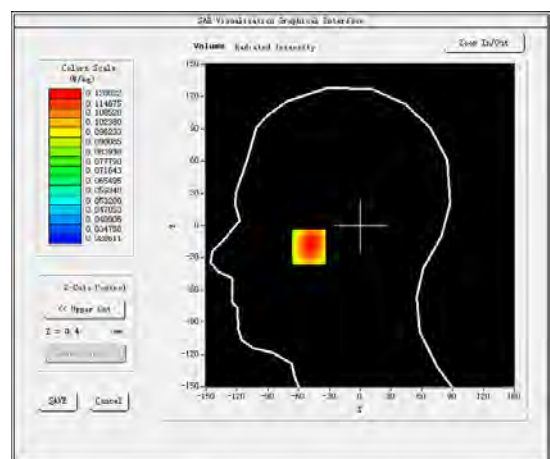
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.565029
Relative permittivity (imaginary part)	19.442995
Conductivity (S/m)	0.903559
Variation (%)	-0.420000

SURFACE SAR



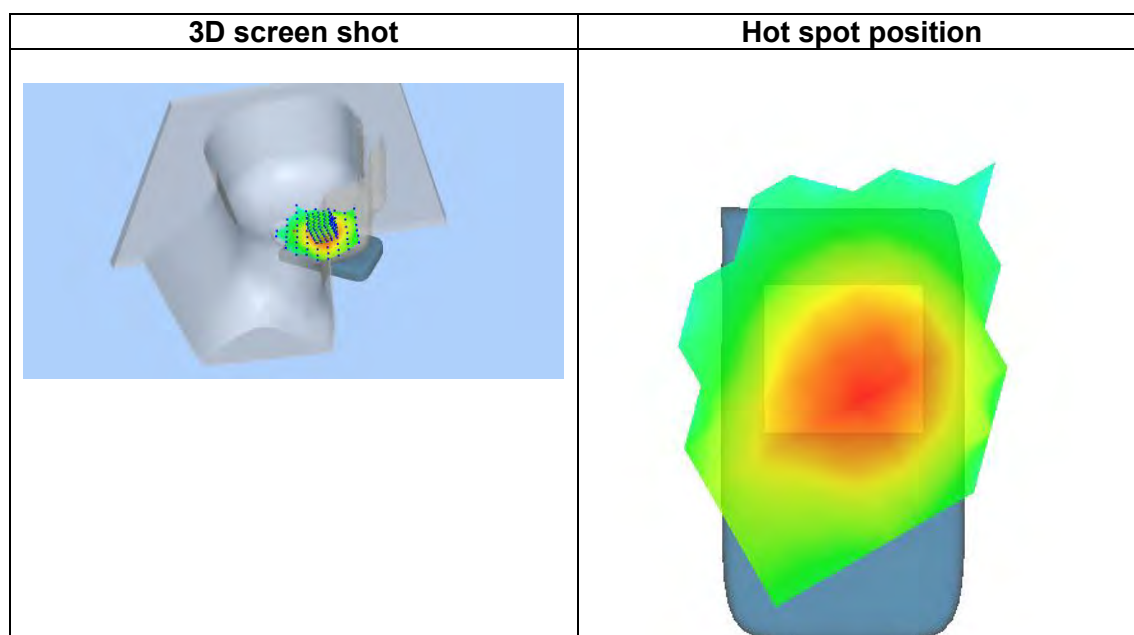
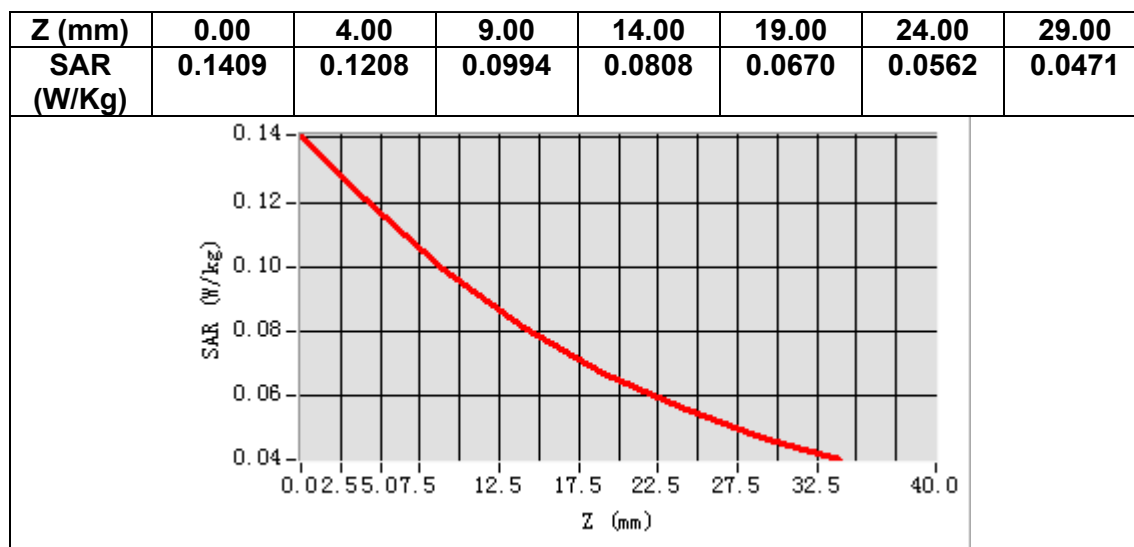
VOLUME SAR



Maximum location: X=-50.00, Y=-20.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.090623
SAR 1g (W/Kg)	0.118283



MEASUREMENT 22

Date of measurement: 24/11/2023

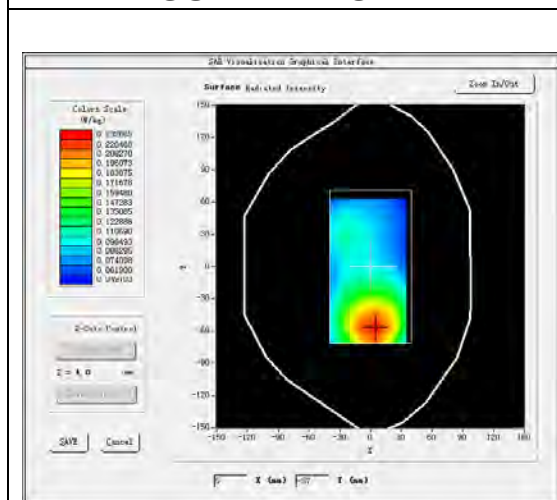
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.32</u>

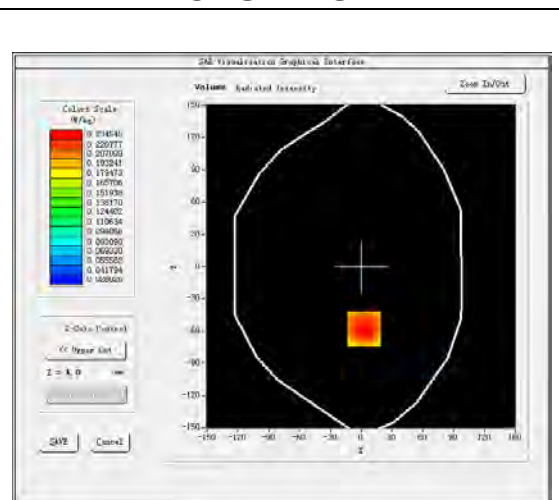
B. SAR Measurement Results

Frequency (MHz)	836.500000
Relative permittivity (real part)	41.565029
Relative permittivity (imaginary part)	19.442995
Conductivity (S/m)	0.903559
Variation (%)	-0.740000

SURFACE SAR



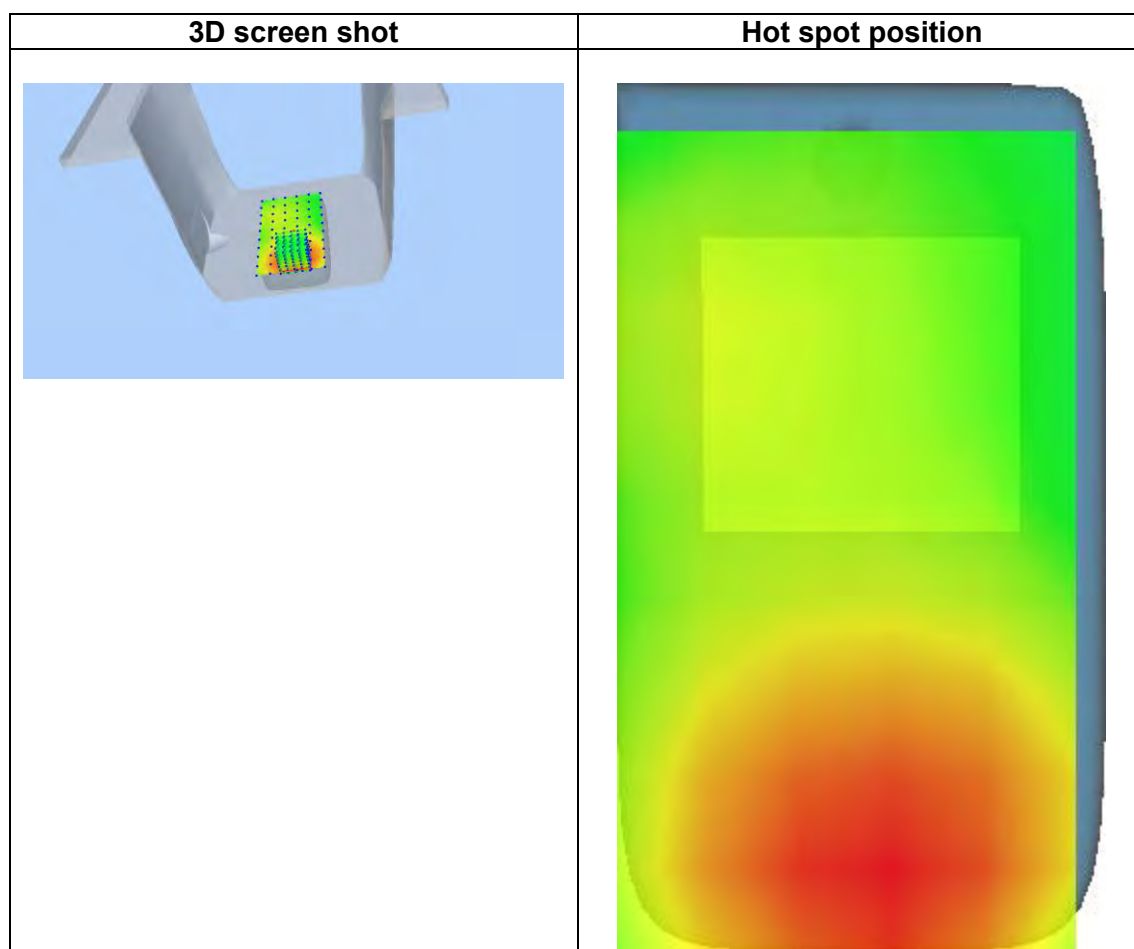
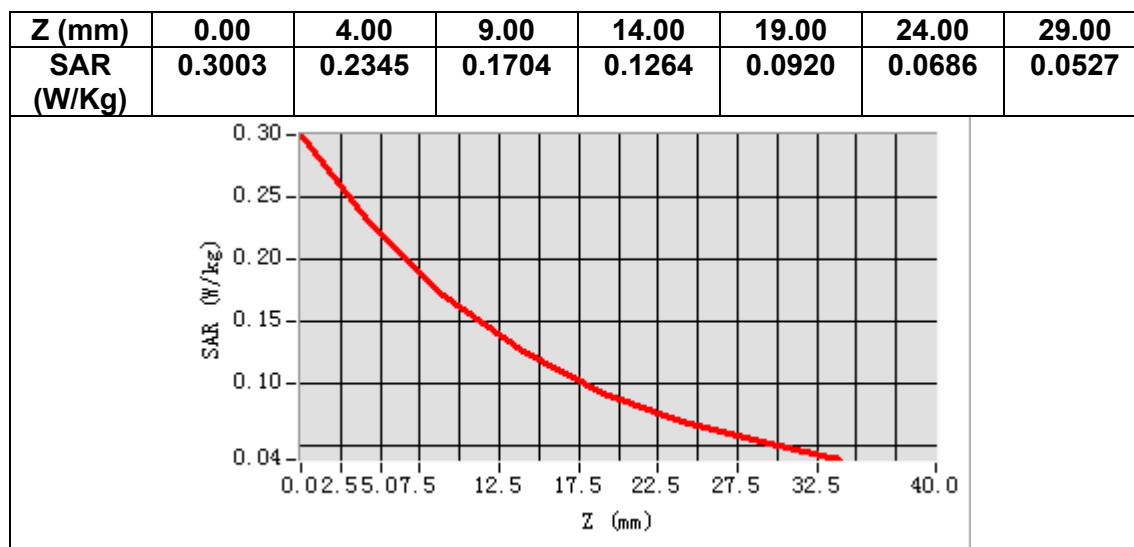
VOLUME SAR



Maximum location: X=3.00, Y=-58.00

SAR Peak: 0.31 W/kg

SAR 10g (W/Kg)	0.158934
SAR 1g (W/Kg)	0.227045



MEASUREMENT 23

Date of measurement: 22/11/2023

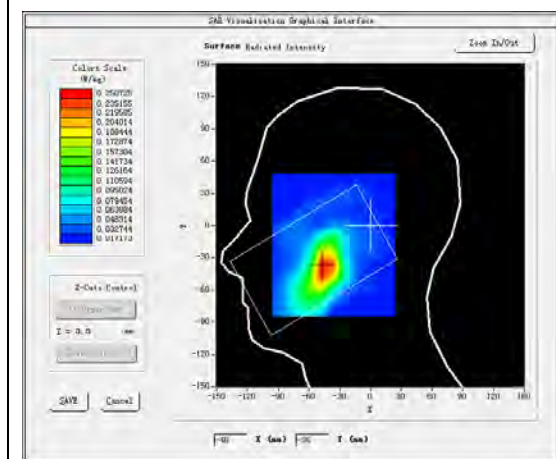
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

