

CE SAR EVALUATION REPORT

**In accordance with the requirements of
EN50360, EN50566, EN62209-1/-2, EN62479 and COUNCIL
RECOMMENDATION 1999/519/EC**

Product Name : Smart phone

Trademark : Blackview, OSCAL

Model Name : SHARK 9

Family Model : TIGER 13

Report No. : S24071504603001

Prepared for

DOKE COMMUNICATION (HK) LIMITED

19H MAXGRAND PLAZA NO 3 TAI YAU STREET SAN PO KONG KL

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TEST RESULT CERTIFICATION**Applicant's name**: DOKE COMMUNICATION (HK) LIMITED

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Manufacturer's Name.....: Shenzhen DOKE Electronic Co., LtdAddress: 801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road,
Guangming District, Shenzhen, China.**Product description**

Product name: Smart phone

Trademark: Blackview, OSCAL

Model and/or type reference : SHARK 9

Family Model: TIGER 13

EN 50360:2017;

EN 50566:2017;

Standards: EN 62209-1:2016;

EN 62209-2:2010;

EN 62479:2010;

This device described above has been tested by Shenzhen NTEK. In accordance with the measurement methods and procedures specified in EN62209. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in COUNCIL 1999/519/EC. 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 S240715046002

Date of Test

Date (s) of performance of tests Jun. 18, 2024 ~ Aug. 17, 2024

Date of Issue Aug. 27, 2024

Test Result..... **Pass**Prepared By: Owen Xiao
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※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Aug. 27, 2024	Owen Xiao

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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	10.0	20.0

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

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	2.0	4.0

NOTE: **Whole-Body SAR** is averaged over the entire body, **partial-body SAR** is averaged over any 10 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
2.0 W/kg AND MEMBER LIMIT 4.0 W/kg
APPLIED TO THIS EUT

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for SHARK 9 are as follows.

RF Exposure Conditions	Max SAR Value(W/kg)		
	10-g Head	10-g Body & Hotspot (Separation distance of 5mm)	10-g Member DAS (See note ³) (Separation distance of 0mm)
	0.268	0.964	1.537
Max Simultaneous Tx	0.759	0.964	2.051

NOTE: 1. The Max Simultaneous Tx is calculated based on the same configuration and test position.

2. This device is in compliance with Specific Absorption Rate (SAR) for general population / uncontrolled exposure limits (2.0 W/kg for head and body, 4.0 W/kg for member) specified in COUNCIL RECOMMENDATION 1999/519/EC, and had been tested in accordance with the measurement methods and procedures specified in EN 62209-1:2016 & EN 62209-2:2010.

3. The member DAS, It is only an assessment required by the ANFR (Sell to France).

1.3. EUT Description

Device Information	
Product Name	Smart phone
Trademark	Blackview, OSCAL
Model Name	SHARK 9
Family Model	TIGER 13
Model Difference	All models have the same circuit and RF module, except for the model name and appearance. (The shape of the camera decoration, camera bracket, rear camera FPC, and flash are different, and the size of the rear camera FPC is also different. The SHARK 9 is longer, but the chip is the same.)
Device Phase	Identical Prototype
Exposure Category	General population / Uncontrolled environment
Antenna Type	MDA Antenna
Battery Information	DC 3.89V, 5000mAh, 19.45Wh
Hardware version	S822H_V1
Software version	SHARK9_EEA_S7607B_V1.0_* TIGER 13_EEA_S7607B_V1.0_*
Device Operating Configurations	
Supporting Mode(s)	GSM 900/1800, WCDMA Band 1/8, LTE Band 1/3/7/8/20/28/38/40/41, NR SA n1/n3/n7/n8/n20/n28/n38/n40/n41/n77/n78, WLAN 2.4G/5G, Bluetooth, GPS,FM,NFC

Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16-QAM), NR(DFT-s-OFDM:PI/2 BPSK/QPSK/16-QAM/64QAM/256QAM CP-OFDM:QPSK/16-QAM/64QAM/256QAM), WLAN(DSSS/OFDM), WLAN(DSSS/OFDM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK) , GPS(BPSK),FM(FM),NFC(ASK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM 900	880-915	925-960
	GSM 1800	1710-1785	1805-1880
	WCDMA Band 1	1920-1980	2110-2170
	WCDMA Band 8	880-915	925-960
	LTE Band 1	1920-1980	2110-2170
	LTE Band 3	1710-1785	1805-1880
	LTE Band 7	2500-2570	2620-2690
	LTE Band 8	880- 915	925- 960
	LTE Band 20	832-862	791-821
	LTE Band 28	703-748	758-803
	LTE Band 38	2570-2620	
	LTE Band 40	2300-2400	
	LTE Band 41	2496-2690	
	NR n1	1920-1980	2110-2170
	NR n3	1710-1785	1805-1880
	NR n7	2500-2570	2620-2690
	NR n8	880-915	925-960
	NR n20	832-862	791-821
	NR n28	703-748	758-803
	NR n38	2570-2620	
	NR n40	2300-2400	
	NR n41	2496-2690	
	NR n77	3300-4200	
	NR n78	3300-3800	
	WLAN 2.4G	2412-2472	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	Bluetooth	2402-2480	
	NFC	13.56	
	FM	N/A	87.5-108
	GPS	N/A	1575.42
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 900)	
	1, tested with power level 0(GSM 1800)	
	3, tested with power control "all 1"(WCDMA Band 1)	
	3, tested with power control "all 1"(WCDMA Band 8)	
	3, tested with power control all Max.(LTE Band 1)	
	3, tested with power control all Max.(LTE Band 3)	
	3, tested with power control all Max.(LTE Band 7)	
	3, tested with power control all Max.(LTE Band 8)	
	3, tested with power control all Max.(LTE Band 20)	
	3, tested with power control all Max.(LTE Band 28)	
	3, tested with power control all Max.(LTE Band 38)	
	3, tested with power control all Max.(LTE Band 40)	
	3, tested with power control all Max.(LTE Band 41)	
	3, tested with power control all Max.(NR SA 1)	
	3, tested with power control all Max.(NR SA 3)	
	3, tested with power control all Max.(NR SA 7)	
	3, tested with power control all Max.(NR SA 8)	
	3, tested with power control all Max.(NR SA 20)	
	3, tested with power control all Max.(NR SA 28)	
	3, tested with power control all Max.(NR SA 38)	
	3, tested with power control all Max.(NR SA 40)	
	3, tested with power control all Max.(NR SA 41)	
	3, tested with power control all Max.(NR SA 77)	
	3, tested with power control all Max.(NR SA 78)	

1.4. Test specification(s)

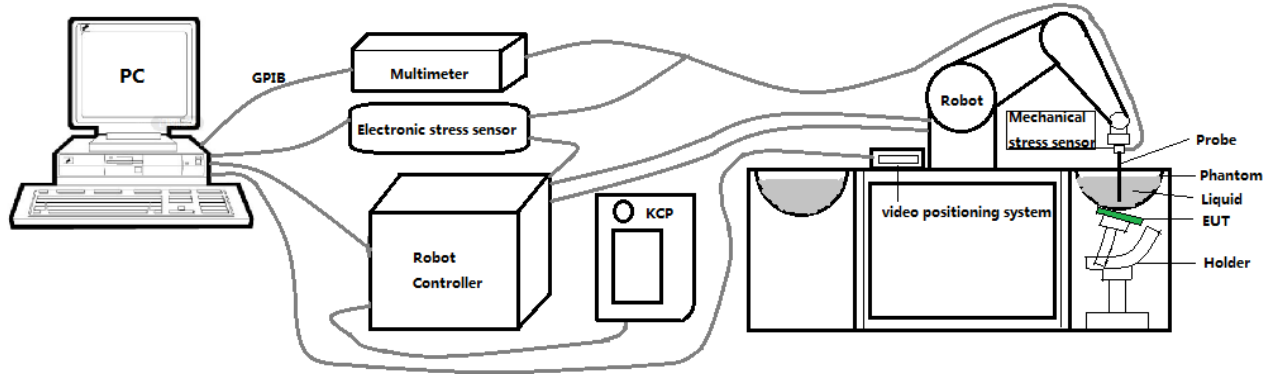
EN 50360:2017	Product standard to demonstrate the compliance of wireless communication devices, with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 300 MHz to 6 GHz: devices used next to the ear
EN 50566:2017	Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz: hand-held and body mounted devices in close proximity to the human body
EN 62209-1:2016	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)
EN 62209-2:2010	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR) in the head and body for 30MHz to 6GHz Handheld and Body-Mounted Devices used in close proximity to the body
EN 62479:2010	Assessment of the compliance of low-power electronic and electrical equipment with the restrictions related to human exposure to electromagnetic fields(10 MHz to 300 GHz)

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

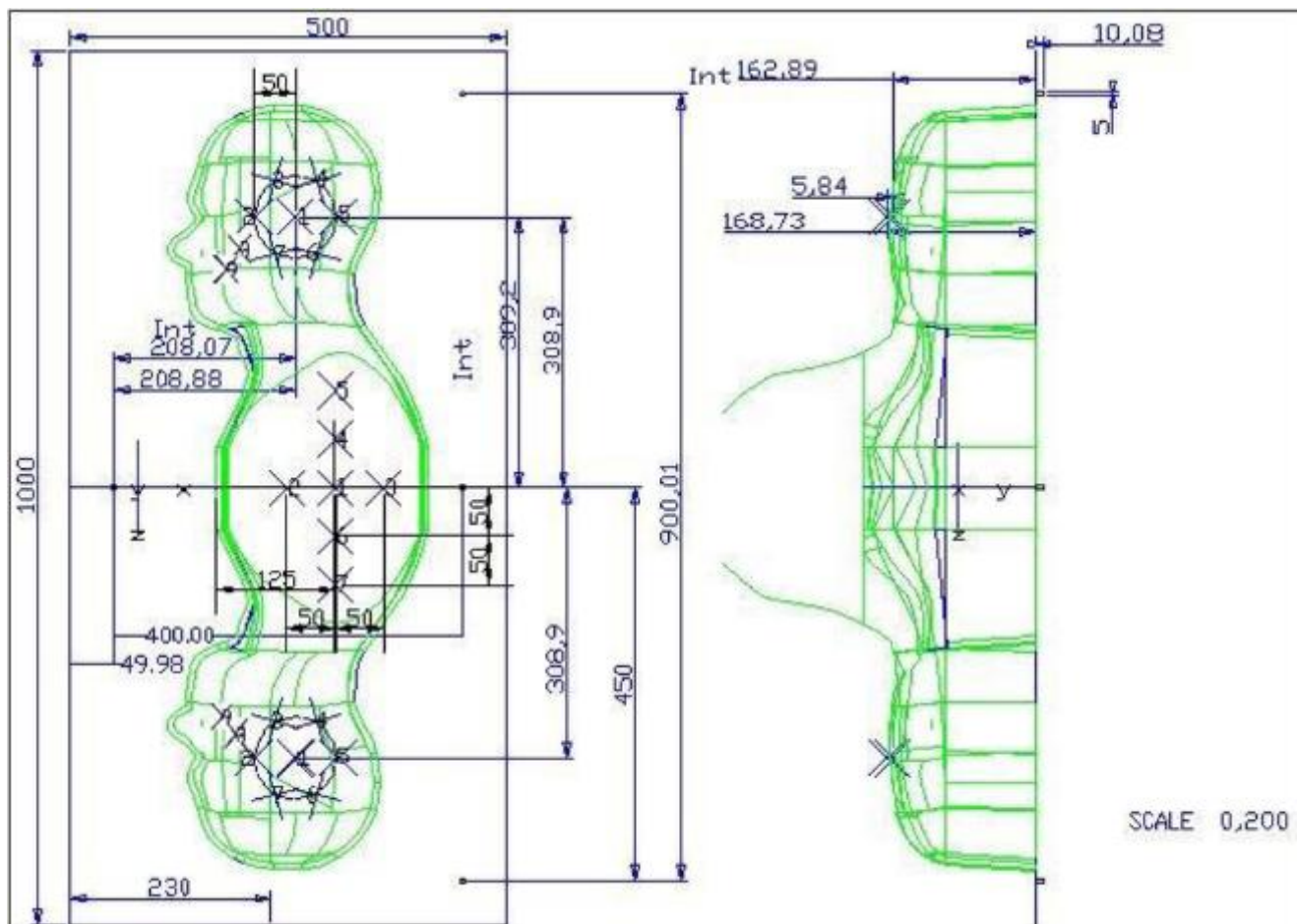
Photo of SAM phantom SN 16/15 SAM119



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

2.4.1. Technical Data

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

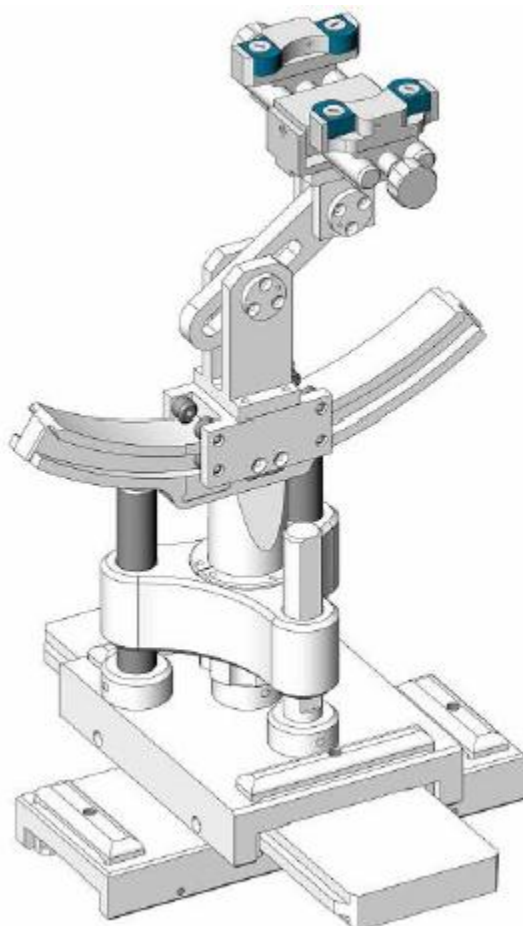


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

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

2.5. Device Holder

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



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

2.6. Test Equipment List

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

Devices used during the test described are marked ☒

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
☒	MVG	E FIELD PROBE	SSE2	3423-EPGO-426	Sep. 18, 2023	Sep. 17, 2024
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Feb. 22, 2024	Feb. 21, 2027
☐	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Feb. 22, 2024	Feb. 21, 2027
☐	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	3300 MHz Dipole	SID3300	SN 03/21 DIP 3G300-359	May. 18, 2024	May. 17, 2027
☒	MVG	3500 MHz Dipole	SID3500	SN 09/12 DIP 3G500-360	Oct. 15, 2022	Oct. 14, 2025
☒	MVG	3700 MHz Dipole	SID3700	SN 09/12 DIP 3G/700-361	Oct. 15 2022	Oct. 14 2025
☒	MVG	4200 MHz Dipole	SID4200	SN 03/21 DIP 4G200-363	May. 18, 2024	May. 17, 2027
☒	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Feb. 22, 2024	Feb. 21, 2027
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
☒	MVG	Power	N.A	AMPLISAR_28/14_003	NCR	NCR

		Amplifier				
☒	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
☒	R&S	Universal radio communication tester	CMU200	105747	Apr. 26, 2024	Apr. 25, 2025
☒	R&S	Wideband radio communication tester	CMW500	103917	Apr. 26, 2024	Apr. 25, 2025
☒	HP	Network Analyzer	8753D	3410J01136	Apr. 26, 2024	Apr. 25, 2025
☒	Agilent	MXG Vector Signal Generator	N5182A	MY47070317	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power meter	E4419B	MY45102538	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	MY41495644	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	US39212148	Apr. 25, 2024	Apr. 24, 2025
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Apr. 26, 2024	Apr. 25, 2027
☒	N/A	Thermometer	N/A	LES-085	Mar. 27, 2023	Mar. 26, 2026
☒	MVG	SAM Phantom	SSM2	SN 16/15 SAM119	NCR	NCR
☒	MVG	Device Holder	SMPPD	SN 16/15 MSH100	NCR	NCR

Measurement Software

Manufacturer	Software Name	Software Version
SATIMO	OpenSAR	V4_02_31

3. SAR Measurement Procedures

The measurement procedures are as follows:

- (a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the middle channel.
- (b) Keep EUT to radiate maximum output power or 100% duty factor (if applicable)
- (c) Measure output power through RF cable and power meter.
- (d) Place the EUT in the positions as setup photos demonstrates.
- (e) Set scan area, grid size and other setting on the OPENSAR software.
- (f) Measure SAR transmitting at the middle channel for all applicable exposure positions.
- (g) Identify the exposure position and device configuration resulting the highest SAR
- (h) Measure SAR at the lowest and highest channels at the worst exposure position and device configuration.

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).

3.3. Description of interpolation/extrapolation scheme

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

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

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

3.4. Volumetric Scan

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

3.5. Power Drift

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

4. System Verification Procedure

4.1. Tissue Verification

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

Ingredients (% of weight)	Head Tissue								
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5000
Water	34.40	34.40	34.40	55.36	55.36	71.88	71.88	71.88	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00
1,2-Propanediol	64.81	64.81	64.81	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	17.24
DGBE	0.00	0.00	0.00	13.84	13.84	7.99	7.99	7.99	0.00

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

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

4.1.1. Tissue Dielectric Parameter Check Results

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

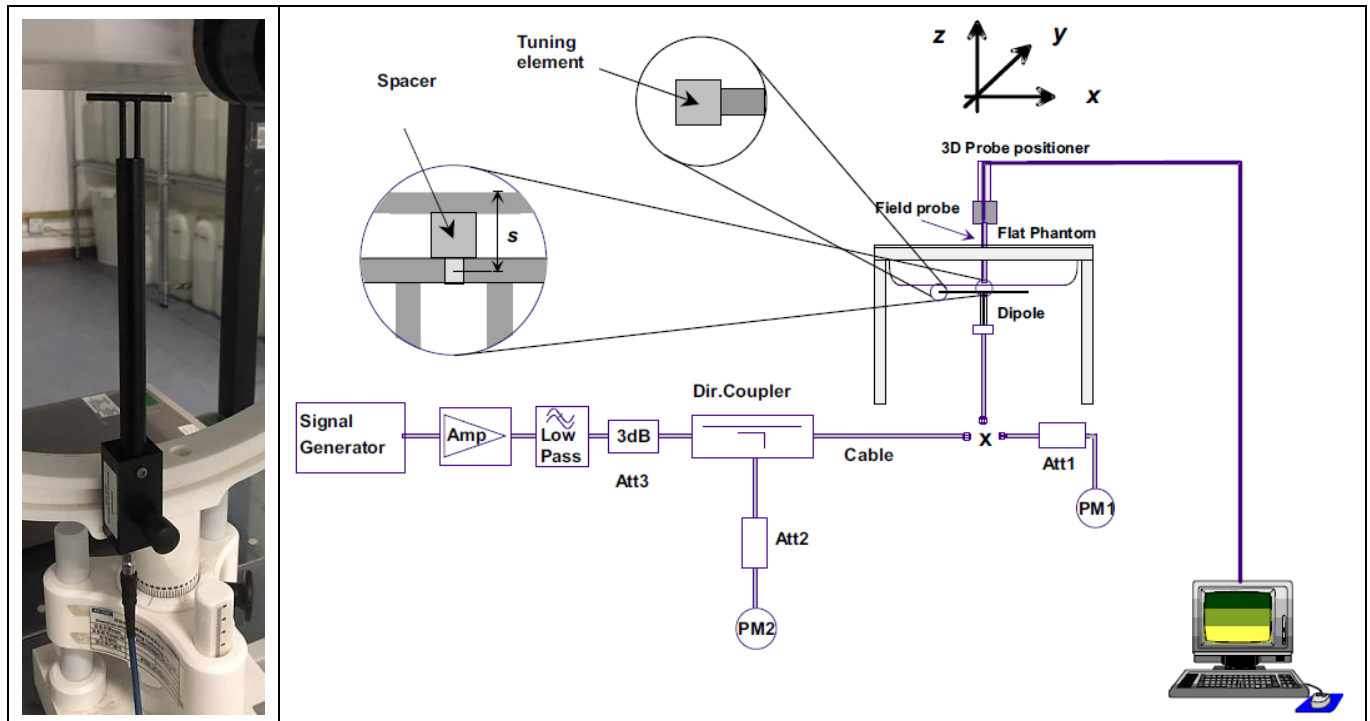
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	$\sigma \text{ (S/m)} (\pm 5\%)$	ϵ_r	$\sigma \text{ (S/m)}$		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	40.84	0.91	21.8 °C	Aug. 01, 2024
Head 900	900	41.50 (39.43~43.58)	0.97 (0.92~1.02)	41.14	0.98	21.3 °C	Jul. 24, 2024
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.89	1.38	21.7 °C	Jul. 25, 2024
Head 2000	2000	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.82	1.44	21.8 °C	Jul. 26, 2024
Head 2300	2300	39.47 (37.50~41.44)	1.66 (1.58~1.74)	39.31	1.62	21.1 °C	Jul. 29, 2024
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	37.79	1.77	21.6 °C	Jul. 18, 2024
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	39.13	2.01	21.0 °C	Jul. 19, 2024
Head 3300	3300	38.14 (36.23~40.05)	2.71 (2.57~2.84)	39.31	2.16	21.3 °C	Aug. 17, 2024
Head 3500	3500	37.93 (36.04~39.82)	2.91 (2.77~3.05)	37.99	2.89	21.8 °C	Aug. 05, 2024
Head 3700	3700	37.70 (35.82~39.59)	3.12 (2.97~3.27)	37.45	3.12	21.0 °C	Aug. 06, 2024
Head 4200	4200	37.10 (35.25~38.96)	3.63 (3.45~3.81)	37.78	3.53	21.5 °C	Aug. 07, 2024
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	34.48	4.50	21.2 °C	Jul. 30, 2024
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	33.91	5.14	21.5 °C	Jul. 31, 2024

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

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

System Verification	Target SAR (1W) ($\pm 10\%$)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
750MHz	8.60 (7.74~9.46)	5.78 (5.20~6.36)	7.95	5.95	21.8 °C	Aug. 01, 2024
900MHz	10.63 (9.57~11.69)	7.01 (6.31~7.71)	10.87	6.44	21.3 °C	Jul. 24, 2024
1800MHz	37.06 (33.35~40.77)	20.01 (18.01~22.01)	36.27	20.03	21.7 °C	Jul. 25, 2024
2000MHz	38.27 (34.44~42.10)	19.79 (17.81~21.77)	34.77	19.28	21.8 °C	Jul. 26, 2024
2300MHz	50.63 (45.57~55.69)	23.51 (21.16~25.86)	46.89	22.89	21.1 °C	Jul. 29, 2024
2450MHz	50.05 (45.05~55.06)	23.80 (21.42~26.18)	45.17	22.42	21.6 °C	Jul. 18, 2024
2600MHz	54.16 (48.74~59.58)	24.85 (22.37~27.34)	52.62	26.41	21.0 °C	Jul. 19, 2024
3300MHz	67.61 (60.85~74.37)	26.04 (23.44~28.64)	60.12	24.41	21.3 °C	Aug. 17, 2024
3500MHz	59.22 (53.30~65.14)	23.80 (21.42~26.18)	66.68	23.52	21.8 °C	Aug. 05, 2024
3700MHz	62.36 (56.12~68.60)	23.56 (21.20~25.92)	68.21	24.41	21.0 °C	Aug. 06, 2024
4200MHz	66.85 (61.17~73.54)	22.84 (20.56~25.12)	68.98	24.41	21.5 °C	Aug. 07, 2024
5200MHz	162.59 (146.33~178.85)	56.21 (50.59~61.83)	153.67	52.57	21.2 °C	Jul. 30, 2024
5800MHz	182.20 (163.98~200.42)	61.32 (55.19~67.45)	175.02	65.46	21.5 °C	Jul. 31, 2024

5. SAR Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2003. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Uncertainty Component	Tol. (±%)	Prob. Dist.	Div.	Ci (1 g)	Ci (10 g)	1 g Ui (±%)	10 g Ui (±%)	Vi
Measurement System ☐								
Probe Calibration	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	$\sqrt{3}$	0.97	0.97	1.98	1.98	∞
Hemispherical Isotropy	5.9	R	$\sqrt{3}$	0.28	0.28	0.96	0.96	∞
Boundary Effect	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System Detection Limits	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	3	N	1	1	1	3.00	3.00	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Integration Time	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF Ambient Conditions - Noise	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF Ambient Conditions - Reflections	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe Positioner Mechanical Tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe Positioning with respect to Phantom Shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related								
Test Sample Positioning	2.6	N	1	1	1	2.60	2.60	11
Device Holder Uncertainty	3	N	1	1	1	3.00	3.00	7
Output Power Variation - SAR drift measurement	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	2	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and Tissue Parameters ☐								
Phantom Uncertainty (shape and thickness tolerances)	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation (in permittivity and conductivity)	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid conductivity - measurement uncertainty	1.59	N	1	0.23	0.26	0.37	0.41	99

Liquid permittivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity - measurement uncertainty	1.65	N	1	0.23	0.26	0.38	0.43	99
Combined Standard Uncertainty		RSS				10.19	10.02	
Expanded Uncertainty (95% Confidence interval)		k				20.38	20.04	

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”.



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

6.2. Definition of the cheek position

2. 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.
3. 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.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP
5. 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.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the

N-F line.

7. 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.

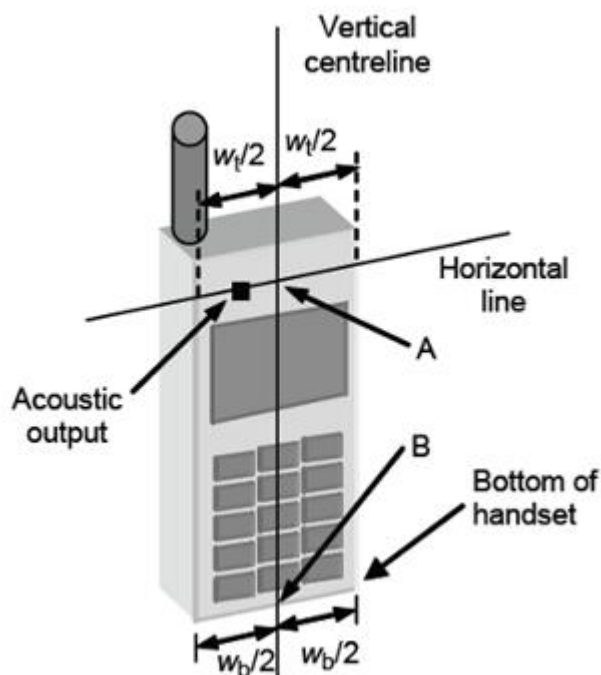


Fig 6.2.1 Handset vertical and horizontal reference lines—"fixed case"

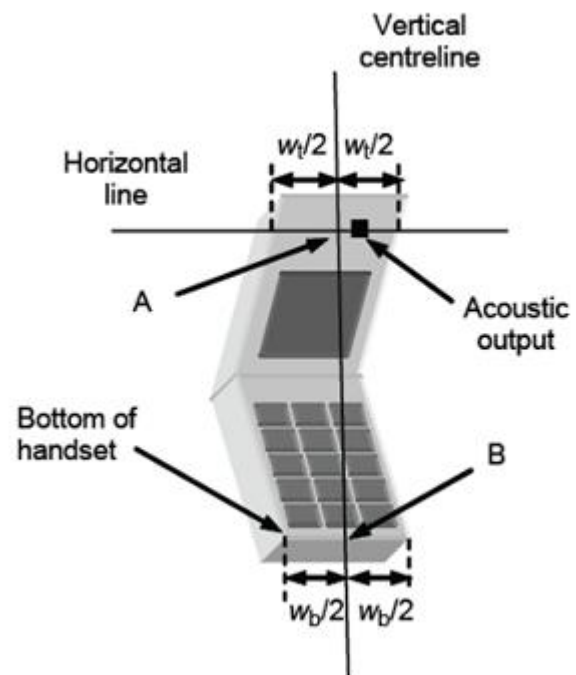


Fig 6.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

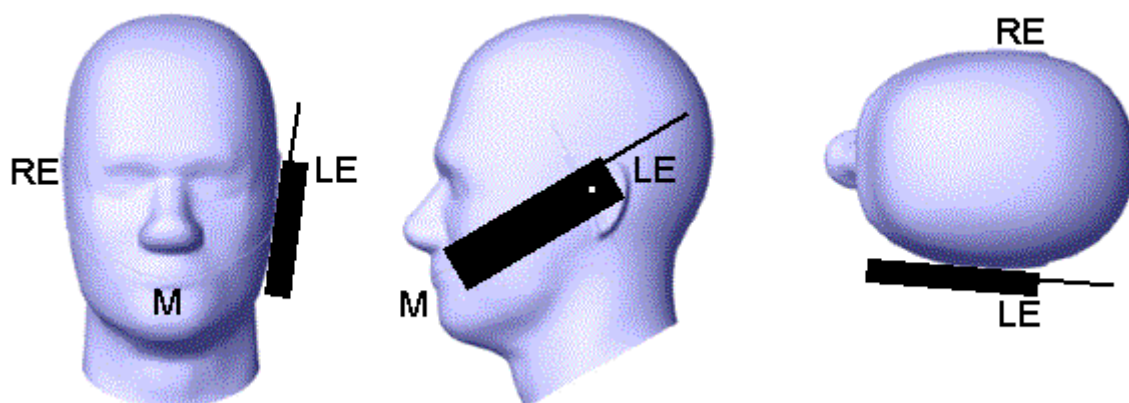


Fig 6.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

6.3. Definition of the tilt position

8. 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.

9. Rotate the Handset around the horizontal line by 15 degree (see Figure 6.3.1).
10. 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.

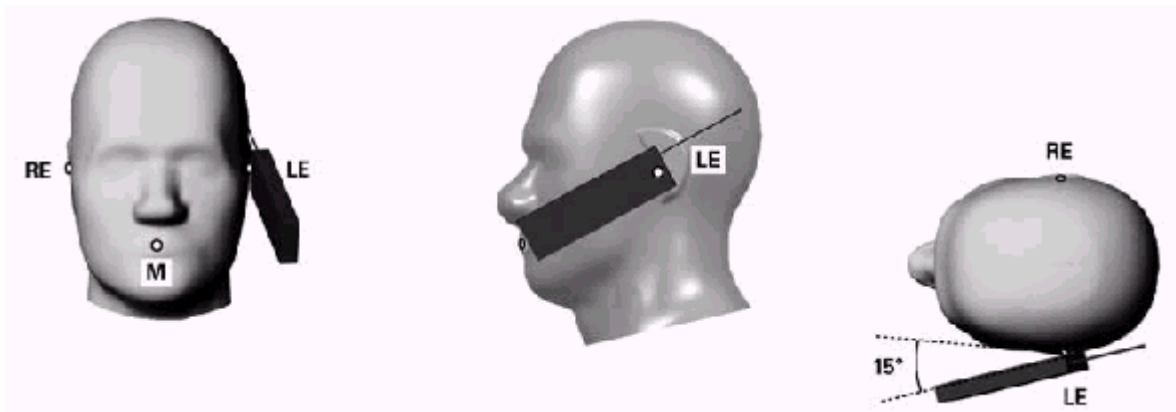


Figure 6.3.1 – Tilt position of the wireless device on the left side of SAM

6.4. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer. The device shall be positioned as intended at the distance to the outer surface of the phantom that corresponds to the specified distance (See figure 6.1). Adjust the distance between the device surface and the flat phantom to 5mm.