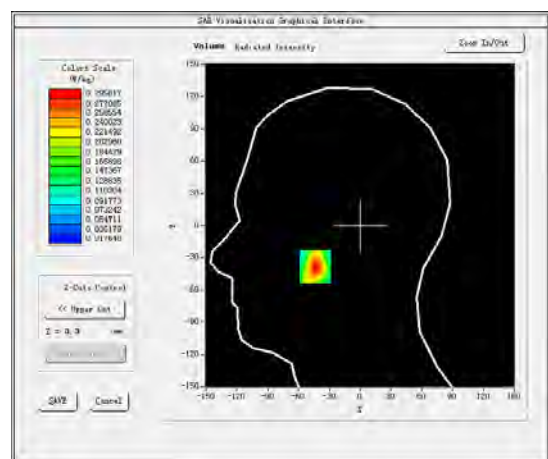
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.811852
Relative permittivity (imaginary part)	13.088056
Conductivity (S/m)	1.843235
Variation (%)	2.380000

SURFACE SAR



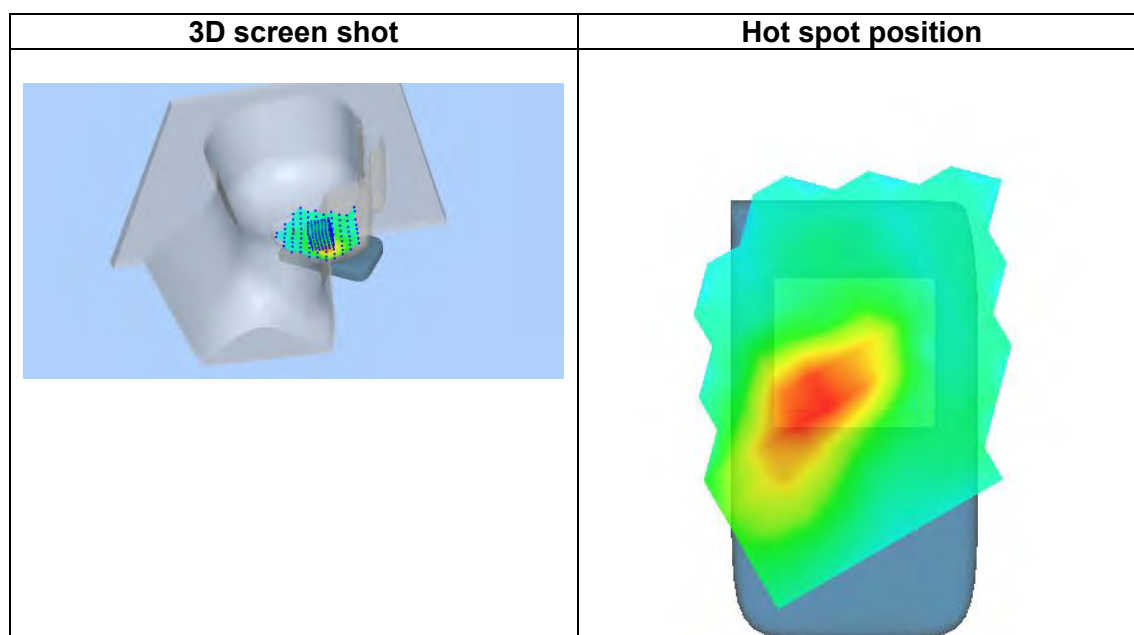
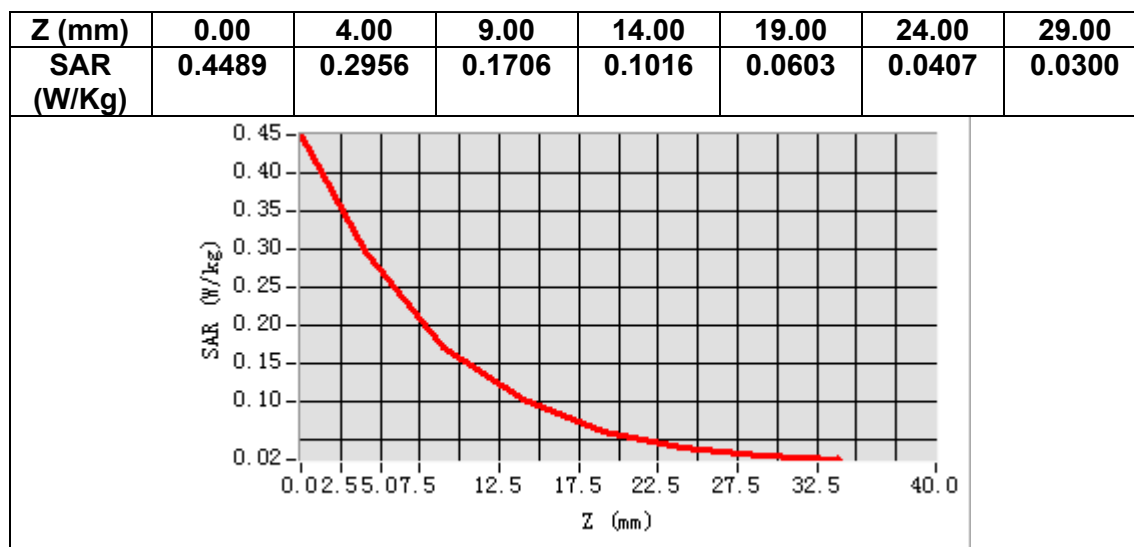
VOLUME SAR



Maximum location: X=-44.00, Y=-38.00

SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.144698
SAR 1g (W/Kg)	0.272864



MEASUREMENT 24

Date of measurement: 22/11/2023

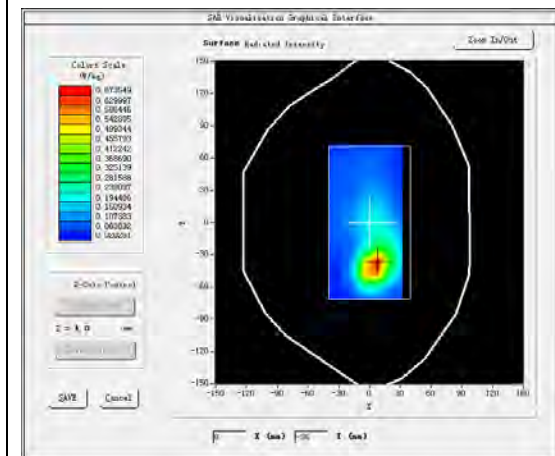
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

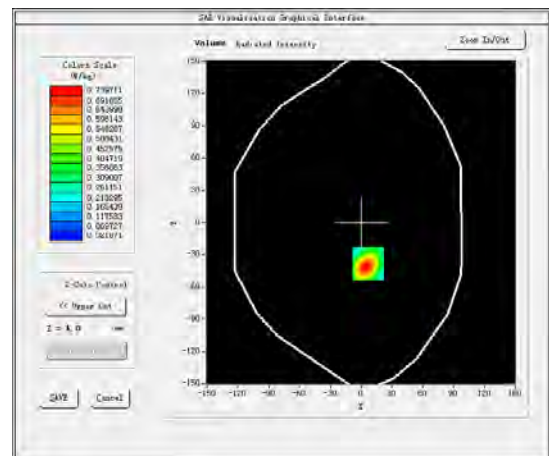
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	38.811852
Relative permittivity (imaginary part)	13.088056
Conductivity (S/m)	1.843235
Variation (%)	0.050000

SURFACE SAR



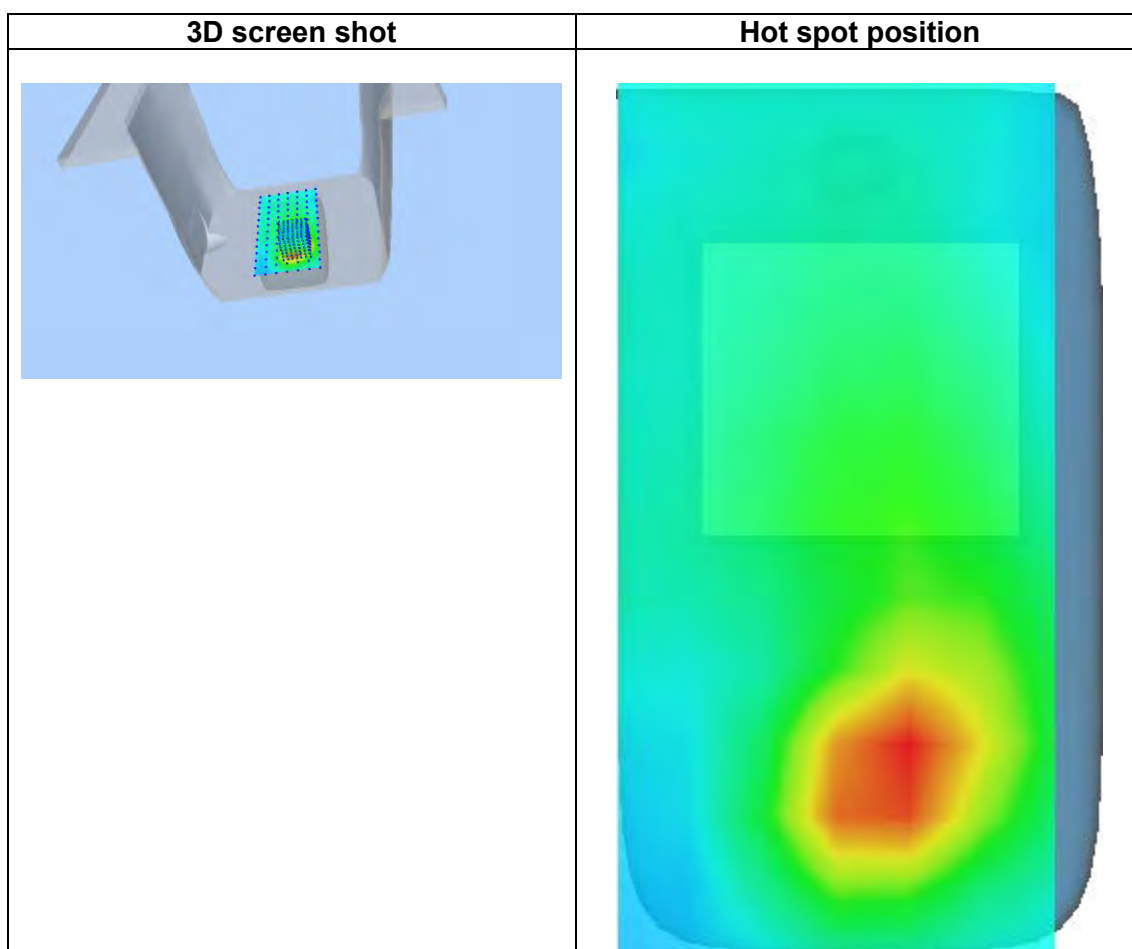
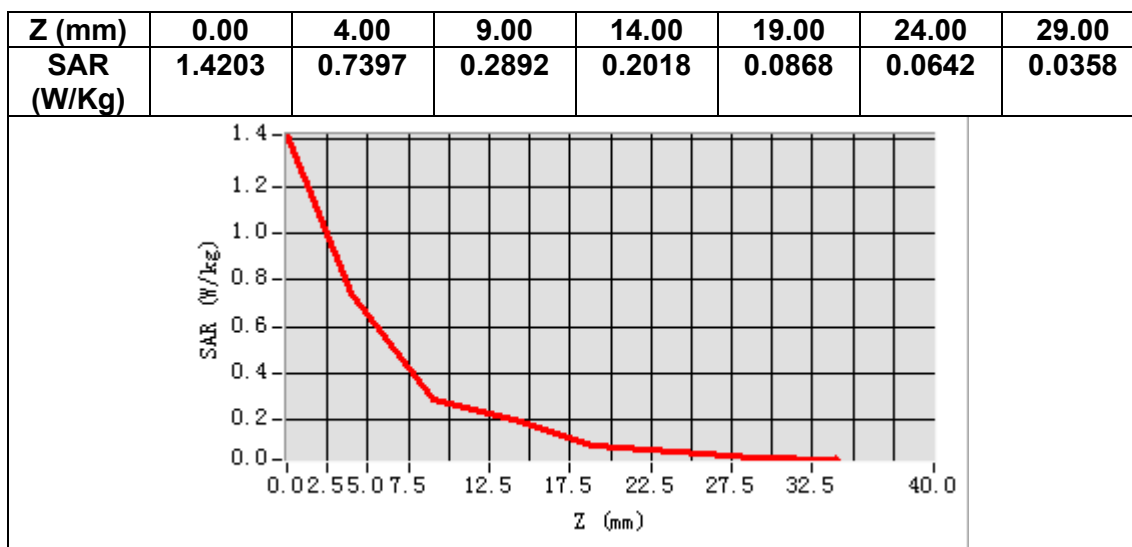
VOLUME SAR



Maximum location: X=7.00, Y=-38.00

SAR Peak: 1.22 W/kg

SAR 10g (W/Kg)	0.335979
SAR 1g (W/Kg)	0.694958



MEASUREMENT 25

Date of measurement: 5/12/2023

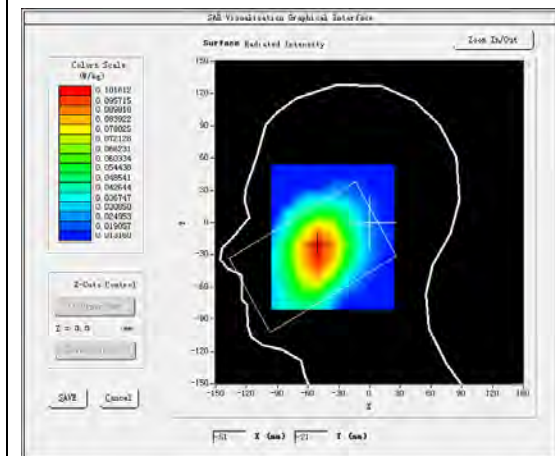
A. Experimental conditions.

<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>2.37</u>

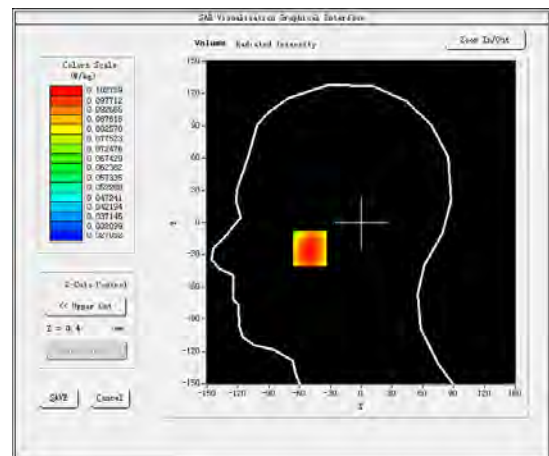
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	42.544853
Relative permittivity (imaginary part)	21.803511
Conductivity (S/m)	0.856999
Variation (%)	4.360000

SURFACE SAR



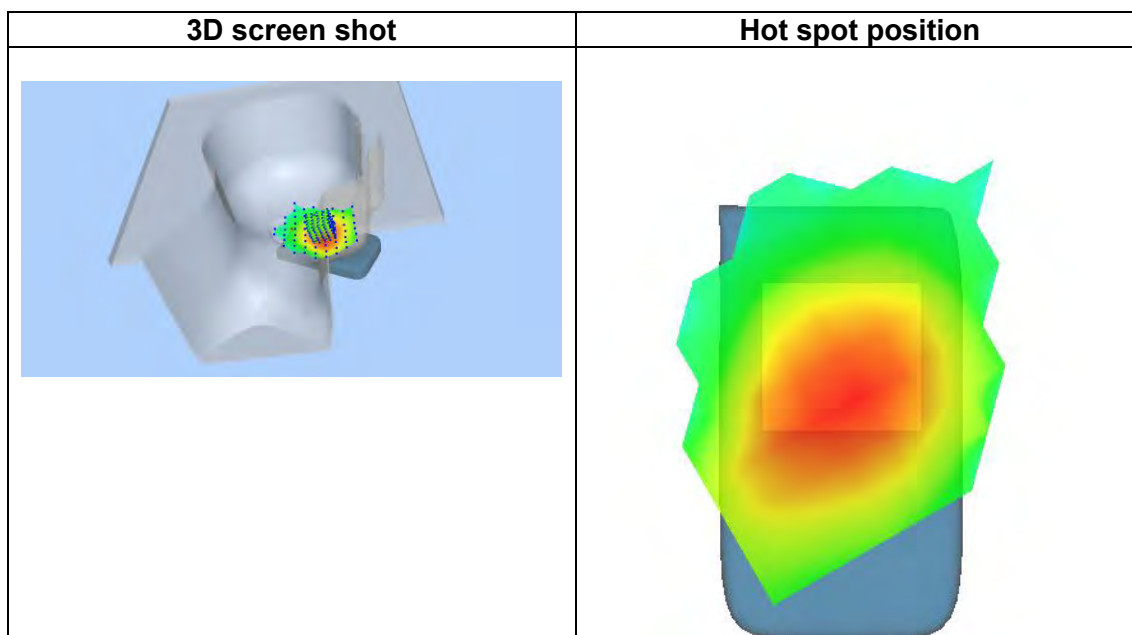
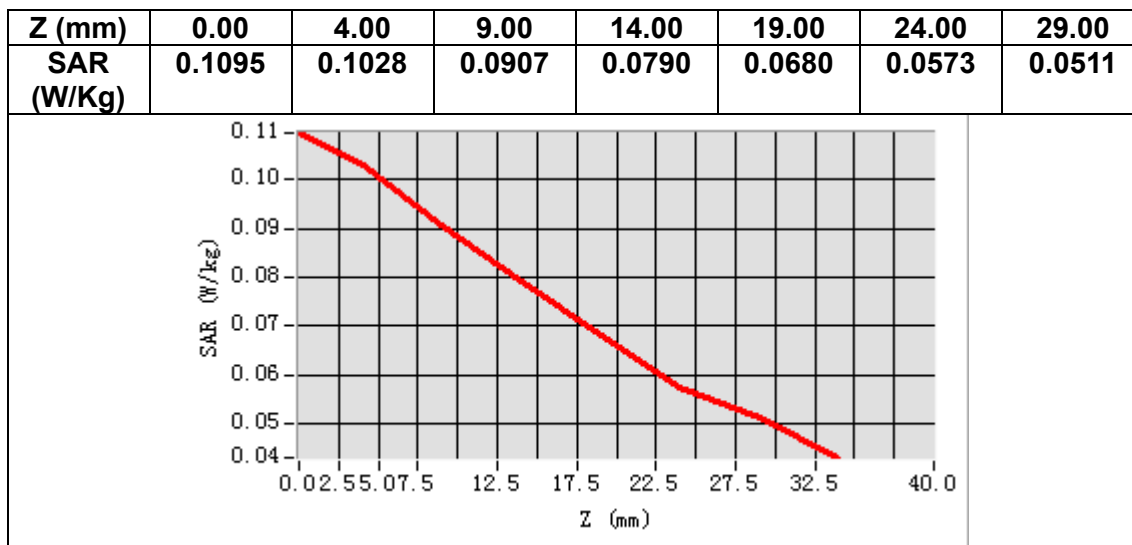
VOLUME SAR



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

SAR Peak: 0.11 W/kg

SAR 10g (W/Kg)	0.082469
SAR 1g (W/Kg)	0.099817



MEASUREMENT 26

Date of measurement: 5/12/2023

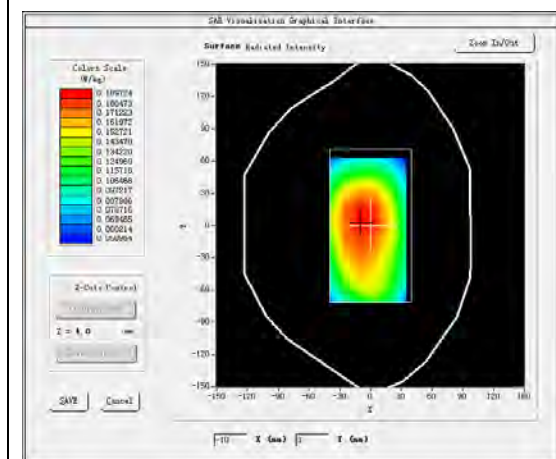
A. Experimental conditions.

<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>2.37</u>

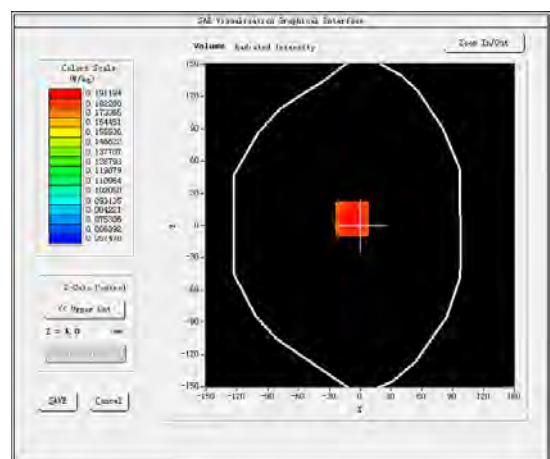
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	42.544853
Relative permittivity (imaginary part)	21.803511
Conductivity (S/m)	0.856999
Variation (%)	-0.390000

SURFACE SAR



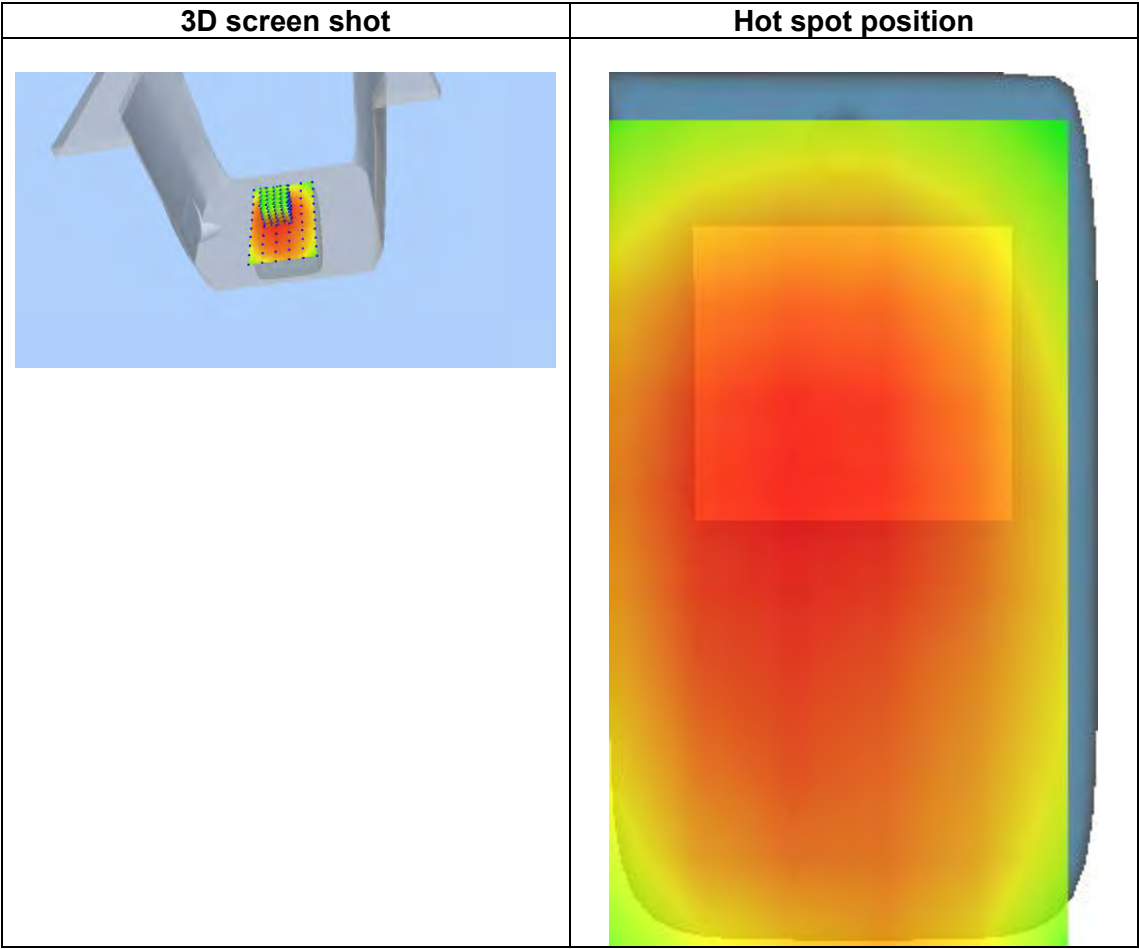
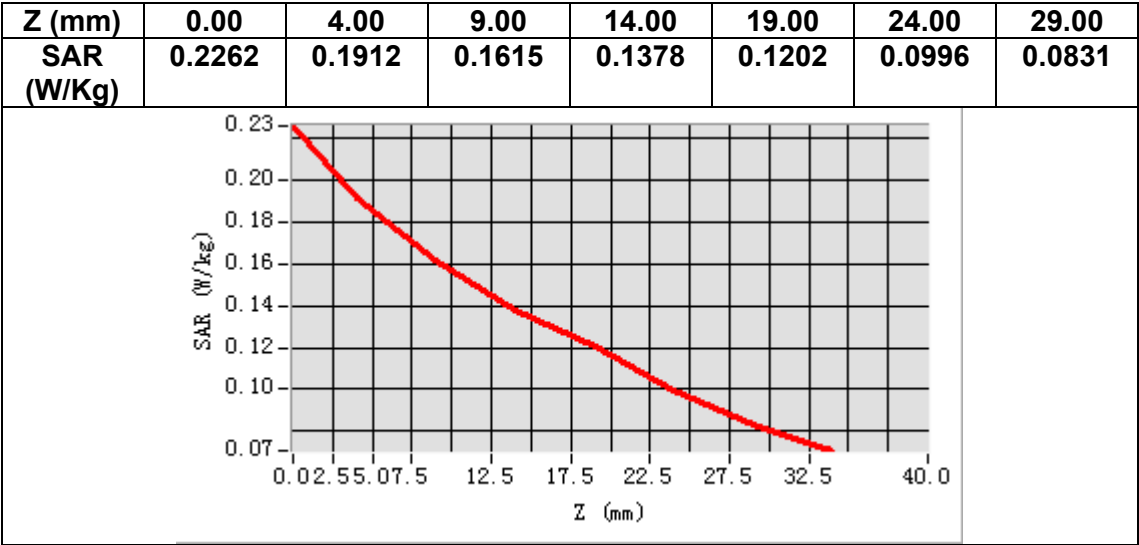
VOLUME SAR



Maximum location: X=-8.00, Y=6.00

SAR Peak: 0.23 W/kg

SAR 10g (W/Kg)	0.153718
SAR 1g (W/Kg)	0.188550



MEASUREMENT 27

Date of measurement: 5/12/2023

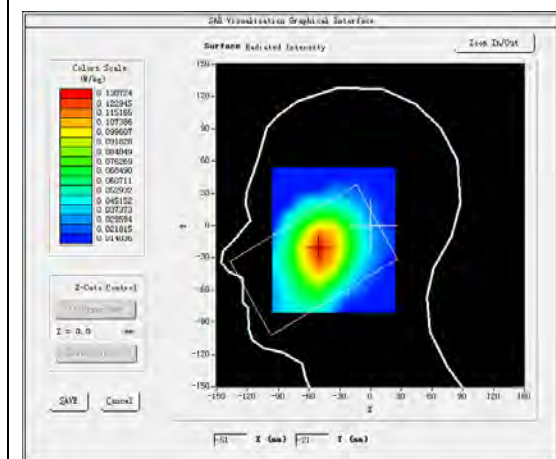
A. Experimental conditions.