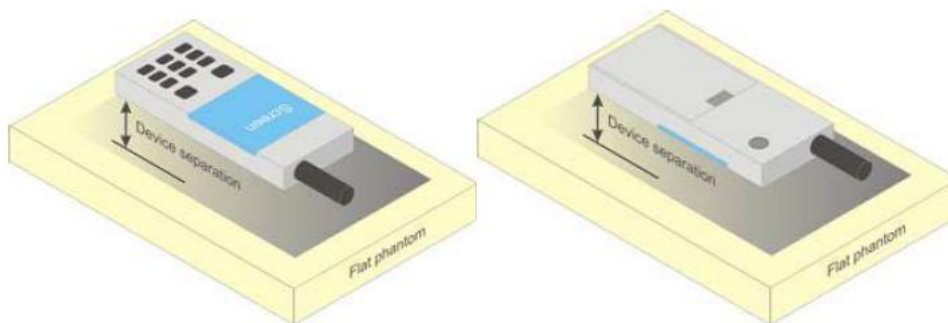


Figure 6.1 – Test positions for Body-worn device

7. RF Output Power

7.1. GSM Conducted Power

Band GSM900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	975	38	124	Tune-up	975	38	124
Frequency (MHz)		880.2	897.6	914.8		880.2	897.6	914.8
GSM (GMSK)	32.50	32.16	32.14	32.24	23.47	23.13	23.11	23.21
GPRS(GMSK,1 Tx slot)	32.50	32.16	32.20	32.25	23.47	23.13	23.17	23.22
GPRS(GMSK,2 Tx slot)	32.00	31.61	31.57	31.69	25.98	25.59	25.55	25.67
GPRS(GMSK,3 Tx slot)	30.50	30.03	30.08	30.17	26.24	25.77	25.82	25.91
GPRS(GMSK,4 Tx slot)	29.00	28.84	28.88	28.97	25.99	25.83	25.87	25.96
EGPRS(8PSK,1 Tx slot)	26.00	25.55	25.00	25.38	16.97	16.52	15.97	16.35
EGPRS(8PSK,2 Tx slot)	25.50	25.08	24.52	24.91	19.48	19.06	18.50	18.89
EGPRS(8PSK,3 Tx slot)	23.00	22.59	22.08	22.47	18.74	18.33	17.82	18.21
EGPRS(8PSK,4 Tx slot)	21.50	21.32	20.84	21.23	18.49	18.31	17.83	18.22

Band GSM1800	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up	512	698	885	Tune-up	512	698	885
Frequency (MHz)		1710.2	1747.4	1784.8		1710.2	1747.4	1784.8
GSM (GMSK)	29.50	28.56	28.83	29.29	20.47	19.53	19.80	20.26
GPRS(GMSK,1 Tx slot)	29.50	28.55	28.88	29.32	20.47	19.52	19.85	20.29
GPRS(GMSK,2 Tx slot)	29.00	28.05	28.35	28.83	22.98	22.03	22.33	22.81
GPRS(GMSK,3 Tx slot)	27.50	26.35	26.74	27.10	23.24	22.09	22.48	22.84
GPRS(GMSK,4 Tx slot)	26.50	25.37	25.76	26.14	23.49	22.36	22.75	23.13
EGPRS(8PSK,1 Tx slot)	25.00	23.98	24.84	24.53	15.97	14.95	15.81	15.50
EGPRS(8PSK,2 Tx slot)	24.50	23.55	24.41	24.05	18.48	17.53	18.39	18.03
EGPRS(8PSK,3 Tx slot)	24.00	22.76	23.59	23.24	19.74	18.50	19.33	18.98
EGPRS(8PSK,4 Tx slot)	23.50	22.21	23.05	22.77	20.49	19.20	20.04	19.76

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

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

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

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

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

7.2. WCDMA Conducted Power

WCDMA Band1	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	9612	9750	9888
Frequency (MHz)		1922.4	1950	1977.6
RMC12.2K	23.50	22.63	22.61	22.57
HSDPA Sub 1	23.50	23.23	22.37	22.31
HSDPA Sub 2	23.00	22.68	21.98	22.12
HSDPA Sub 3	22.50	22.38	21.70	21.66
HSDPA Sub 4	22.50	22.13	21.65	21.62
HSUPA Sub 1	22.50	22.12	21.18	21.20
HSUPA Sub 2	22.00	21.90	21.28	21.39
HSUPA Sub 3	22.00	21.52	20.94	21.00
HSUPA Sub 4	22.00	21.79	21.25	21.18
HSUPA Sub 5	22.00	21.60	21.08	21.13
WCDMA Band 8	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	2712	2788	2863
Frequency (MHz)		882.4	897.6	912.6
RMC12.2K	22.50	21.32	21.33	21.26
HSDPA Sub 1	22.50	22.25	21.74	21.64
HSDPA Sub 2	22.00	21.68	21.53	21.28
HSDPA Sub 3	21.50	21.34	21.00	21.11
HSDPA Sub 4	21.50	21.12	21.19	20.98
HSUPA Sub 1	21.00	20.76	20.27	20.16
HSUPA Sub 2	21.00	20.63	20.33	20.32
HSUPA Sub 3	20.50	20.26	20.10	19.86
HSUPA Sub 4	20.50	20.33	20.27	20.18
HSUPA Sub 5	20.50	20.35	20.35	20.33

7.3. LTE Conducted Power

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Tune-up	Power (dBm)
Band1	5	18025	1	#0	QPSK	23.50	22.78
Band1	5	18025	8	#0	QPSK	23.50	22.89
Band1	5	18025	25	#0	QPSK	23.50	22.20
Band1	5	18300	1	#0	QPSK	23.50	23.07
Band1	5	18300	8	#0	QPSK	23.50	23.11
Band1	5	18300	25	#0	QPSK	23.50	22.33
Band1	5	18575	1	#0	QPSK	23.50	22.82
Band1	5	18575	8	#0	QPSK	23.50	22.96
Band1	5	18575	25	#0	QPSK	23.50	22.13
Band1	20	18100	1	#0	QPSK	23.50	22.89
Band1	20	18100	18	#0	QPSK	23.50	23.01
Band1	20	18100	100	#0	QPSK	23.50	22.30
Band1	20	18300	1	#0	QPSK	23.50	23.04
Band1	20	18300	18	#0	QPSK	23.50	23.09
Band1	20	18300	100	#0	QPSK	23.50	22.44
Band1	20	18500	1	#0	QPSK	23.50	23.02
Band1	20	18500	18	#0	QPSK	23.50	23.20
Band1	20	18500	100	#0	QPSK	23.50	22.36
Band20	5	24175	1	#0	QPSK	23.00	22.73
Band20	5	24175	8	#0	QPSK	23.00	22.34
Band20	5	24175	25	#0	QPSK	23.00	21.34
Band20	5	24300	1	#0	QPSK	23.00	22.31
Band20	5	24300	8	#0	QPSK	23.00	22.30
Band20	5	24300	25	#0	QPSK	23.00	21.31
Band20	5	24425	1	#0	QPSK	23.00	22.30
Band20	5	24425	8	#0	QPSK	23.00	22.35
Band20	5	24425	25	#0	QPSK	23.00	21.36
Band20	20	24250	1	#0	QPSK	23.00	22.39
Band20	20	24250	18	#0	QPSK	23.00	22.47
Band20	20	24250	100	#0	QPSK	23.00	21.38
Band20	20	24300	1	#0	QPSK	23.00	22.36
Band20	20	24300	18	#0	QPSK	23.00	22.46
Band20	20	24300	100	#0	QPSK	23.00	21.38
Band20	20	24350	1	#0	QPSK	23.00	22.14

Band20	20	24350	18	#0	QPSK	23.00	22.05
Band20	20	24350	100	#0	QPSK	23.00	21.01
Band28	3	27225	1	#0	QPSK	23.00	22.36
Band28	3	27225	1	#Max	QPSK	23.00	22.37
Band28	3	27225	4	#0	QPSK	23.00	22.45
Band28	3	27225	4	#Max	QPSK	23.00	22.40
Band28	3	27375	1	#0	QPSK	23.00	22.44
Band28	3	27375	1	#Max	QPSK	23.00	22.49
Band28	3	27375	4	#0	QPSK	23.00	22.50
Band28	3	27375	4	#Max	QPSK	23.00	22.48
Band28	3	27525	1	#0	QPSK	23.00	22.50
Band28	3	27525	1	#Max	QPSK	23.00	22.50
Band28	3	27525	4	#0	QPSK	23.00	22.48
Band28	3	27525	4	#Max	QPSK	23.00	22.51
Band28	5	27235	1	#0	QPSK	23.00	22.43
Band28	5	27235	1	#Max	QPSK	23.00	22.35
Band28	5	27235	8	#0	QPSK	23.00	22.62
Band28	5	27235	8	#Max	QPSK	23.00	22.44
Band28	5	27385	1	#0	QPSK	23.00	22.58
Band28	5	27385	1	#Max	QPSK	23.00	22.49
Band28	5	27385	8	#0	QPSK	23.00	22.63
Band28	5	27385	8	#Max	QPSK	23.00	22.51
Band28	5	27515	1	#0	QPSK	23.00	22.51
Band28	5	27515	1	#Max	QPSK	23.00	22.50
Band28	5	27515	8	#0	QPSK	23.00	22.57
Band28	5	27515	8	#Max	QPSK	23.00	22.57
Band28	20	27310	1	#0	QPSK	23.00	22.53
Band28	20	27310	1	#Max	QPSK	23.00	22.49
Band28	20	27310	18	#0	QPSK	23.00	22.59
Band28	20	27310	18	#Max	QPSK	23.00	22.59
Band28	20	27460	1	#0	QPSK	23.00	22.63
Band28	20	27460	1	#Max	QPSK	23.00	22.47
Band28	20	27460	18	#0	QPSK	23.00	22.66
Band28	20	27460	18	#Max	QPSK	23.00	22.54
Band28	20	27440	1	#0	QPSK	23.00	22.60
Band28	20	27440	1	#Max	QPSK	23.00	22.59
Band28	20	27440	18	#0	QPSK	23.00	22.69
Band28	20	27440	18	#Max	QPSK	23.00	22.60
Band3	1.4	19207	1	#0	QPSK	23.00	21.96

Band3	1.4	19207	5	#0	QPSK	23.00	22.18
Band3	1.4	19207	6	#0	QPSK	23.00	21.52
Band3	1.4	19575	1	#0	QPSK	23.00	21.98
Band3	1.4	19575	5	#0	QPSK	23.00	22.13
Band3	1.4	19575	6	#0	QPSK	23.00	21.55
Band3	1.4	19943	1	#0	QPSK	23.00	22.03
Band3	1.4	19943	5	#0	QPSK	23.00	22.02
Band3	1.4	19943	6	#0	QPSK	23.00	21.50
Band3	5	19225	1	#0	QPSK	23.00	22.33
Band3	5	19225	8	#0	QPSK	23.00	22.50
Band3	5	19225	25	#0	QPSK	23.00	21.71
Band3	5	19575	1	#0	QPSK	23.00	22.42
Band3	5	19575	8	#0	QPSK	23.00	22.46
Band3	5	19575	25	#0	QPSK	23.00	21.59
Band3	5	19925	1	#0	QPSK	23.00	22.34
Band3	5	19925	8	#0	QPSK	23.00	22.42
Band3	5	19925	25	#0	QPSK	23.00	21.62
Band3	20	19300	1	#0	QPSK	23.00	22.40
Band3	20	19300	18	#0	QPSK	23.00	22.59
Band3	20	19300	100	#0	QPSK	23.00	21.76
Band3	20	19575	1	#0	QPSK	23.00	22.58
Band3	20	19575	18	#0	QPSK	23.00	22.63
Band3	20	19575	100	#0	QPSK	23.00	21.72
Band3	20	19850	1	#0	QPSK	23.00	22.30
Band3	20	19850	18	#0	QPSK	23.00	22.42
Band3	20	19850	100	#0	QPSK	23.00	21.76
Band38	5	37775	1	#0	QPSK	22.50	22.35
Band38	5	37775	8	#0	QPSK	22.50	22.23
Band38	5	37775	25	#0	QPSK	22.50	21.28
Band38	5	38000	1	#0	QPSK	22.50	22.25
Band38	5	38000	8	#0	QPSK	22.50	22.37
Band38	5	38000	25	#0	QPSK	22.50	21.28
Band38	5	38225	1	#0	QPSK	22.50	22.27
Band38	5	38225	8	#0	QPSK	22.50	22.43
Band38	5	38225	25	#0	QPSK	22.50	21.41
Band38	20	37850	1	#0	QPSK	22.50	22.25
Band38	20	37850	18	#0	QPSK	22.50	22.38
Band38	20	37850	100	#0	QPSK	22.50	21.44
Band38	20	38000	1	#0	QPSK	22.50	22.38

Band38	20	38000	18	#0	QPSK	22.50	22.50
Band38	20	38000	100	#0	QPSK	22.50	21.31
Band38	20	38150	1	#0	QPSK	22.50	22.46
Band38	20	38150	18	#0	QPSK	22.50	22.36
Band38	20	38150	100	#0	QPSK	22.50	21.41
Band40	5	38675	1	#0	QPSK	23.00	22.54
Band40	5	38675	8	#0	QPSK	23.00	22.23
Band40	5	38675	25	#0	QPSK	23.00	21.28
Band40	5	39150	1	#0	QPSK	23.00	22.52
Band40	5	39150	8	#0	QPSK	23.00	22.22
Band40	5	39150	25	#0	QPSK	23.00	21.18
Band40	5	39625	1	#0	QPSK	23.00	22.43
Band40	5	39625	8	#0	QPSK	23.00	22.14
Band40	5	39625	25	#0	QPSK	23.00	21.25
Band40	20	38750	1	#0	QPSK	23.00	22.56
Band40	20	38750	18	#0	QPSK	23.00	22.47
Band40	20	38750	100	#0	QPSK	23.00	21.54
Band40	20	39150	1	#0	QPSK	23.00	22.77
Band40	20	39150	18	#0	QPSK	23.00	22.52
Band40	20	39150	100	#0	QPSK	23.00	21.18
Band40	20	39550	1	#0	QPSK	23.00	22.17
Band40	20	39550	18	#0	QPSK	23.00	21.97
Band40	20	39550	100	#0	QPSK	23.00	21.09
Band41	5	39675	1	#0	QPSK	22.50	21.88
Band41	5	39675	8	#0	QPSK	22.50	22.02
Band41	5	39675	25	#0	QPSK	22.50	21.11
Band41	5	40620	1	#0	QPSK	22.50	22.15
Band41	5	40620	8	#0	QPSK	22.50	22.24
Band41	5	40620	25	#0	QPSK	22.50	21.22
Band41	5	41565	1	#0	QPSK	22.50	22.38
Band41	5	41565	8	#0	QPSK	22.50	22.36
Band41	5	41565	25	#0	QPSK	22.50	21.34
Band41	20	39750	1	#0	QPSK	22.50	21.91
Band41	20	39750	18	#0	QPSK	22.50	22.10
Band41	20	39750	100	#0	QPSK	22.50	21.08
Band41	20	40620	1	#0	QPSK	22.50	22.16
Band41	20	40620	18	#0	QPSK	22.50	22.34
Band41	20	40620	100	#0	QPSK	22.50	21.19
Band41	20	41490	1	#0	QPSK	22.50	22.08

Band41	20	41490	18	#0	QPSK	22.50	22.27
Band41	20	41490	100	#0	QPSK	22.50	21.25
Band7	5	20775	1	#0	QPSK	22.50	21.63
Band7	5	20775	8	#0	QPSK	22.50	21.81
Band7	5	20775	25	#0	QPSK	22.50	21.02
Band7	5	21100	1	#0	QPSK	22.50	22.13
Band7	5	21100	8	#0	QPSK	22.50	22.22
Band7	5	21100	25	#0	QPSK	22.50	21.26
Band7	5	21425	1	#0	QPSK	22.50	22.15
Band7	5	21425	8	#0	QPSK	22.50	22.29
Band7	5	21425	25	#0	QPSK	22.50	21.18
Band7	20	20850	1	#0	QPSK	22.50	21.69
Band7	20	20850	18	#0	QPSK	22.50	21.91
Band7	20	20850	100	#0	QPSK	22.50	21.13
Band7	20	21100	1	#0	QPSK	22.50	21.95
Band7	20	21100	18	#0	QPSK	22.50	22.16
Band7	20	21100	100	#0	QPSK	22.50	21.26
Band7	20	21350	1	#0	QPSK	22.50	22.12
Band7	20	21350	18	#0	QPSK	22.50	22.20
Band7	20	21350	100	#0	QPSK	22.50	21.25
Band8	1.4	21457	1	#0	QPSK	23.00	22.61
Band8	1.4	21457	5	#0	QPSK	23.00	22.63
Band8	1.4	21457	6	#0	QPSK	23.00	21.83
Band8	1.4	21625	1	#0	QPSK	23.00	22.54
Band8	1.4	21625	5	#0	QPSK	23.00	22.69
Band8	1.4	21625	6	#0	QPSK	23.00	21.96
Band8	1.4	21793	1	#0	QPSK	23.00	22.46
Band8	1.4	21793	5	#0	QPSK	23.00	22.63
Band8	1.4	21793	6	#0	QPSK	23.00	21.80
Band8	5	21475	1	#0	QPSK	23.00	22.69
Band8	5	21475	8	#0	QPSK	23.00	22.69
Band8	5	21475	25	#0	QPSK	23.00	21.87
Band8	5	21625	1	#0	QPSK	23.00	22.67
Band8	5	21625	8	#0	QPSK	23.00	22.72
Band8	5	21625	25	#0	QPSK	23.00	21.98
Band8	5	21775	1	#0	QPSK	23.00	22.57
Band8	5	21775	8	#0	QPSK	23.00	22.59
Band8	5	21775	25	#0	QPSK	23.00	21.85
Band8	10	21500	1	#0	QPSK	23.00	22.78

Band8	10	21500	12	#0	QPSK	23.00	22.76
Band8	10	21500	50	#0	QPSK	23.00	21.96
Band8	10	21625	1	#0	QPSK	23.00	22.65
Band8	10	21625	12	#0	QPSK	23.00	22.71
Band8	10	21625	50	#0	QPSK	23.00	21.99
Band8	10	21750	1	#0	QPSK	23.00	22.80
Band8	10	21750	12	#0	QPSK	23.00	22.84
Band8	10	21750	50	#0	QPSK	23.00	21.95

7.4. NR Output Power

Band	SCS (kHz)	Bandwidth (MHz)	UL Channel	RB Allocation	Modulation	Tune-up	Power (dBm)
n1	30	10	385000	12@6	DFT_BPSK	23.00	22.66
n1	30	10	385000	1@1	DFT_BPSK	23.00	22.59
n1	30	10	385000	1@22	DFT_BPSK	23.00	22.64
n1	30	10	385000	12@6	DFT_QPSK	23.00	22.62
n1	30	10	385000	1@1	DFT_QPSK	23.00	22.60
n1	30	10	385000	1@22	DFT_QPSK	23.00	22.57
n1	30	10	390000	12@6	DFT_BPSK	23.00	21.48
n1	30	10	390000	1@1	DFT_BPSK	23.00	21.74
n1	30	10	390000	1@22	DFT_BPSK	23.00	22.34
n1	30	10	390000	12@6	DFT_QPSK	23.00	21.95
n1	30	10	390000	1@1	DFT_QPSK	23.00	21.75
n1	30	10	390000	1@22	DFT_QPSK	23.00	22.35
n1	30	10	395000	12@6	DFT_BPSK	23.00	21.54
n1	30	10	395000	1@1	DFT_BPSK	23.00	21.49
n1	30	10	395000	1@22	DFT_BPSK	23.00	21.50
n1	30	10	395000	12@6	DFT_QPSK	23.00	21.49
n1	30	10	395000	1@1	DFT_QPSK	23.00	21.47
n1	30	10	395000	1@22	DFT_QPSK	23.00	21.48
n1	30	25	386500	32@16	DFT_BPSK	23.00	22.26
n1	30	25	386500	1@1	DFT_BPSK	23.00	22.59
n1	30	25	386500	1@63	DFT_BPSK	23.00	22.20
n1	30	25	386500	32@16	DFT_QPSK	23.00	22.28
n1	30	25	386500	1@1	DFT_QPSK	23.00	22.65
n1	30	25	386500	1@63	DFT_QPSK	23.00	22.11
n1	30	25	390000	32@16	DFT_BPSK	23.00	21.90
n1	30	25	390000	1@1	DFT_BPSK	23.00	21.64

n1	30	25	390000	1@63	DFT_BPSK	23.00	21.97
n1	30	25	390000	32@16	DFT_QPSK	23.00	21.85
n1	30	25	390000	1@1	DFT_QPSK	23.00	21.53
n1	30	25	390000	1@63	DFT_QPSK	23.00	21.93
n1	30	25	393500	32@16	DFT_BPSK	23.00	21.87
n1	30	25	393500	1@1	DFT_BPSK	23.00	22.50
n1	30	25	393500	1@63	DFT_BPSK	23.00	21.88
n1	30	25	393500	32@16	DFT_QPSK	23.00	21.90
n1	30	25	393500	1@1	DFT_QPSK	23.00	22.40
n1	30	25	393500	1@63	DFT_QPSK	23.00	21.89
n1	30	50	389000	64@32	DFT_BPSK	23.00	21.99
n1	30	50	389000	1@1	DFT_BPSK	23.00	22.69
n1	30	50	389000	1@131	DFT_BPSK	23.00	22.51
n1	30	50	389000	64@32	DFT_QPSK	23.00	22.02
n1	30	50	389000	1@1	DFT_QPSK	23.00	22.74
n1	30	50	389000	1@131	DFT_QPSK	23.00	22.49
n1	30	50	390000	64@32	DFT_BPSK	23.00	22.21
n1	30	50	390000	1@1	DFT_BPSK	23.00	22.82
n1	30	50	390000	1@131	DFT_BPSK	23.00	22.67
n1	30	50	390000	64@32	DFT_QPSK	23.00	22.18
n1	30	50	390000	1@1	DFT_QPSK	23.00	22.80
n1	30	50	390000	1@131	DFT_QPSK	23.00	22.68
n1	30	50	391000	64@32	DFT_BPSK	23.00	22.31
n1	30	50	391000	1@1	DFT_BPSK	23.00	22.51
n1	30	50	391000	1@131	DFT_BPSK	23.00	22.54
n1	30	50	391000	64@32	DFT_QPSK	23.00	22.28
n1	30	50	391000	1@1	DFT_QPSK	23.00	22.49
n1	30	50	391000	1@131	DFT_QPSK	23.00	22.54
n3	30	10	343000	12@6	DFT_BPSK	24.50	22.50
n3	30	10	343000	1@1	DFT_BPSK	24.50	22.51
n3	30	10	343000	1@22	DFT_BPSK	24.50	22.80
n3	30	10	343000	12@6	DFT_QPSK	24.50	22.45
n3	30	10	343000	1@1	DFT_QPSK	24.50	22.70
n3	30	10	343000	1@22	DFT_QPSK	24.50	22.82
n3	30	10	349500	12@6	DFT_BPSK	24.50	22.23
n3	30	10	349500	1@1	DFT_BPSK	24.50	22.08
n3	30	10	349500	1@22	DFT_BPSK	24.50	22.45
n3	30	10	349500	12@6	DFT_QPSK	24.50	22.26
n3	30	10	349500	1@1	DFT_QPSK	24.50	22.28

n3	30	10	349500	1@22	DFT_QPSK	24.50	22.52
n3	30	10	356000	12@6	DFT_BPSK	24.50	22.67
n3	30	10	356000	1@1	DFT_BPSK	24.50	22.68
n3	30	10	356000	1@22	DFT_BPSK	24.50	22.36
n3	30	10	356000	12@6	DFT_QPSK	24.50	22.73
n3	30	10	356000	1@1	DFT_QPSK	24.50	22.84
n3	30	10	356000	1@22	DFT_QPSK	24.50	22.55
n3	30	20	344000	25@12	DFT_BPSK	24.50	22.47
n3	30	20	344000	1@1	DFT_BPSK	24.50	23.23
n3	30	20	344000	1@49	DFT_BPSK	24.50	23.54
n3	30	20	344000	25@12	DFT_QPSK	24.50	22.53
n3	30	20	344000	1@1	DFT_QPSK	24.50	23.28
n3	30	20	344000	1@49	DFT_QPSK	24.50	23.55
n3	30	20	349500	25@12	DFT_BPSK	24.50	22.24
n3	30	20	349500	1@1	DFT_BPSK	24.50	23.03
n3	30	20	349500	1@49	DFT_BPSK	24.50	22.94
n3	30	20	349500	25@12	DFT_QPSK	24.50	22.27
n3	30	20	349500	1@1	DFT_QPSK	24.50	23.10
n3	30	20	349500	1@49	DFT_QPSK	24.50	22.93
n3	30	20	355000	25@12	DFT_BPSK	24.50	22.61
n3	30	20	355000	1@1	DFT_BPSK	24.50	23.31
n3	30	20	355000	1@49	DFT_BPSK	24.50	23.27
n3	30	20	355000	25@12	DFT_QPSK	24.50	22.66
n3	30	20	355000	1@1	DFT_QPSK	24.50	23.31
n3	30	20	355000	1@49	DFT_QPSK	24.50	23.22
n3	30	30	345000	36@18	DFT_BPSK	24.50	22.75
n3	30	30	345000	1@1	DFT_BPSK	24.50	23.54
n3	30	30	345000	1@76	DFT_BPSK	24.50	23.38
n3	30	30	345000	36@18	DFT_QPSK	24.50	22.74
n3	30	30	345000	1@1	DFT_QPSK	24.50	23.57
n3	30	30	345000	1@76	DFT_QPSK	24.50	23.46
n3	30	30	349500	36@18	DFT_BPSK	24.50	22.61
n3	30	30	349500	1@1	DFT_BPSK	24.50	23.77
n3	30	30	349500	1@76	DFT_BPSK	24.50	23.21
n3	30	30	349500	36@18	DFT_QPSK	24.50	22.58
n3	30	30	349500	1@1	DFT_QPSK	24.50	23.72
n3	30	30	349500	1@76	DFT_QPSK	24.50	23.19
n3	30	30	354000	36@18	DFT_BPSK	24.50	22.80
n3	30	30	354000	1@1	DFT_BPSK	24.50	24.00

n3	30	30	354000	1@76	DFT_BPSK	24.50	23.60
n3	30	30	354000	36@18	DFT_QPSK	24.50	22.77
n3	30	30	354000	1@1	DFT_QPSK	24.50	23.96
n3	30	30	354000	1@76	DFT_QPSK	24.50	23.66
n7	30	10	501000	12@6	DFT_BPSK	23.00	22.11
n7	30	10	501000	1@1	DFT_BPSK	23.00	22.11
n7	30	10	501000	1@22	DFT_BPSK	23.00	22.07
n7	30	10	501000	12@6	DFT_QPSK	23.00	22.05
n7	30	10	501000	1@1	DFT_QPSK	23.00	22.08
n7	30	10	501000	1@22	DFT_QPSK	23.00	22.03
n7	30	10	507000	12@6	DFT_BPSK	23.00	21.88
n7	30	10	507000	1@1	DFT_BPSK	23.00	21.86
n7	30	10	507000	1@22	DFT_BPSK	23.00	21.79
n7	30	10	507000	12@6	DFT_QPSK	23.00	21.78
n7	30	10	507000	1@1	DFT_QPSK	23.00	21.81
n7	30	10	507000	1@22	DFT_QPSK	23.00	21.75
n7	30	10	513000	12@6	DFT_BPSK	23.00	21.65
n7	30	10	513000	1@1	DFT_BPSK	23.00	21.71
n7	30	10	513000	1@22	DFT_BPSK	23.00	21.65
n7	30	10	513000	12@6	DFT_QPSK	23.00	21.61
n7	30	10	513000	1@1	DFT_QPSK	23.00	21.67
n7	30	10	513000	1@22	DFT_QPSK	23.00	21.63
n7	30	15	501500	18@9	DFT_BPSK	23.00	21.97
n7	30	15	501500	1@1	DFT_BPSK	23.00	22.31
n7	30	15	501500	1@36	DFT_BPSK	23.00	22.30
n7	30	15	501500	18@9	DFT_QPSK	23.00	21.82
n7	30	15	501500	1@1	DFT_QPSK	23.00	22.24
n7	30	15	501500	1@36	DFT_QPSK	23.00	22.26
n7	30	15	507000	18@9	DFT_BPSK	23.00	21.53
n7	30	15	507000	1@1	DFT_BPSK	23.00	21.93
n7	30	15	507000	1@36	DFT_BPSK	23.00	22.02
n7	30	15	507000	18@9	DFT_QPSK	23.00	21.58
n7	30	15	507000	1@1	DFT_QPSK	23.00	22.00
n7	30	15	507000	1@36	DFT_QPSK	23.00	22.00
n7	30	15	512500	18@9	DFT_BPSK	23.00	21.35
n7	30	15	512500	1@1	DFT_BPSK	23.00	21.79
n7	30	15	512500	1@36	DFT_BPSK	23.00	21.85
n7	30	15	512500	18@9	DFT_QPSK	23.00	21.32
n7	30	15	512500	1@1	DFT_QPSK	23.00	21.76

n7	30	15	512500	1@36	DFT_QPSK	23.00	21.84
n7	30	20	502000	25@12	DFT_BPSK	23.00	21.78
n7	30	20	502000	1@1	DFT_BPSK	23.00	22.46
n7	30	20	502000	1@49	DFT_BPSK	23.00	22.56
n7	30	20	502000	25@12	DFT_QPSK	23.00	21.74
n7	30	20	502000	1@1	DFT_QPSK	23.00	22.44
n7	30	20	502000	1@49	DFT_QPSK	23.00	22.54
n7	30	20	507000	25@12	DFT_BPSK	23.00	21.51
n7	30	20	507000	1@1	DFT_BPSK	23.00	22.29
n7	30	20	507000	1@49	DFT_BPSK	23.00	22.26
n7	30	20	507000	25@12	DFT_QPSK	23.00	21.48
n7	30	20	507000	1@1	DFT_QPSK	23.00	22.28
n7	30	20	507000	1@49	DFT_QPSK	23.00	22.25
n7	30	20	512000	25@12	DFT_BPSK	23.00	21.57
n7	30	20	512000	1@1	DFT_BPSK	23.00	22.28
n7	30	20	512000	1@49	DFT_BPSK	23.00	21.45
n7	30	20	512000	25@12	DFT_QPSK	23.00	21.46
n7	30	20	512000	1@1	DFT_QPSK	23.00	22.21
n7	30	20	512000	1@49	DFT_QPSK	23.00	21.43
n8	30	10	177000	12@6	DFT_BPSK	24.00	23.43
n8	30	10	177000	1@1	DFT_BPSK	24.00	23.56
n8	30	10	177000	1@22	DFT_BPSK	24.00	23.64
n8	30	10	177000	12@6	DFT_QPSK	24.00	23.34
n8	30	10	177000	1@1	DFT_QPSK	24.00	23.47
n8	30	10	177000	1@22	DFT_QPSK	24.00	23.60
n8	30	10	179500	12@6	DFT_BPSK	24.00	23.14
n8	30	10	179500	1@1	DFT_BPSK	24.00	23.32
n8	30	10	179500	1@22	DFT_BPSK	24.00	22.90
n8	30	10	179500	12@6	DFT_QPSK	24.00	23.01
n8	30	10	179500	1@1	DFT_QPSK	24.00	23.25
n8	30	10	179500	1@22	DFT_QPSK	24.00	22.88
n8	30	10	182000	12@6	DFT_BPSK	24.00	23.18
n8	30	10	182000	1@1	DFT_BPSK	24.00	23.31
n8	30	10	182000	1@22	DFT_BPSK	24.00	22.51
n8	30	10	182000	12@6	DFT_QPSK	24.00	23.06
n8	30	10	182000	1@1	DFT_QPSK	24.00	23.26
n8	30	10	182000	1@22	DFT_QPSK	24.00	22.51
n8	30	15	177500	18@9	DFT_BPSK	24.00	22.85
n8	30	15	177500	1@1	DFT_BPSK	24.00	23.36

n8	30	15	177500	1@36	DFT_BPSK	24.00	23.41
n8	30	15	177500	18@9	DFT_QPSK	24.00	22.83
n8	30	15	177500	1@1	DFT_QPSK	24.00	23.33
n8	30	15	177500	1@36	DFT_QPSK	24.00	23.37
n8	30	15	179500	18@9	DFT_BPSK	24.00	22.63
n8	30	15	179500	1@1	DFT_BPSK	24.00	23.33
n8	30	15	179500	1@36	DFT_BPSK	24.00	22.84
n8	30	15	179500	18@9	DFT_QPSK	24.00	22.59
n8	30	15	179500	1@1	DFT_QPSK	24.00	23.32
n8	30	15	179500	1@36	DFT_QPSK	24.00	22.87
n8	30	15	181500	18@9	DFT_BPSK	24.00	23.00
n8	30	15	181500	1@1	DFT_BPSK	24.00	23.20
n8	30	15	181500	1@36	DFT_BPSK	24.00	22.93
n8	30	15	181500	18@9	DFT_QPSK	24.00	22.92
n8	30	15	181500	1@1	DFT_QPSK	24.00	23.14
n8	30	15	181500	1@36	DFT_QPSK	24.00	22.87
n8	30	20	178000	25@12	DFT_BPSK	24.00	22.69
n8	30	20	178000	1@1	DFT_BPSK	24.00	23.45
n8	30	20	178000	1@49	DFT_BPSK	24.00	23.27
n8	30	20	178000	25@12	DFT_QPSK	24.00	22.67
n8	30	20	178000	1@1	DFT_QPSK	24.00	23.39
n8	30	20	178000	1@49	DFT_QPSK	24.00	23.21
n8	30	20	179500	25@12	DFT_BPSK	24.00	22.63
n8	30	20	179500	1@1	DFT_BPSK	24.00	23.51
n8	30	20	179500	1@49	DFT_BPSK	24.00	23.20
n8	30	20	179500	25@12	DFT_QPSK	24.00	22.59
n8	30	20	179500	1@1	DFT_QPSK	24.00	23.49
n8	30	20	179500	1@49	DFT_QPSK	24.00	23.23
n8	30	20	181000	25@12	DFT_BPSK	24.00	22.21
n8	30	20	181000	1@1	DFT_BPSK	24.00	23.24
n8	30	20	181000	1@49	DFT_BPSK	24.00	21.51
n8	30	20	181000	25@12	DFT_QPSK	24.00	22.22
n8	30	20	181000	1@1	DFT_QPSK	24.00	23.20
n8	30	20	181000	1@49	DFT_QPSK	24.00	21.52
n20	30	10	167400	12@6	DFT_BPSK	24.00	22.95
n20	30	10	167400	1@1	DFT_BPSK	24.00	22.30
n20	30	10	167400	1@22	DFT_BPSK	24.00	22.71
n20	30	10	167400	12@6	DFT_QPSK	24.00	22.77
n20	30	10	167400	1@1	DFT_QPSK	24.00	22.19

n20	30	10	167400	1@22	DFT_QPSK	24.00	22.61
n20	30	10	169400	12@6	DFT_BPSK	24.00	22.73
n20	30	10	169400	1@1	DFT_BPSK	24.00	22.36
n20	30	10	169400	1@22	DFT_BPSK	24.00	22.63
n20	30	10	169400	12@6	DFT_QPSK	24.00	22.63
n20	30	10	169400	1@1	DFT_QPSK	24.00	22.27
n20	30	10	169400	1@22	DFT_QPSK	24.00	22.57
n20	30	10	171400	12@6	DFT_BPSK	24.00	23.16
n20	30	10	171400	1@1	DFT_BPSK	24.00	23.38
n20	30	10	171400	1@22	DFT_BPSK	24.00	22.91
n20	30	10	171400	12@6	DFT_QPSK	24.00	23.10
n20	30	10	171400	1@1	DFT_QPSK	24.00	23.34
n20	30	10	171400	1@22	DFT_QPSK	24.00	22.86
n20	30	15	167900	18@9	DFT_BPSK	24.00	22.46
n20	30	15	167900	1@1	DFT_BPSK	24.00	22.29
n20	30	15	167900	1@36	DFT_BPSK	24.00	23.09
n20	30	15	167900	18@9	DFT_QPSK	24.00	22.34
n20	30	15	167900	1@1	DFT_QPSK	24.00	22.22
n20	30	15	167900	1@36	DFT_QPSK	24.00	23.03
n20	30	15	169400	18@9	DFT_BPSK	24.00	22.23
n20	30	15	169400	1@1	DFT_BPSK	24.00	22.25
n20	30	15	169400	1@36	DFT_BPSK	24.00	22.36
n20	30	15	169400	18@9	DFT_QPSK	24.00	22.21
n20	30	15	169400	1@1	DFT_QPSK	24.00	22.22
n20	30	15	169400	1@36	DFT_QPSK	24.00	22.36
n20	30	15	170900	18@9	DFT_BPSK	24.00	22.92
n20	30	15	170900	1@1	DFT_BPSK	24.00	23.77
n20	30	15	170900	1@36	DFT_BPSK	24.00	22.87
n20	30	15	170900	18@9	DFT_QPSK	24.00	22.79
n20	30	15	170900	1@1	DFT_QPSK	24.00	23.68
n20	30	15	170900	1@36	DFT_QPSK	24.00	22.81
n20	30	20	168400	25@12	DFT_BPSK	24.00	22.84
n20	30	20	168400	1@1	DFT_BPSK	24.00	22.99
n20	30	20	168400	1@49	DFT_BPSK	24.00	23.66
n20	30	20	168400	25@12	DFT_QPSK	24.00	22.72
n20	30	20	168400	1@1	DFT_QPSK	24.00	22.93
n20	30	20	168400	1@49	DFT_QPSK	24.00	23.60
n20	30	20	169400	25@12	DFT_BPSK	24.00	22.43
n20	30	20	169400	1@1	DFT_BPSK	24.00	22.91

n20	30	20	169400	1@49	DFT_BPSK	24.00	22.91
n20	30	20	169400	25@12	DFT_QPSK	24.00	22.41
n20	30	20	169400	1@1	DFT_QPSK	24.00	22.86
n20	30	20	169400	1@49	DFT_QPSK	24.00	22.90
n20	30	20	170400	25@12	DFT_BPSK	24.00	22.77
n20	30	20	170400	1@1	DFT_BPSK	24.00	23.67
n20	30	20	170400	1@49	DFT_BPSK	24.00	22.49
n20	30	20	170400	25@12	DFT_QPSK	24.00	22.76
n20	30	20	170400	1@1	DFT_QPSK	24.00	23.61
n20	30	20	170400	1@49	DFT_QPSK	24.00	22.45
n28	30	10	141600	12@6	DFT_BPSK	24.00	22.76
n28	30	10	141600	1@1	DFT_BPSK	24.00	22.80
n28	30	10	141600	1@22	DFT_BPSK	24.00	22.88
n28	30	10	141600	12@6	DFT_QPSK	24.00	22.70
n28	30	10	141600	1@1	DFT_QPSK	24.00	22.78
n28	30	10	141600	1@22	DFT_QPSK	24.00	22.88
n28	30	10	145100	12@6	DFT_BPSK	24.00	23.17
n28	30	10	145100	1@1	DFT_BPSK	24.00	22.96
n28	30	10	145100	1@22	DFT_BPSK	24.00	23.07
n28	30	10	145100	12@6	DFT_QPSK	24.00	23.08
n28	30	10	145100	1@1	DFT_QPSK	24.00	22.91
n28	30	10	145100	1@22	DFT_QPSK	24.00	23.02
n28	30	10	148600	12@6	DFT_BPSK	24.00	22.99
n28	30	10	148600	1@1	DFT_BPSK	24.00	23.12
n28	30	10	148600	1@22	DFT_BPSK	24.00	22.92
n28	30	10	148600	12@6	DFT_QPSK	24.00	22.97
n28	30	10	148600	1@1	DFT_QPSK	24.00	23.11
n28	30	10	148600	1@22	DFT_QPSK	24.00	22.88
n28	30	15	142100	18@9	DFT_BPSK	24.00	22.76
n28	30	15	142100	1@1	DFT_BPSK	24.00	23.13
n28	30	15	142100	1@36	DFT_BPSK	24.00	23.35
n28	30	15	142100	18@9	DFT_QPSK	24.00	22.64
n28	30	15	142100	1@1	DFT_QPSK	24.00	23.07
n28	30	15	142100	1@36	DFT_QPSK	24.00	23.33
n28	30	15	145100	18@9	DFT_BPSK	24.00	22.87
n28	30	15	145100	1@1	DFT_BPSK	24.00	23.08
n28	30	15	145100	1@36	DFT_BPSK	24.00	22.55
n28	30	15	145100	18@9	DFT_QPSK	24.00	22.86
n28	30	15	145100	1@1	DFT_QPSK	24.00	23.08