<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 13</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

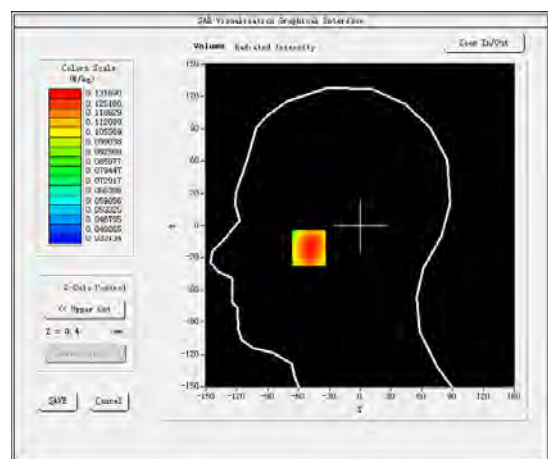
B. SAR Measurement Results

Frequency (MHz)	782.000000
Relative permittivity (real part)	41.586803
Relative permittivity (imaginary part)	21.160711
Conductivity (S/m)	0.918728
Variation (%)	1.870000

SURFACE SAR



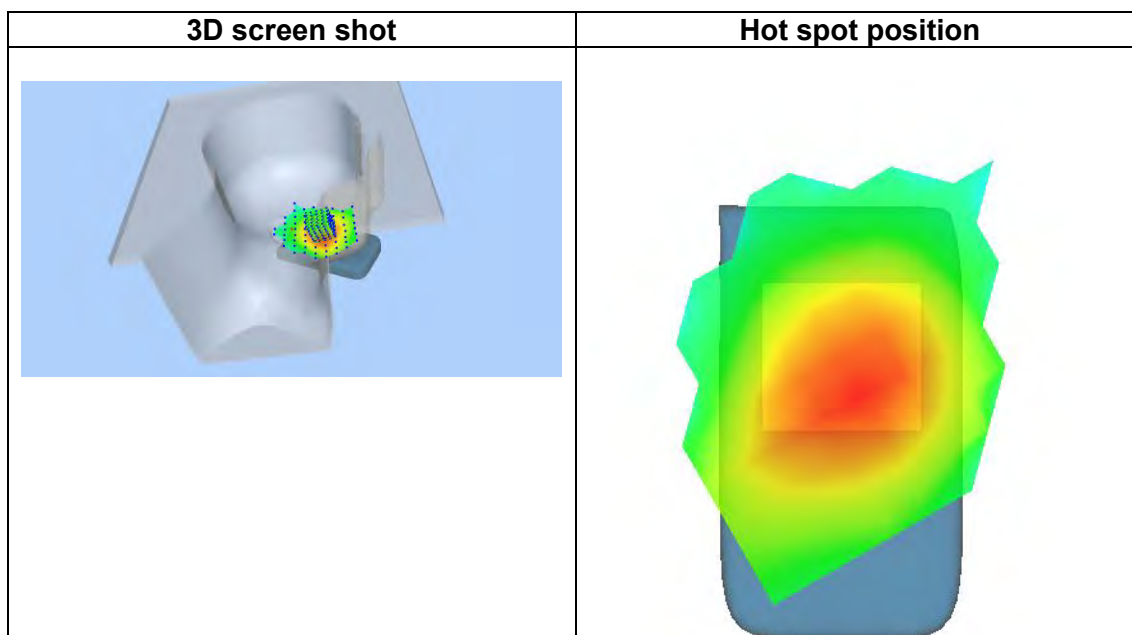
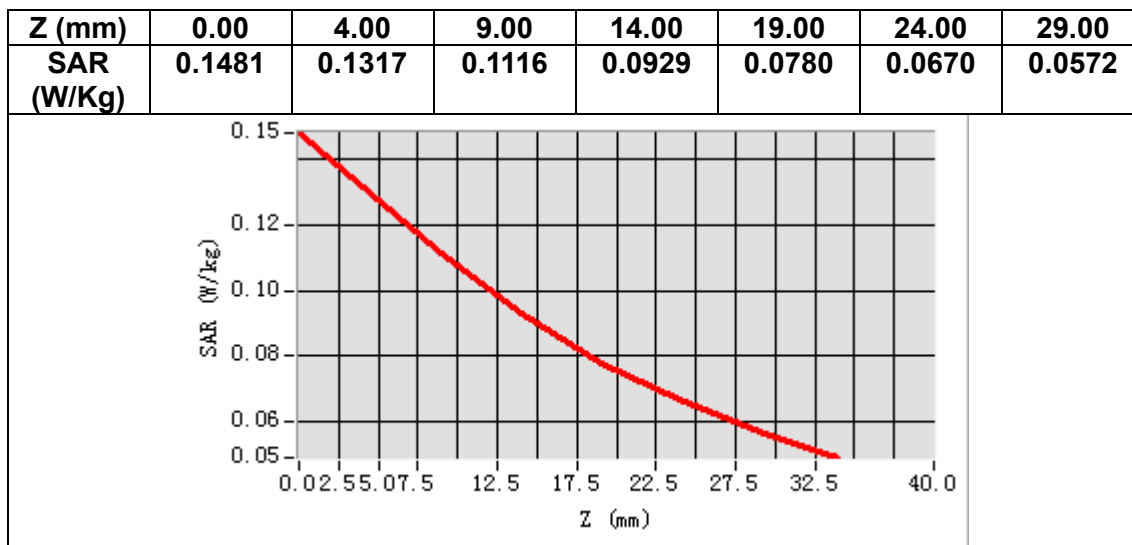
VOLUME SAR



Maximum location: X=-50.00, Y=-21.00

SAR Peak: 0.15 W/kg

SAR 10g (W/Kg)	0.102876
SAR 1g (W/Kg)	0.130198



MEASUREMENT 28

Date of measurement: 5/12/2023

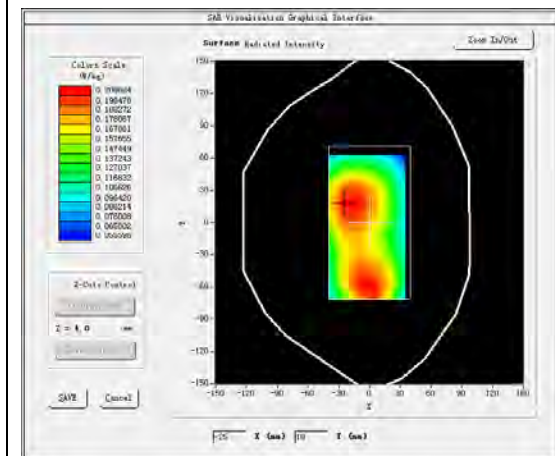
A. Experimental conditions.

<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 13</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

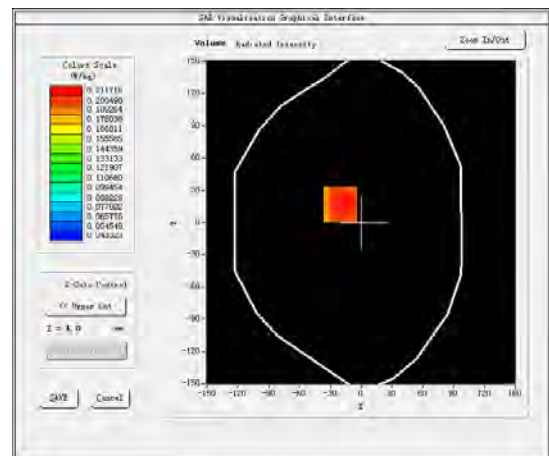
B. SAR Measurement Results

Frequency (MHz)	782.000000
Relative permittivity (real part)	41.586803
Relative permittivity (imaginary part)	21.160711
Conductivity (S/m)	0.918728
Variation (%)	-0.980000

SURFACE SAR



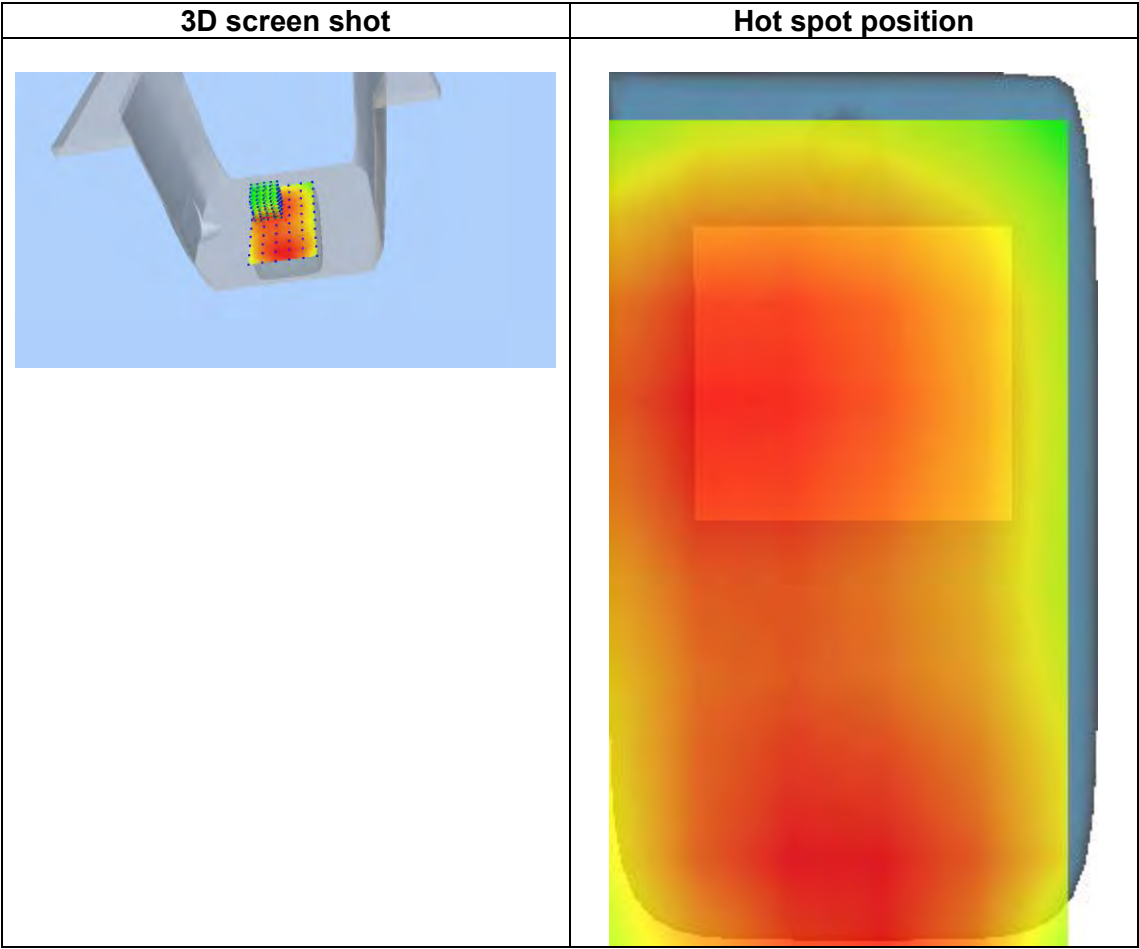
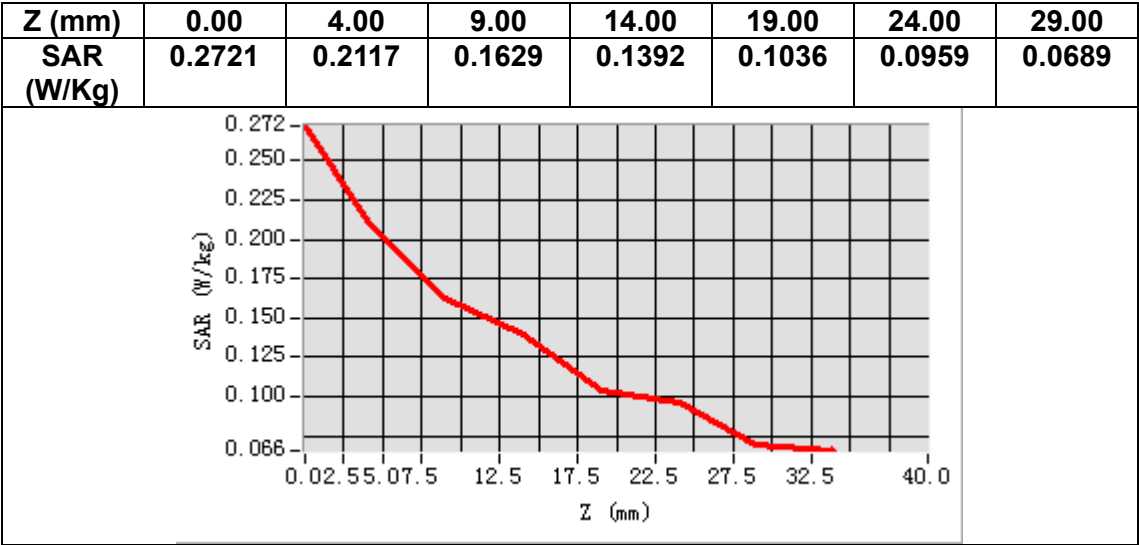
VOLUME SAR



Maximum location: X=-20.00, Y=17.00

SAR Peak: 0.26 W/kg

SAR 10g (W/Kg)	0.163346
SAR 1g (W/Kg)	0.209353



MEASUREMENT 29

Date of measurement: 5/12/2023

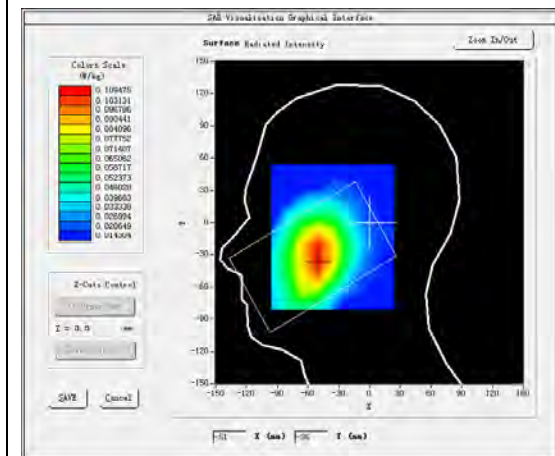
A. Experimental conditions.