n28	30	15	145100	1@36	DFT_QPSK	24.00	22.54
n28	30	15	148100	18@9	DFT_BPSK	24.00	22.74
n28	30	15	148100	1@1	DFT_BPSK	24.00	22.56
n28	30	15	148100	1@36	DFT_BPSK	24.00	22.94
n28	30	15	148100	18@9	DFT_QPSK	24.00	22.73
n28	30	15	148100	1@1	DFT_QPSK	24.00	22.57
n28	30	15	148100	1@36	DFT_QPSK	24.00	22.92
n28	30	30	143600	36@18	DFT_BPSK	24.00	23.03
n28	30	30	143600	1@1	DFT_BPSK	24.00	23.75
n28	30	30	143600	1@76	DFT_BPSK	24.00	23.40
n28	30	30	143600	36@18	DFT_QPSK	24.00	22.92
n28	30	30	143600	1@1	DFT_QPSK	24.00	23.69
n28	30	30	143600	1@76	DFT_QPSK	24.00	23.33
n28	30	30	145100	36@18	DFT_BPSK	24.00	23.04
n28	30	30	145100	1@1	DFT_BPSK	24.00	23.80
n28	30	30	145100	1@76	DFT_BPSK	24.00	23.77
n28	30	30	145100	36@18	DFT_QPSK	24.00	22.94
n28	30	30	145100	1@1	DFT_QPSK	24.00	23.73
n28	30	30	145100	1@76	DFT_QPSK	24.00	23.72
n28	30	30	146600	36@18	DFT_BPSK	24.00	22.87
n28	30	30	146600	1@1	DFT_BPSK	24.00	23.91
n28	30	30	146600	1@76	DFT_BPSK	24.00	23.66
n28	30	30	146600	36@18	DFT_QPSK	24.00	22.84
n28	30	30	146600	1@1	DFT_QPSK	24.00	23.90
n28	30	30	146600	1@76	DFT_QPSK	24.00	23.62
n38	30	10	515000	12@6	DFT_BPSK	24.50	23.05
n38	30	10	515000	1@1	DFT_BPSK	24.50	23.19
n38	30	10	515000	1@22	DFT_BPSK	24.50	23.38
n38	30	10	515000	12@6	DFT_QPSK	24.50	23.02
n38	30	10	515000	1@1	DFT_QPSK	24.50	23.18
n38	30	10	515000	1@22	DFT_QPSK	24.50	23.32
n38	30	10	519000	12@6	DFT_BPSK	24.50	23.09
n38	30	10	519000	1@1	DFT_BPSK	24.50	23.19
n38	30	10	519000	1@22	DFT_BPSK	24.50	23.19
n38	30	10	519000	12@6	DFT_QPSK	24.50	23.04
n38	30	10	519000	1@1	DFT_QPSK	24.50	23.17
n38	30	10	519000	1@22	DFT_QPSK	24.50	23.16
n38	30	10	523000	12@6	DFT_BPSK	24.50	23.02
n38	30	10	523000	1@1	DFT_BPSK	24.50	23.09

n38	30	10	523000	1@22	DFT_BPSK	24.50	23.27
n38	30	10	523000	12@6	DFT_QPSK	24.50	22.97
n38	30	10	523000	1@1	DFT_QPSK	24.50	23.07
n38	30	10	523000	1@22	DFT_QPSK	24.50	23.25
n38	30	15	515500	18@9	DFT_BPSK	24.50	22.87
n38	30	15	515500	1@1	DFT_BPSK	24.50	23.45
n38	30	15	515500	1@36	DFT_BPSK	24.50	23.57
n38	30	15	515500	18@9	DFT_QPSK	24.50	22.82
n38	30	15	515500	1@1	DFT_QPSK	24.50	23.42
n38	30	15	515500	1@36	DFT_QPSK	24.50	23.56
n38	30	15	519000	18@9	DFT_BPSK	24.50	22.90
n38	30	15	519000	1@1	DFT_BPSK	24.50	23.52
n38	30	15	519000	1@36	DFT_BPSK	24.50	23.49
n38	30	15	519000	18@9	DFT_QPSK	24.50	22.86
n38	30	15	519000	1@1	DFT_QPSK	24.50	23.51
n38	30	15	519000	1@36	DFT_QPSK	24.50	23.47
n38	30	15	522500	18@9	DFT_BPSK	24.50	22.83
n38	30	15	522500	1@1	DFT_BPSK	24.50	23.22
n38	30	15	522500	1@36	DFT_BPSK	24.50	23.76
n38	30	15	522500	18@9	DFT_QPSK	24.50	22.79
n38	30	15	522500	1@1	DFT_QPSK	24.50	23.20
n38	30	15	522500	1@36	DFT_QPSK	24.50	23.75
n38	30	20	516000	25@12	DFT_BPSK	24.50	22.87
n38	30	20	516000	1@1	DFT_BPSK	24.50	23.79
n38	30	20	516000	1@49	DFT_BPSK	24.50	24.04
n38	30	20	516000	25@12	DFT_QPSK	24.50	22.84
n38	30	20	516000	1@1	DFT_QPSK	24.50	23.76
n38	30	20	516000	1@49	DFT_QPSK	24.50	24.02
n38	30	20	519000	25@12	DFT_BPSK	24.50	23.41
n38	30	20	519000	1@1	DFT_BPSK	24.50	24.33
n38	30	20	519000	1@49	DFT_BPSK	24.50	24.34
n38	30	20	519000	25@12	DFT_QPSK	24.50	23.31
n38	30	20	519000	1@1	DFT_QPSK	24.50	24.25
n38	30	20	519000	1@49	DFT_QPSK	24.50	24.27
n38	30	20	522000	25@12	DFT_BPSK	24.50	22.99
n38	30	20	522000	1@1	DFT_BPSK	24.50	23.84
n38	30	20	522000	1@49	DFT_BPSK	24.50	23.62
n38	30	20	522000	25@12	DFT_QPSK	24.50	22.92
n38	30	20	522000	1@1	DFT_QPSK	24.50	23.78

n38	30	20	522000	1@49	DFT_QPSK	24.50	23.57
n40	30	10	461000	12@6	DFT_BPSK	24.50	23.26
n40	30	10	461000	1@1	DFT_BPSK	24.50	23.34
n40	30	10	461000	1@22	DFT_BPSK	24.50	23.38
n40	30	10	461000	12@6	DFT_QPSK	24.50	23.13
n40	30	10	461000	1@1	DFT_QPSK	24.50	23.27
n40	30	10	461000	1@22	DFT_QPSK	24.50	23.32
n40	30	10	470000	12@6	DFT_BPSK	24.50	22.97
n40	30	10	470000	1@1	DFT_BPSK	24.50	23.19
n40	30	10	470000	1@22	DFT_BPSK	24.50	23.19
n40	30	10	470000	12@6	DFT_QPSK	24.50	22.92
n40	30	10	470000	1@1	DFT_QPSK	24.50	23.17
n40	30	10	470000	1@22	DFT_QPSK	24.50	23.16
n40	30	10	479000	12@6	DFT_BPSK	24.50	23.07
n40	30	10	479000	1@1	DFT_BPSK	24.50	23.26
n40	30	10	479000	1@22	DFT_BPSK	24.50	23.19
n40	30	10	479000	12@6	DFT_QPSK	24.50	23.02
n40	30	10	479000	1@1	DFT_QPSK	24.50	23.24
n40	30	10	479000	1@22	DFT_QPSK	24.50	23.16
n40	30	30	463000	36@18	DFT_BPSK	24.50	23.39
n40	30	30	463000	1@1	DFT_BPSK	24.50	24.39
n40	30	30	463000	1@76	DFT_BPSK	24.50	24.37
n40	30	30	463000	36@18	DFT_QPSK	24.50	23.30
n40	30	30	463000	1@1	DFT_QPSK	24.50	24.34
n40	30	30	463000	1@76	DFT_QPSK	24.50	24.31
n40	30	30	470000	36@18	DFT_BPSK	24.50	22.91
n40	30	30	470000	1@1	DFT_BPSK	24.50	24.20
n40	30	30	470000	1@76	DFT_BPSK	24.50	23.98
n40	30	30	470000	36@18	DFT_QPSK	24.50	22.87
n40	30	30	470000	1@1	DFT_QPSK	24.50	24.18
n40	30	30	470000	1@76	DFT_QPSK	24.50	23.96
n40	30	30	477000	36@18	DFT_BPSK	24.50	23.18
n40	30	30	477000	1@1	DFT_BPSK	24.50	24.47
n40	30	30	477000	1@76	DFT_BPSK	24.50	24.04
n40	30	30	477000	36@18	DFT_QPSK	24.50	23.14
n40	30	30	477000	1@1	DFT_QPSK	24.50	24.45
n40	30	30	477000	1@76	DFT_QPSK	24.50	23.98
n40	30	80	468000	108@54	DFT_BPSK	24.50	23.35
n40	30	80	468000	1@1	DFT_BPSK	24.50	24.31

n40	30	80	468000	1@215	DFT_BPSK	24.50	23.24
n40	30	80	468000	108@54	DFT_QPSK	24.50	23.30
n40	30	80	468000	1@1	DFT_QPSK	24.50	24.25
n40	30	80	468000	1@215	DFT_QPSK	24.50	23.23
n40	30	80	470000	108@54	DFT_BPSK	24.50	23.00
n40	30	80	470000	1@1	DFT_BPSK	24.50	24.12
n40	30	80	470000	1@215	DFT_BPSK	24.50	22.97
n40	30	80	470000	108@54	DFT_QPSK	24.50	22.97
n40	30	80	470000	1@1	DFT_QPSK	24.50	24.09
n40	30	80	470000	1@215	DFT_QPSK	24.50	22.96
n40	30	80	472000	108@54	DFT_BPSK	24.50	23.05
n40	30	80	472000	1@1	DFT_BPSK	24.50	24.45
n40	30	80	472000	1@215	DFT_BPSK	24.50	22.90
n40	30	80	472000	108@54	DFT_QPSK	24.50	22.99
n40	30	80	472000	1@1	DFT_QPSK	24.50	24.39
n40	30	80	472000	1@215	DFT_QPSK	24.50	22.86
n41	30	10	500202	12@6	DFT_BPSK	28.00	26.80
n41	30	10	500202	1@1	DFT_BPSK	28.00	26.80
n41	30	10	500202	1@22	DFT_BPSK	28.00	26.94
n41	30	10	500202	12@6	DFT_QPSK	28.00	26.66
n41	30	10	500202	1@1	DFT_QPSK	28.00	26.70
n41	30	10	500202	1@22	DFT_QPSK	28.00	26.85
n41	30	10	518598	12@6	DFT_BPSK	28.00	26.89
n41	30	10	518598	1@1	DFT_BPSK	28.00	27.04
n41	30	10	518598	1@22	DFT_BPSK	28.00	27.04
n41	30	10	518598	12@6	DFT_QPSK	28.00	26.77
n41	30	10	518598	1@1	DFT_QPSK	28.00	26.94
n41	30	10	518598	1@22	DFT_QPSK	28.00	26.94
n41	30	10	537000	12@6	DFT_BPSK	28.00	26.54
n41	30	10	537000	1@1	DFT_BPSK	28.00	26.88
n41	30	10	537000	1@22	DFT_BPSK	28.00	26.86
n41	30	10	537000	12@6	DFT_QPSK	28.00	26.63
n41	30	10	537000	1@1	DFT_QPSK	28.00	26.77
n41	30	10	537000	1@22	DFT_QPSK	28.00	26.76
n41	30	50	504204	64@32	DFT_BPSK	28.00	27.19
n41	30	50	504204	1@1	DFT_BPSK	28.00	27.70
n41	30	50	504204	1@131	DFT_BPSK	28.00	27.96
n41	30	50	504204	64@32	DFT_QPSK	28.00	27.13
n41	30	50	504204	1@1	DFT_QPSK	28.00	27.65

n41	30	50	504204	1@131	DFT_QPSK	28.00	27.91
n41	30	50	518598	64@32	DFT_BPSK	28.00	26.80
n41	30	50	518598	1@1	DFT_BPSK	28.00	27.41
n41	30	50	518598	1@131	DFT_BPSK	28.00	27.91
n41	30	50	518598	64@32	DFT_QPSK	28.00	26.70
n41	30	50	518598	1@1	DFT_QPSK	28.00	27.30
n41	30	50	518598	1@131	DFT_QPSK	28.00	27.85
n41	30	50	532998	64@32	DFT_BPSK	28.00	27.01
n41	30	50	532998	1@1	DFT_BPSK	28.00	27.57
n41	30	50	532998	1@131	DFT_BPSK	28.00	27.74
n41	30	50	532998	64@32	DFT_QPSK	28.00	26.93
n41	30	50	532998	1@1	DFT_QPSK	28.00	27.50
n41	30	50	532998	1@131	DFT_QPSK	28.00	27.59
n41	30	100	509202	135@67	DFT_BPSK	28.00	26.79
n41	30	100	509202	1@1	DFT_BPSK	28.00	26.31
n41	30	100	509202	1@271	DFT_BPSK	28.00	26.23
n41	30	100	509202	135@67	DFT_QPSK	28.00	26.71
n41	30	100	509202	1@1	DFT_QPSK	28.00	26.25
n41	30	100	509202	1@271	DFT_QPSK	28.00	26.16
n41	30	100	518598	135@67	DFT_BPSK	28.00	26.58
n41	30	100	518598	1@1	DFT_BPSK	28.00	26.26
n41	30	100	518598	1@271	DFT_BPSK	28.00	26.25
n41	30	100	518598	135@67	DFT_QPSK	28.00	26.49
n41	30	100	518598	1@1	DFT_QPSK	28.00	26.20
n41	30	100	518598	1@271	DFT_QPSK	28.00	26.22
n41	30	100	528000	135@67	DFT_BPSK	28.00	26.22
n41	30	100	528000	1@1	DFT_BPSK	28.00	25.99
n41	30	100	528000	1@271	DFT_BPSK	28.00	26.25
n41	30	100	528000	135@67	DFT_QPSK	28.00	26.60
n41	30	100	528000	1@1	DFT_QPSK	28.00	25.90
n41	30	100	528000	1@271	DFT_QPSK	28.00	26.18
n77	30	10	620334	12@6	DFT_BPSK	27.50	25.48
n77	30	10	620334	1@1	DFT_BPSK	27.50	25.45
n77	30	10	620334	1@22	DFT_BPSK	27.50	25.74
n77	30	10	620334	12@6	DFT_QPSK	27.50	25.38
n77	30	10	620334	1@1	DFT_QPSK	27.50	25.41
n77	30	10	620334	1@22	DFT_QPSK	27.50	25.70
n77	30	10	650000	12@6	DFT_BPSK	27.50	25.25
n77	30	10	650000	1@1	DFT_BPSK	27.50	25.42

n77	30	10	650000	1@22	DFT_BPSK	27.50	25.49
n77	30	10	650000	12@6	DFT_QPSK	27.50	25.21
n77	30	10	650000	1@1	DFT_QPSK	27.50	25.41
n77	30	10	650000	1@22	DFT_QPSK	27.50	25.49
n77	30	10	679666	12@6	DFT_BPSK	27.50	25.98
n77	30	10	679666	1@1	DFT_BPSK	27.50	26.29
n77	30	10	679666	1@22	DFT_BPSK	27.50	26.34
n77	30	10	679666	12@6	DFT_QPSK	27.50	26.08
n77	30	10	679666	1@1	DFT_QPSK	27.50	26.31
n77	30	10	679666	1@22	DFT_QPSK	27.50	26.35
n77	30	50	621668	64@32	DFT_BPSK	27.50	25.98
n77	30	50	621668	1@1	DFT_BPSK	27.50	26.51
n77	30	50	621668	1@131	DFT_BPSK	27.50	27.45
n77	30	50	621668	64@32	DFT_QPSK	27.50	25.82
n77	30	50	621668	1@1	DFT_QPSK	27.50	26.40
n77	30	50	621668	1@131	DFT_QPSK	27.50	27.35
n77	30	50	650000	64@32	DFT_BPSK	27.50	25.76
n77	30	50	650000	1@1	DFT_BPSK	27.50	26.59
n77	30	50	650000	1@131	DFT_BPSK	27.50	26.90
n77	30	50	650000	64@32	DFT_QPSK	27.50	25.71
n77	30	50	650000	1@1	DFT_QPSK	27.50	26.56
n77	30	50	650000	1@131	DFT_QPSK	27.50	26.86
n77	30	50	678332	64@32	DFT_BPSK	27.50	26.50
n77	30	50	678332	1@1	DFT_BPSK	27.50	27.48
n77	30	50	678332	1@131	DFT_BPSK	27.50	27.44
n77	30	50	678332	64@32	DFT_QPSK	27.50	26.48
n77	30	50	678332	1@1	DFT_QPSK	27.50	27.47
n77	30	50	678332	1@131	DFT_QPSK	27.50	27.42
n77	30	100	623334	135@67	DFT_BPSK	27.50	25.51
n77	30	100	623334	1@1	DFT_BPSK	27.50	24.18
n77	30	100	623334	1@271	DFT_BPSK	27.50	25.11
n77	30	100	623334	135@67	DFT_QPSK	27.50	25.50
n77	30	100	623334	1@1	DFT_QPSK	27.50	24.20
n77	30	100	623334	1@271	DFT_QPSK	27.50	25.13
n77	30	100	650000	135@67	DFT_BPSK	27.50	25.27
n77	30	100	650000	1@1	DFT_BPSK	27.50	24.17
n77	30	100	650000	1@271	DFT_BPSK	27.50	25.00
n77	30	100	650000	135@67	DFT_QPSK	27.50	25.26
n77	30	100	650000	1@1	DFT_QPSK	27.50	24.17

n77	30	100	650000	1@271	DFT_QPSK	27.50	25.02
n77	30	100	676666	135@67	DFT_BPSK	27.50	26.72
n77	30	100	676666	1@1	DFT_BPSK	27.50	26.38
n77	30	100	676666	1@271	DFT_BPSK	27.50	25.86
n77	30	100	676666	135@67	DFT_QPSK	27.50	26.58
n77	30	100	676666	1@1	DFT_QPSK	27.50	26.32
n77	30	100	676666	1@271	DFT_QPSK	27.50	25.82
n78	30	10	620334	12@6	DFT_BPSK	27.50	25.39
n78	30	10	620334	1@1	DFT_BPSK	27.50	25.55
n78	30	10	620334	1@22	DFT_BPSK	27.50	25.63
n78	30	10	620334	12@6	DFT_QPSK	27.50	25.36
n78	30	10	620334	1@1	DFT_QPSK	27.50	25.54
n78	30	10	620334	1@22	DFT_QPSK	27.50	25.63
n78	30	10	636666	12@6	DFT_BPSK	27.50	25.14
n78	30	10	636666	1@1	DFT_BPSK	27.50	25.30
n78	30	10	636666	1@22	DFT_BPSK	27.50	25.40
n78	30	10	636666	12@6	DFT_QPSK	27.50	25.12
n78	30	10	636666	1@1	DFT_QPSK	27.50	25.30
n78	30	10	636666	1@22	DFT_QPSK	27.50	25.40
n78	30	10	653000	12@6	DFT_BPSK	27.50	25.85
n78	30	10	653000	1@1	DFT_BPSK	27.50	25.95
n78	30	10	653000	1@22	DFT_BPSK	27.50	26.12
n78	30	10	653000	12@6	DFT_QPSK	27.50	25.82
n78	30	10	653000	1@1	DFT_QPSK	27.50	25.95
n78	30	10	653000	1@22	DFT_QPSK	27.50	26.12
n78	30	50	621668	64@32	DFT_BPSK	27.50	25.58
n78	30	50	621668	1@1	DFT_BPSK	27.50	26.51
n78	30	50	621668	1@131	DFT_BPSK	27.50	27.01
n78	30	50	621668	64@32	DFT_QPSK	27.50	25.56
n78	30	50	621668	1@1	DFT_QPSK	27.50	26.52
n78	30	50	621668	1@131	DFT_QPSK	27.50	27.01
n78	30	50	636666	64@32	DFT_BPSK	27.50	25.66
n78	30	50	636666	1@1	DFT_BPSK	27.50	26.64
n78	30	50	636666	1@131	DFT_BPSK	27.50	26.44
n78	30	50	636666	64@32	DFT_QPSK	27.50	25.49
n78	30	50	636666	1@1	DFT_QPSK	27.50	26.53
n78	30	50	636666	1@131	DFT_QPSK	27.50	26.34
n78	30	50	651666	64@32	DFT_BPSK	27.50	25.93
n78	30	50	651666	1@1	DFT_BPSK	27.50	26.49

n78	30	50	651666	1@131	DFT_BPSK	27.50	27.14
n78	30	50	651666	64@32	DFT_QPSK	27.50	25.88
n78	30	50	651666	1@1	DFT_QPSK	27.50	26.46
n78	30	50	651666	1@131	DFT_QPSK	27.50	27.12
n78	30	100	623334	135@67	DFT_BPSK	27.50	25.44
n78	30	100	623334	1@1	DFT_BPSK	27.50	24.57
n78	30	100	623334	1@271	DFT_BPSK	27.50	24.85
n78	30	100	623334	135@67	DFT_QPSK	27.50	25.32
n78	30	100	623334	1@1	DFT_QPSK	27.50	24.51
n78	30	100	623334	1@271	DFT_QPSK	27.50	24.80
n78	30	100	636666	135@67	DFT_BPSK	27.50	25.20
n78	30	100	636666	1@1	DFT_BPSK	27.50	24.98
n78	30	100	636666	1@271	DFT_BPSK	27.50	25.10
n78	30	100	636666	135@67	DFT_QPSK	27.50	25.17
n78	30	100	636666	1@1	DFT_QPSK	27.50	24.97
n78	30	100	636666	1@271	DFT_QPSK	27.50	25.11
n78	30	100	650000	135@67	DFT_BPSK	27.50	25.82
n78	30	100	650000	1@1	DFT_BPSK	27.50	24.98
n78	30	100	650000	1@271	DFT_BPSK	27.50	25.62
n78	30	100	650000	135@67	DFT_QPSK	27.50	25.80
n78	30	100	650000	1@1	DFT_QPSK	27.50	24.99
n78	30	100	650000	1@271	DFT_QPSK	27.50	25.64

7.5. WLAN & Bluetooth Output Power

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11b	1	2412	15.00	14.93
	7	2442	15.00	14.58
	13	2472	15.00	14.60
802.11g	1	2412	13.00	12.88
	7	2442	13.00	12.21
	13	2472	13.00	12.73
802.11n (HT20)	1	2412	12.50	12.11
	7	2442	12.50	11.77
	13	2472	12.50	12.14
802.11n (HT40)	3	2422	12.00	11.74
	7	2442	12.00	11.17
	11	2462	12.00	11.78

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	36	5180	11.50	11.11
	40	5200	11.50	10.26
	48	5240	11.50	10.12
802.11n HT20	36	5180	11.50	11.38
	40	5200	11.50	11.02
	48	5240	11.00	10.74
802.11n HT40	38	5190	9.50	9.45
	46	5230	9.50	9.12
802.11ac VHT20	36	5180	10.50	10.22
	40	5200	10.50	9.51
	48	5240	10.50	10.02
802.11ac VHT40	38	5190	10.00	9.57
	46	5230	10.00	8.70
802.11ac VHT80	42	5210	10.00	9.89

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up	Output Power (dBm)
802.11a	149	5745	10.00	9.87
	157	5785	10.00	9.39
	165	5825	10.00	9.17
802.11n HT20	149	5745	10.50	10.23
	157	5785	10.50	9.64
	165	5825	10.50	9.59
802.11n HT40	151	5755	9.50	9.04
	159	5795	9.50	9.06
802.11ac VHT20	149	5745	10.50	10.21
	157	5785	10.50	9.77
	165	5825	10.50	9.54
802.11ac VHT40	151	5755	9.50	9.03
	159	5795	9.50	9.03
802.11ac VHT80	155	5775	10.00	9.64

NOTE: Power measurement results of WLAN 5.8G.

BLE	Channel	Tune - up	Output Power (dBm)	
			1M	2M
	0CH	-2.00	-2.83	-3.43
	19CH	-4.00	-4.17	-4.37
	39CH	-4.00	-4.20	-4.43

7.6. NFC Assessment

NOTE: Refer to COUNCIL RECOMMENDATION 1999/519/EC, the available H-Field of this EUT is 0.00001114 A/m, the H-Field is less than the exclusion level defined in Table 2 (0.073 A/m), So NFC is compliance.

According to EN 62479 Clause 4.1& 4.2, these require does not apply to the receivers that has no transmit. So, GPS and FM is compliance.

9.1.1. SAR measurement Result of GSM900

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										

9.1.2. SAR measurement Result of GSM1800

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										

Left Cheek	698/1747.4	GPRS(GMSK 4TS)	0	0.022	0.015	3.89	25.76	26.50	0.018	2024/7/25
Left Tilt 15 Degree	698/1747.4	GPRS(GMSK 4TS)	0	0.013	0.011	0.84	25.76	26.50	0.013	2024/7/25
Right Cheek	698/1747.4	GPRS(GMSK 4TS)	0	0.021	0.014	3.39	25.76	26.50	0.017	2024/7/25
Right Tilt 15 Degree	698/1747.4	GPRS(GMSK 4TS)	0	0.010	0.008	-2.42	25.76	26.50	0.009	2024/7/25
Left Cheek	512/1710.2	GPRS(GMSK 4TS)	0	0.013	0.011	-3.21	25.37	26.50	0.014	2024/7/25
Left Cheek	885/1784.8	GPRS(GMSK 4TS)	0	0.020	0.012	-3.73	26.14	26.50	0.013	2024/7/25
Extremity										
Front Side	698/1747.4	GPRS(GMSK 4TS)	0	0.290	0.113	0.35	25.76	26.50	0.134	2024/7/25
Back Side	698/1747.4	GPRS(GMSK 4TS)	0	1.319	0.528	2.33	25.76	26.50	0.626	2024/7/25
Left Side	698/1747.4	GPRS(GMSK 4TS)	0	0.673	0.259	1.11	25.76	26.50	0.307	2024/7/25
Right Side	698/1747.4	GPRS(GMSK 4TS)	0	0.079	0.031	3.09	25.76	26.50	0.037	2024/7/25
Top Side	698/1747.4	GPRS(GMSK 4TS)	0	0.053	0.021	-0.52	25.76	26.50	0.025	2024/7/25
Bottom Side	698/1747.4	GPRS(GMSK 4TS)	0	0.369	0.145	2.13	25.76	26.50	0.172	2024/7/25
Back Side	512/1710.2	GPRS(GMSK 4TS)	0	1.187	0.451	-1.68	25.37	26.50	0.585	2024/7/25
Back Side	885/1784.8	GPRS(GMSK 4TS)	0	1.266	0.502	-1.41	26.14	26.50	0.545	2024/7/25
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	698/1747.4	GPRS(GMSK 4TS)	5	0.857	0.336	-1.21	25.76	26.50	0.398	2024/7/25

9.1.3. SAR measurement Result of WCDMA Band 1

Test Position	Test channel /Freq	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	9750/1950	RMC12.2K	0	0.063	0.037	2.57	22.61	23.00	0.040	2024/7/26

Left Tilt 15 Degree	9750/1950	RMC12.2K	0	0.033	0.019	1.47	22.61	23.00	0.021	2024/7/26
Right Cheek	9750/1950	RMC12.2K	0	0.056	0.032	1.10	22.61	23.00	0.035	2024/7/26
Right Tilt 15 Degree	9750/1950	RMC12.2K	0	0.026	0.015	-1.09	22.61	23.00	0.016	2024/7/26
Left Cheek	9612/1922.4	RMC12.2K	0	0.054	0.030	0.02	22.63	23.00	0.033	2024/7/26
Left Cheek	9888/1977.6	RMC12.2K	0	0.058	0.033	1.32	22.57	23.00	0.036	2024/7/26
Extremity										
Front Side	9750/1950	RMC12.2K	0	0.480	0.199	0.39	22.61	23.00	0.218	2024/7/26
Back Side	9750/1950	RMC12.2K	0	2.526	1.067	2.87	22.61	23.00	1.167	2024/7/26
Left Side	9750/1950	RMC12.2K	0	1.339	0.537	2.17	22.61	23.00	0.587	2024/7/26
Right Side	9750/1950	RMC12.2K	0	0.101	0.043	0.52	22.61	23.00	0.047	2024/7/26
Top Side	9750/1950	RMC12.2K	0	0.051	0.021	3.96	22.61	23.00	0.023	2024/7/26
Bottom Side	9750/1950	RMC12.2K	0	0.733	0.303	0.99	22.61	23.00	0.331	2024/7/26
Back Side	9612/1922.4	RMC12.2K	0	2.400	1.004	3.46	22.63	23.00	1.093	2024/7/26
Back Side	9888/1977.6	RMC12.2K	0	2.450	1.014	3.11	22.57	23.00	1.120	2024/7/26
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	9750/1950	RMC12.2K	5	1.541	0.631	-3.24	22.61	23.00	0.690	2024/7/26

9.1.4. SAR measurement Result of WCDMA Band 8

Test Position	Test channel /Freq	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	2788/897.6	RMC12.2K	0	0.033	0.026	1.14	21.33	21.50	0.027	2024/7/24
Left Tilt 15 Degree	2788/897.6	RMC12.2K	0	0.017	0.015	3.09	21.33	21.50	0.016	2024/7/24
Right Cheek	2788/897.6	RMC12.2K	0	0.028	0.021	0.24	21.33	21.50	0.022	2024/7/24
Right Tilt 15 Degree	2788/897.6	RMC12.2K	0	0.015	0.013	0.45	21.33	21.50	0.014	2024/7/24
Left Cheek	2712/882.4	RMC12.2K	0	0.030	0.023	0.44	21.32	21.50	0.024	2024/7/24
Left Cheek	2863/912.6	RMC12.2K	0	0.028	0.022	-2.64	21.26	21.50	0.023	2024/7/24
Extremity										
Front Side	2788/897.6	RMC12.2K	0	0.351	0.159	-0.45	21.33	21.50	0.165	2024/7/24
Back Side	2788/897.6	RMC12.2K	0	0.798	0.377	-2.23	21.33	21.50	0.392	2024/7/24
Left Side	2788/897.6	RMC12.2K	0	0.040	0.019	3.83	21.33	21.50	0.020	2024/7/24
Right Side	2788/897.6	RMC12.2K	0	0.423	0.200	-0.74	21.33	21.50	0.208	2024/7/24
Top Side	2788/897.6	RMC12.2K	0	0.024	0.011	3.08	21.33	21.50	0.011	2024/7/24

Bottom Side	2788/897.6	RMC12.2K	0	0.782	0.358	-0.88	21.33	21.50	0.372	2024/7/24
Back Side	2712/882.4	RMC12.2K	0	0.694	0.318	-1.64	21.32	21.50	0.331	2024/7/24
Back Side	2863/912.6	RMC12.2K	0	0.785	0.360	-3.59	21.26	21.50	0.380	2024/7/24
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	2788/897.6	RMC12.2K	5	0.487	0.225	-2.55	21.33	21.50	0.234	2024/7/24

9.1.5. SAR measurement Result of LTE Band 1

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	18300/1950	20M QPSK(1,0)	0	0.051	0.031	3.04	23.04	23.50	0.034	2024/7/26
Left Tilt 15 Degree	18300/1950	20M QPSK(1,0)	0	0.029	0.017	-0.13	23.04	23.50	0.019	2024/7/26
Right Cheek	18300/1950	20M QPSK(1,0)	0	0.046	0.027	-3.19	23.04	23.50	0.030	2024/7/26
Right Tilt 15 Degree	18300/1950	20M QPSK(1,0)	0	0.024	0.014	0.91	23.04	23.50	0.016	2024/7/26
Left Cheek	18100/1930	20M QPSK(1,0)	0	0.041	0.023	-2.16	22.89	23.50	0.026	2024/7/26
Left Cheek	18500/1970	20M QPSK(1,0)	0	0.048	0.028	2.87	23.02	23.50	0.031	2024/7/26
Extremity										
Front Side	18300/1950	20M QPSK(1,0)	0	0.387	0.181	-0.37	23.04	23.50	0.201	2024/7/26
Back Side	18300/1950	20M QPSK(1,0)	0	2.404	1.010	4.73	23.04	23.50	1.123	2024/7/26
Left Side	18300/1950	20M QPSK(1,0)	0	1.274	0.541	3.97	23.04	23.50	0.601	2024/7/26
Right Side	18300/1950	20M QPSK(1,0)	0	0.144	0.059	-2.97	23.04	23.50	0.066	2024/7/26
Top Side	18300/1950	20M QPSK(1,0)	0	0.024	0.010	-0.69	23.04	23.50	0.011	2024/7/26
Bottom Side	18300/1950	20M QPSK(1,0)	0	0.571	0.285	1.93	23.04	23.50	0.317	2024/7/26
Back Side	18100/1930	20M QPSK(1,0)	0	2.164	0.882	0.18	22.89	23.50	1.015	2024/7/26

Back Side	18500/1970	20M QPSK(1,0)	0	2.356	0.940	-1.61	23.02	23.50	1.050	2024/7/26
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	18300/1950	20M QPSK(1,0)	5	1.442	0.588	-0.44	23.04	23.50	0.654	2024/7/26

9.1.6. SAR measurement Result of LTE Band 3

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	19575/1747.5	20M QPSK(1,0)	0	0.054	0.036	2.13	22.58	23.00	0.040	2024/7/25
Left Tilt 15 Degree	19575/1747.5	20M QPSK(1,0)	0	0.031	0.021	3.90	22.58	23.00	0.023	2024/7/25
Right Cheek	19575/1747.5	20M QPSK(1,0)	0	0.048	0.030	-2.12	22.58	23.00	0.033	2024/7/25
Right Tilt 15 Degree	19575/1747.5	20M QPSK(1,0)	0	0.025	0.016	1.75	22.58	23.00	0.018	2024/7/25
Left Cheek	19300/1720	20M QPSK(1,0)	0	0.040	0.027	-4.74	22.40	23.00	0.031	2024/7/25
Left Cheek	19850/1775	20M QPSK(1,0)	0	0.048	0.033	-2.30	22.30	23.00	0.039	2024/7/25
Extremity										
Front Side	19575/1747.5	20M QPSK(1,0)	0	0.700	0.290	-1.32	22.58	23.00	0.319	2024/7/25
Back Side	19575/1747.5	20M QPSK(1,0)	0	3.333	1.395	-3.30	22.58	23.00	1.537	2024/7/25
Left Side	19575/1747.5	20M QPSK(1,0)	0	1.667	0.670	-0.69	22.58	23.00	0.738	2024/7/25
Right Side	19575/1747.5	20M QPSK(1,0)	0	0.133	0.054	1.50	22.58	23.00	0.059	2024/7/25
Top Side	19575/1747.5	20M QPSK(1,0)	0	0.033	0.014	2.59	22.58	23.00	0.015	2024/7/25
Bottom Side	19575/1747.5	20M QPSK(1,0)	0	1.067	0.447	2.27	22.58	23.00	0.492	2024/7/25
Back Side	19300/1720	20M QPSK(1,0)	0	3.133	1.311	-2.03	22.40	23.00	1.505	2024/7/25

Back Side	19850/1775	20M QPSK(1,0)	0	3.100	1.287	-2.63	22.30	23.00	1.512	2024/7/25
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	19575/1747.5	20M QPSK(1,0)	5	2.000	0.795	-2.45	22.58	23.00	0.876	2024/7/25

9.1.7. SAR measurement Result of LTE Band 7

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	21100/2535	20M QPSK(1,0)	0	0.535	0.197	0.42	21.95	22.50	0.224	2024/7/19
Left Tilt 15 Degree	21100/2535	20M QPSK(1,0)	0	0.287	0.104	-2.53	21.95	22.50	0.118	2024/7/19
Right Cheek	21100/2535	20M QPSK(1,0)	0	0.497	0.179	-2.15	21.95	22.50	0.203	2024/7/19
Right Tilt 15 Degree	21100/2535	20M QPSK(1,0)	0	0.242	0.089	-3.86	21.95	22.50	0.101	2024/7/19
Left Cheek	20850/2510	20M QPSK(1,0)	0	0.445	0.171	1.72	21.69	22.50	0.206	2024/7/19
Left Cheek	21350/2560	20M QPSK(1,0)	0	0.635	0.229	0.84	22.12	22.50	0.250	2024/7/19
Extremity										
Front Side	21100/2535	20M QPSK(1,0)	0	1.583	0.556	1.50	21.95	22.50	0.631	2024/7/19
Back Side	21100/2535	20M QPSK(1,0)	0	1.596	0.603	-0.40	21.95	22.50	0.684	2024/7/19
Left Side	21100/2535	20M QPSK(1,0)	0	3.609	1.249	1.27	21.95	22.50	1.418	2024/7/19
Right Side	21100/2535	20M QPSK(1,0)	0	0.495	0.187	-0.06	21.95	22.50	0.212	2024/7/19
Top Side	21100/2535	20M QPSK(1,0)	0	0.686	0.249	0.67	21.95	22.50	0.283	2024/7/19
Bottom Side	21100/2535	20M QPSK(1,0)	0	0.239	0.086	1.89	21.95	22.50	0.098	2024/7/19
Left Side	20850/2510	20M QPSK(1,0)	0	3.301	1.168	-3.63	21.69	22.50	1.407	2024/7/19
Left Side	21350/2560	20M	0	3.949	1.326	0.03	22.12	22.50	1.447	2024/7/19