<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>2.37</u>

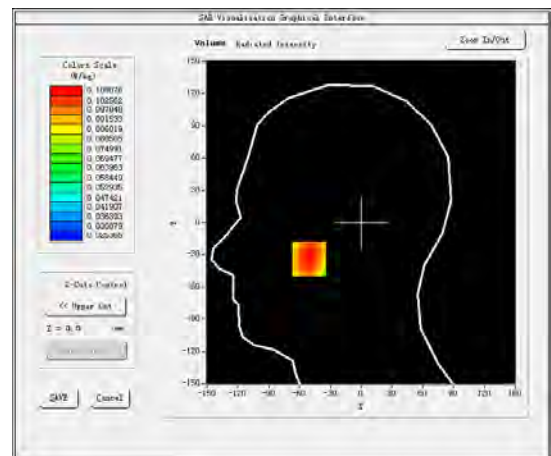
B. SAR Measurement Results

Frequency (MHz)	710.000000
Relative permittivity (real part)	42.523605
Relative permittivity (imaginary part)	21.831911
Conductivity (S/m)	0.861148
Variation (%)	0.850000

SURFACE SAR



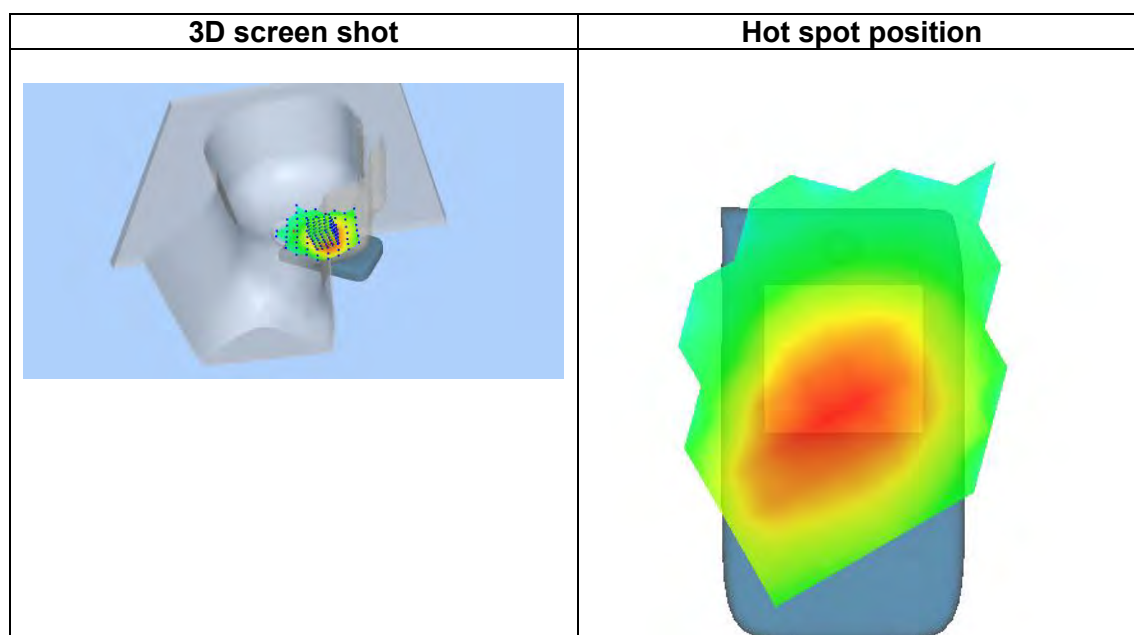
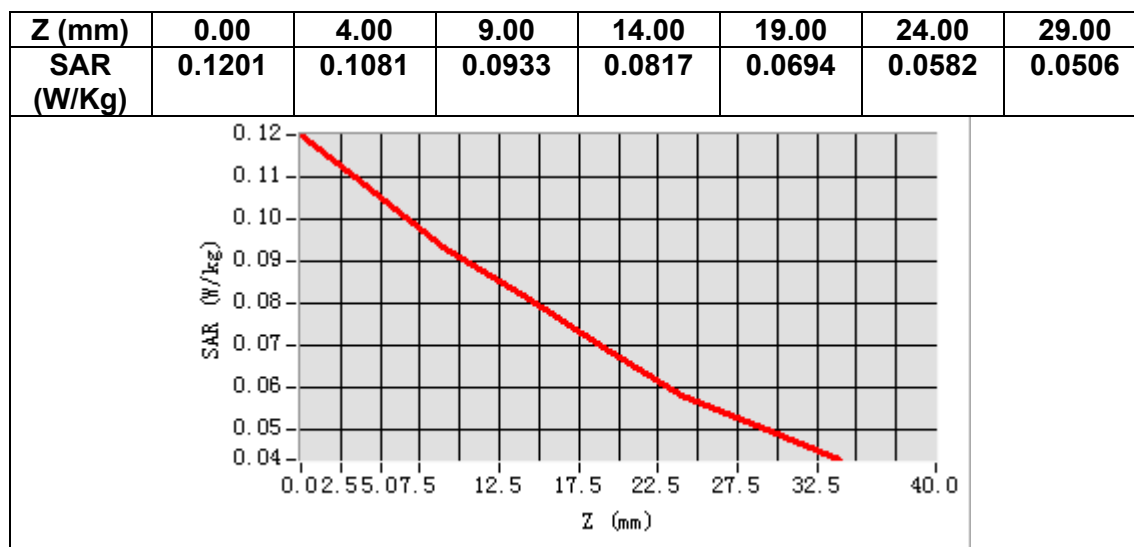
VOLUME SAR



Maximum location: X=-51.00, Y=-34.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.086543
SAR 1g (W/Kg)	0.105820



MEASUREMENT 30

Date of measurement: 5/12/2023

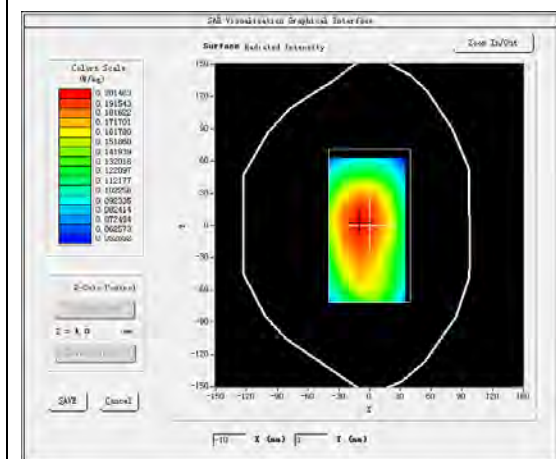
A. Experimental conditions.

<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>2.37</u>

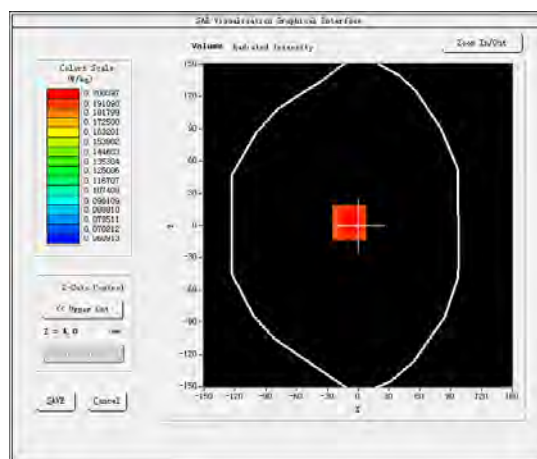
B. SAR Measurement Results

Frequency (MHz)	710.000000
Relative permittivity (real part)	42.523605
Relative permittivity (imaginary part)	21.831911
Conductivity (S/m)	0.861148
Variation (%)	-0.520000

SURFACE SAR



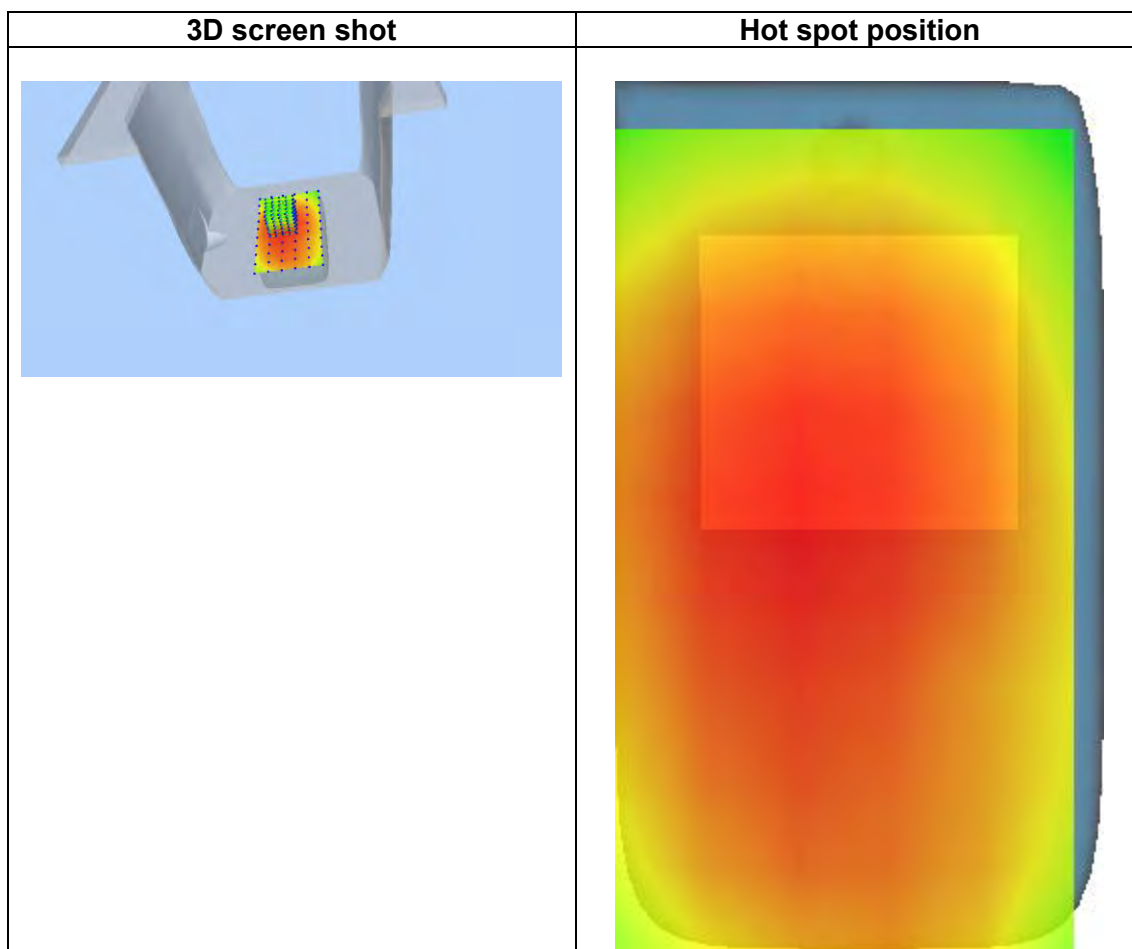
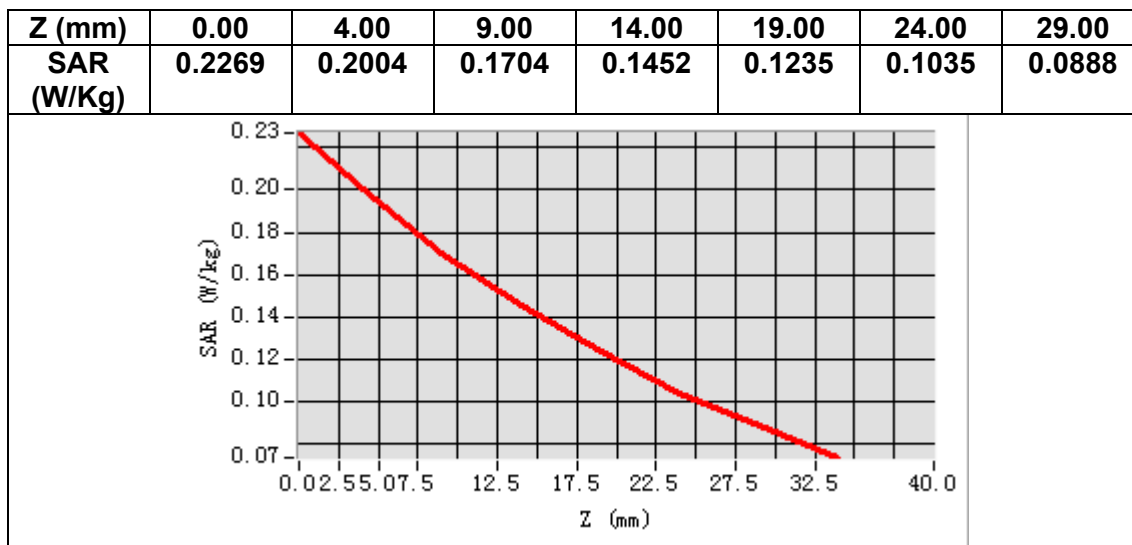
VOLUME SAR



Maximum location: X=-9.00, Y=3.00

SAR Peak: 0.23 W/kg

SAR 10g (W/Kg)	0.160851
SAR 1g (W/Kg)	0.196220



MEASUREMENT 31

Date of measurement: 22/11/2023

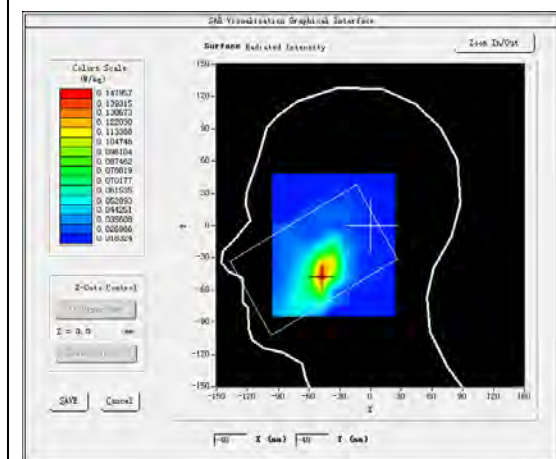
A. Experimental conditions.

<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: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

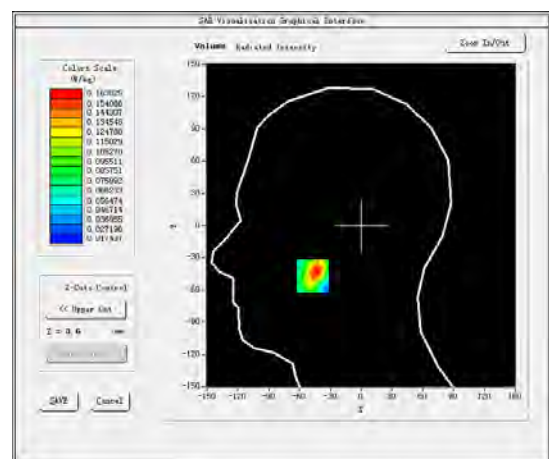
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	38.443951
Relative permittivity (imaginary part)	13.301856
Conductivity (S/m)	1.917684
Variation (%)	-1.690000

SURFACE SAR



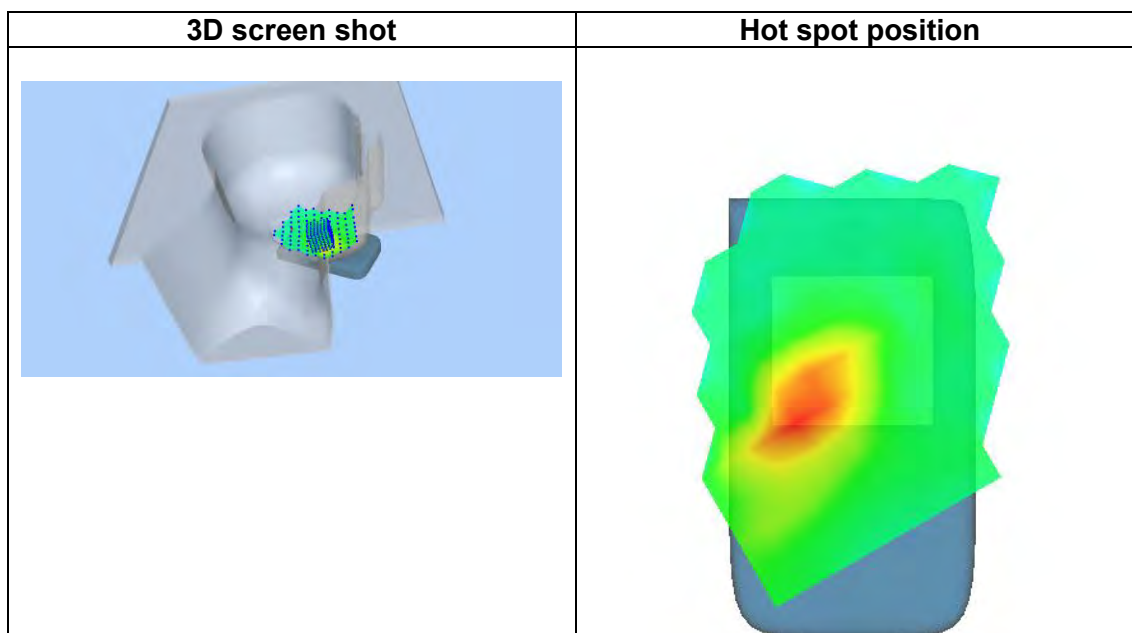
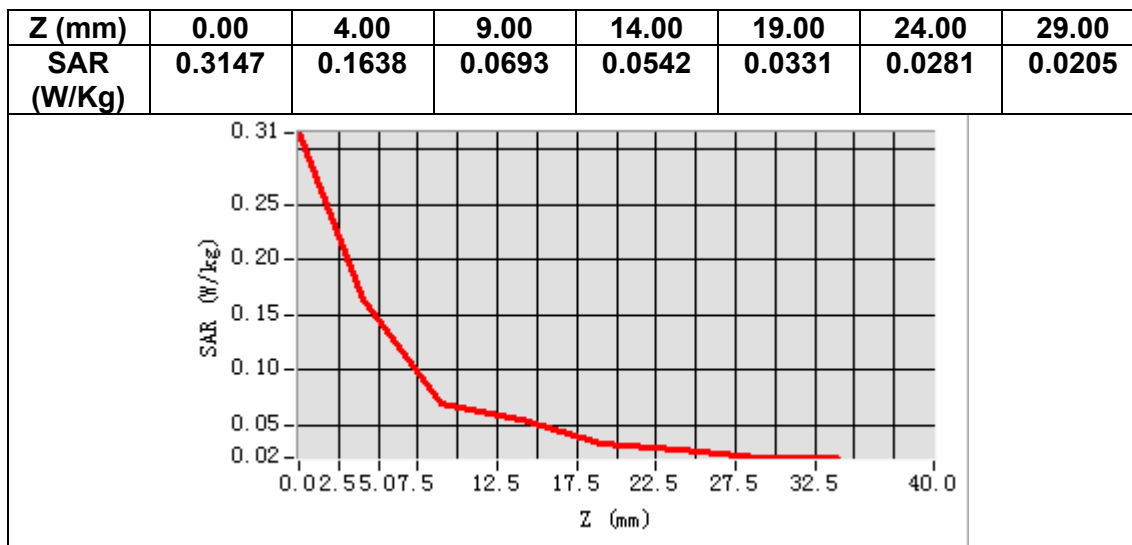
VOLUME SAR



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

SAR Peak: 0.25 W/kg

SAR 10g (W/Kg)	0.079123
SAR 1g (W/Kg)	0.150759



MEASUREMENT 32

Date of measurement: 22/11/2023

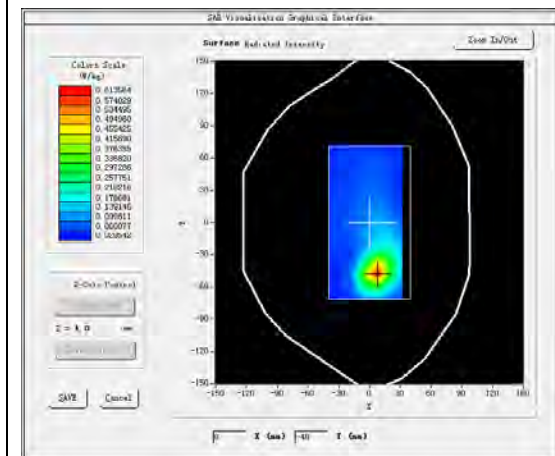
A. Experimental conditions.

<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: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

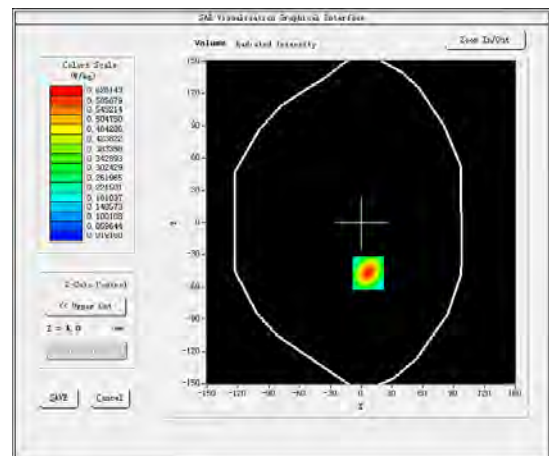
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	38.443951
Relative permittivity (imaginary part)	13.301856
Conductivity (S/m)	1.917684
Variation (%)	1.360000

SURFACE SAR



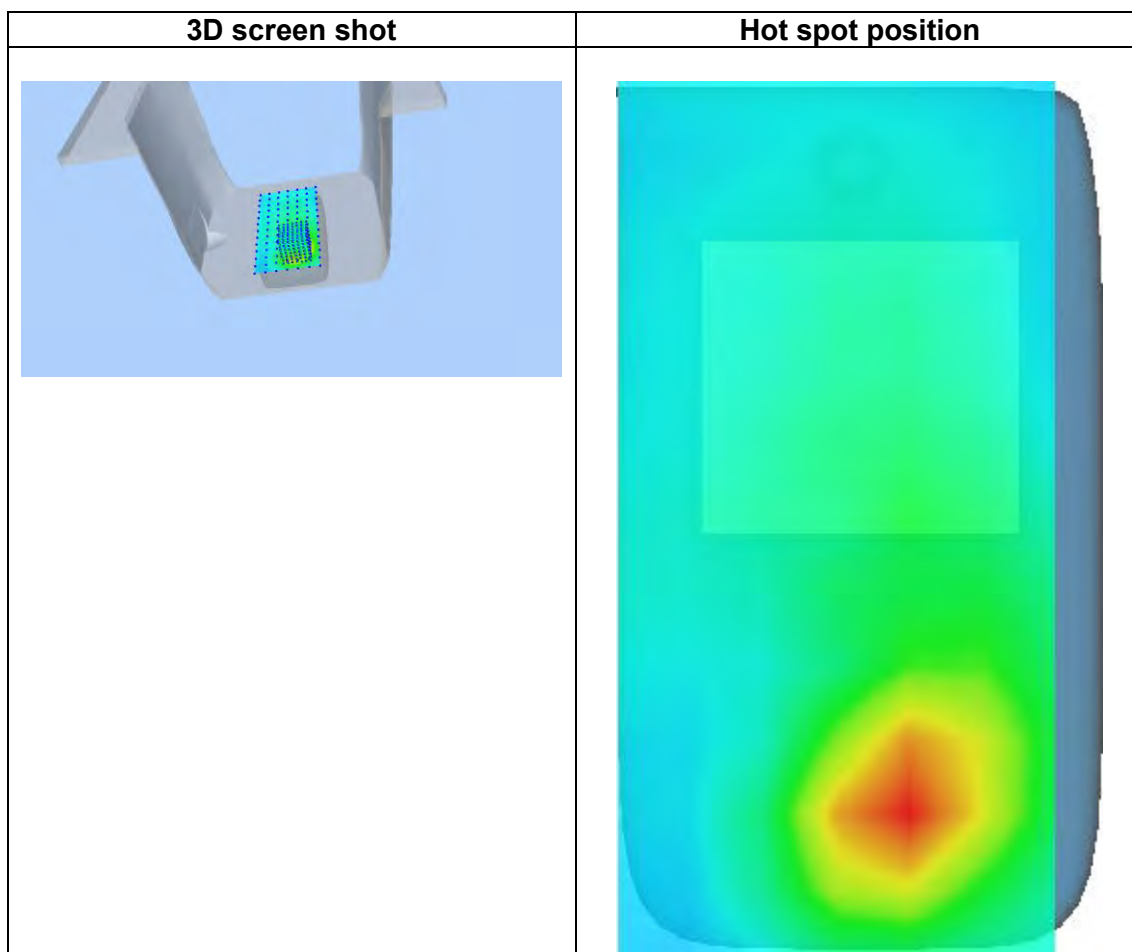
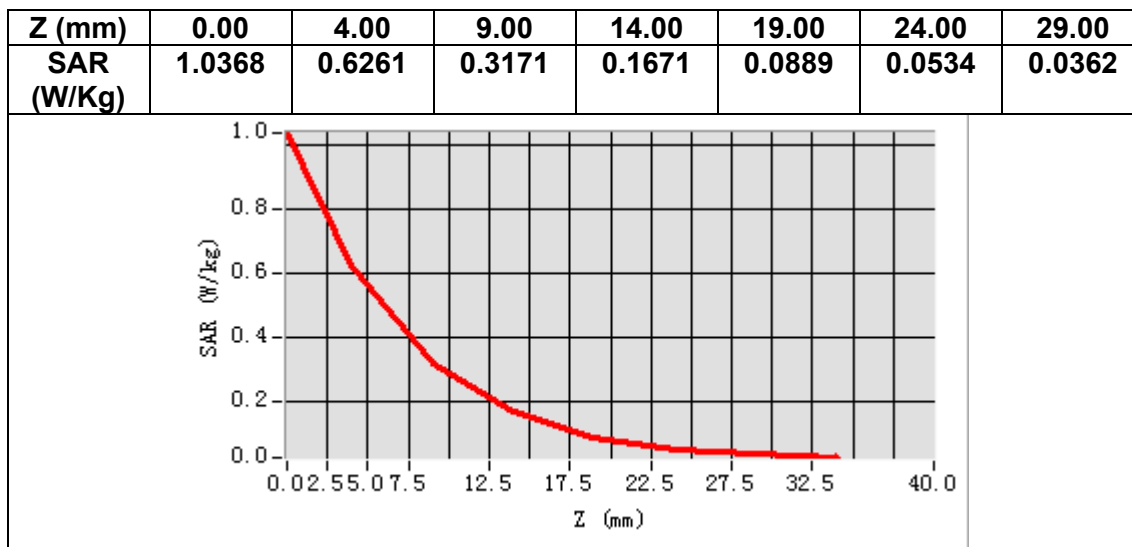
VOLUME SAR