		QPSK(1,0)								
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Left Side	21350/2560	20M QPSK(1,0)	5	1.835	0.686	-3.27	22.12	22.50	0.749	2024/7/19

9.1.8. SAR measurement Result of LTE Band 8

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	21625/897.5	10M QPSK(1,0)	0	0.049	0.036	-4.97	22.65	23.00	0.039	2024/7/24
Left Tilt 15 Degree	21625/897.5	10M QPSK(1,0)	0	0.025	0.017	-1.96	22.65	23.00	0.018	2024/7/24
Right Cheek	21625/897.5	10M QPSK(1,0)	0	0.046	0.033	-4.12	22.65	23.00	0.036	2024/7/24
Right Tilt 15 Degree	21625/897.5	10M QPSK(1,0)	0	0.021	0.015	-0.11	22.65	23.00	0.016	2024/7/24
Left Cheek	21500/885	10M QPSK(1,0)	0	0.043	0.030	0.00	22.78	23.00	0.032	2024/7/24
Left Cheek	21750/910	10M QPSK(1,0)	0	0.035	0.024	-2.61	22.80	23.00	0.025	2024/7/24
Extremity										
Front Side	21625/897.5	10M QPSK(1,0)	0	0.497	0.229	-2.29	22.65	23.00	0.248	2024/7/24
Back Side	21625/897.5	10M QPSK(1,0)	0	1.105	0.524	0.35	22.65	23.00	0.568	2024/7/24
Left Side	21625/897.5	10M QPSK(1,0)	0	0.044	0.021	-0.48	22.65	23.00	0.023	2024/7/24
Right Side	21625/897.5	10M QPSK(1,0)	0	0.586	0.278	0.19	22.65	23.00	0.301	2024/7/24
Top Side	21625/897.5	10M QPSK(1,0)	0	0.066	0.030	-0.81	22.65	23.00	0.033	2024/7/24
Bottom Side	21625/897.5	10M QPSK(1,0)	0	1.050	0.473	-1.49	22.65	23.00	0.513	2024/7/24
Back Side	21500/885	10M QPSK(1,0)	0	0.906	0.425	-1.45	22.78	23.00	0.447	2024/7/24
Back Side	21750/910	10M	0	1.027	0.508	-2.88	22.80	23.00	0.532	2024/7/24

		QPSK(1,0)								
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	21625/897.5	10M QPSK(1,0)	5	0.674	0.320	1.41	22.65	23.00	0.347	2024/7/24

9.1.9. SAR measurement Result of LTE Band 20

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	24300/847	20M QPSK(1,0)	0	0.103	0.076	-0.46	22.36	23.00	0.088	2024/7/24
Left Tilt 15 Degree	24300/847	20M QPSK(1,0)	0	0.058	0.042	-3.31	22.36	23.00	0.049	2024/7/24
Right Cheek	24300/847	20M QPSK(1,0)	0	0.096	0.071	-0.36	22.36	23.00	0.082	2024/7/24
Right Tilt 15 Degree	24300/847	20M QPSK(1,0)	0	0.046	0.032	1.06	22.36	23.00	0.037	2024/7/24
Left Cheek	24250/842	20M QPSK(1,0)	0	0.097	0.069	1.11	22.39	23.00	0.079	2024/7/24
Left Cheek	24350/852	20M QPSK(1,0)	0	0.082	0.060	0.09	22.14	23.00	0.073	2024/7/24
Extremity										
Front Side	24300/847	20M QPSK(1,0)	0	0.464	0.232	-1.72	22.36	23.00	0.269	2024/7/24
Back Side	24300/847	20M QPSK(1,0)	0	1.030	0.515	-0.21	22.36	23.00	0.597	2024/7/24
Left Side	24300/847	20M QPSK(1,0)	0	0.082	0.039	3.65	22.36	23.00	0.045	2024/7/24
Right Side	24300/847	20M QPSK(1,0)	0	0.567	0.278	-1.90	22.36	23.00	0.322	2024/7/24
Top Side	24300/847	20M QPSK(1,0)	0	0.052	0.026	-3.51	22.36	23.00	0.030	2024/7/24
Bottom Side	24300/847	20M QPSK(1,0)	0	0.999	0.500	-2.16	22.36	23.00	0.579	2024/7/24
Back Side	24250/842	20M QPSK(1,0)	0	0.855	0.423	-2.45	22.39	23.00	0.487	2024/7/24
Back Side	24350/852	20M QPSK(1,0)	0	1.051	0.480	-2.22	22.14	23.00	0.585	2024/7/24

Body & Hotspot with 5mm (Worst-case position for 0mm)

Back Side	24300/847	20M QPSK(1,0)	5	0.670	0.325	0.04	22.36	23.00	0.377	2024/7/24
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9.1.10. SAR measurement Result of LTE Band 28

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	27460/728	20M QPSK(1,0)	0	0.078	0.062	-4.56	22.63	23.00	0.068	2024/8/01
Left Tilt 15 Degree	27460/728	20M QPSK(1,0)	0	0.040	0.032	1.39	22.63	23.00	0.035	2024/8/01
Right Cheek	27460/728	20M QPSK(1,0)	0	0.069	0.052	-4.44	22.63	23.00	0.057	2024/8/01
Right Tilt 15 Degree	27460/728	20M QPSK(1,0)	0	0.032	0.025	-0.52	22.63	23.00	0.027	2024/8/01
Left Cheek	27310/713	20M QPSK(1,0)	0	0.073	0.058	0.53	22.53	23.00	0.065	2024/8/01
Left Cheek	27560/738	20M QPSK(1,0)	0	0.068	0.054	-3.13	22.59	23.00	0.059	2024/8/01
Extremity										
Front Side	27460/728	20M QPSK(1,0)	0	0.395	0.199	2.31	22.63	23.00	0.217	2024/8/01
Back Side	27460/728	20M QPSK(1,0)	0	0.877	0.442	-1.43	22.63	23.00	0.481	2024/8/01
Left Side	27460/728	20M QPSK(1,0)	0	0.044	0.021	-2.84	22.63	23.00	0.023	2024/8/01
Right Side	27460/728	20M QPSK(1,0)	0	0.447	0.225	-3.15	22.63	23.00	0.245	2024/8/01
Top Side	27460/728	20M QPSK(1,0)	0	0.044	0.022	1.56	22.63	23.00	0.024	2024/8/01
Bottom Side	27460/728	20M QPSK(1,0)	0	0.868	0.429	-2.44	22.63	23.00	0.467	2024/8/01
Back Side	27310/713	20M QPSK(1,0)	0	0.754	0.369	-2.52	22.53	23.00	0.411	2024/8/01
Back Side	27560/738	20M QPSK(1,0)	0	0.813	0.431	-0.44	22.59	23.00	0.474	2024/8/01

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	27460/728	20M QPSK(1,0)	5	0.535	0.256	2.41	22.63	23.00	0.279	2024/8/01

9.1.11. SAR measurement Result of LTE Band 38

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	38000/2595	20M QPSK(1,0)	0	0.205	0.077	-2.75	22.38	22.50	0.079	2024/7/19
Left Tilt 15 Degree	38000/2595	20M QPSK(1,0)	0	0.117	0.042	-3.40	22.38	22.50	0.043	2024/7/19
Right Cheek	38000/2595	20M QPSK(1,0)	0	0.193	0.072	3.57	22.38	22.50	0.074	2024/7/19
Right Tilt 15 Degree	38000/2595	20M QPSK(1,0)	0	0.096	0.035	-4.67	22.38	22.50	0.036	2024/7/19
Left Cheek	37850/2580	20M QPSK(1,0)	0	0.187	0.067	0.41	22.25	22.50	0.071	2024/7/19
Left Cheek	38150/2610	20M QPSK(1,0)	0	0.190	0.068	-0.36	22.46	22.50	0.069	2024/7/19
Extremity										
Front Side	38000/2595	20M QPSK(1,0)	0	0.787	0.365	2.75	22.38	22.50	0.375	2024/7/19
Back Side	38000/2595	20M QPSK(1,0)	0	0.828	0.396	-0.31	22.38	22.50	0.407	2024/7/19
Left Side	38000/2595	20M QPSK(1,0)	0	2.542	0.886	0.14	22.38	22.50	0.911	2024/7/19
Right Side	38000/2595	20M QPSK(1,0)	0	0.290	0.135	0.94	22.38	22.50	0.139	2024/7/19
Top Side	38000/2595	20M QPSK(1,0)	0	0.339	0.159	3.47	22.38	22.50	0.163	2024/7/19
Bottom Side	38000/2595	20M QPSK(1,0)	0	0.116	0.053	-0.83	22.38	22.50	0.054	2024/7/19
Back Side	37850/2580	20M QPSK(1,0)	0	2.149	0.856	-0.91	22.25	22.50	0.907	2024/7/19
Back Side	38150/2610	20M QPSK(1,0)	0	2.195	0.883	3.42	22.46	22.50	0.891	2024/7/19

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Left Side	38000/2595	20M QPSK(1,0)	5	0.936	0.448	-1.11	22.38	22.50	0.461	2024/7/19

9.1.12. SAR measurement Result of LTE Band 40

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	39150/2350	20M QPSK(1,0)	0	0.582	0.254	-0.65	22.77	23.00	0.268	2024/7/29
Left Tilt 15 Degree	39150/2350	20M QPSK(1,0)	0	0.302	0.125	5.25	22.77	23.00	0.132	2024/7/29
Right Cheek	39150/2350	20M QPSK(1,0)	0	0.560	0.245	0.88	22.77	23.00	0.258	2024/7/29
Right Tilt 15 Degree	39150/2350	20M QPSK(1,0)	0	0.299	0.129	-2.38	22.77	23.00	0.136	2024/7/29
Left Cheek	38750/2310	20M QPSK(1,0)	0	0.552	0.229	-2.88	22.56	23.00	0.253	2024/7/29
Left Cheek	39550/2390	20M QPSK(1,0)	0	0.513	0.215	-2.15	22.17	23.00	0.260	2024/7/29
Extremity										
Front Side	39150/2350	20M QPSK(1,0)	0	1.626	0.822	3.70	22.77	23.00	0.867	2024/7/29
Back Side	39150/2350	20M QPSK(1,0)	0	1.807	0.962	-4.36	22.77	23.00	1.014	2024/7/29
Left Side	39150/2350	20M QPSK(1,0)	0	3.494	1.154	2.42	22.77	23.00	1.217	2024/7/29
Right Side	39150/2350	20M QPSK(1,0)	0	0.542	0.283	2.24	22.77	23.00	0.298	2024/7/29
Top Side	39150/2350	20M QPSK(1,0)	0	0.723	0.370	1.67	22.77	23.00	0.390	2024/7/29
Bottom Side	39150/2350	20M QPSK(1,0)	0	0.271	0.144	-3.91	22.77	23.00	0.152	2024/7/29
Left Side	38750/2310	20M QPSK(1,0)	0	3.158	1.067	0.14	22.56	23.00	1.181	2024/7/29
Left Side	39550/2390	20M QPSK(1,0)	0	1.897	0.980	2.47	22.17	23.00	1.186	2024/7/29

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Left Side	39150/2350	20M QPSK(1,0)	5	2.201	0.698	0.19	22.77	23.00	0.736	2024/7/29

9.1.13. SAR measurement Result of LTE Band 41

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	40620/2593	20M QPSK(1,0)	0	0.239	0.089	3.80	22.16	22.50	0.096	2024/7/19
Left Tilt 15 Degree	40620/2593	20M QPSK(1,0)	0	0.137	0.051	4.30	22.16	22.50	0.055	2024/7/19
Right Cheek	40620/2593	20M QPSK(1,0)	0	0.223	0.081	1.63	22.16	22.50	0.088	2024/7/19
Right Tilt 15 Degree	40620/2593	20M QPSK(1,0)	0	0.105	0.038	-1.04	22.16	22.50	0.041	2024/7/19
Left Cheek	39750/2506	20M QPSK(1,0)	0	0.222	0.079	3.07	21.91	22.50	0.090	2024/7/19
Left Cheek	41490/2680	20M QPSK(1,0)	0	0.209	0.077	-1.90	22.08	22.50	0.085	2024/7/19
Extremity										
Front Side	40620/2593	20M QPSK(1,0)	0	0.751	0.355	-2.95	22.16	22.50	0.384	2024/7/19
Back Side	40620/2593	20M QPSK(1,0)	0	0.790	0.377	2.92	22.16	22.50	0.408	2024/7/19
Left Side	40620/2593	20M QPSK(1,0)	0	2.587	0.923	2.37	22.16	22.50	0.998	2024/7/19
Right Side	40620/2593	20M QPSK(1,0)	0	0.237	0.112	-2.20	22.16	22.50	0.121	2024/7/19
Top Side	40620/2593	20M QPSK(1,0)	0	0.348	0.161	-2.48	22.16	22.50	0.174	2024/7/19
Bottom Side	40620/2593	20M QPSK(1,0)	0	0.079	0.036	-1.23	22.16	22.50	0.039	2024/7/19
Left Side	39750/2506	20M QPSK(1,0)	0	2.356	0.824	-0.56	21.91	22.50	0.944	2024/7/19
Left Side	41490/2680	20M QPSK(1,0)	0	2.461	0.877	-0.93	22.08	22.50	0.966	2024/7/19

Body & Hotspot with 5mm (Worst-case position for 0mm)

Left Side	40620/2593	20M QPSK(1,0)	5	1.630	0.576	3.85	22.16	22.50	0.623	2024/7/19
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9.1.14. SAR measurement Result of NR SA n1

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	390000/1950	30kHz 50M QPSK(1,1)	0	0.038	0.022	3.56	22.80	23.00	0.023	2024/7/26
Left Tilt 15 Degree	390000/1950	30kHz 50M QPSK(1,1)	0	0.019	0.017	-3.81	22.80	23.00	0.018	2024/7/26
Right Cheek	390000/1950	30kHz 50M QPSK(1,1)	0	0.033	0.019	3.70	22.80	23.00	0.020	2024/7/26
Right Tilt 15 Degree	390000/1950	30kHz 50M QPSK(1,1)	0	0.016	0.014	3.17	22.80	23.00	0.015	2024/7/26
Left Cheek	389000/1945	30kHz 50M QPSK(1,1)	0	0.030	0.017	4.34	22.74	23.00	0.018	2024/7/26
Left Cheek	391000/1955	30kHz 50M QPSK(1,1)	0	0.036	0.020	-0.07	22.49	23.00	0.022	2024/7/26
Extremity										
Front Side	390000/1950	30kHz 50M QPSK(1,1)	0	0.190	0.091	1.77	22.80	23.00	0.095	2024/7/26
Back Side	390000/1950	30kHz 50M QPSK(1,1)	0	1.690	0.706	-4.22	22.80	23.00	0.739	2024/7/26
Left Side	390000/1950	30kHz 50M QPSK(1,1)	0	0.876	0.362	-2.28	22.80	23.00	0.379	2024/7/26
Right Side	390000/1950	30kHz 50M QPSK(1,1)	0	0.051	0.021	2.81	22.80	23.00	0.022	2024/7/26
Top Side	390000/1950	30kHz 50M QPSK(1,1)	0	0.017	0.015	-0.74	22.80	23.00	0.016	2024/7/26
Bottom Side	390000/1950	30kHz 50M QPSK(1,1)	0	0.456	0.187	-3.58	22.80	23.00	0.196	2024/7/26
Back Side	386000/1930	30kHz 50M QPSK(1,1)	0	1.589	0.664	-0.53	22.74	23.00	0.705	2024/7/26
Back Side	394000/1970	30kHz 50M QPSK(1,1)	0	1.555	0.637	-3.49	22.49	23.00	0.716	2024/7/26

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	390000/1950	30kHz 50M QPSK(1,1)	5	1.099	0.445	-1.58	22.82	23.00	0.464	2024/7/26

9.1.15. SAR measurement Result of NR SA n3

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.036	0.024	0.43	23.72	24.50	0.029	2024/7/25
Left Tilt 15 Degree	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.020	0.018	-0.40	23.72	24.50	0.022	2024/7/25
Right Cheek	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.033	0.021	4.50	23.72	24.50	0.025	2024/7/25
Right Tilt 15 Degree	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.015	0.013	1.30	23.72	24.50	0.016	2024/7/25
Left Cheek	345000/1725	30kHz 30M QPSK(1,1)	0	0.031	0.020	-0.54	23.57	24.50	0.025	2024/7/25
Left Cheek	354000/1770	30kHz 30M QPSK(1,1)	0	0.032	0.021	-2.55	23.96	24.50	0.024	2024/7/25
Extremity										
Front Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.414	0.174	-1.49	23.72	24.50	0.208	2024/7/25
Back Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	2.177	0.915	-0.05	23.72	24.50	1.095	2024/7/25
Left Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	1.132	0.452	-3.27	23.72	24.50	0.541	2024/7/25
Right Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.131	0.053	1.20	23.72	24.50	0.063	2024/7/25
Top Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.109	0.046	-0.43	23.72	24.50	0.055	2024/7/25
Bottom Side	349500/1747.5	30kHz 30M QPSK(1,1)	0	0.610	0.246	-3.67	23.72	24.50	0.294	2024/7/25
Back Side	345000/1725	30kHz 30M QPSK(1,1)	0	2.025	0.817	-2.67	23.57	24.50	1.012	2024/7/25
Back Side	354000/1770	30kHz 30M QPSK(1,1)	0	2.112	0.888	2.24	23.96	24.50	1.006	2024/7/25

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	349500/1747.5	30kHz 30M QPSK(1,1)	5	1.393	0.556	2.57	23.72	24.50	0.665	2024/7/25

9.1.16. SAR measurement Result of NR SA n7

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	507000/2535	30kHz 20M QPSK(1,1)	0	0.473	0.172	-2.05	22.28	23.00	0.203	2024/7/19
Left Tilt 15 Degree	507000/2535	30kHz 20M QPSK(1,1)	0	0.269	0.097	-0.48	22.28	23.00	0.114	2024/7/19
Right Cheek	507000/2535	30kHz 20M QPSK(1,1)	0	0.455	0.159	1.78	22.28	23.00	0.188	2024/7/19
Right Tilt 15 Degree	507000/2535	30kHz 20M QPSK(1,1)	0	0.203	0.071	0.01	22.28	23.00	0.084	2024/7/19
Left Cheek	502000/2510	30kHz 20M QPSK(1,1)	0	0.434	0.158	-2.00	22.44	23.00	0.180	2024/7/19
Left Cheek	512000/2560	30kHz 20M QPSK(1,1)	0	0.447	0.154	3.77	22.21	23.00	0.185	2024/7/19
Extremity										
Front Side	507000/2535	30kHz 20M QPSK(1,1)	0	0.846	0.311	-1.67	22.28	23.00	0.367	2024/7/19
Back Side	507000/2535	30kHz 20M QPSK(1,1)	0	0.854	0.313	0.00	22.28	23.00	0.369	2024/7/19
Left Side	507000/2535	30kHz 20M QPSK(1,1)	0	1.772	0.626	-1.27	22.28	23.00	0.739	2024/7/19
Right Side	507000/2535	30kHz 20M QPSK(1,1)	0	0.256	0.090	2.29	22.28	23.00	0.106	2024/7/19
Top Side	507000/2535	30kHz 20M QPSK(1,1)	0	0.342	0.119	2.24	22.28	23.00	0.140	2024/7/19
Bottom Side	507000/2535	30kHz 20M QPSK(1,1)	0	0.120	0.044	-2.55	22.28	23.00	0.052	2024/7/19
Left Side	502000/2510	30kHz 20M QPSK(1,1)	0	1.665	0.580	1.71	22.44	23.00	0.660	2024/7/19
Left Side	512000/2560	30kHz 20M QPSK(1,1)	0	1.734	0.615	2.13	22.21	23.00	0.738	2024/7/19

Body & Hotspot with 5mm (Worst-case position for 0mm)

Left Side	507000/2535	30kHz 20M QPSK(1,1)	5	0.956	0.333	2.00	22.28	23.00	0.393	2024/7/19
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9.1.17. SAR measurement Result of NR SA n8

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	179500/897.5	30kHz 20M QPSK(1,1)	0	0.040	0.033	-3.74	23.49	24.00	0.037	2024/7/24
Left Tilt 15 Degree	179500/897.5	30kHz 20M QPSK(1,1)	0	0.022	0.017	-3.78	23.49	24.00	0.019	2024/7/24
Right Cheek	179500/897.5	30kHz 20M QPSK(1,1)	0	0.034	0.028	2.54	23.49	24.00	0.031	2024/7/24
Right Tilt 15 Degree	179500/897.5	30kHz 20M QPSK(1,1)	0	0.016	0.014	-0.09	23.49	24.00	0.016	2024/7/24
Left Cheek	178000/890	30kHz 20M QPSK(1,1)	0	0.032	0.026	0.96	23.39	24.00	0.030	2024/7/24
Left Cheek	181000/905	30kHz 20M QPSK(1,1)	0	0.037	0.030	4.72	23.20	24.00	0.036	2024/7/24
Extremity										
Front Side	179500/897.5	30kHz 20M QPSK(1,1)	0	0.757	0.371	1.44	23.49	24.00	0.417	2024/7/24
Back Side	179500/897.5	30kHz 20M QPSK(1,1)	0	1.051	0.536	1.52	23.49	24.00	0.603	2024/7/24
Left Side	179500/897.5	30kHz 20M QPSK(1,1)	0	0.063	0.032	-3.97	23.49	24.00	0.036	2024/7/24
Right Side	179500/897.5	30kHz 20M QPSK(1,1)	0	0.998	0.489	0.14	23.49	24.00	0.550	2024/7/24
Top Side	179500/897.5	30kHz 20M QPSK(1,1)	0	0.053	0.027	-2.74	23.49	24.00	0.030	2024/7/24
Bottom Side	179500/897.5	30kHz 20M QPSK(1,1)	0	1.068	0.509	0.07	23.49	24.00	0.572	2024/7/24
Back Side	178000/890	30kHz 20M QPSK(1,1)	0	0.904	0.443	1.19	23.39	24.00	0.510	2024/7/24
Back Side	181000/905	30kHz 20M QPSK(1,1)	0	0.956	0.468	3.19	23.20	24.00	0.563	2024/7/24

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	179500/897.5	30kHz 20M QPSK(1,1)	5	0.683	0.334	1.71	23.49	24.00	0.376	2024/7/24

9.1.18. SAR measurement Result of NR SA n20

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	169400/847	30kHz 20M QPSK(1,1)	0	0.077	0.063	-1.79	22.86	24.00	0.082	2024/7/24
Left Tilt 15 Degree	169400/847	30kHz 20M QPSK(1,1)	0	0.044	0.035	-1.06	22.86	24.00	0.046	2024/7/24
Right Cheek	169400/847	30kHz 20M QPSK(1,1)	0	0.070	0.056	-0.82	22.86	24.00	0.073	2024/7/24
Right Tilt 15 Degree	169400/847	30kHz 20M QPSK(1,1)	0	0.032	0.026	-4.20	22.86	24.00	0.034	2024/7/24
Left Cheek	168400/842	30kHz 20M QPSK(1,1)	0	0.070	0.057	3.87	22.93	24.00	0.073	2024/7/24
Left Cheek	170400/852	30kHz 20M QPSK(1,1)	0	0.073	0.058	-0.88	23.61	24.00	0.063	2024/7/24
Extremity										
Front Side	169400/847	30kHz 20M QPSK(1,1)	0	0.510	0.300	-3.26	22.86	24.00	0.390	2024/7/24
Back Side	169400/847	30kHz 20M QPSK(1,1)	0	0.729	0.437	-0.14	22.86	24.00	0.568	2024/7/24
Left Side	169400/847	30kHz 20M QPSK(1,1)	0	0.066	0.038	-2.93	22.86	24.00	0.049	2024/7/24
Right Side	169400/847	30kHz 20M QPSK(1,1)	0	0.756	0.394	1.30	22.86	24.00	0.512	2024/7/24
Top Side	169400/847	30kHz 20M QPSK(1,1)	0	0.007	0.005	3.11	22.86	24.00	0.007	2024/7/24
Bottom Side	169400/847	30kHz 20M QPSK(1,1)	0	0.793	0.425	0.16	22.86	24.00	0.553	2024/7/24
Back Side	168400/842	30kHz 20M QPSK(1,1)	0	0.634	0.376	0.69	22.93	24.00	0.481	2024/7/24
Back Side	170400/852	30kHz 20M QPSK(1,1)	0	0.729	0.427	-1.41	23.61	24.00	0.467	2024/7/24

Body & Hotspot with 5mm (Worst-case position for 0mm)

Back Side	169400/847	30kHz 20M QPSK(1,1)	5	0.459	0.261	-0.31	22.86	24.00	0.339	2024/7/24
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9.1.19. SAR measurement Result of NR SA n28

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	145100/725.5	30kHz 30M QPSK(1,1)	0	0.074	0.062	2.64	23.72	24.00	0.066	2024/8/01
Left Tilt 15 Degree	145100/725.5	30kHz 30M QPSK(1,1)	0	0.044	0.036	2.72	23.72	24.00	0.038	2024/8/01
Right Cheek	145100/725.5	30kHz 30M QPSK(1,1)	0	0.066	0.053	-2.01	23.72	24.00	0.057	2024/8/01
Right Tilt 15 Degree	145100/725.5	30kHz 30M QPSK(1,1)	0	0.035	0.029	-0.50	23.72	24.00	0.031	2024/8/01
Left Cheek	143600/718	30kHz 30M QPSK(1,1)	0	0.064	0.052	-1.47	23.69	24.00	0.056	2024/8/01
Left Cheek	146600/733	30kHz 30M QPSK(1,1)	0	0.069	0.058	-1.24	23.90	24.00	0.059	2024/8/01
Extremity										
Front Side	145100/725.5	30kHz 30M QPSK(1,1)	0	0.592	0.302	1.62	23.72	24.00	0.322	2024/8/01
Back Side	145100/725.5	30kHz 30M QPSK(1,1)	0	0.835	0.481	-4.31	23.72	24.00	0.513	2024/8/01
Left Side	145100/725.5	30kHz 30M QPSK(1,1)	0	0.074	0.025	1.79	23.72	24.00	0.027	2024/8/01
Right Side	145100/725.5	30kHz 30M QPSK(1,1)	0	1.106	0.440	-4.37	23.72	24.00	0.469	2024/8/01
Top Side	145100/725.5	30kHz 30M QPSK(1,1)	0	0.025	0.014	-2.02	23.72	24.00	0.015	2024/8/01
Bottom Side	145100/725.5	30kHz 30M QPSK(1,1)	0	1.224	0.476	4.89	23.72	24.00	0.508	2024/8/01
Back Side	143600/718	30kHz 30M QPSK(1,1)	0	0.693	0.399	0.07	23.69	24.00	0.429	2024/8/01
Back Side	146600/733	30kHz 30M QPSK(1,1)	0	0.835	0.471	-0.51	23.90	24.00	0.482	2024/8/01

Body & Hotspot with 5mm (Worst-case position for 0mm)

Back Side	145100/725.5	30kHz 30M QPSK(1,1)	5	0.518	0.295	2.80	23.69	24.00	0.317	2024/8/01
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9.1.20. SAR measurement Result of NR SA n38

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	519000/2595	30kHz 20M QPSK(1,1)	0	0.065	0.029	-3.36	24.25	24.50	0.031	2024/7/19
Left Tilt 15 Degree	519000/2595	30kHz 20M QPSK(1,1)	0	0.038	0.017	-1.39	24.25	24.50	0.018	2024/7/19
Right Cheek	519000/2595	30kHz 20M QPSK(1,1)	0	0.061	0.027	0.21	24.25	24.50	0.029	2024/7/19
Right Tilt 15 Degree	519000/2595	30kHz 20M QPSK(1,1)	0	0.029	0.013	-3.09	24.25	24.50	0.014	2024/7/19
Left Cheek	516000/2580	30kHz 20M QPSK(1,1)	0	0.060	0.026	1.44	23.76	24.50	0.031	2024/7/19
Left Cheek	522000/2610	30kHz 20M QPSK(1,1)	0	0.061	0.026	-0.44	23.78	24.50	0.031	2024/7/19
Extremity										
Front Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.159	0.100	-3.88	24.25	24.50	0.106	2024/7/19
Back Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.158	0.099	0.00	24.25	24.50	0.105	2024/7/19
Left Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.404	0.142	1.02	24.25	24.50	0.150	2024/7/19
Right Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.147	0.090	-0.93	24.25	24.50	0.095	2024/7/19
Top Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.003	0.001	1.40	24.25	24.50	0.001	2024/7/19
Bottom Side	519000/2595	30kHz 20M QPSK(1,1)	0	0.158	0.094	0.20	24.25	24.50	0.100	2024/7/19
Back Side	516000/2580	30kHz 20M QPSK(1,1)	0	0.131	0.079	-2.27	23.76	24.50	0.094	2024/7/19
Back Side	522000/2610	30kHz 20M QPSK(1,1)	0	0.163	0.097	0.15	23.78	24.50	0.114	2024/7/19

Body & Hotspot with 5mm (Worst-case position for 0mm)

Left Side	519000/2595	30kHz 20M QPSK(1,1)	5	0.182	0.111	-2.46	24.25	24.50	0.118	2024/7/19
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9.1.21. SAR measurement Result of NR SA n40

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	470000/2350	30kHz 80M QPSK(1,1)	0	0.218	0.095	0.25	24.09	24.50	0.104	2024/7/29
Left Tilt 15 Degree	470000/2350	30kHz 80M QPSK(1,1)	0	0.118	0.050	4.07	24.09	24.50	0.055	2024/7/29
Right Cheek	470000/2350	30kHz 80M QPSK(1,1)	0	0.193	0.082	4.92	24.09	24.50	0.090	2024/7/29
Right Tilt 15 Degree	470000/2350	30kHz 80M QPSK(1,1)	0	0.092	0.039	-2.44	24.09	24.50	0.043	2024/7/29
Left Cheek	468000/2340	30kHz 80M QPSK(1,1)	0	0.196	0.084	4.72	24.25	24.50	0.089	2024/7/29
Left Cheek	472000/2360	30kHz 80M QPSK(1,1)	0	0.206	0.088	-2.10	24.39	24.50	0.090	2024/7/29
Extremity										
Front Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.535	0.180	-1.67	24.09	24.50	0.198	2024/7/29
Left Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.891	0.309	-0.06	24.09	24.50	0.340	2024/7/29
Back Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.490	0.163	-2.80	24.09	24.50	0.179	2024/7/29
Right Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.009	0.007	3.97	24.09	24.50	0.008	2024/7/29
Top Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.009	0.007	-2.81	24.09	24.50	0.008	2024/7/29
Bottom Side	470000/2350	30kHz 80M QPSK(1,1)	0	0.027	0.009	3.69	24.09	24.50	0.010	2024/7/29
Back Side	468000/2340	30kHz 80M QPSK(1,1)	0	0.731	0.246	-1.72	24.25	24.50	0.261	2024/7/29
Back Side	472000/2360	30kHz 80M QPSK(1,1)	0	0.882	0.306	-0.81	24.39	24.50	0.314	2024/7/29

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Left Side	470000/2350	30kHz 80M QPSK(1,1)	5	0.490	0.163	1.69	24.09	24.50	0.179	2024/7/29

9.1.22. SAR measurement Result of NR SA n41

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.132	0.051	-1.08	26.20	28.00	0.077	2024/7/19
Left Tilt 15 Degree	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.068	0.025	4.93	26.20	28.00	0.038	2024/7/19
Right Cheek	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.122	0.045	-4.70	26.20	28.00	0.068	2024/7/19
Right Tilt 15 Degree	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.059	0.022	3.35	26.20	28.00	0.033	2024/7/19
Left Cheek	509202/2546.01	30kHz 100M QPSK(1,1)	0	0.119	0.044	0.32	26.25	28.00	0.066	2024/7/19
Left Cheek	528000/2640	30kHz 100M QPSK(1,1)	0	0.113	0.041	1.90	25.90	28.00	0.066	2024/7/19
Extremity										
Front Side	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.476	0.160	3.28	26.20	28.00	0.242	2024/7/19
Left Side	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.755	0.257	-1.53	26.20	28.00	0.389	2024/7/19
Back Side	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.378	0.127	1.68	26.20	28.00	0.192	2024/7/19
Right Side	518598/2592.99	30kHz 100M	0	0.038	0.013	0.10	26.20	28.00	0.020	2024/7/19

		QPSK(1,1)								
Top Side	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.015	0.013	-1.99	26.20	28.00	0.020	2024/7/19
Bottom Side	518598/2592.99	30kHz 100M QPSK(1,1)	0	0.045	0.015	-0.75	26.20	28.00	0.023	2024/7/19
Back Side	509202/2546.01	30kHz 100M QPSK(1,1)	0	0.634	0.214	2.69	26.25	28.00	0.320	2024/7/19
Back Side	528000/2640	30kHz 100M QPSK(1,1)	0	0.680	0.227	2.33	26.90	28.00	0.292	2024/7/19
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Left Side	518598/2592.99	30kHz 100M QPSK(1,1)	5	0.461	0.152	-0.75	26.20	28.00	0.230	2024/7/19

9.1.23. SAR measurement Result of NR SA n77

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	650000/3750	30kHz 100M QPSK(1,1)	0	0.399	0.142	-3.78	26.17	27.50	0.193	2024/8/06
Left Tilt 15 Degree	650000/3750	30kHz 100M QPSK(1,1)	0	0.227	0.080	-0.33	26.17	27.50	0.109	2024/8/06
Right Cheek	650000/3750	30kHz 100M QPSK(1,1)	0	0.356	0.127	4.32	26.17	27.50	0.173	2024/8/06
Right Tilt 15 Degree	650000/3750	30kHz 100M QPSK(1,1)	0	0.180	0.063	3.29	26.17	27.50	0.086	2024/8/06
Left Cheek	623334/3350.01	30kHz 100M QPSK(1,1)	0	0.364	0.126	-0.28	26.20	27.50	0.170	2024/8/06
Left Cheek	676666/4149.99	30kHz	0	0.349	0.123	2.45	26.32	27.50	0.161	2024/8/06

		100M QPSK(1,1)								
Extremity										
Front Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.587	0.202	-2.83	26.17	27.50	0.274	2024/8/06
Back Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.741	0.254	0.53	26.17	27.50	0.345	2024/8/06
Left Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.184	0.068	2.23	26.17	27.50	0.092	2024/8/06
Right Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.044	0.015	2.99	26.17	27.50	0.020	2024/8/06
Top Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.044	0.015	-3.77	26.17	27.50	0.020	2024/8/06
Bottom Side	650000/3750	30kHz 100M QPSK(1,1)	0	0.015	0.013	0.53	26.17	27.50	0.018	2024/8/06
Back Side	623334/3350.01	30kHz 100M QPSK(1,1)	0	0.682	0.222	-3.64	26.20	27.50	0.299	2024/8/4
Back Side	676666/4149.99	30kHz 100M QPSK(1,1)	0	0.741	0.249	3.45	26.32	27.50	0.327	2024/8/7
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	650000/3750	30kHz 100M QPSK(1,1)	5	0.482	0.160	-3.98	26.17	27.50	0.217	2024/8/06

9.1.24. SAR measurement Result of NR SA n78

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	636666/3549.99	30kHz 100M	0	0.383	0.135	0.05	25.97	27.50	0.192	2024/8/05