Maximum location: X=7.00, Y=-47.00

SAR Peak: 1.03 W/kg

SAR 10g (W/Kg)	0.279183
SAR 1g (W/Kg)	0.575734



MEASUREMENT 33

Date of measurement: 17/11/2023

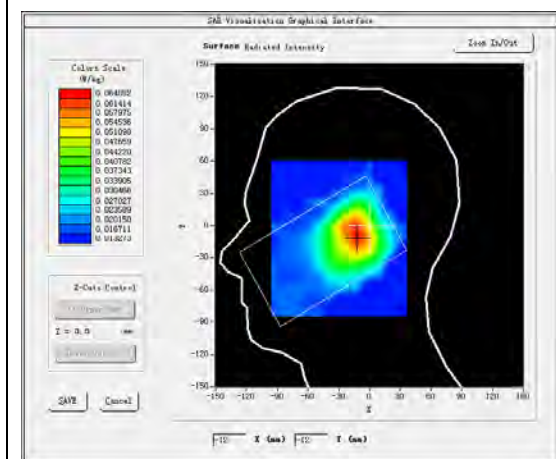
A. Experimental conditions.

<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>Bluetooth</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>Bluetooth (Crest factor: 0.77)</u>
<u>ConvF</u>	<u>2.85</u>

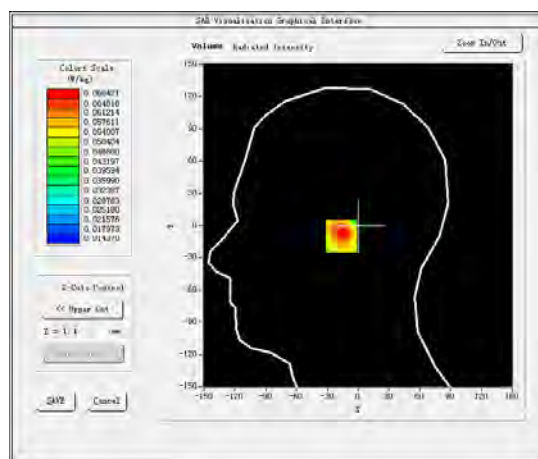
B. SAR Measurement Results

Frequency (MHz)	2441.000000
Relative permittivity (real part)	38.609112
Relative permittivity (imaginary part)	13.027752
Conductivity (S/m)	1.766708
Variation (%)	0.230000

SURFACE SAR



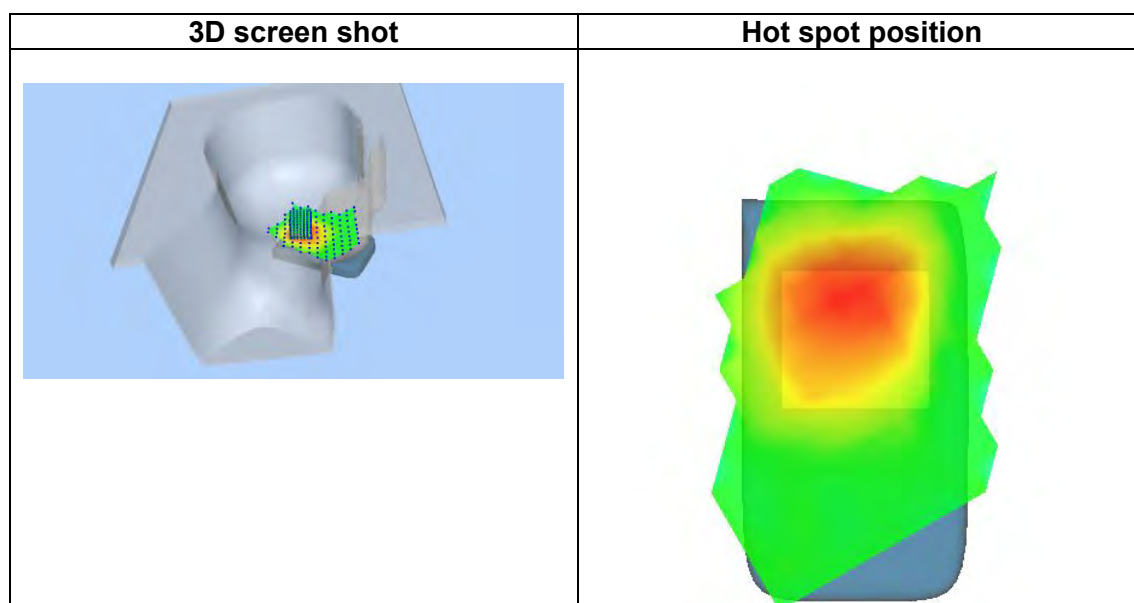
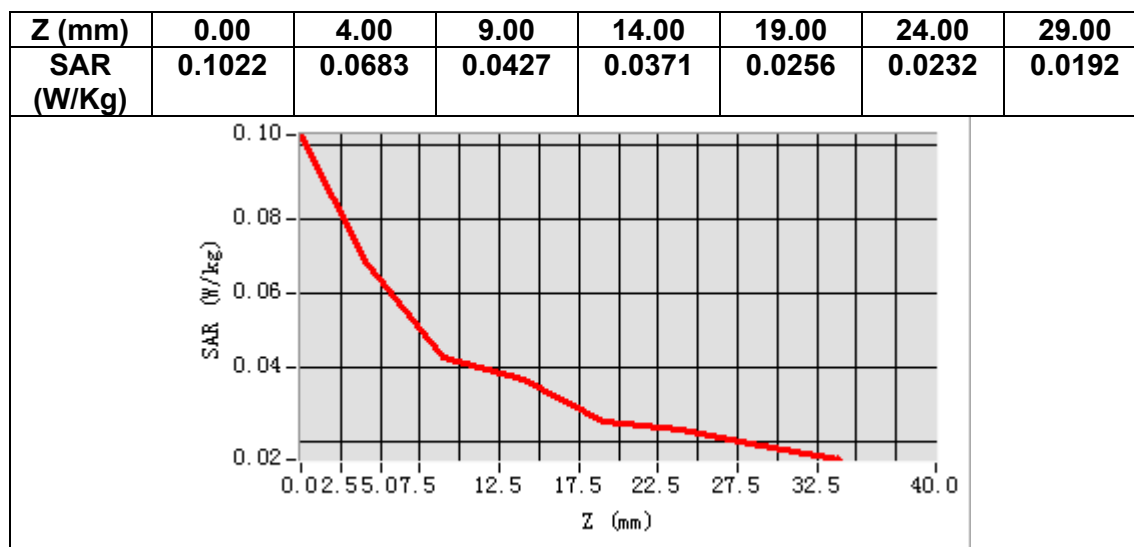
VOLUME SAR



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

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.043210
SAR 1g (W/Kg)	0.063125



MEASUREMENT 34

Date of measurement: 17/11/2023

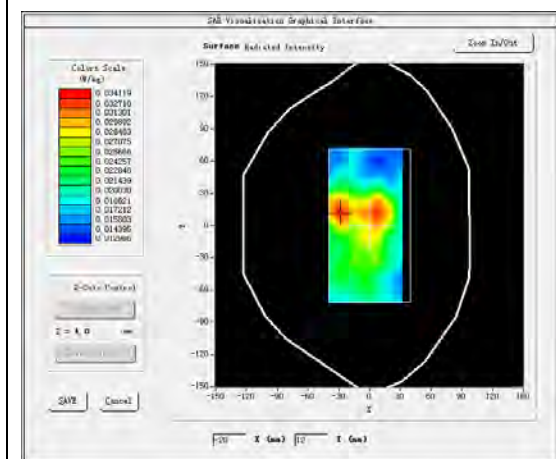
A. Experimental conditions.

<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>Bluetooth</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>Bluetooth (Crest factor: 0.77)</u>
<u>ConvF</u>	<u>2.85</u>

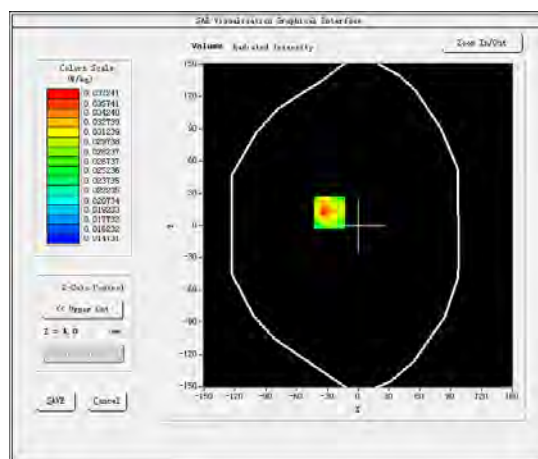
B. SAR Measurement Results

Frequency (MHz)	2441.000000
Relative permittivity (real part)	38.609112
Relative permittivity (imaginary part)	13.027752
Conductivity (S/m)	1.766708
Variation (%)	2.130000

SURFACE SAR



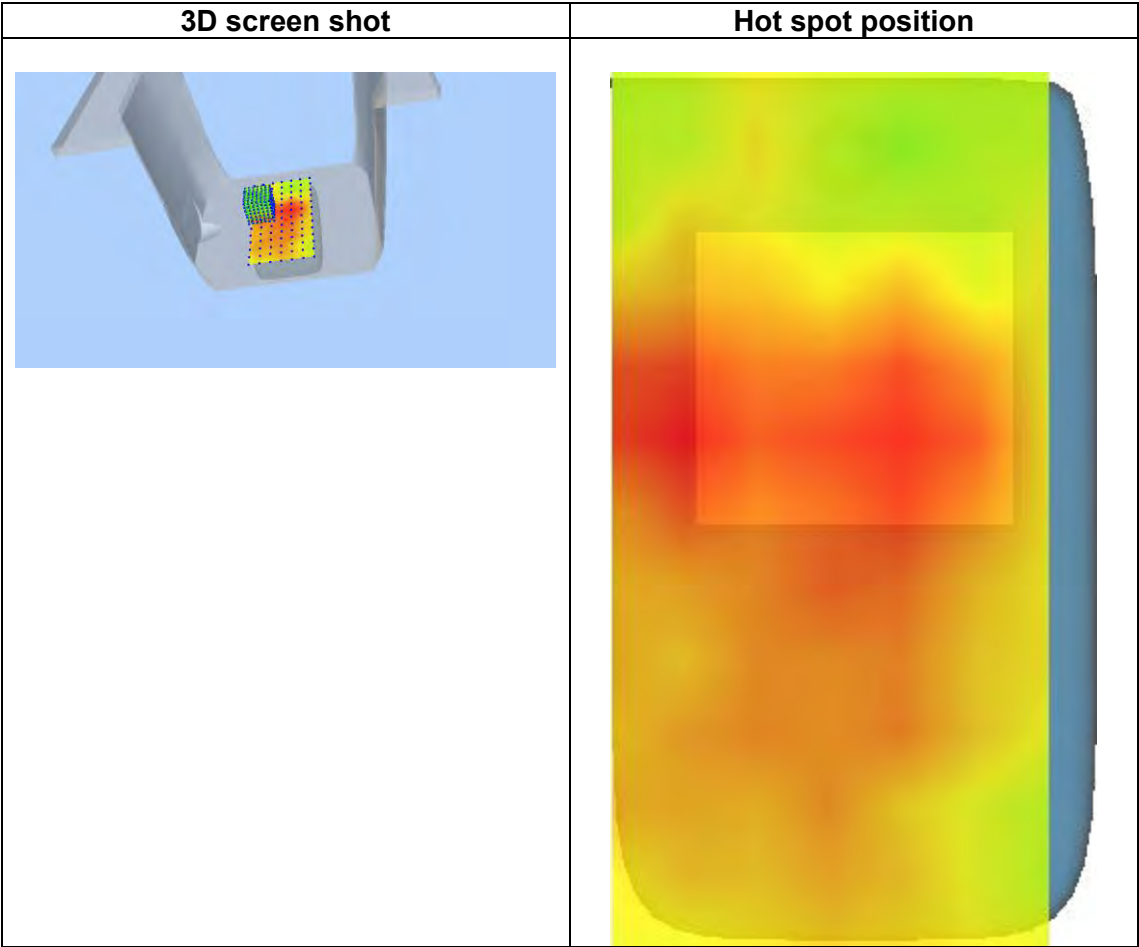
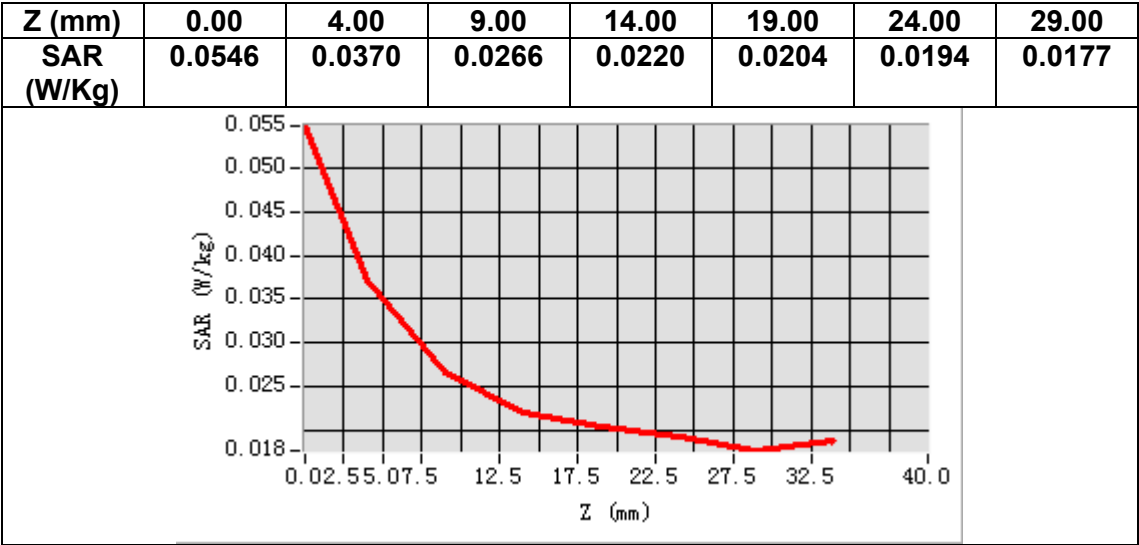
VOLUME SAR



Maximum location: X=-28.00, Y=12.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.022014
SAR 1g (W/Kg)	0.033118



2. Appendix D. Calibration Certificate

Table of contents
E Field Probe - 3423-EPGO-426
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.261.11.23.BES.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: 3423-EPGO-426

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 09/18/2023



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

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Summary:

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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

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

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

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

1 DEVICE UNDER TEST

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

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

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



Figure 1 – MVG COMOSAR Dosimetric E field Probe

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

3 MEASUREMENT METHOD

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

3.1 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

3.2 LINEARITY

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

3.3 ISOTROPY

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

3.4 BOUNDARY EFFECT

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

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

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

where

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

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty associated with a SAR probe calibration using the waveguide or calorimetric cell technique depending on the frequency.

The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-11% for the frequency range 150-450MHz.

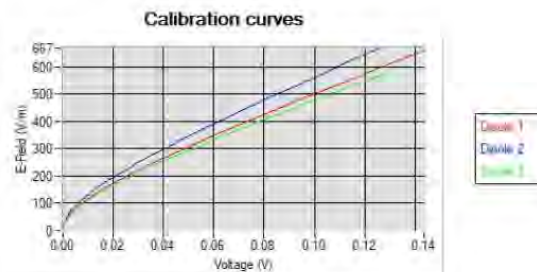
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

Ambient condition	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 CALIBRATION IN AIR

The following curve represents the measurement in waveguide of the voltage picked up by the probe toward the E-field generated inside the waveguide.



From this curve, the sensitivity in air is calculated using the below formula.

$$E^2 = \sum_{i=1}^3 \frac{V_i (1 + V_i / DCP_i)}{Norm_i}$$

where

V_i =voltage readings on the 3 channels of the probe

DCP_i =diode compression point given below for the 3 channels of the probe

$Norm_i$ =dipole sensitivity given below for the 3 channels of the probe



COMOSAR E-FIELD PROBE CALIBRATION REPORT

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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 ($\mu\text{V}/(\text{V}/\text{m})^2$)
0.78	0.62	0.85

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
105	108	107

5.2 CALIBRATION IN LIQUID

The calorimeter cell or the waveguide is used to determine the calibration in liquid using the formula below.

$$ConvF = \frac{E_{liquid}^2}{E_{air}^2}$$

The E-field in the liquid is determined from the SAR measurement according to the below formula.

$$E_{liquid}^2 = \frac{\rho SAR}{\sigma}$$

where

σ =the conductivity of the liquid

ρ =the volumetric density of the liquid

SAR=the SAR measured from the formula that depends on the setup used. The SAR formulas are given below

For the calorimeter cell (150-450 MHz), the formula is:

$$SAR = c \frac{dT}{dt}$$

where

c =the specific heat for the liquid

dT/dt =the temperature rises over the time

For the waveguide setup (600-75000 MHz), the formula is:

$$SAR = \frac{4P_W}{ab\delta} e^{-\frac{2z}{\delta}}$$

where

a =the larger cross-sectional of the waveguide

b =the smaller cross-sectional of the waveguide

δ =the skin depth for the liquid in the waveguide

P_W =the power delivered to the liquid



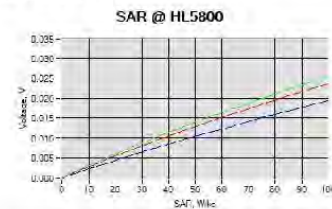
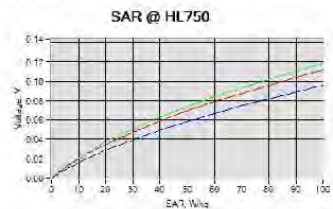
COMOSAR E-FIELD PROBE CALIBRATION REPORT

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The below table summarize the ConvF for the calibrated liquid. The curves give examples for the measured SAR depending on the voltage in some liquid.

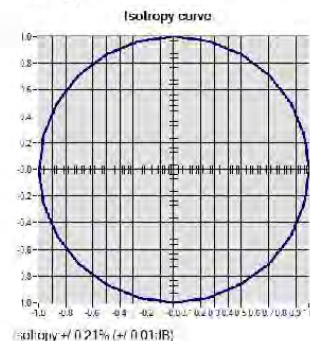
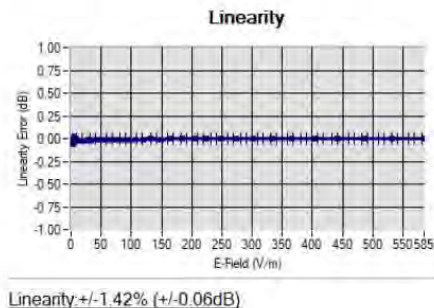
Liquid	Frequency (MHz*)	ConvF
HL750	750	2.37
HL850	835	2.32
HL900	900	2.23
HL1800	1800	2.45
HL1900	1900	2.63
HL2000	2000	2.83
HL2300	2300	2.81
HL2450	2450	2.85
HL2600	2600	2.65
HL3300	3300	2.21
HL3500	3500	2.20
HL3700	3700	2.11
HL3900	3900	2.40
HL4200	4200	2.40
HL4600	4600	2.33
HL4900	4900	2.37
HL5200	5200	2.07
HL5400	5400	2.11
HL5600	5600	2.20
HL5800	5800	2.04

(*) Frequency validity is +/-50MHz below 600MHz, +/-100MHz from 600MHz to 6GHz and +/-700MHz above 6GHz



6 VERIFICATION RESULTS

The figures below represent the measured linearity and axial isotropy for this probe. The probe specification is +/-0.2 dB for linearity and +/-0.15 dB for axial isotropy.





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7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer	Agilent 8753ES	MY40003210	10/2019	10/2023
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Multimeter	Keithley 2000	4013982	02/2023	02/2026
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2021	06/2024
Power Meter	Keysight U2000A	SN: MY62340002	10/2022	10/2025
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Fluoroptic Thermometer	LumaSense Luxtron 812	94264	09/2022	09/2025
Coaxial cell	MVG	SN 32/16 COAXCELL_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG2_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G600_1	Validated. No cal required.	Validated. No cal required.

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

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Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_5G000_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG14_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_7G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.60.2.21.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 REFERENCE DIPOLE

FREQUENCY: 750 MHZ

SERIAL NO.: SN 03/15 DIP0G750-355

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 03/01/2021



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

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed at MVG, using the COMOSAR test bench. The test results covered by accreditation are traceable to the International System of Units (SI).



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.2.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	3/1/2021	<i>JS</i>
Checked by :	Jérôme Luc	Technical Manager	3/1/2021	<i>JS</i>
Approved by :	Yann Toutain	Laboratory Director	3/1/2021	<i>Yann Toutain</i>

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

Issue	Name	Date	Modifications
A	Jérôme Luc	3/1/2021	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.2.21.MVGB.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

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1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEEE 1528, FCC KDBs and CEI/IEC 62209 standards for reference dipoles used for SAR measurement system validations and the measurements that were performed to verify that the product complies with the fore mentioned standards.

2 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR 750 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID750
Serial Number	SN 03/15 DIP0G750-355
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEEE 1528, FCC KDBs and CEI/IEC 62209 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



SAR REFERENCE DIPOLE CALIBRATION REPORT

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4 MEASUREMENT METHOD

The IEEE 1528, FCC KDBs and CEI/IEC 62209 standards provide requirements for reference dipoles used for system validation measurements. The following measurements were performed to verify that the product complies with the fore mentioned standards.

4.1 RETURN LOSS REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a return loss of -20 dB or better. The return loss measurement shall be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. A direct method is used with a network analyser and its calibration kit, both with a valid ISO17025 calibration.

4.2 MECHANICAL REQUIREMENTS

The IEEE Std. 1528 and CEI/IEC 62209 standards specify the mechanical components and dimensions of the validation dipoles, with the dimension's frequency and phantom shell thickness dependent. The COMOSAR test bench employs a 2 mm phantom shell thickness therefore the dipoles sold for use with the COMOSAR test bench comply with the requirements set forth for a 2 mm phantom shell thickness. A direct method is used with a ISO17025 calibrated caliper.

5 MEASUREMENT UNCERTAINTY

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.

5.1 RETURN LOSS

The following uncertainties apply to the return loss measurement:

Frequency band	Expanded Uncertainty on Return Loss
400-6000MHz	0.08 LIN

5.2 DIMENSION MEASUREMENT

The following uncertainties apply to the dimension measurements:

Length (mm)	Expanded Uncertainty on Length
0 - 300	0.20 mm
300 - 450	0.44 mm

5.3 VALIDATION MEASUREMENT

The guidelines outlined in the IEEE 1528, FCC KDBs, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty for validation measurements.

Scan Volume	Expanded Uncertainty
-------------	----------------------



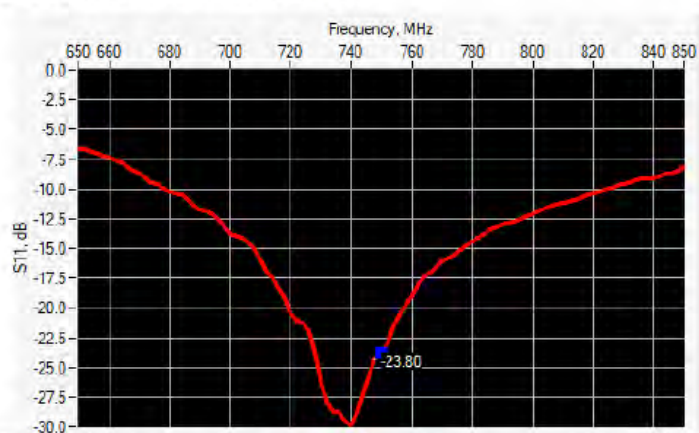
SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.60.2.21.MVGB.A

1 g	19 % (SAR)
10 g	19 % (SAR)

6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
750	-23.80	-20	56.4 Ω - 0.1 j Ω

6.2 MECHANICAL DIMENSIONS

Frequency MHz	L mm		h mm		d mm	
	required	measured	required	measured	required	measured
300	420.0 $\pm$ 1 %.		250.0 $\pm$ 1 %.		6.35 $\pm$ 1 %.	
450	290.0 $\pm$ 1 %.		166.7 $\pm$ 1 %.		6.35 $\pm$ 1 %.	
750	176.0 $\pm$ 1 %.	-	100.0 $\pm$ 1 %.	-	6.35 $\pm$ 1 %.	-
835	161.0 $\pm$ 1 %.		89.8 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
900	149.0 $\pm$ 1 %.		83.3 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1450	89.1 $\pm$ 1 %.		51.7 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1500	80.5 $\pm$ 1 %.		50.0 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1640	79.0 $\pm$ 1 %.		45.7 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1750	75.2 $\pm$ 1 %.		42.9 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1800	72.0 $\pm$ 1 %.		41.7 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1900	68.0 $\pm$ 1 %.		39.5 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
1950	66.3 $\pm$ 1 %.		38.5 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
2000	64.5 $\pm$ 1 %.		37.5 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
2100	61.0 $\pm$ 1 %.		35.7 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
2300	55.5 $\pm$ 1 %.		32.6 $\pm$ 1 %.		3.6 $\pm$ 1 %.	
2450	51.5 $\pm$ 1 %.		30.4 $\pm$ 1 %.		3.6 $\pm$ 1 %.	

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