		QPSK(1,1)								
Left Tilt 15 Degree	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.228	0.077	-2.96	25.97	27.50	0.110	2024/8/05
Right Cheek	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.363	0.125	2.71	25.97	27.50	0.178	2024/8/05
Right Tilt 15 Degree	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.183	0.063	-4.27	25.97	27.50	0.090	2024/8/05
Left Cheek	623334/3350.01	30kHz 100M QPSK(1,1)	0	0.335	0.113	4.66	25.51	27.50	0.179	2024/8/05
Left Cheek	650000/3750	30kHz 100M QPSK(1,1)	0	0.360	0.126	4.41	25.99	27.50	0.178	2024/8/05
Extremity										
Front Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.714	0.235	1.09	25.97	27.50	0.334	2024/8/05
Back Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.744	0.255	4.34	25.97	27.50	0.363	2024/8/05
Left Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.181	0.067	3.23	25.97	27.50	0.095	2024/8/05
Right Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.022	0.007	2.49	25.97	27.50	0.010	2024/8/05
Top Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.022	0.007	-3.87	25.97	27.50	0.010	2024/8/05
Bottom Side	636666/3549.99	30kHz 100M QPSK(1,1)	0	0.022	0.007	-0.42	25.97	27.50	0.010	2024/8/05
Back Side	623334/3350.01	30kHz 100M QPSK(1,1)	0	0.692	0.228	1.83	25.51	27.50	0.361	2024/8/4
Back Side	650000/3750	30kHz 100M	0	0.722	0.245	-3.88	25.99	27.50	0.347	2024/8/05

		QPSK(1,1)								
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Back Side	636666/3549.99	30kHz 100M QPSK(1,1)	5	0.409	0.135	-2.02	25.97	27.50	0.192	2024/8/05

9.1.25. SAR measurement Result of WLAN 2.4G

Test Position	Test channel /Freq.	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	7/2442	802.11 b	0	0.391	0.177	-3.58	14.58	15.00	0.195	2024/7/18
Left Tilt 15 Degree	7/2442	802.11 b	0	0.202	0.090	2.53	14.58	15.00	0.099	2024/7/18
Right Cheek	7/2442	802.11 b	0	0.355	0.156	-3.32	14.58	15.00	0.172	2024/7/18
Right Tilt 15 Degree	7/2442	802.11 b	0	0.185	0.084	2.88	14.58	15.00	0.093	2024/7/18
Left Cheek	1/2412	802.11 b	0	0.367	0.150	0.96	14.93	15.00	0.152	2024/7/18
Left Cheek	13/2472	802.11 b	0	0.359	0.146	4.59	14.60	15.00	0.160	2024/7/18
Extremity										
Front Side	7/2442	802.11 b	0	0.627	0.275	1.87	14.58	15.00	0.303	2024/7/18
Back Side	7/2442	802.11 b	0	1.387	0.574	-4.65	14.58	15.00	0.632	2024/7/18
Left Side	7/2442	802.11 b	0	0.236	0.093	0.34	14.58	15.00	0.102	2024/7/18
Right Side	7/2442	802.11 b	0	2.006	0.675	0.18	14.58	15.00	0.744	2024/7/18
Top Side	7/2442	802.11 b	0	0.426	0.179	0.61	14.58	15.00	0.197	2024/7/18
Bottom Side	7/2442	802.11 b	0	0.069	0.028	-0.95	14.58	15.00	0.031	2024/7/18
Right Side	1/2412	802.11 b	0	1.803	0.608	-3.92	14.93	15.00	0.618	2024/7/18
Right Side	13/2472	802.11 b	0	1.920	0.643	-3.60	14.60	15.00	0.705	2024/7/18

		b								
Body & Hotspot with 5mm (Worst-case position for 0mm)										
Right Side	7/2442	802.11 b	5	1.171	0.402	0.28	14.58	15.00	0.443	2024/7/18

9.1.26. SAR measurement Result of WLAN 5.2G

Test Position	Test channel /Freq	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	40/5200	802.11 n HT20	0	1.076	0.312	2.20	11.02	11.50	0.348	2024/7/30
Left Tilt 15 Degree	40/5200	802.11 n HT20	0	0.562	0.158	3.18	11.02	11.50	0.176	2024/7/30
Right Cheek	40/5200	802.11 n HT20	0	0.965	0.280	-4.50	11.02	11.50	0.313	2024/7/30
Right Tilt 15 Degree	40/5200	802.11 n HT20	0	0.472	0.137	2.70	11.02	11.50	0.153	2024/7/30
Left Cheek	36/5180	802.11 n HT20	0	0.957	0.272	-4.67	11.38	11.50	0.280	2024/7/30
Left Cheek	48/5240	802.11 n HT20	0	0.977	0.293	3.02	10.74	11.00	0.311	2024/7/30
Extremity										
Front Side	40/5200	802.11 n HT20	0	1.333	0.292	-2.27	11.02	11.50	0.326	2024/7/30
Back Side	40/5200	802.11 n HT20	0	1.282	0.296	2.44	11.02	11.50	0.331	2024/7/30
Left Side	40/5200	802.11 n HT20	0	0.423	0.097	0.50	11.02	11.50	0.108	2024/7/30
Right Side	40/5200	802.11 n HT20	0	1.154	0.256	-1.27	11.02	11.50	0.286	2024/7/30
Top Side	40/5200	802.11 n HT20	0	5.065	1.119	4.48	11.02	11.50	1.250	2024/7/30
Bottom Side	40/5200	802.11 n HT20	0	0.141	0.031	3.10	11.02	11.50	0.035	2024/7/30
Top Side	36/5180	802.11 n HT20	0	4.782	0.993	-3.35	11.38	11.50	1.021	2024/7/30
Top Side	48/5240	802.11 n HT20	0	4.923	1.093	1.70	10.74	11.00	1.160	2024/7/30

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Top Side	40/5200	802.11 n HT20	5	2.487	0.546	-1.46	11.02	11.50	0.610	2024/7/30

9.1.27. SAR measurement Result of WLAN 5.8G

Test Position	Test channel /Freq	Test Mode	Separation distance (mm)	SAR Value (W/kg)		Power Drift(±5%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 10-g (W/Kg)	Date
				1-g	10-g					
Head										
Left Cheek	157/5785	802.11 n HT20	0	1.358	0.403	-4.88	9.64	10.50	0.491	2024/7/31
Left Tilt 15 Degree	157/5785	802.11 n HT20	0	0.695	0.206	0.91	9.64	10.50	0.251	2024/7/31
Right Cheek	157/5785	802.11 n HT20	0	1.164	0.332	-1.98	9.64	10.50	0.405	2024/7/31
Right Tilt 15 Degree	157/5785	802.11 n HT20	0	0.604	0.176	-2.42	9.64	10.50	0.215	2024/7/31
Left Cheek	149/5745	802.11 n HT20	0	1.204	0.347	-3.28	10.23	10.50	0.369	2024/7/31
Left Cheek	165/5825	802.11 n HT20	0	1.274	0.363	0.61	9.59	10.50	0.448	2024/7/31
Extremity										
Front Side	157/5785	802.11 n HT20	0	1.649	0.456	2.75	9.64	10.50	0.556	2024/7/31
Back Side	157/5785	802.11 n HT20	0	1.434	0.406	-1.99	9.64	10.50	0.495	2024/7/31
Left Side	157/5785	802.11 n HT20	0	0.502	0.138	2.13	9.64	10.50	0.168	2024/7/31
Right Side	157/5785	802.11 n HT20	0	1.261	0.404	1.91	9.64	10.50	0.492	2024/7/31
Top Side	157/5785	802.11 n HT20	0	6.659	1.363	-1.88	9.64	10.50	1.661	2024/7/31
Bottom Side	157/5785	802.11 n HT20	0	0.215	0.059	3.30	9.64	10.50	0.072	2024/7/31
Top Side	149/5745	802.11 n HT20	0	5.936	1.164	1.74	10.23	10.50	1.239	2024/7/31
Top Side	165/5825	802.11 n HT20	0	6.279	1.260	-3.06	9.59	10.50	1.554	2024/7/31

Body & Hotspot with 5mm (Worst-case position for 0mm)										
Top Side	157/5785	802.11 n HT20	5	2.882	0.791	-2.77	9.64	10.50	0.964	2024/7/31

9.2. Simultaneous Transmission Analysis

Refer to EN 62209-2:2010 Annex K, the secondary transmitter SAR test exclusion thresholds are determined by:

$$P_{\text{available}} = P_{\text{th},m} \left(\frac{\text{SAR}_{\text{lim}} - \text{SAR}_1}{\text{SAR}_{\text{lim}}} \right)$$

$P_{\text{th},m}$ is the threshold exclusion power level taken from Annex B of EN 62479.

Mode	P_{max} (dBm)	P_{max} (mW)	$P_{\text{th},m}$ (mW)	SAR_{lim} (W/Kg)	SAR_1 (W/Kg)	Calculation Result (mW)	Simultaneous Transmission Exclusion
Bluetooth	2.50	1.78	20	2	0.876	11.24	YES
Bluetooth	2.50	1.78	40	4	1.537	24.63	YES

9.3. Exposure Conditions

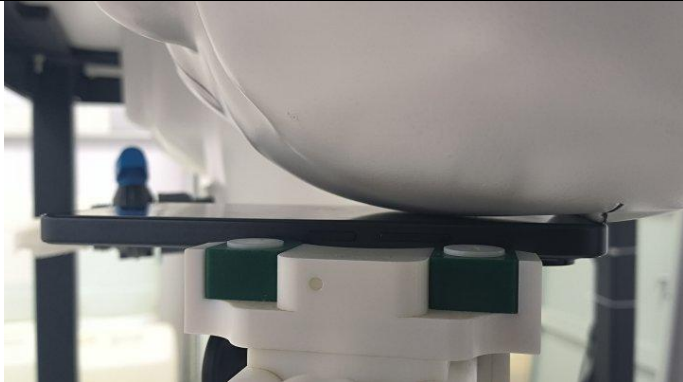
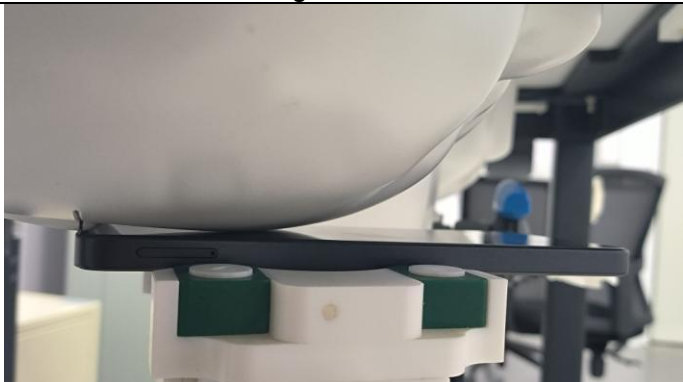
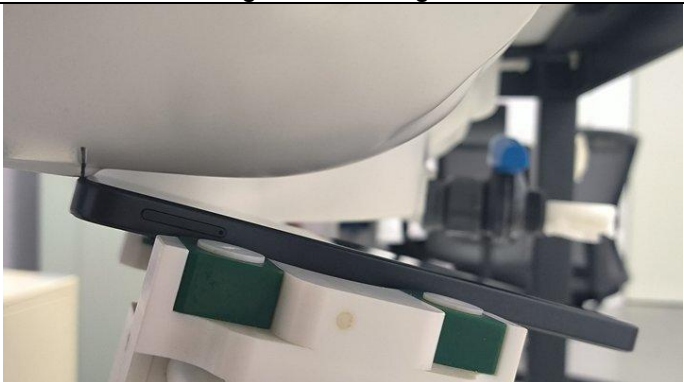
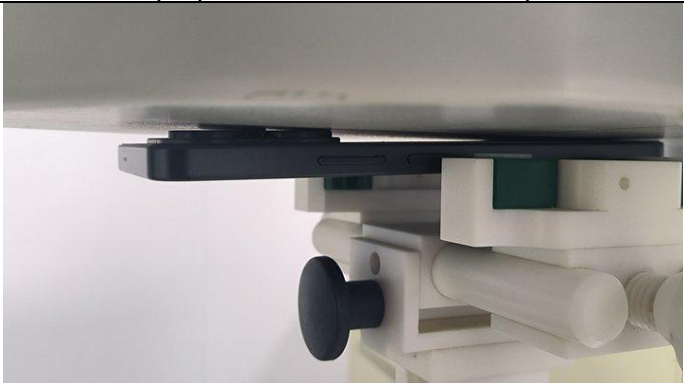
Exposure Position		WWAN Band	WLAN Band	Simultaneous Tx SAR(W/Kg)
		SAR(W/Kg)	SAR(W/Kg)	
Head	Left Cheek	0.268	0.491	0.759
	Left Tilt 15 Degree	0.132	0.251	0.383
	Right Cheek	0.258	0.405	0.663
	Right Tilt 15 Degree	0.136	0.215	0.351
Member	Front Side	0.867	0.556	1.423
	Back Side	1.537	0.495	2.032
	Left Side	1.447	0.168	1.615
	Right Side	0.550	0.492	1.042
	Top Side	0.390	1.661	2.051
	Bottom Side	0.579	0.072	0.651
Body&Hotspot	Left Side	0.749	/	0.749
	Right Side	/	0.443	0.443

	Top Side	/	0.964	0.964
	Back Side	0.876	/	0.876

NOTE: The Simultaneous Tx is calculated based on the same configuration and test position.

10. Appendix A. Photo documentation

Test Positions

Left Cheek	Left Tilt 15 Degree
	
Right Cheek	Right Tilt 15 Degree
	
Front Side (Separation distance of 0mm)	Back Side (Separation distance of 0mm)
	
Left Side (Separation distance of 0mm)	Right Side (Separation distance of 0mm)
	



Top Side
(Separation distance of 0mm)



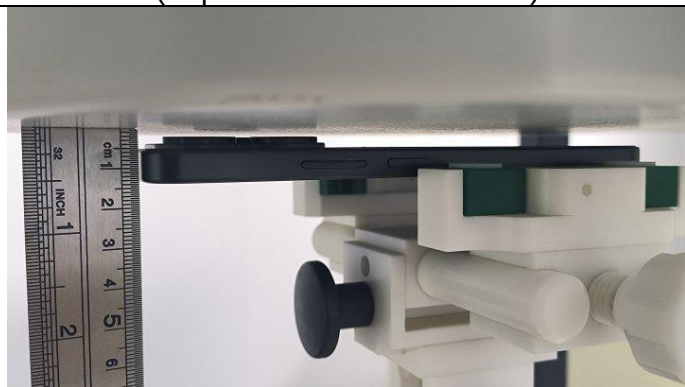
Bottom Side
(Separation distance of 0mm)



Back Side
(Separation distance of 5mm)



Top Side
(Separation distance of 5mm)



Right Side
(Separation distance of 5mm)



Left Side
(Separation distance of 5mm)



11. Appendix B. System Check Plots

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MEASUREMENT 6 System Performance Check - 2450MHz
MEASUREMENT 7 System Performance Check - 2600MHz
MEASUREMENT 8 System Performance Check - 3300MHz
MEASUREMENT 9 System Performance Check - 3500MHz
MEASUREMENT 10 System Performance Check - 3700MHz
MEASUREMENT 11 System Performance Check - 4200MHz
MEASUREMENT 12 System Performance Check - 5200MHz
MEASUREMENT 13 System Performance Check - 5800MHz

MEASUREMENT 1

Date of measurement: 1/8/2024

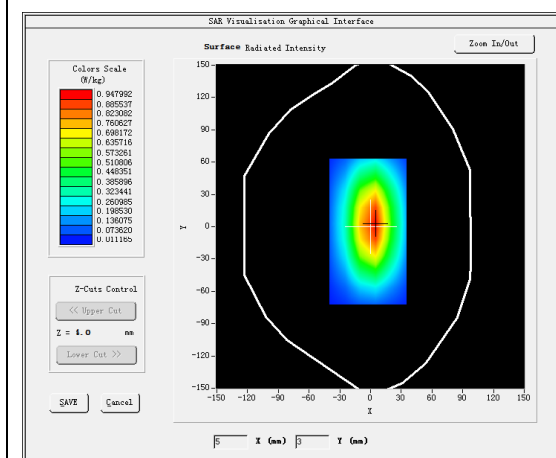
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW750</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

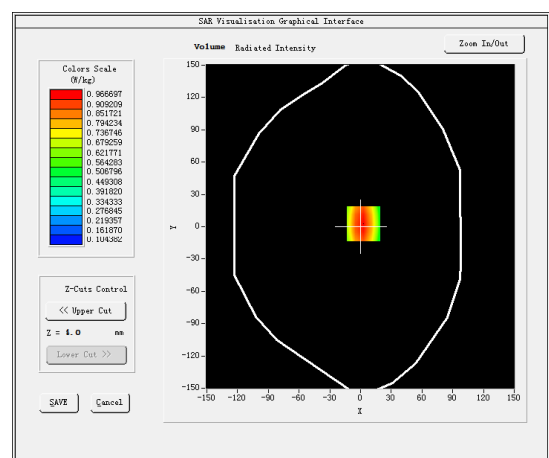
B. SAR Measurement Results

Frequency (MHz)	750.000000
Relative permittivity (real part)	40.842924
Relative permittivity (imaginary part)	21.785262
Conductivity (S/m)	0.907719
Variation (%)	2.220000

SURFACE SAR



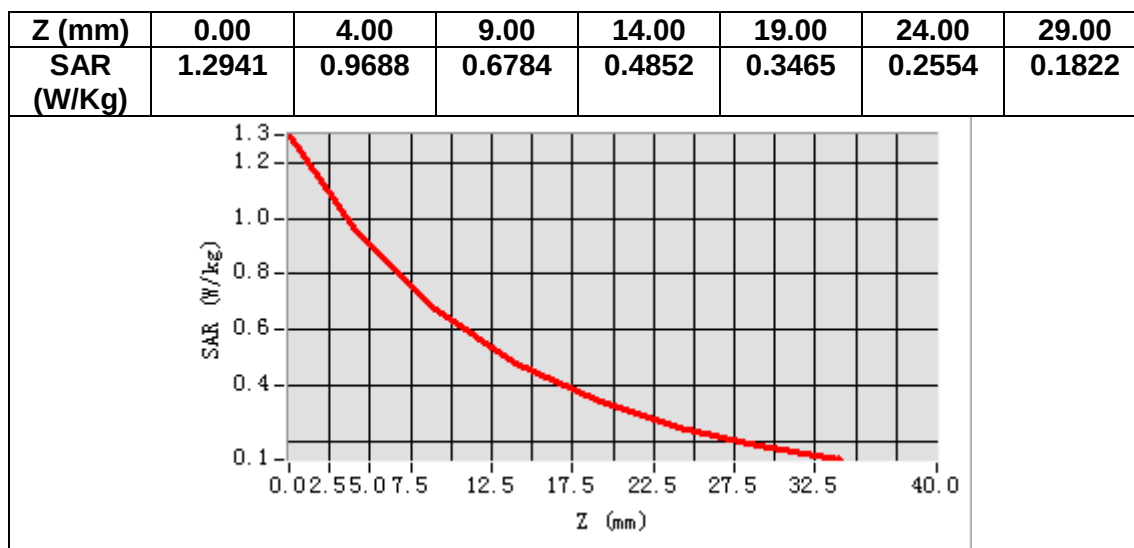
VOLUME SAR



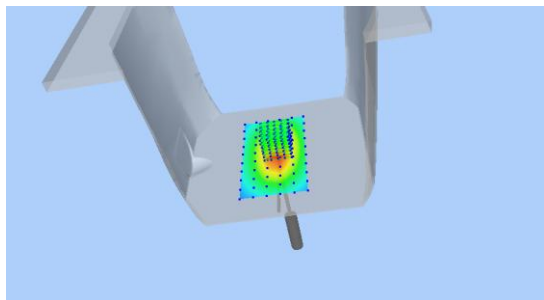
Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

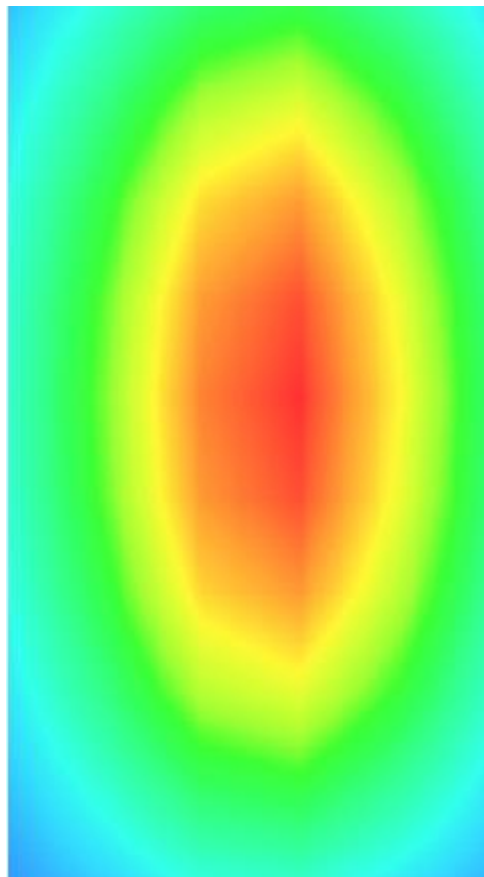
SAR 10g (W/Kg)	0.595283
SAR 1g (W/Kg)	0.795245



3D screen shot



Hot spot position



MEASUREMENT 2

Date of measurement: 24/7/2024

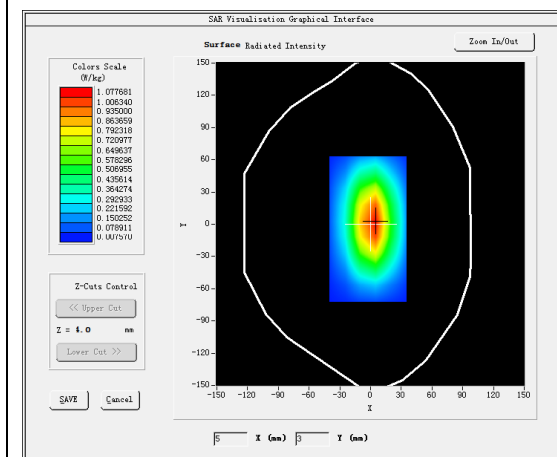
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

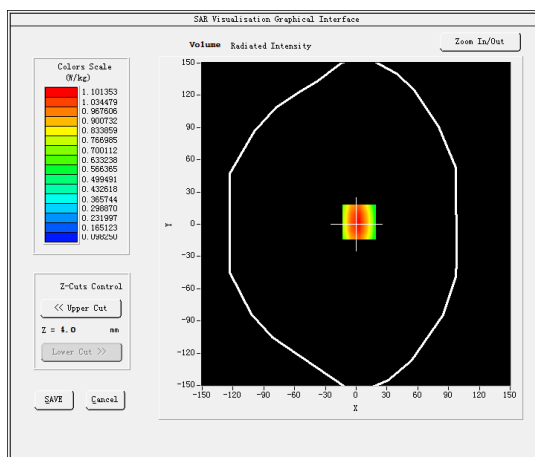
B. SAR Measurement Results

Frequency (MHz)	900.000000
Relative permittivity (real part)	41.140564
Relative permittivity (imaginary part)	19.667307
Conductivity (S/m)	0.983365
Variation (%)	-3.380000

SURFACE SAR



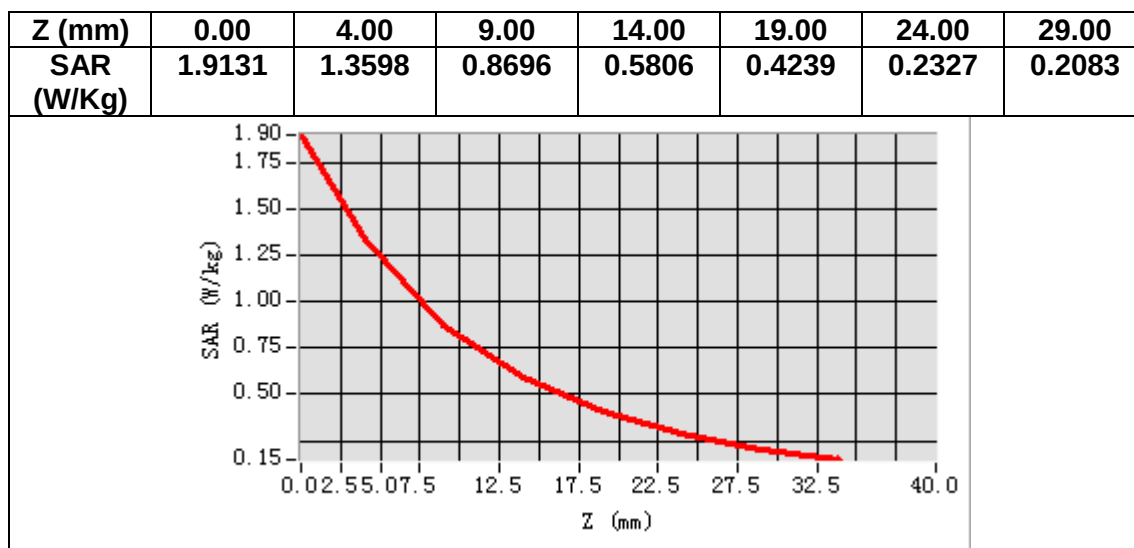
VOLUME SAR



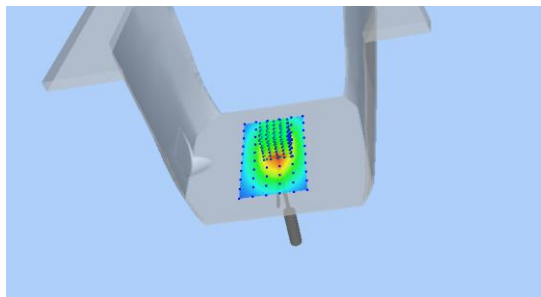
Maximum location: X=3.00, Y=3.00

SAR Peak: 1.90 W/kg

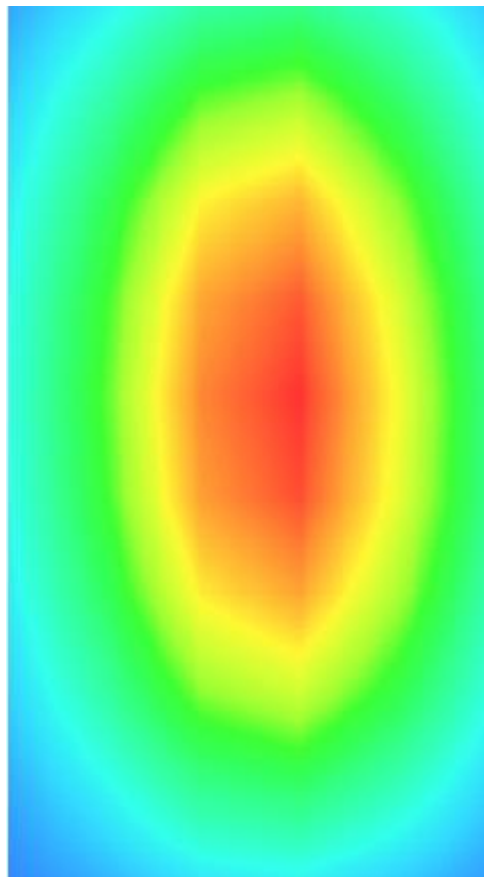
SAR 10g (W/Kg)	0.644064
SAR 1g (W/Kg)	1.087219



3D screen shot



Hot spot position



MEASUREMENT 3

Date of measurement: 25/7/2024

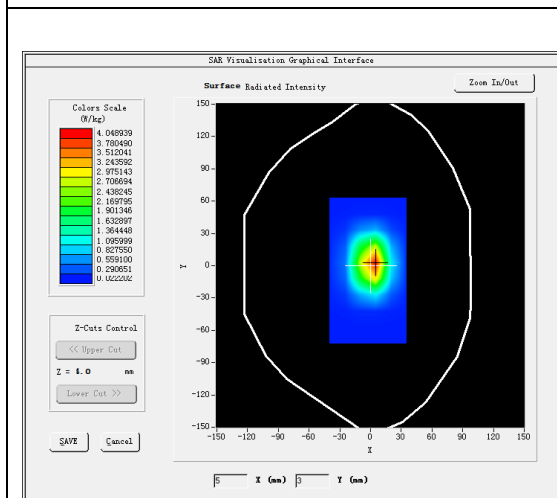
A. Experimental conditions.

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

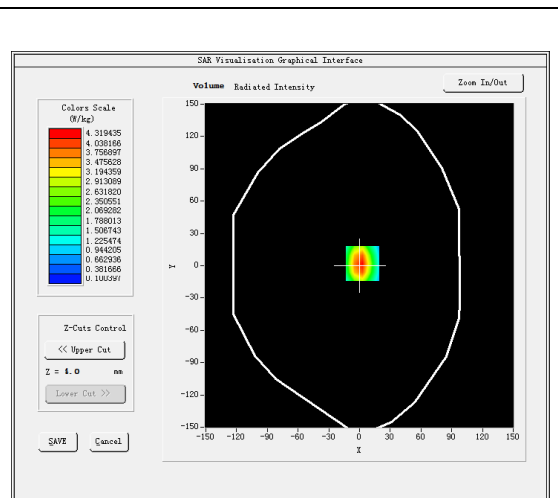
B. SAR Measurement Results

Frequency (MHz)	1800.000000
Relative permittivity (real part)	38.890183
Relative permittivity (imaginary part)	13.761942
Conductivity (S/m)	1.376194
Variation (%)	-1.360000

SURFACE SAR



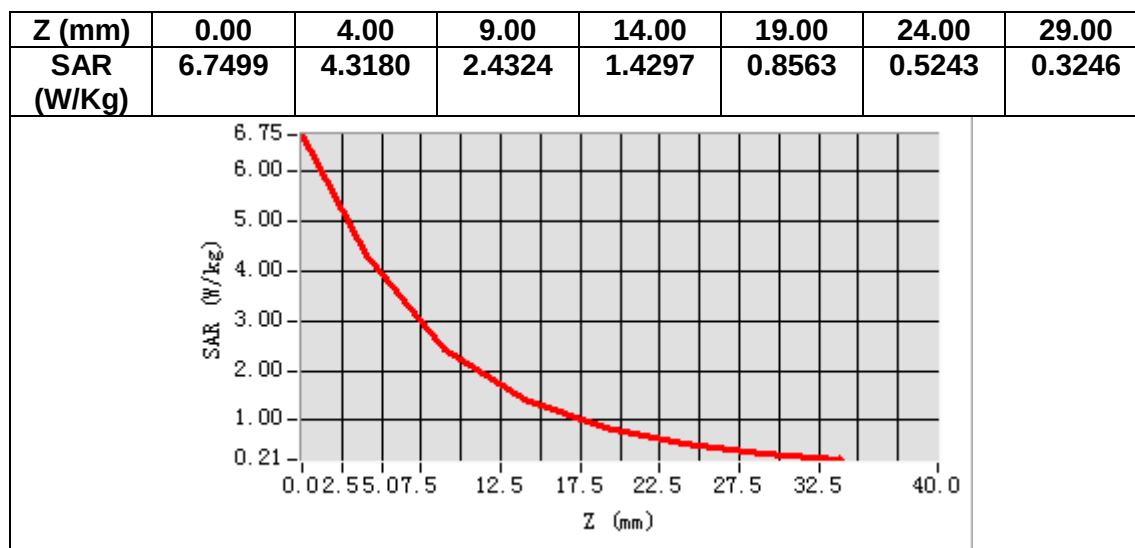
VOLUME SAR



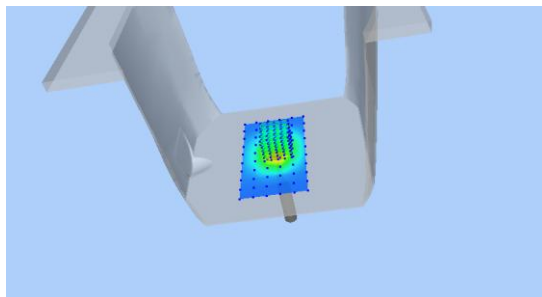
Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

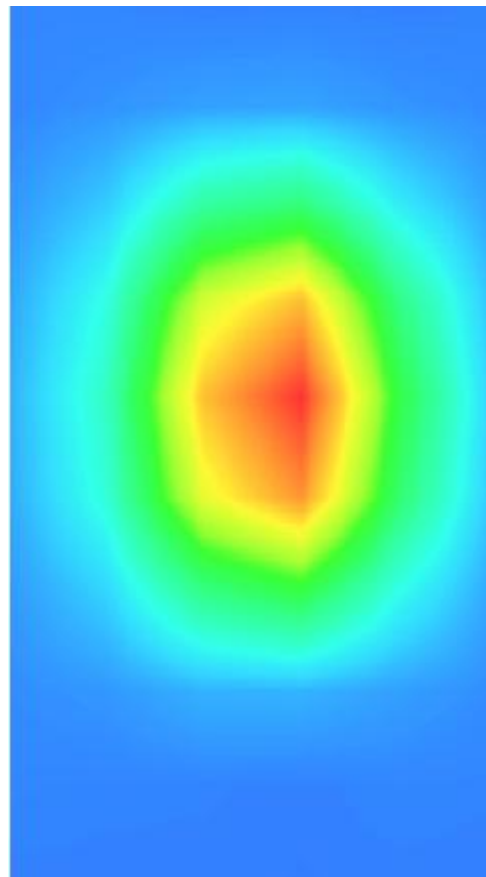
SAR 10g (W/Kg)	2.003340
SAR 1g (W/Kg)	3.627033



3D screen shot



Hot spot position



MEASUREMENT 4

Date of measurement: 26/7/2024

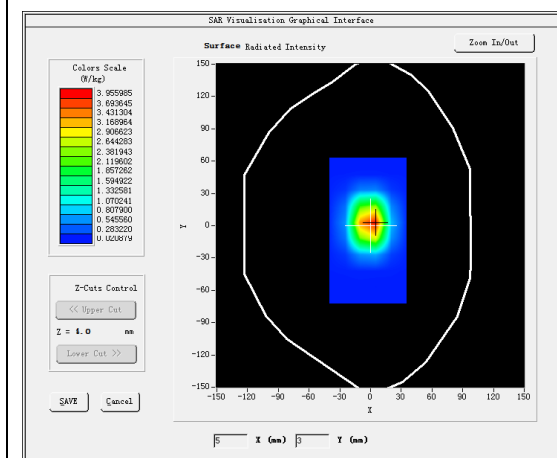
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2000</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

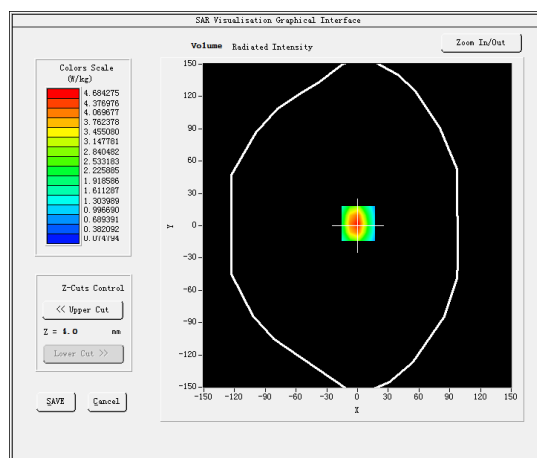
B. SAR Measurement Results

Frequency (MHz)	2000.000000
Relative permittivity (real part)	38.820816
Relative permittivity (imaginary part)	12.977350
Conductivity (S/m)	1.441928
Variation (%)	3.930000

SURFACE SAR



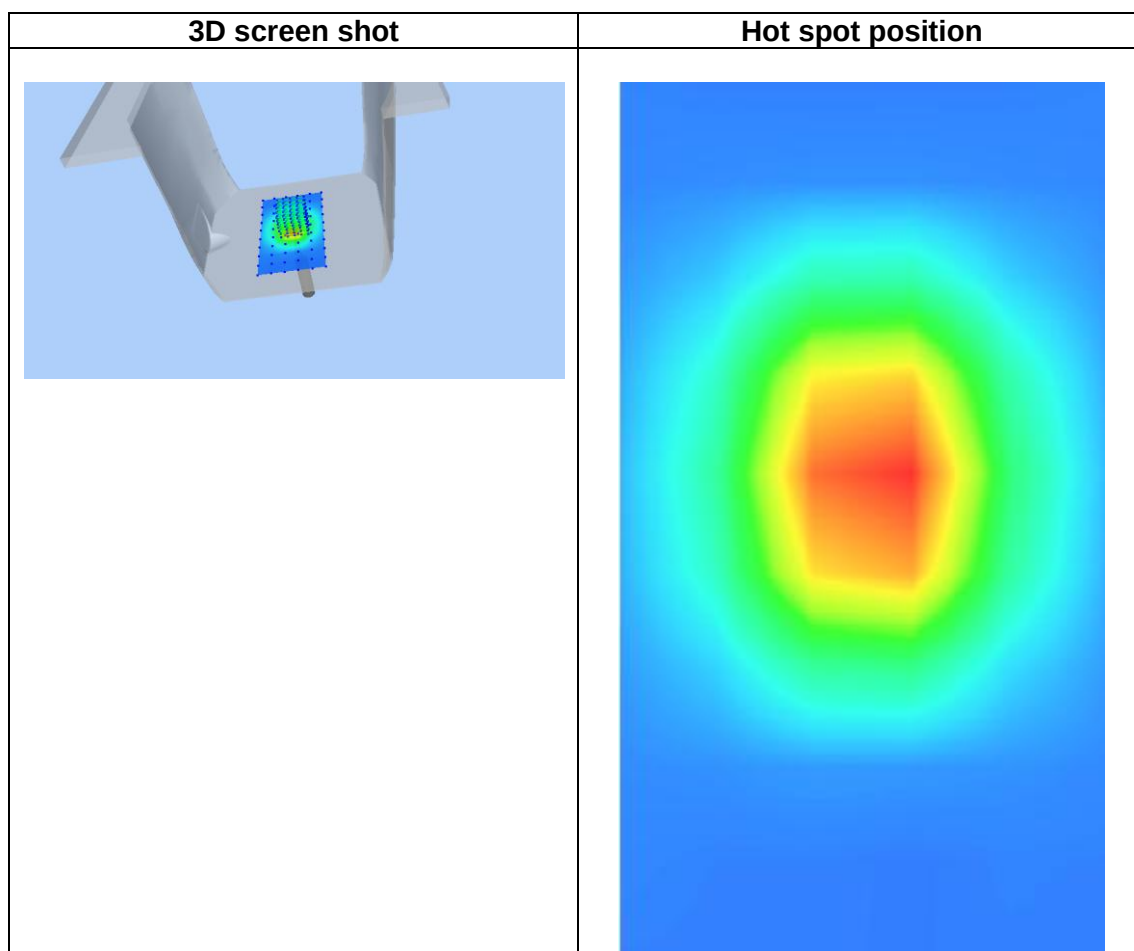
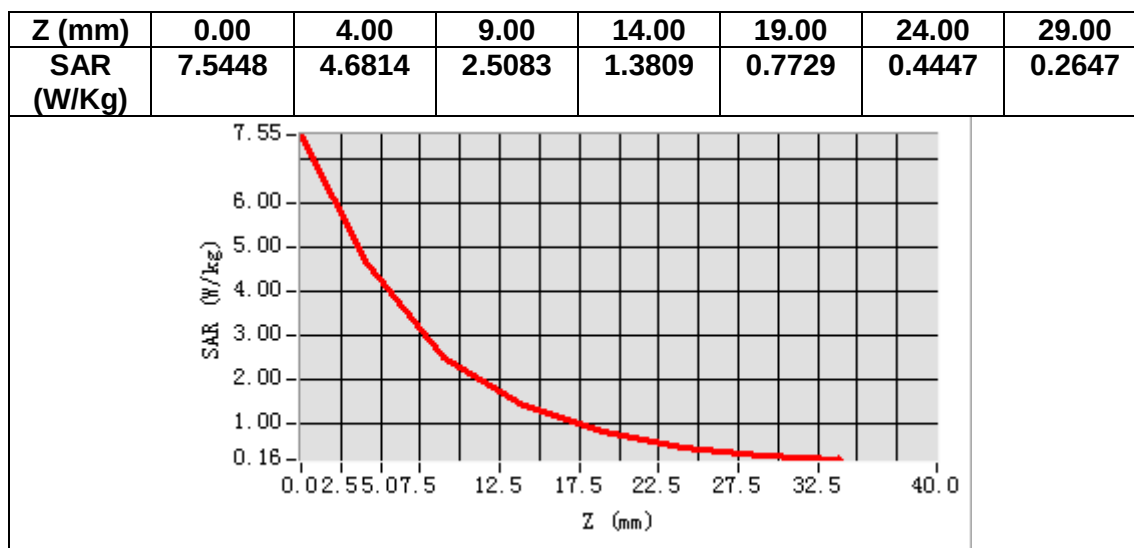
VOLUME SAR



Maximum location: X=1.00, Y=2.00

SAR Peak: 7.65 W/kg

SAR 10g (W/Kg)	1.928170
SAR 1g (W/Kg)	3.477023



MEASUREMENT 5

Date of measurement: 29/7/2024

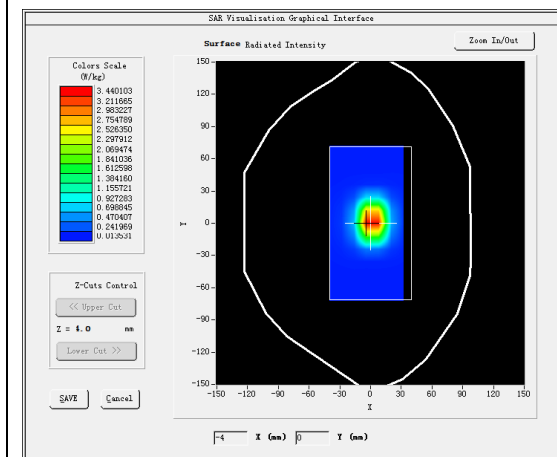
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2300</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.81</u>

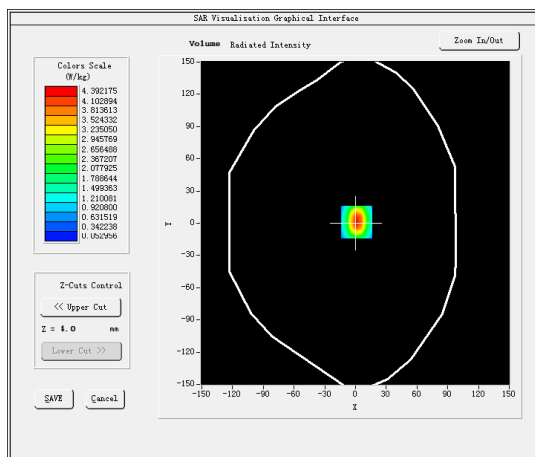
B. SAR Measurement Results

Frequency (MHz)	2300.000000
Relative permittivity (real part)	39.308710
Relative permittivity (imaginary part)	12.704714
Conductivity (S/m)	1.623380
Variation (%)	3.620000

SURFACE SAR



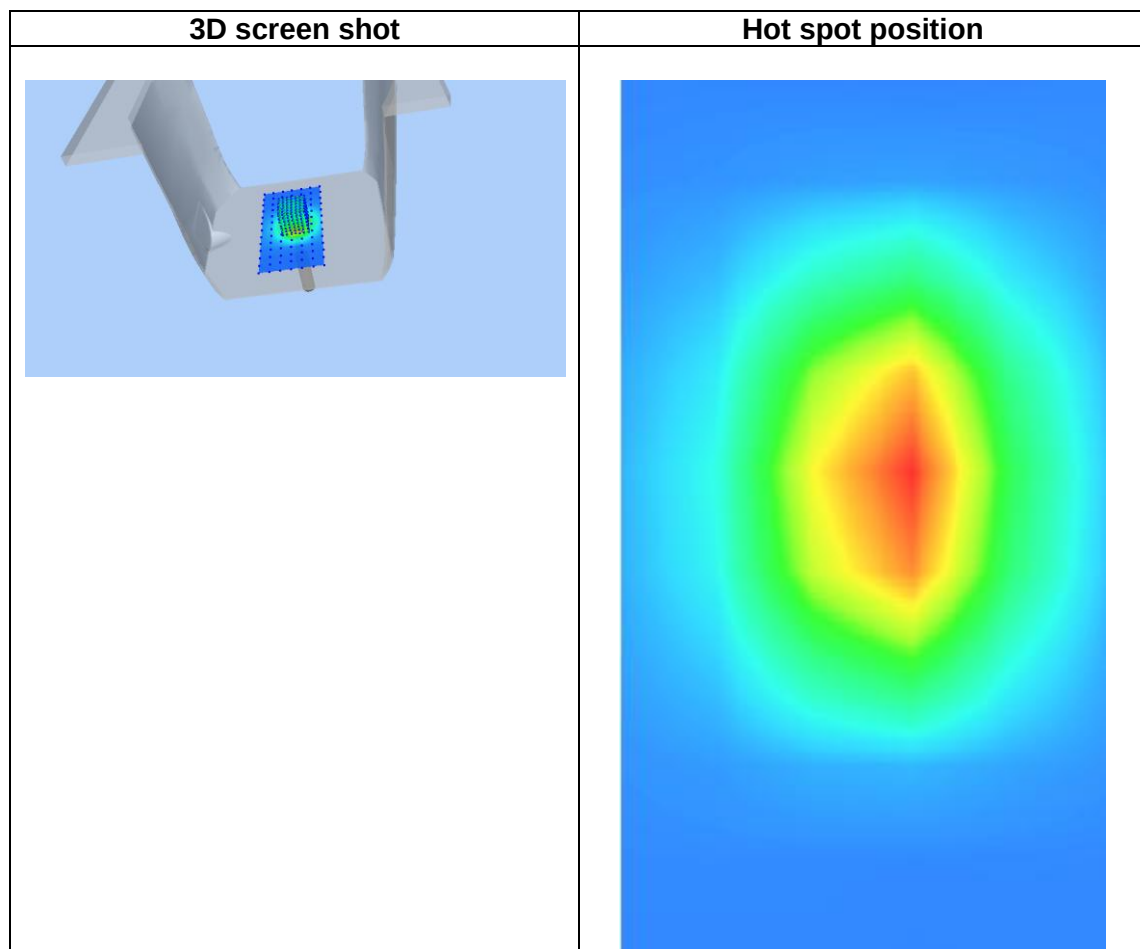
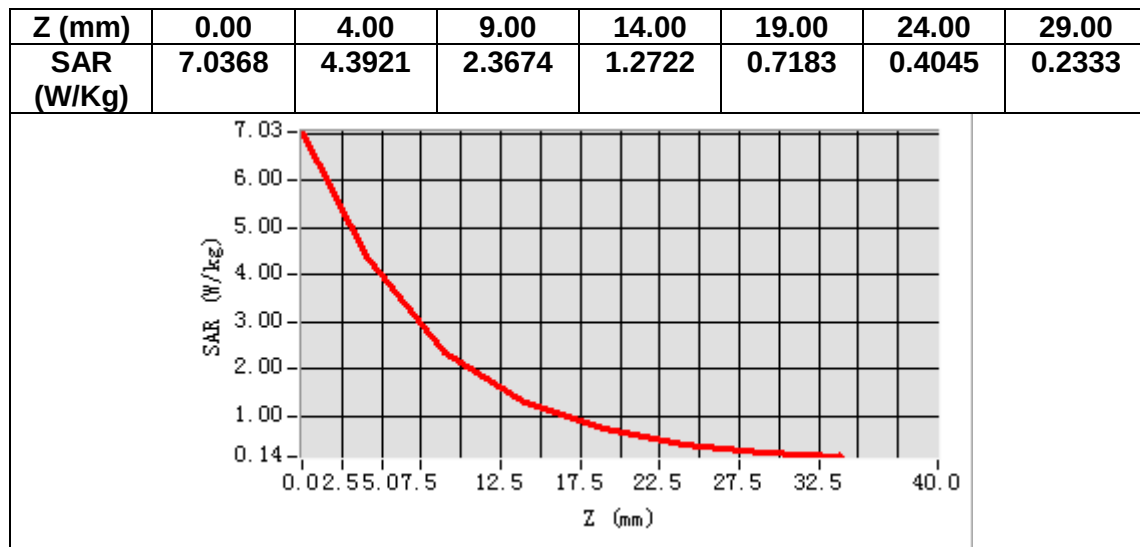
VOLUME SAR



Maximum location: X=1.00, Y=1.00

SAR Peak: 7.04 W/kg

SAR 10g (W/Kg)	2.289368
SAR 1g (W/Kg)	4.689097



MEASUREMENT 6

Date of measurement: 18/7/2024

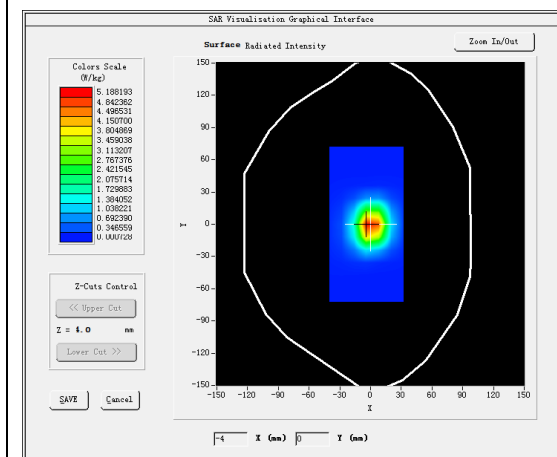
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2450</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.85</u>

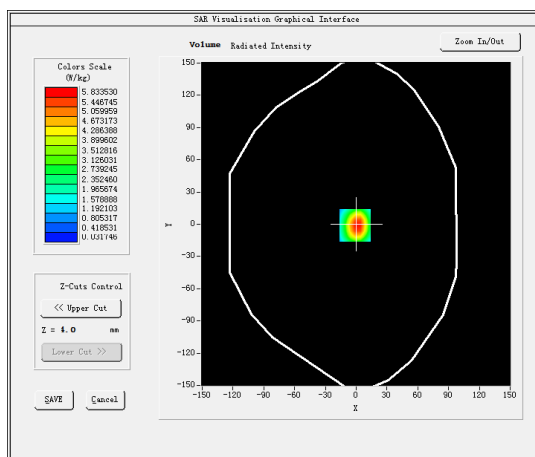
B. SAR Measurement Results

Frequency (MHz)	2450.000000
Relative permittivity (real part)	37.791465
Relative permittivity (imaginary part)	13.028121
Conductivity (S/m)	1.773272
Variation (%)	-3.440000

SURFACE SAR



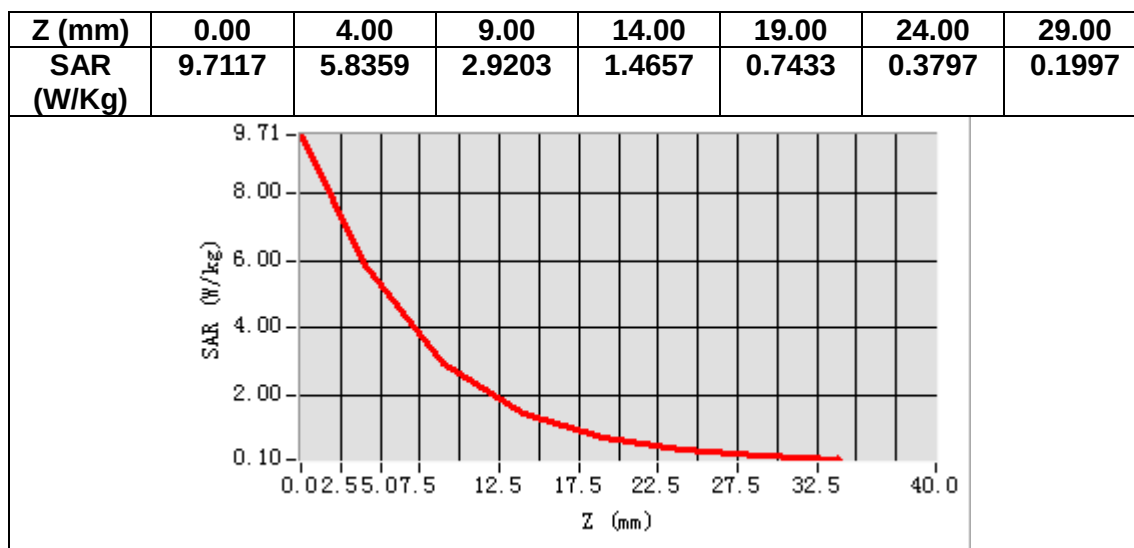
VOLUME SAR



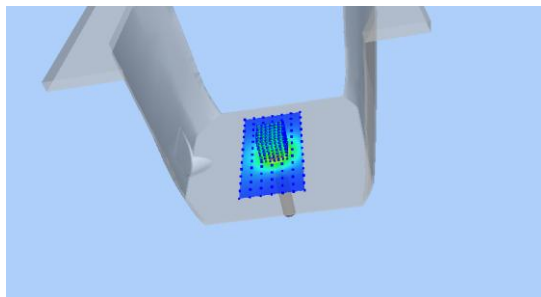
Maximum location: X=-1.00, Y=-1.00

SAR Peak: 9.83 W/kg

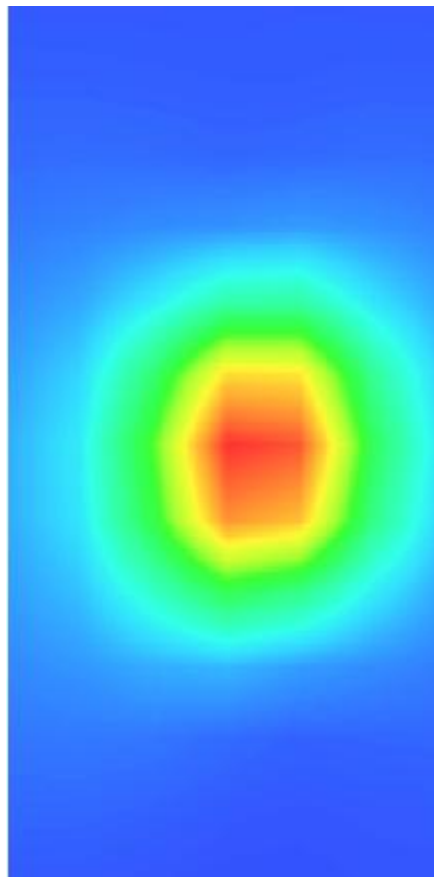
SAR 10g (W/Kg)	2.242203
SAR 1g (W/Kg)	4.517371



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 19/7/2024

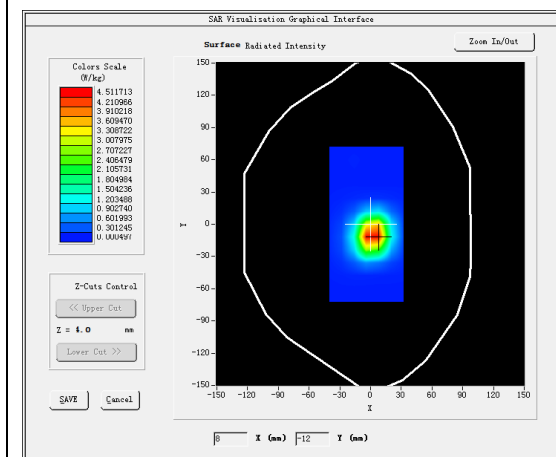
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7, dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2600</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

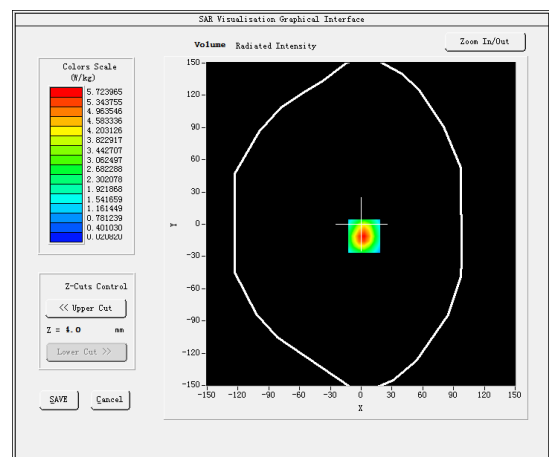
B. SAR Measurement Results

Frequency (MHz)	2600.000000
Relative permittivity (real part)	39.125963
Relative permittivity (imaginary part)	13.908930
Conductivity (S/m)	2.009068
Variation (%)	-2.420000

SURFACE SAR



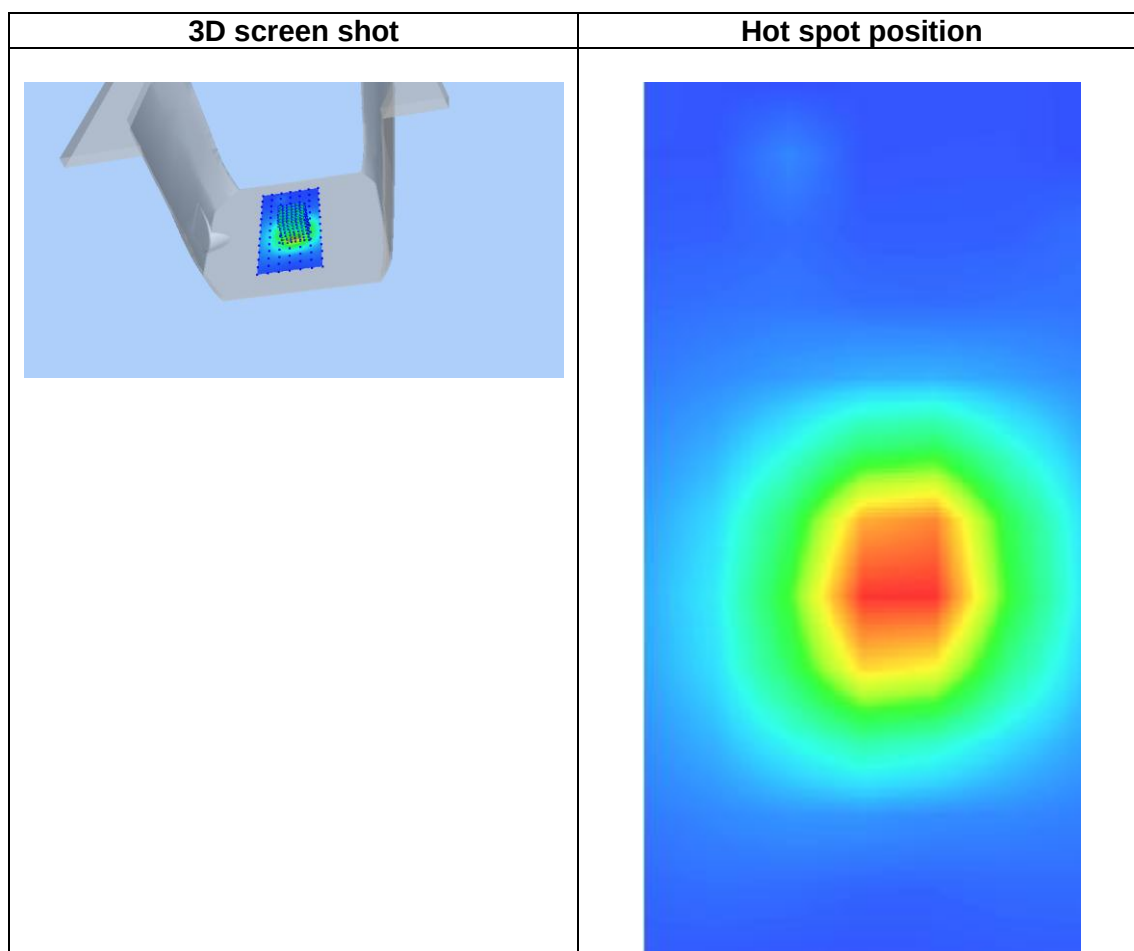
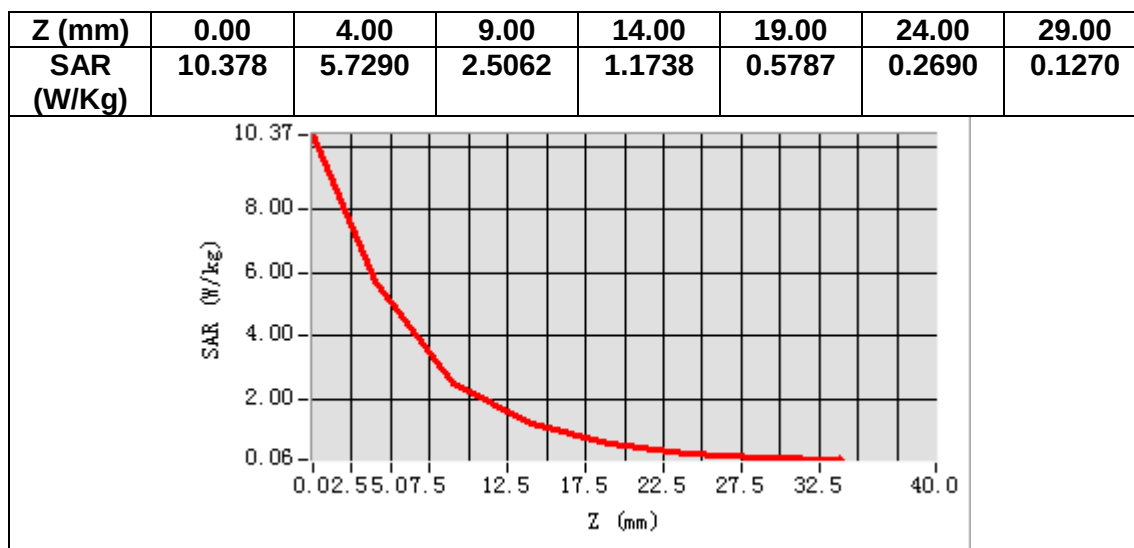
VOLUME SAR



Maximum location: X=3.00, Y=-11.00

SAR Peak: 10.29 W/kg

SAR 10g (W/Kg)	2.641192
SAR 1g (W/Kg)	5.262195



MEASUREMENT 8

Date of measurement: 17/8/2024

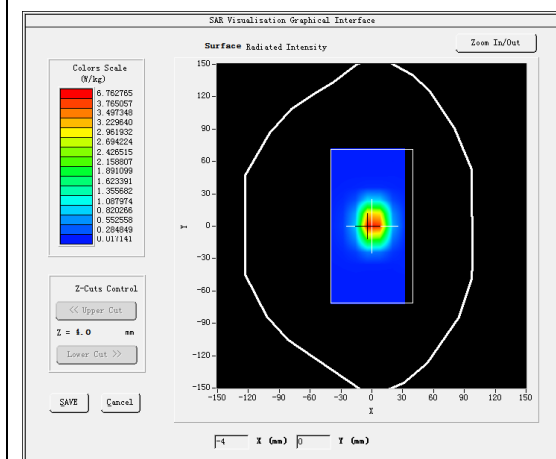
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW3300</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.21</u>

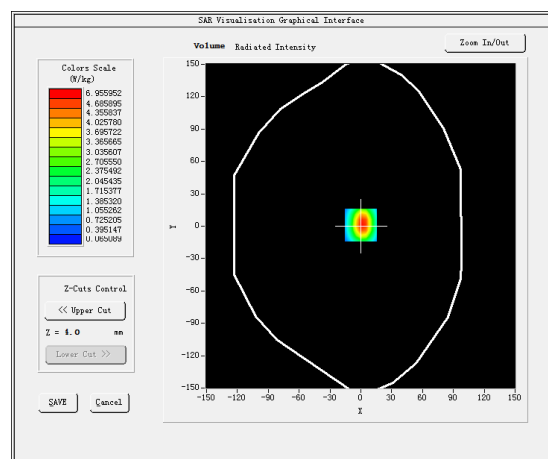
B. SAR Measurement Results

Frequency (MHz)	3300.000000
Relative permittivity (real part)	39.312600
Relative permittivity (imaginary part)	11.807200
Conductivity (S/m)	2.164653
Variation (%)	-1.320000

SURFACE SAR



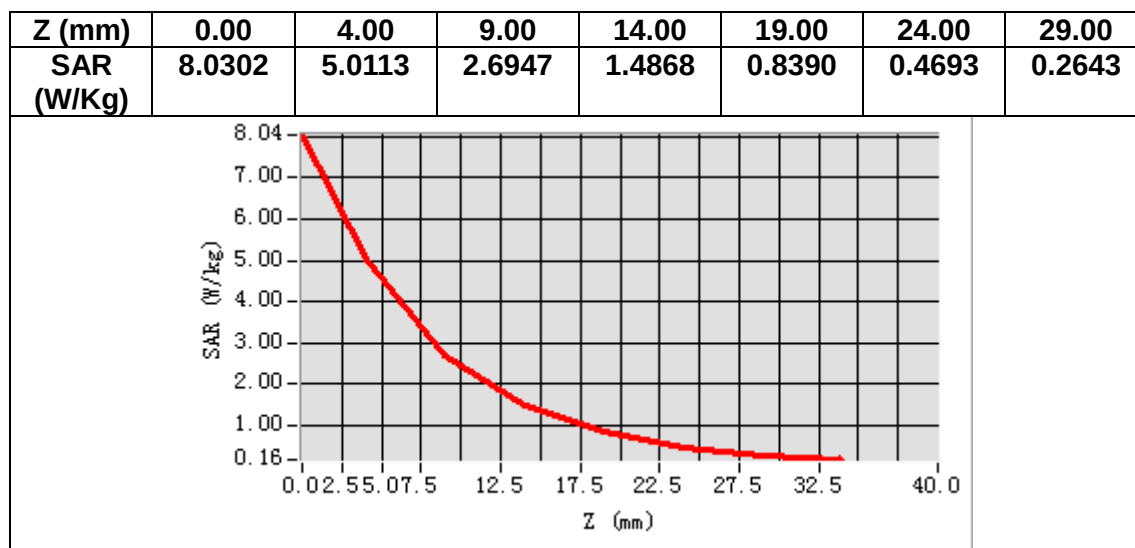
VOLUME SAR



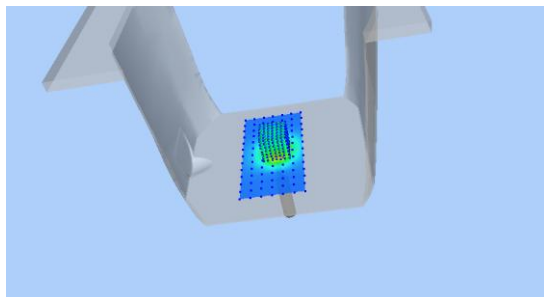
Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

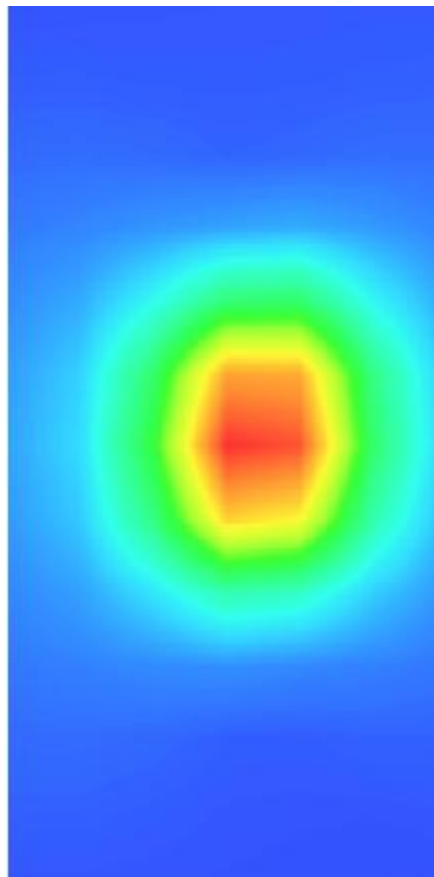
SAR 10g (W/Kg)	2.441234
SAR 1g (W/Kg)	6.012235



3D screen shot



Hot spot position



MEASUREMENT 9

Date of measurement: 5/8/2024

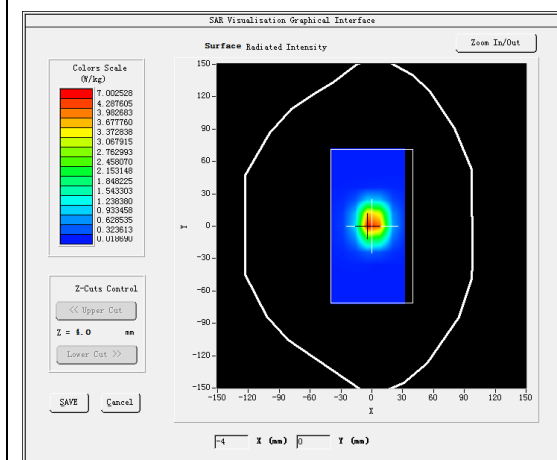
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW3500</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.20</u>

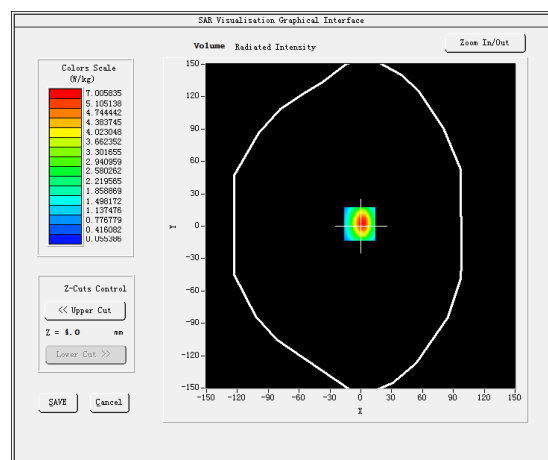
B. SAR Measurement Results

Frequency (MHz)	3500.000000
Relative permittivity (real part)	37.987914
Relative permittivity (imaginary part)	14.861562
Conductivity (S/m)	2.889748
Variation (%)	-1.130000

SURFACE SAR



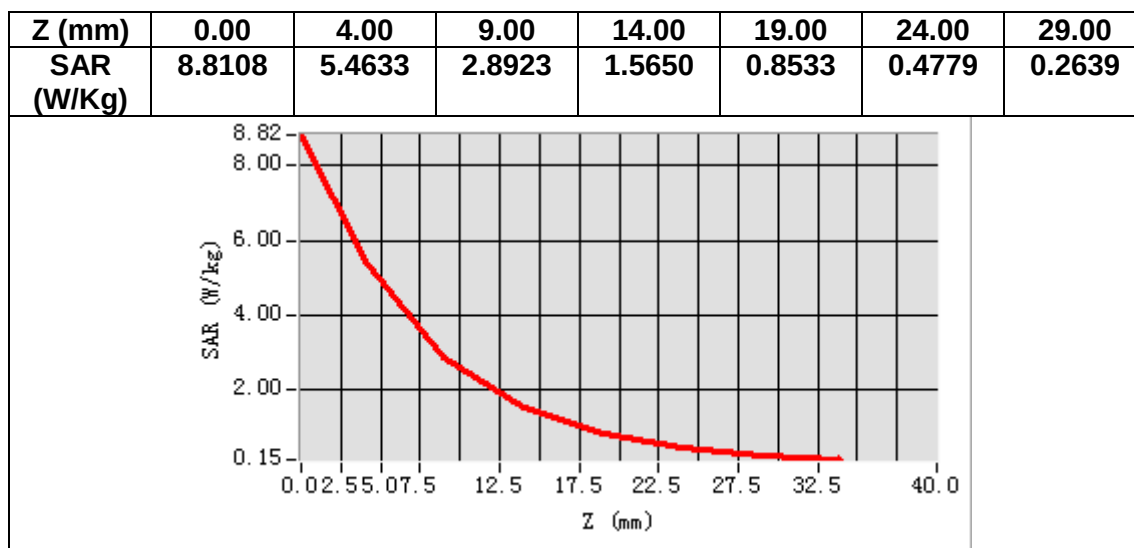
VOLUME SAR



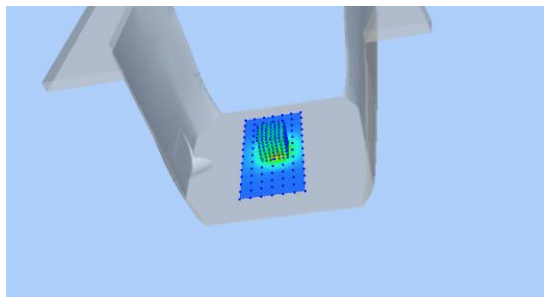
Maximum location: X=-1.00, Y=2.00

SAR Peak: 9.07 W/kg

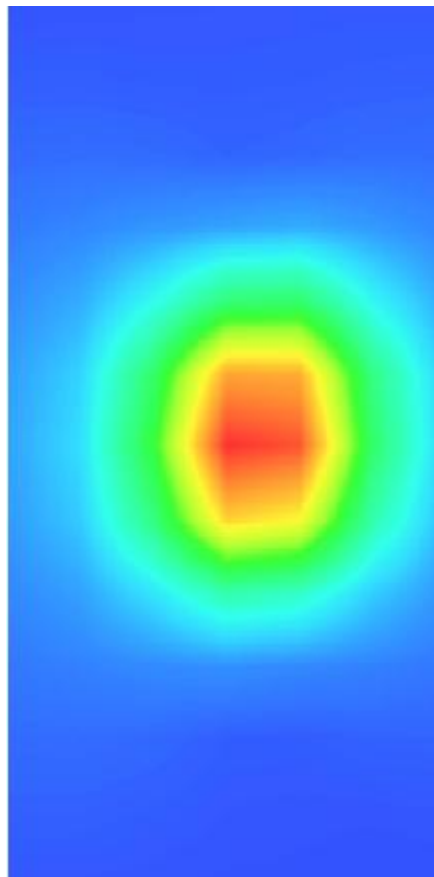
SAR 10g (W/Kg)	2.352122
SAR 1g (W/Kg)	6.668389



3D screen shot



Hot spot position



MEASUREMENT 10

Date of measurement: 6/8/2024

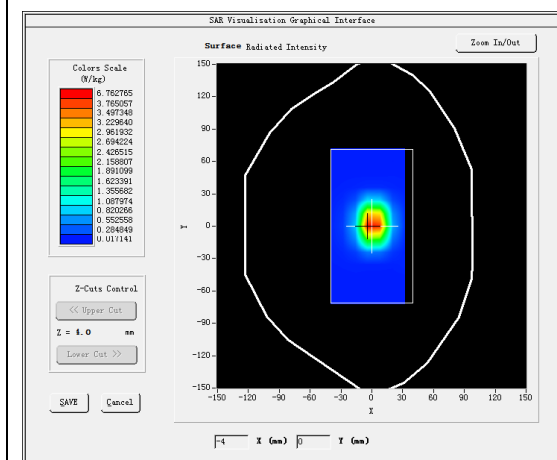
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW3700</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.11</u>

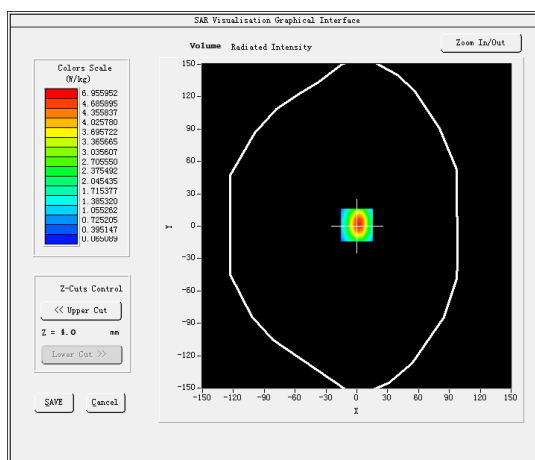
B. SAR Measurement Results

Frequency (MHz)	3700.000000
Relative permittivity (real part)	37.448084
Relative permittivity (imaginary part)	15.171440
Conductivity (S/m)	3.118574
Variation (%)	-0.740000

SURFACE SAR



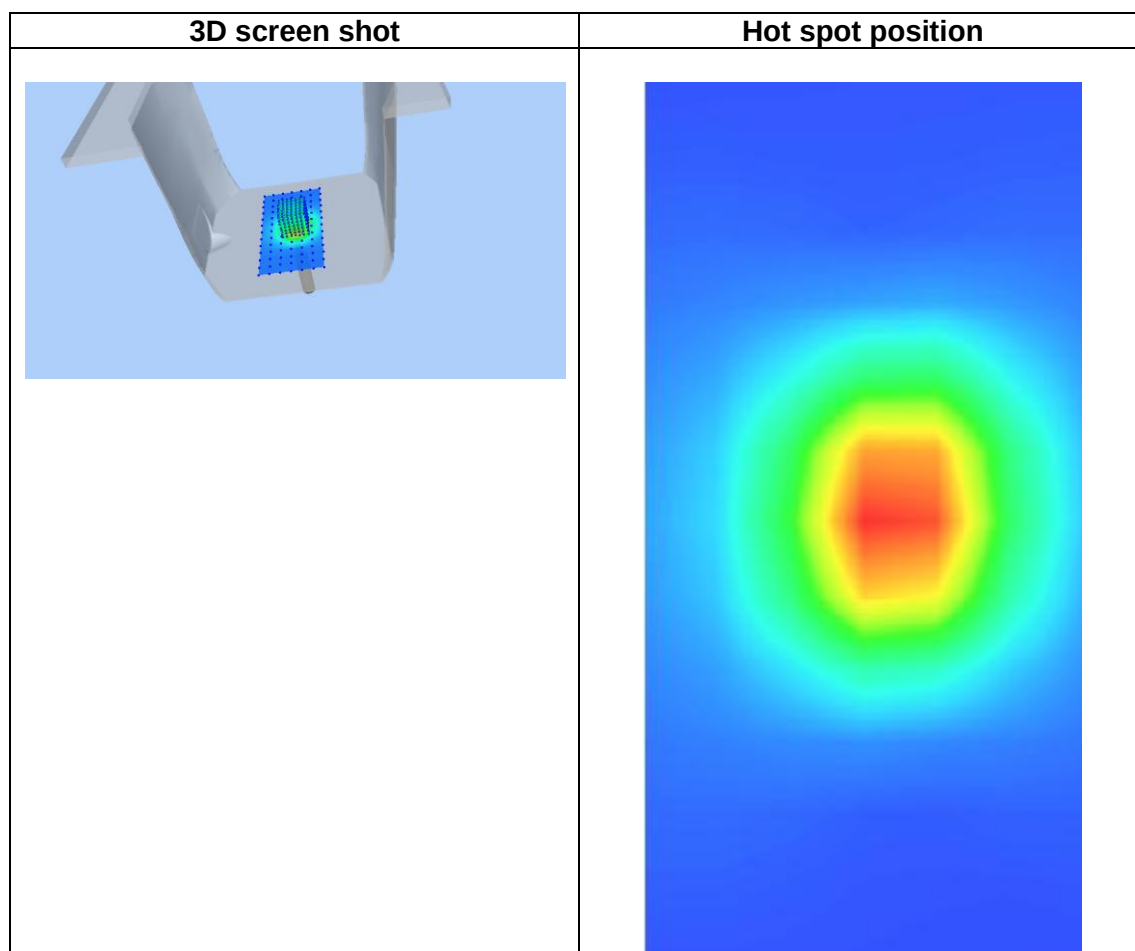
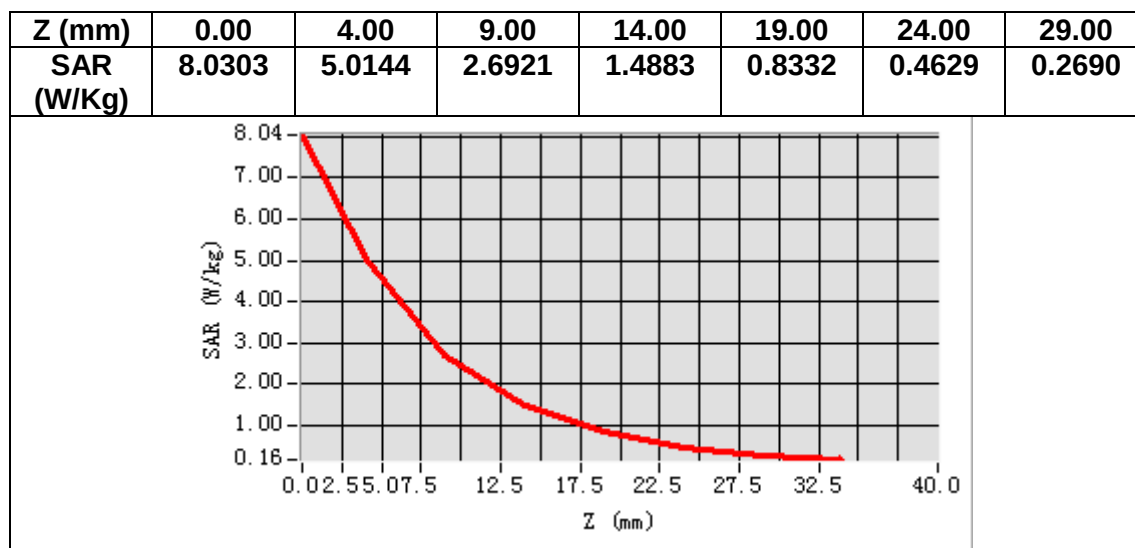
VOLUME SAR



Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

SAR 10g (W/Kg)	2.441101
SAR 1g (W/Kg)	6.821137



MEASUREMENT 11

Date of measurement: 7/8/2024

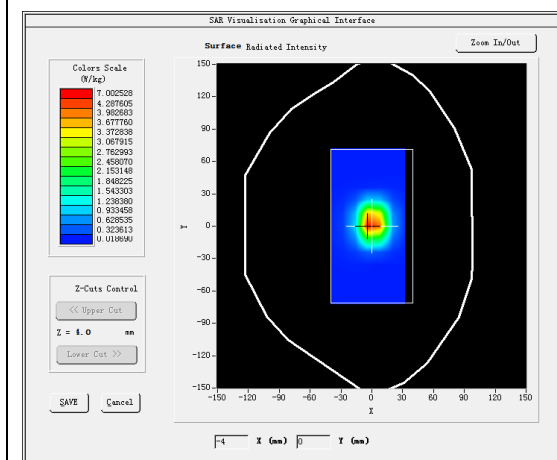
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW4200</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.40</u>

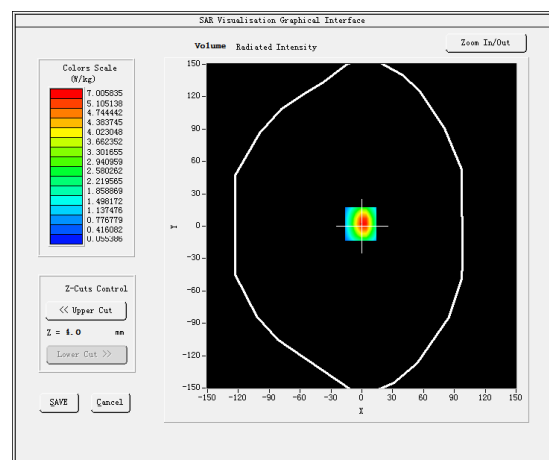
B. SAR Measurement Results

Frequency (MHz)	4200.000000
Relative permittivity (real part)	37.777186
Relative permittivity (imaginary part)	15.116896
Conductivity (S/m)	3.527275
Variation (%)	-3.140000

SURFACE SAR



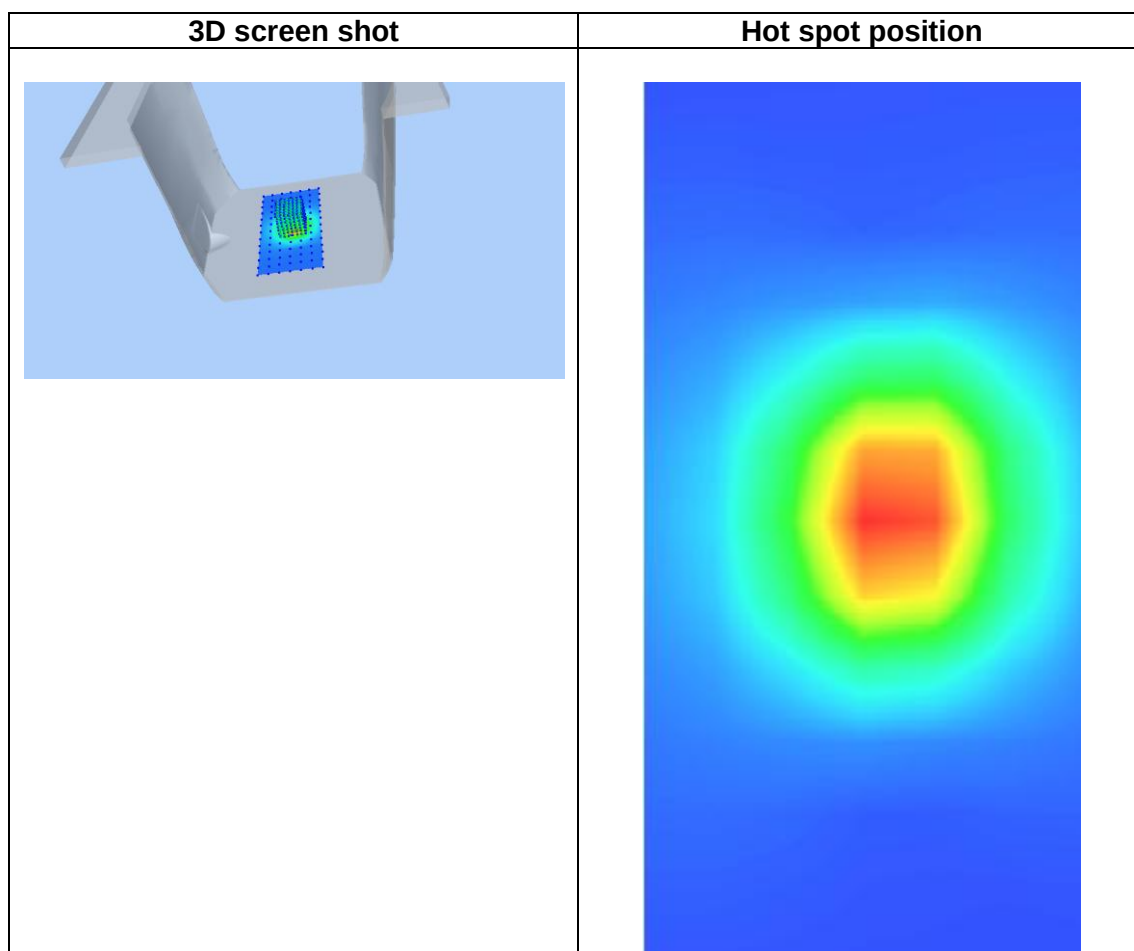
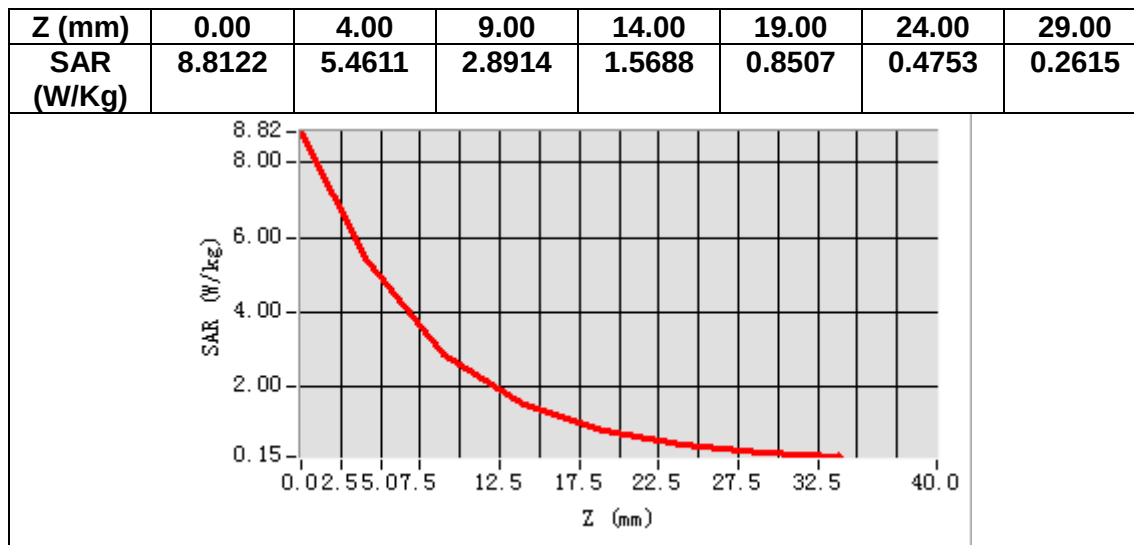
VOLUME SAR



Maximum location: X=-1.00, Y=2.00

SAR Peak: 9.07 W/kg

SAR 10g (W/Kg)	2.441031
SAR 1g (W/Kg)	6.898267



MEASUREMENT 12

Date of measurement: 30/7/2024

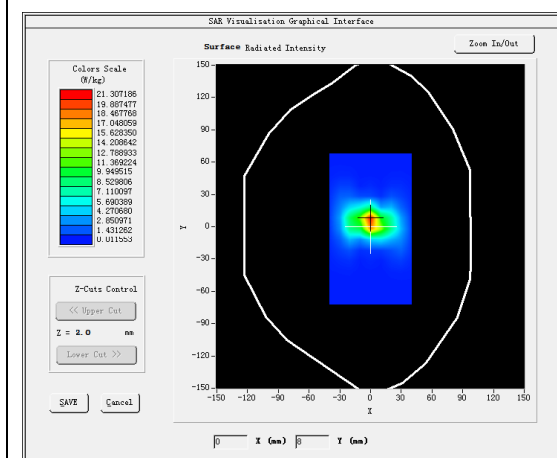
A. Experimental conditions.

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

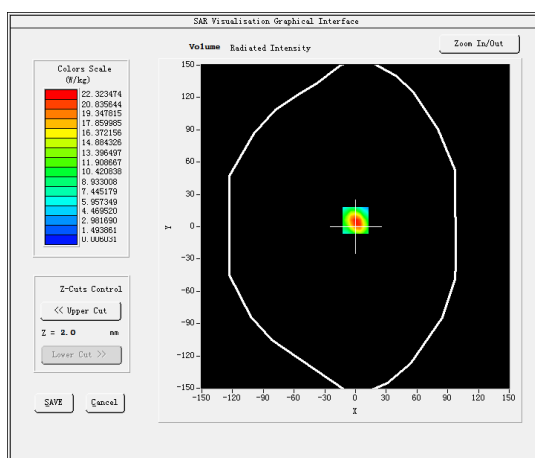
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.481364
Relative permittivity (imaginary part)	15.578307
Conductivity (S/m)	4.500400
Variation (%)	-1.130000

SURFACE SAR



VOLUME SAR

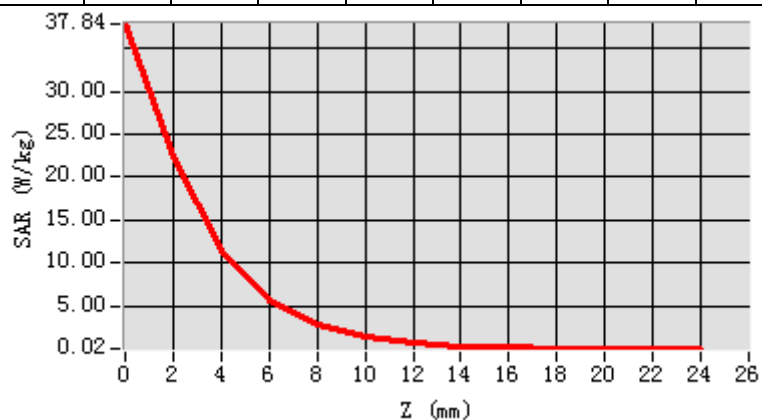


Maximum location: X=0.00, Y=6.00

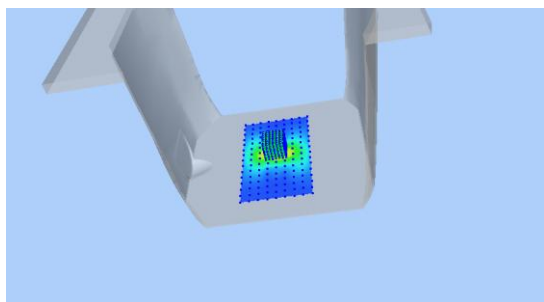
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.257081
SAR 1g (W/Kg)	15.367035

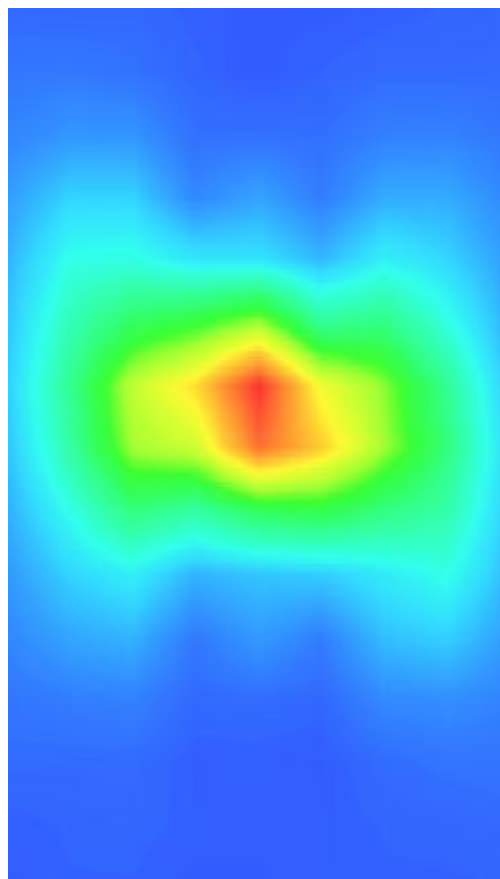
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	37.8 04	22.3 29	11.3 95	5.66 42	2.82 05	1.40 89	0.71 67	0.36 54	0.18 43	0.10 96	0.05 76	0.03 20



3D screen shot



Hot spot position



MEASUREMENT 13

Date of measurement: 31/7/2024

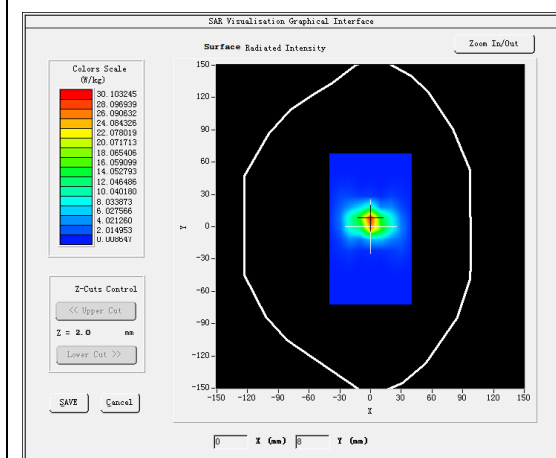
A. Experimental conditions.

<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>

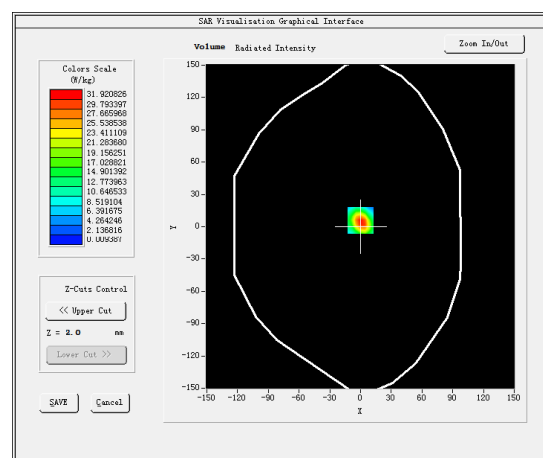
B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	33.912514
Relative permittivity (imaginary part)	15.965078
Conductivity (S/m)	5.144303
Variation (%)	0.760000

SURFACE SAR



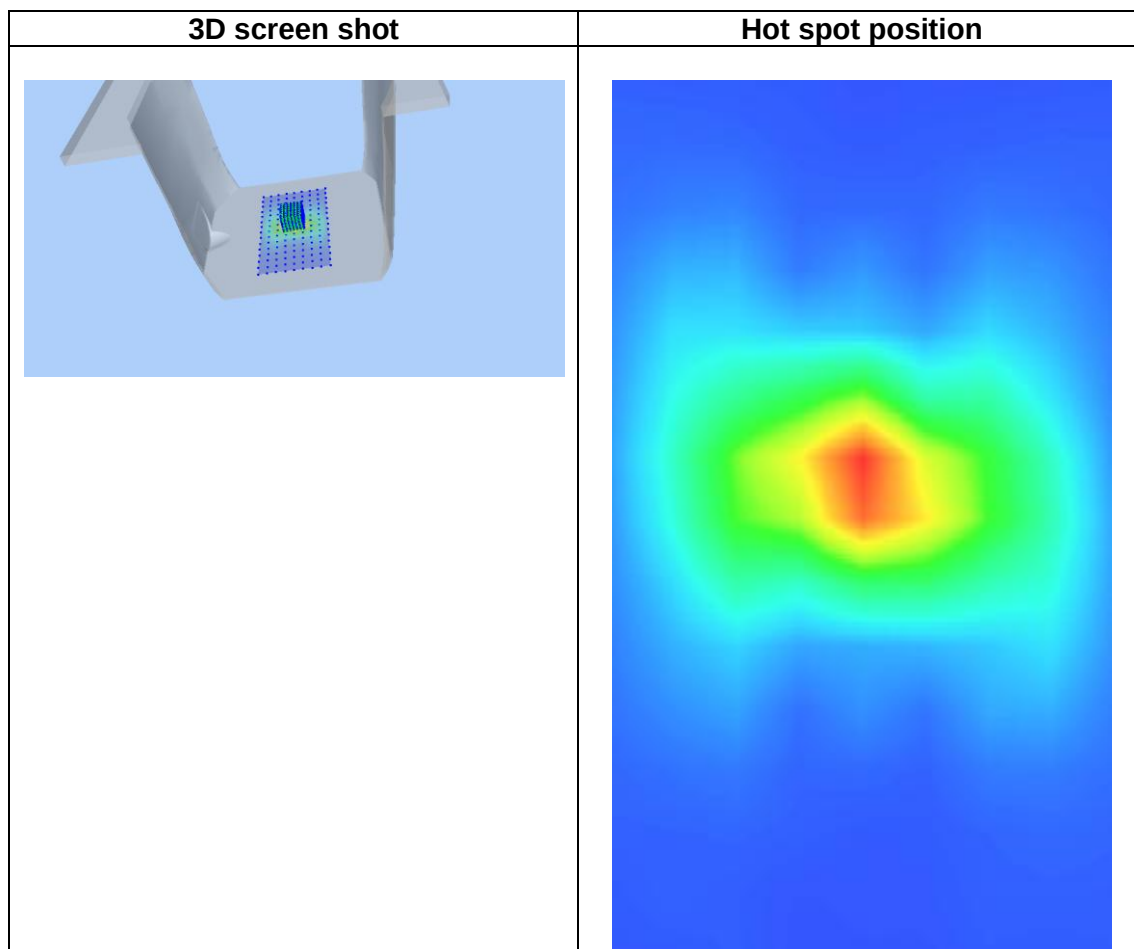
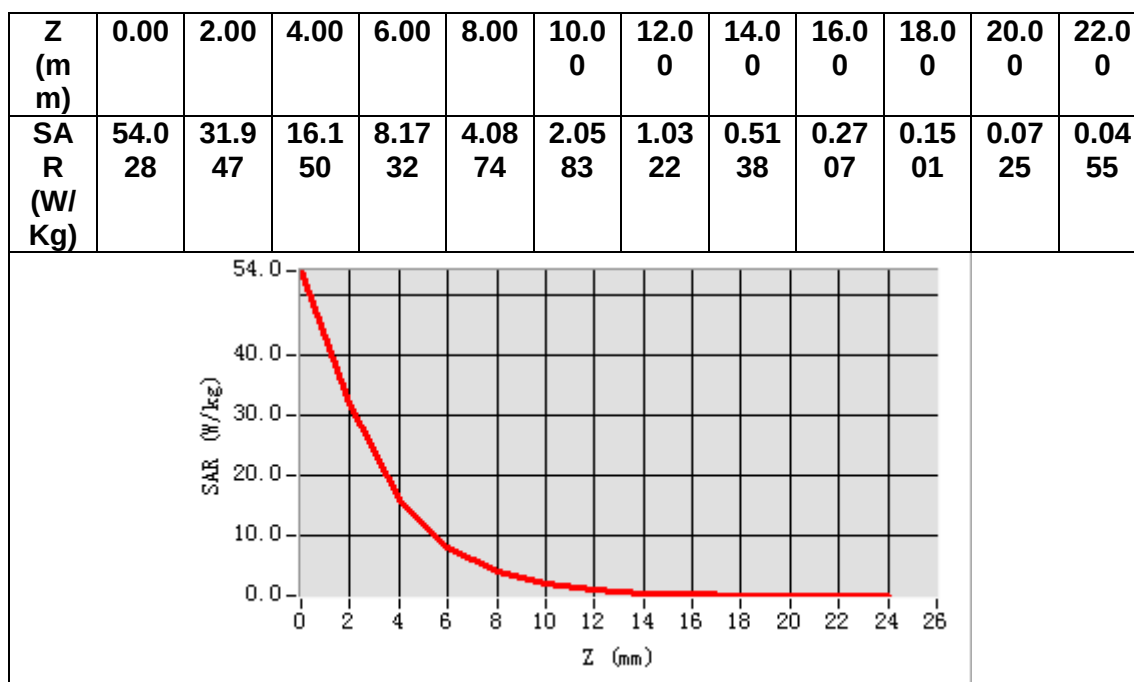
VOLUME SAR



Maximum location: X=0.00, Y=6.00

SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.546002
SAR 1g (W/Kg)	17.502358



12. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 49 NR SA n8 Head
MEASUREMENT 50 NR SA n8 Extremity
MEASUREMENT 51 NR SA n7 Head
MEASUREMENT 52 NR SA n7 Extremity
MEASUREMENT 53 NR SA n20 Head
MEASUREMENT 54 NR SA n20 Extremity

MEASUREMENT 1

Date of measurement: 24/7/2024

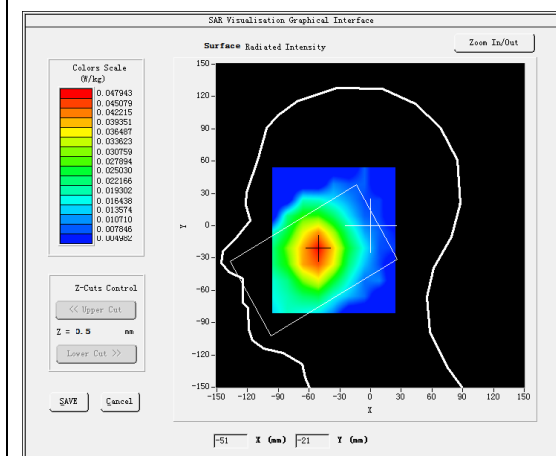
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM900</u>
<u>Channels</u>	<u>Low</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.23</u>

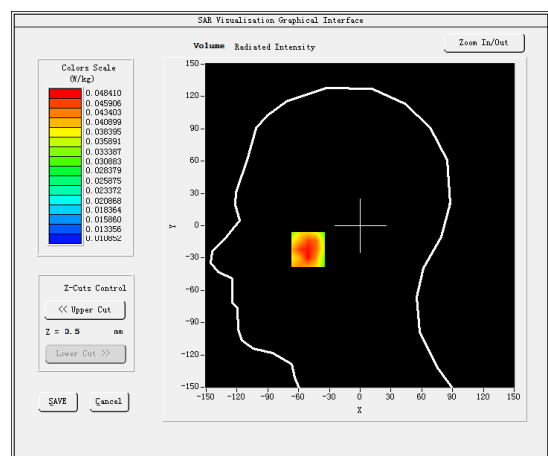
B. SAR Measurement Results

Frequency (MHz)	880.200000
Relative permittivity (real part)	41.407185
Relative permittivity (imaginary part)	19.604326
Conductivity (S/m)	0.958652
Variation (%)	-1.040000

SURFACE SAR



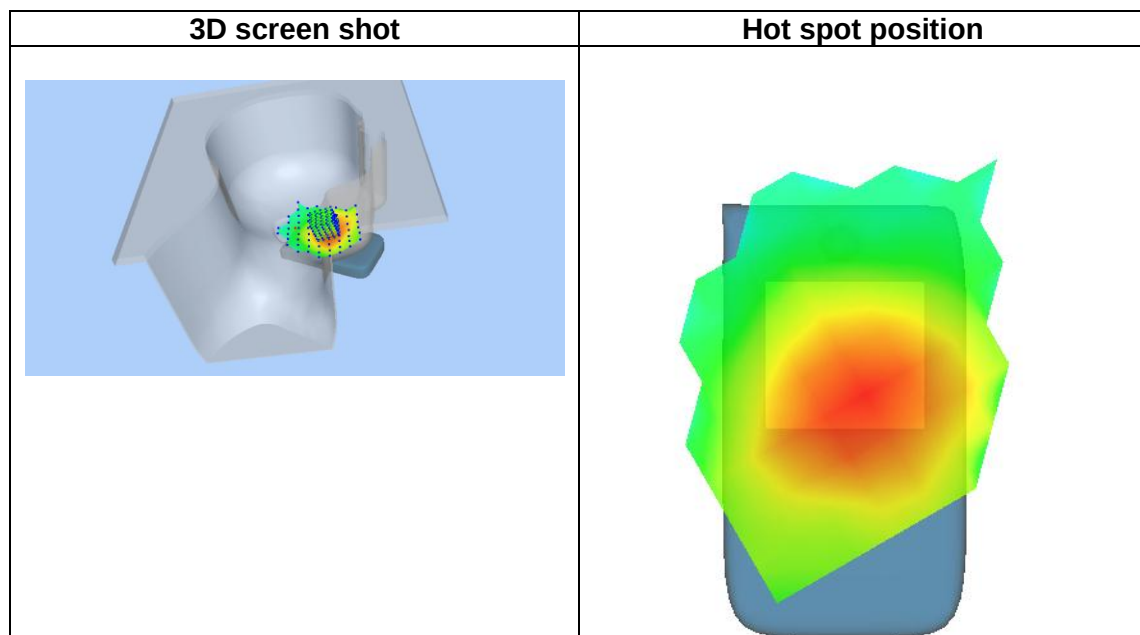
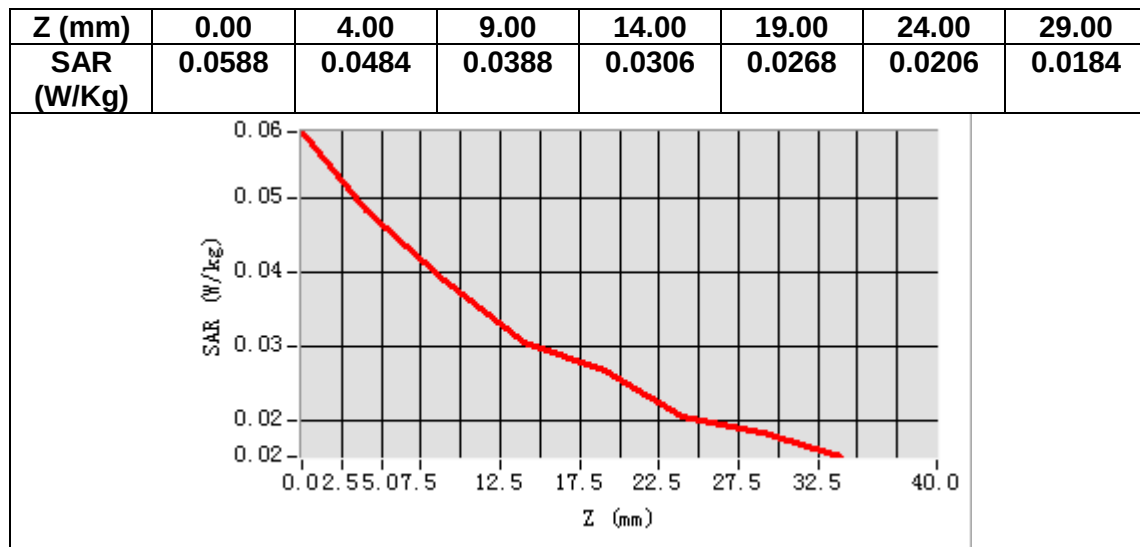
VOLUME SAR



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

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.035452
SAR 1g (W/Kg)	0.046899



MEASUREMENT 2

Date of measurement: 24/7/2024

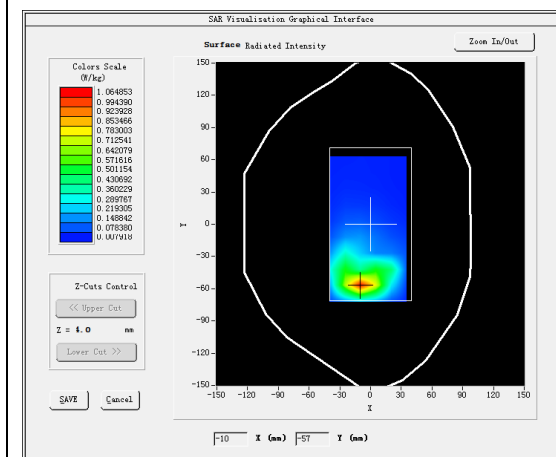
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM900</u>
<u>Channels</u>	<u>High</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.23</u>

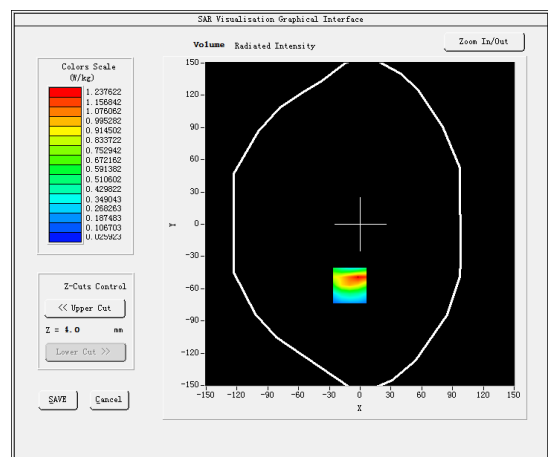
B. SAR Measurement Results

Frequency (MHz)	914.800000
Relative permittivity (real part)	41.022083
Relative permittivity (imaginary part)	19.750128
Conductivity (S/m)	1.003745
Variation (%)	-0.750000

SURFACE SAR



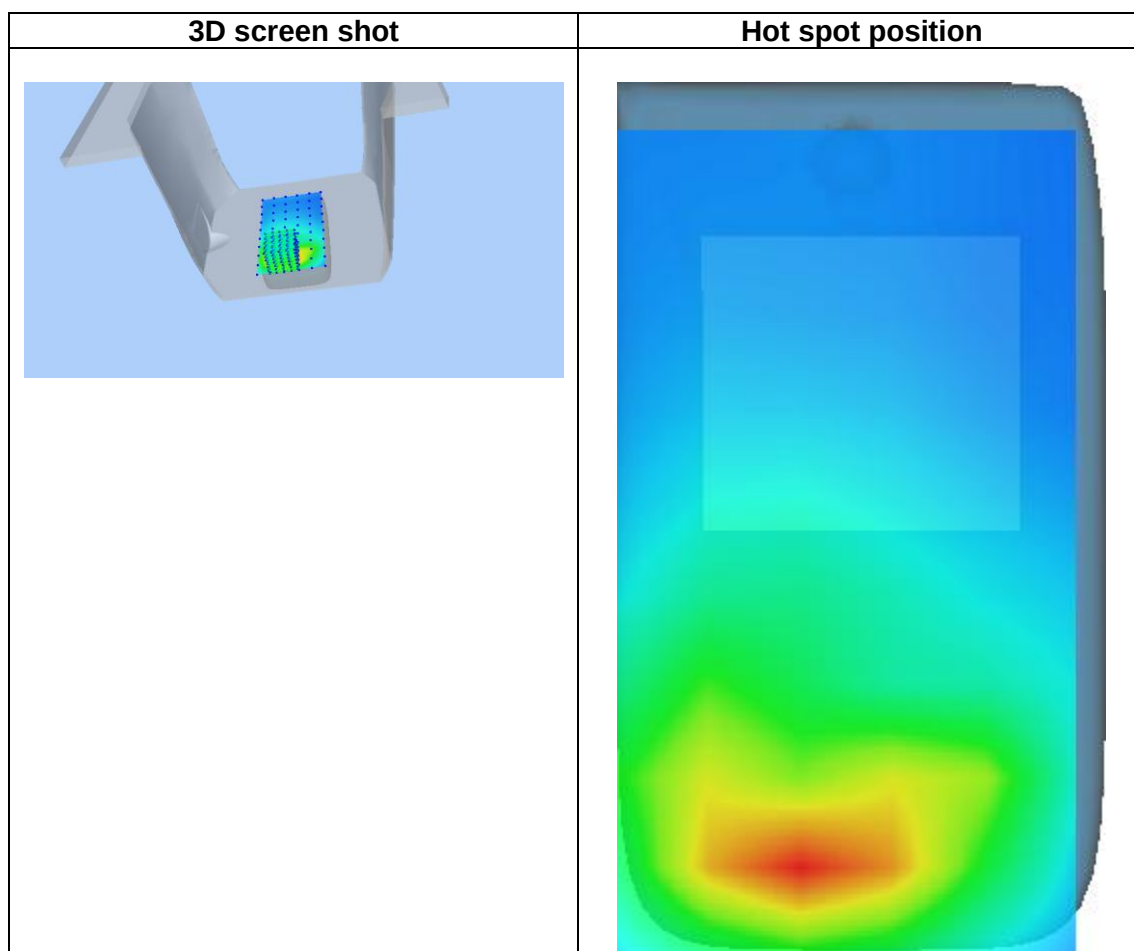
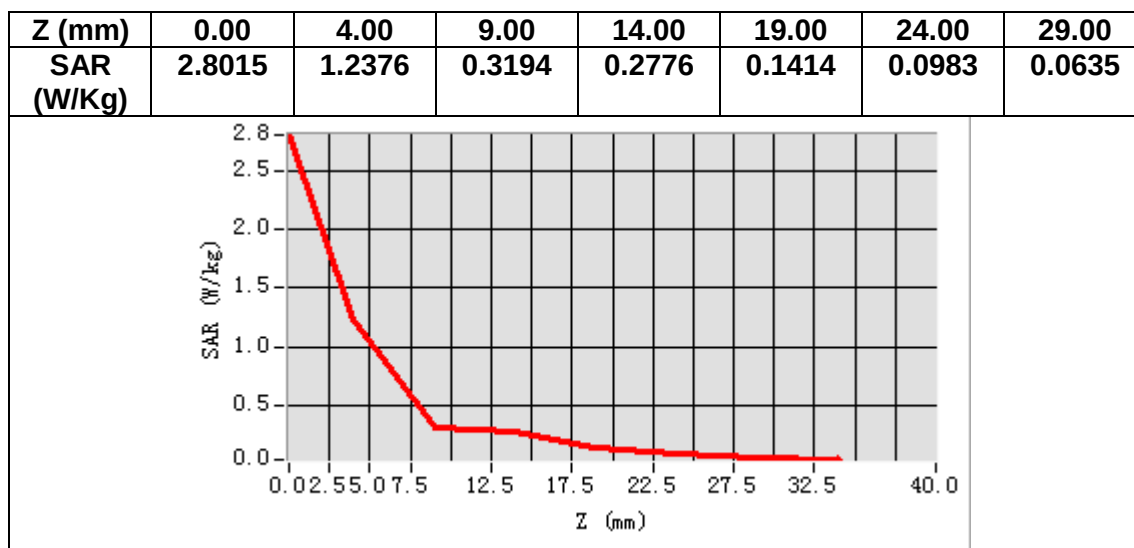
VOLUME SAR



Maximum location: X=-10.00, Y=-57.00

SAR Peak: 2.36 W/kg

SAR 10g (W/Kg)	0.537158
SAR 1g (W/Kg)	1.180109



MEASUREMENT 3

Date of measurement: 25/7/2024

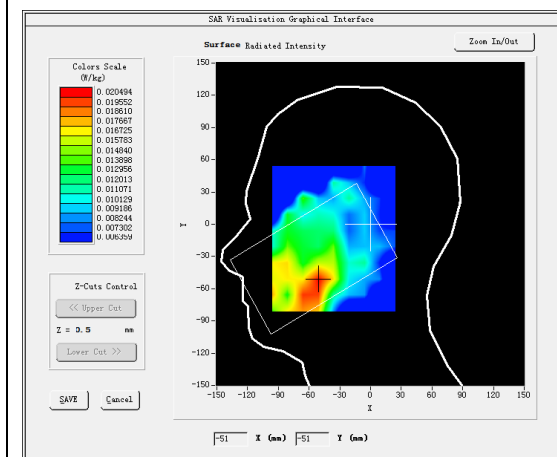
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM1800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>
<u>ConvF</u>	<u>2.45</u>

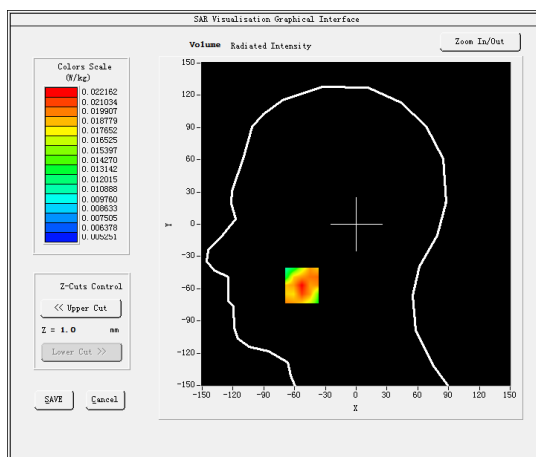
B. SAR Measurement Results

Frequency (MHz)	1747.400000
Relative permittivity (real part)	39.244644
Relative permittivity (imaginary part)	13.729822
Conductivity (S/m)	1.332861
Variation (%)	3.890000

SURFACE SAR



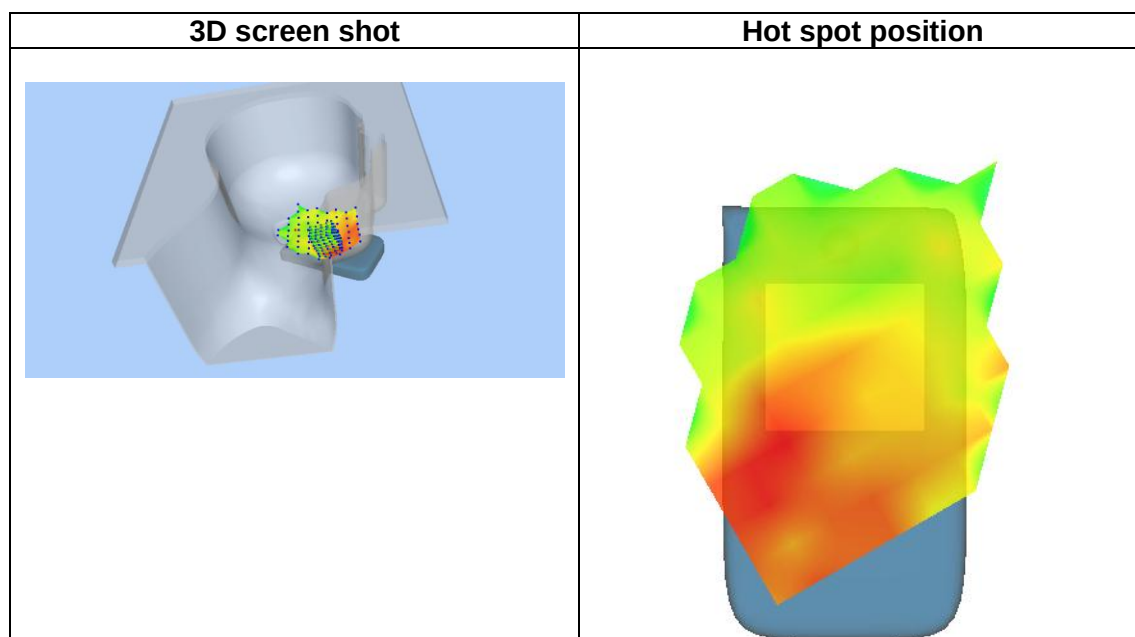
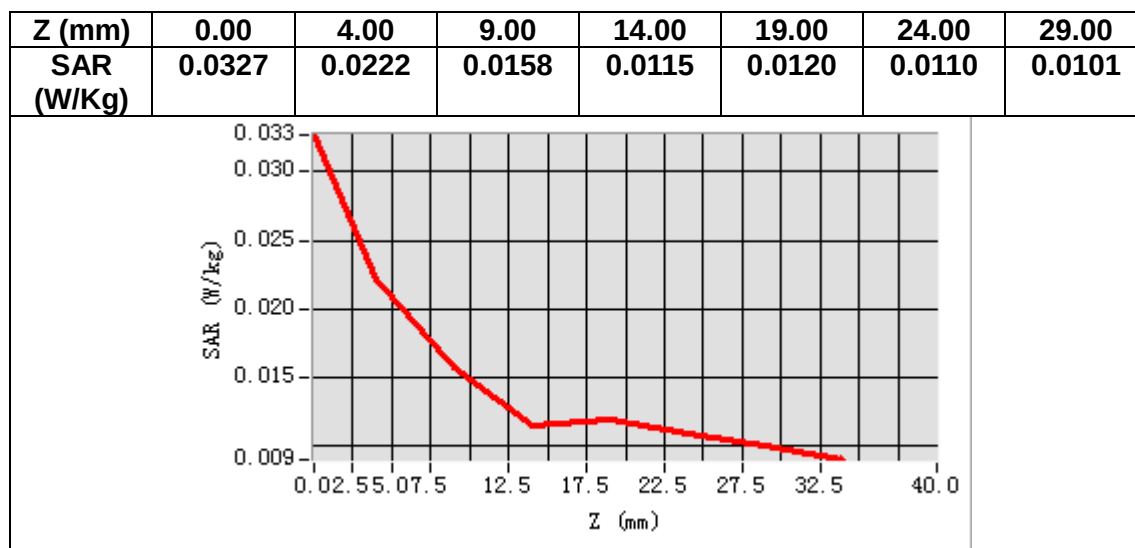
VOLUME SAR



Maximum location: X=-53.00, Y=-57.00

SAR Peak: 0.03 W/kg

SAR 10g (W/Kg)	0.015093
SAR 1g (W/Kg)	0.021579



MEASUREMENT 4

Date of measurement: 25/7/2024

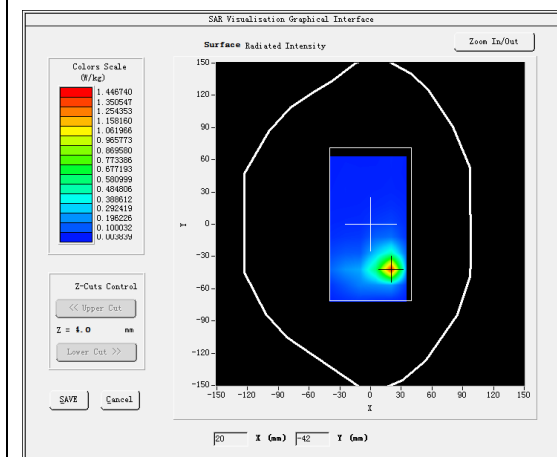
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM1800</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.0)</u>
<u>ConvF</u>	<u>2.45</u>

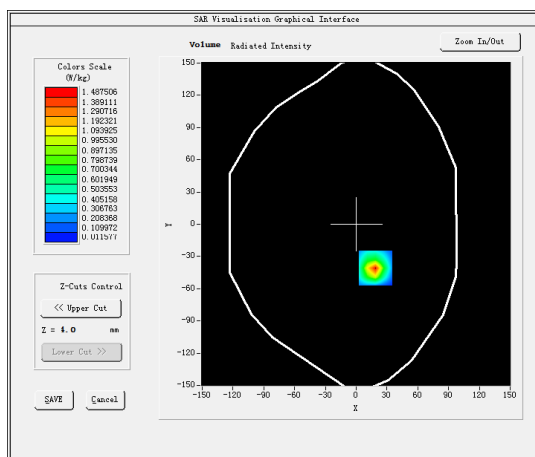
B. SAR Measurement Results

Frequency (MHz)	1747.400000
Relative permittivity (real part)	39.244644
Relative permittivity (imaginary part)	13.729822
Conductivity (S/m)	1.332861
Variation (%)	2.330000

SURFACE SAR



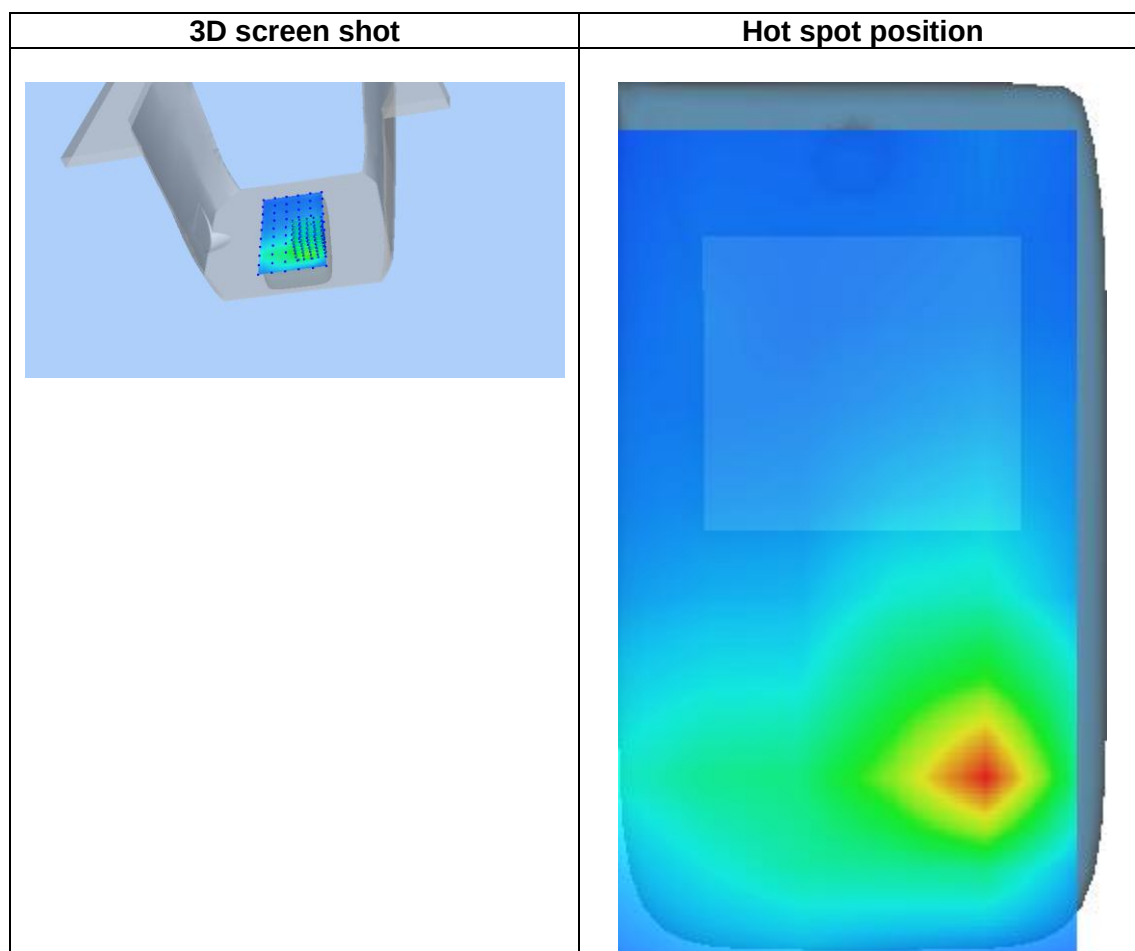
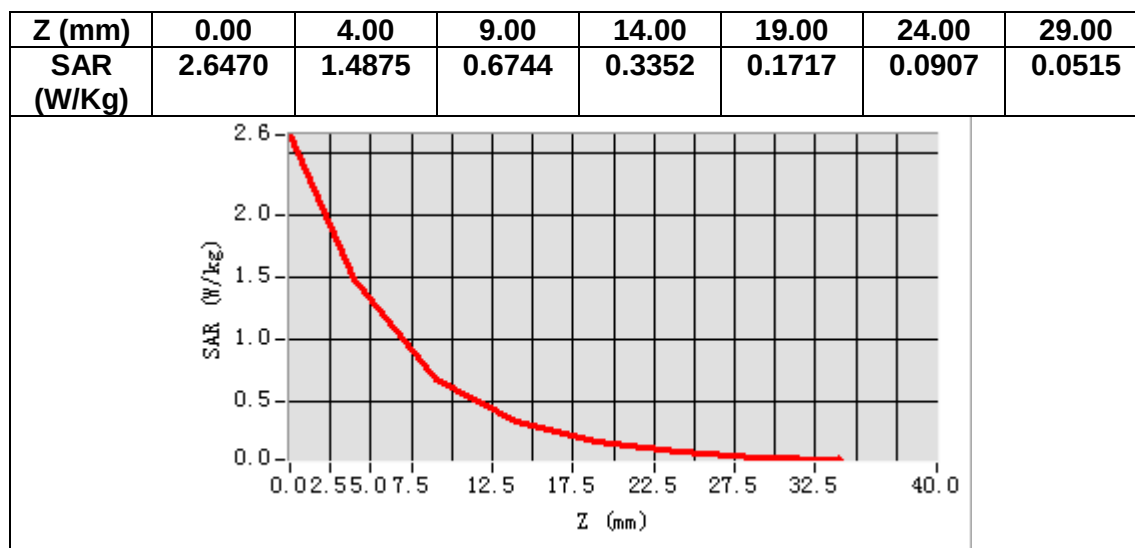
VOLUME SAR



Maximum location: X=19.00, Y=-41.00

SAR Peak: 2.67 W/kg

SAR 10g (W/Kg)	0.528424
SAR 1g (W/Kg)	1.319215



MEASUREMENT 5

Date of measurement: 26/7/2024

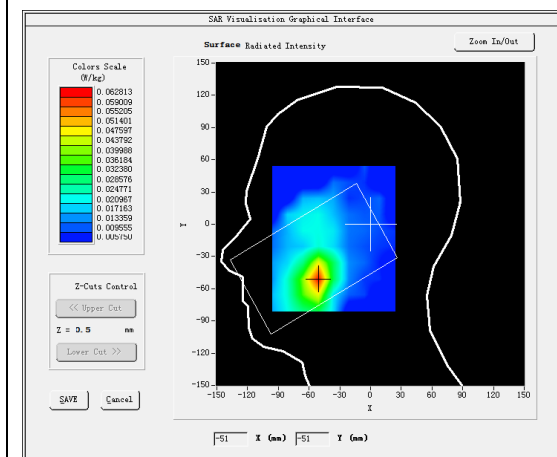
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band1_ UMTS</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

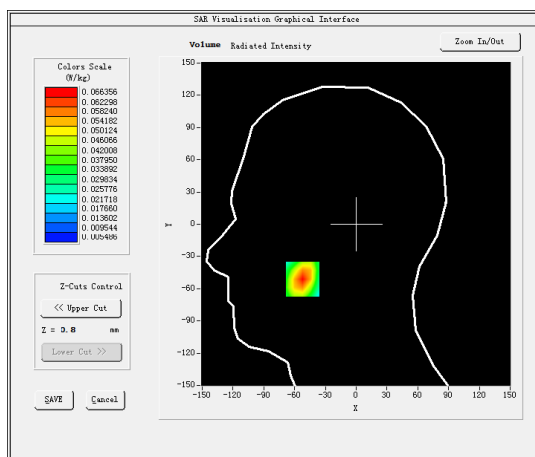
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	2.570000

SURFACE SAR



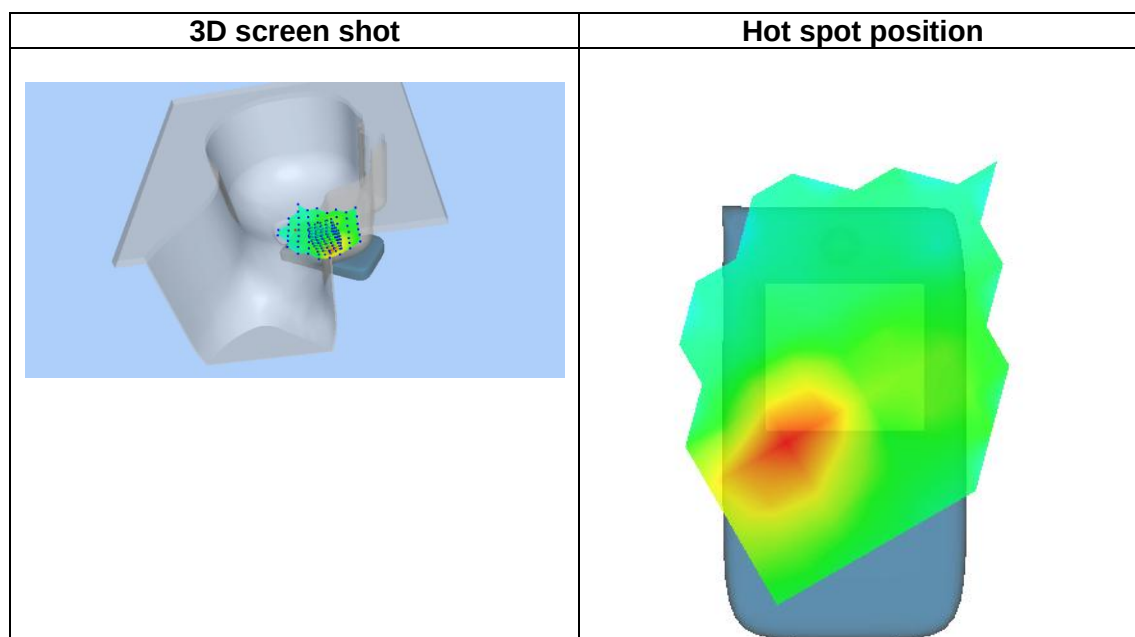
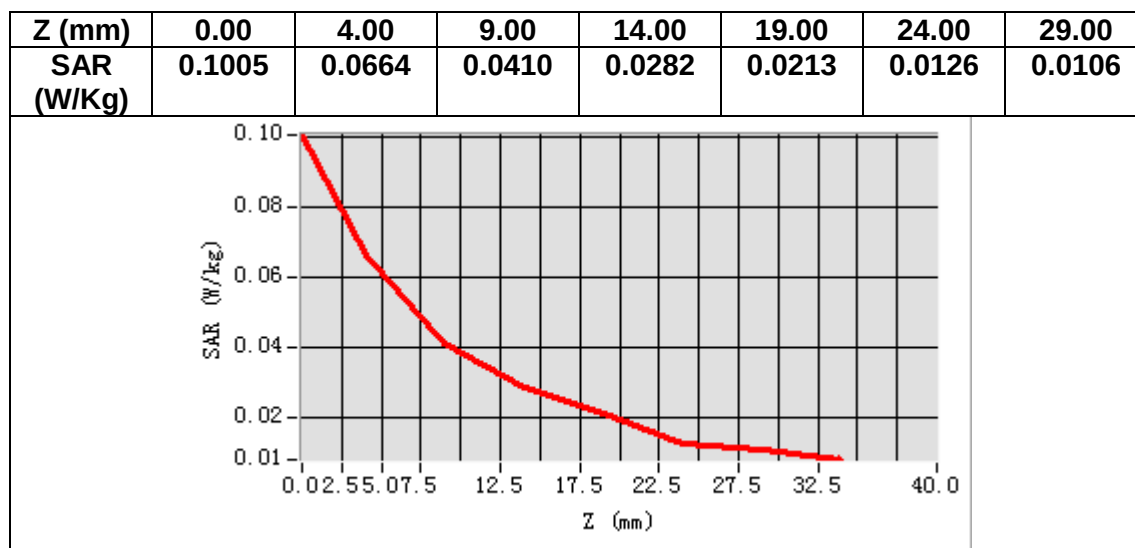
VOLUME SAR



Maximum location: X=-52.00, Y=-51.00

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.037047
SAR 1g (W/Kg)	0.063463



MEASUREMENT 6

Date of measurement: 26/7/2024

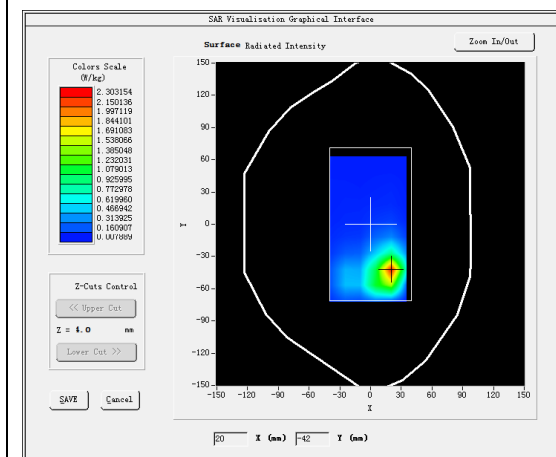
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band1_UMTS</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

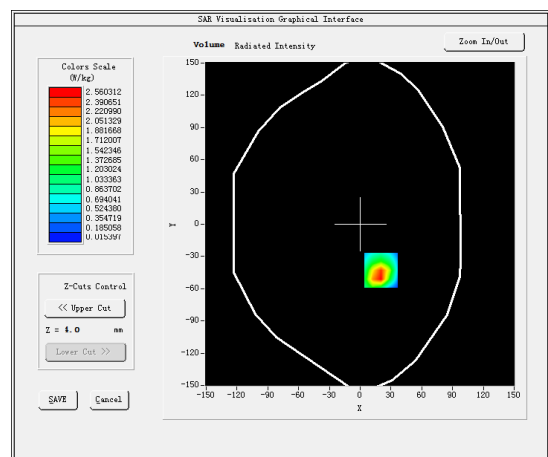
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	2.869999

SURFACE SAR



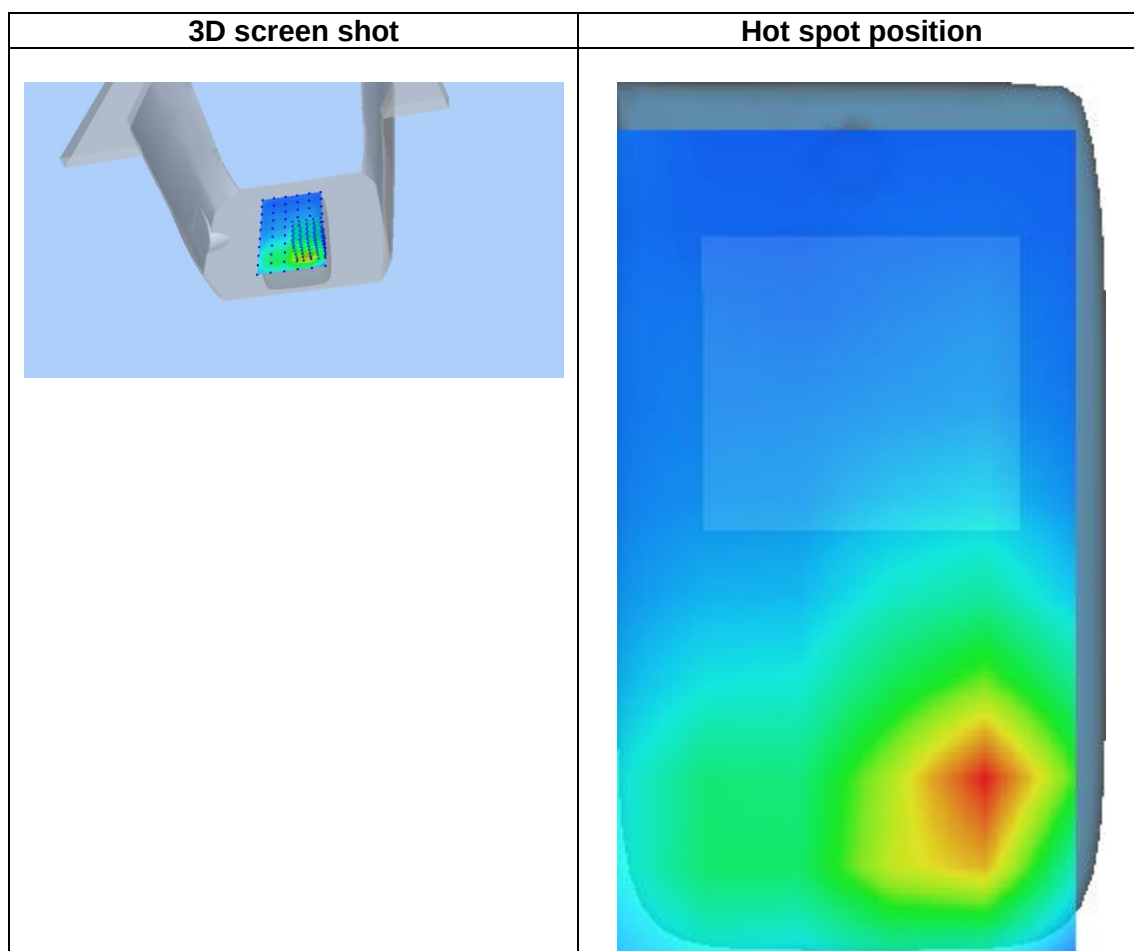
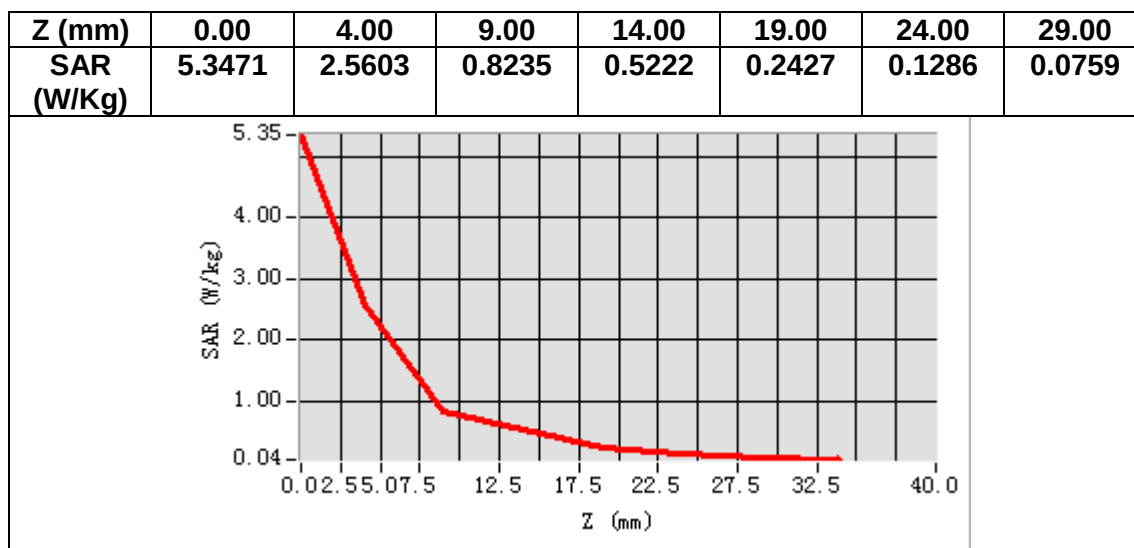
VOLUME SAR



Maximum location: X=20.00, Y=-43.00

SAR Peak: 4.91 W/kg

SAR 10g (W/Kg)	1.067091
SAR 1g (W/Kg)	2.525841



MEASUREMENT 7

Date of measurement: 24/7/2024

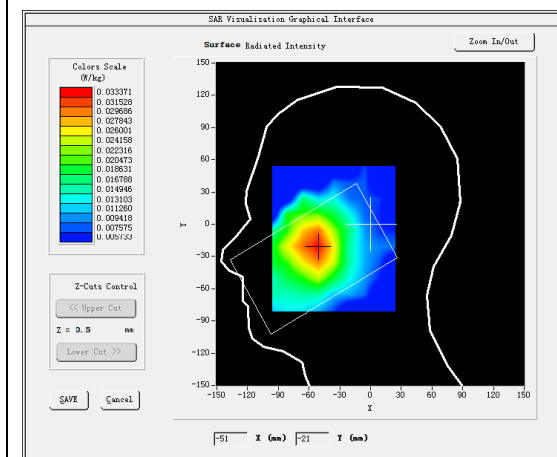
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band8_WCDMA900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

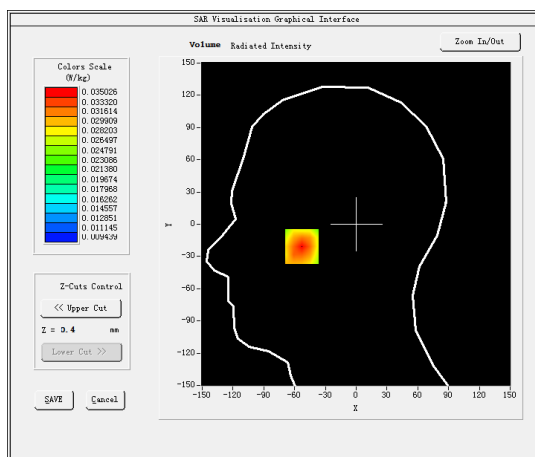
B. SAR Measurement Results

Frequency (MHz)	897.600000
Relative permittivity (real part)	41.235565
Relative permittivity (imaginary part)	19.681707
Conductivity (S/m)	0.980805
Variation (%)	1.140000

SURFACE SAR



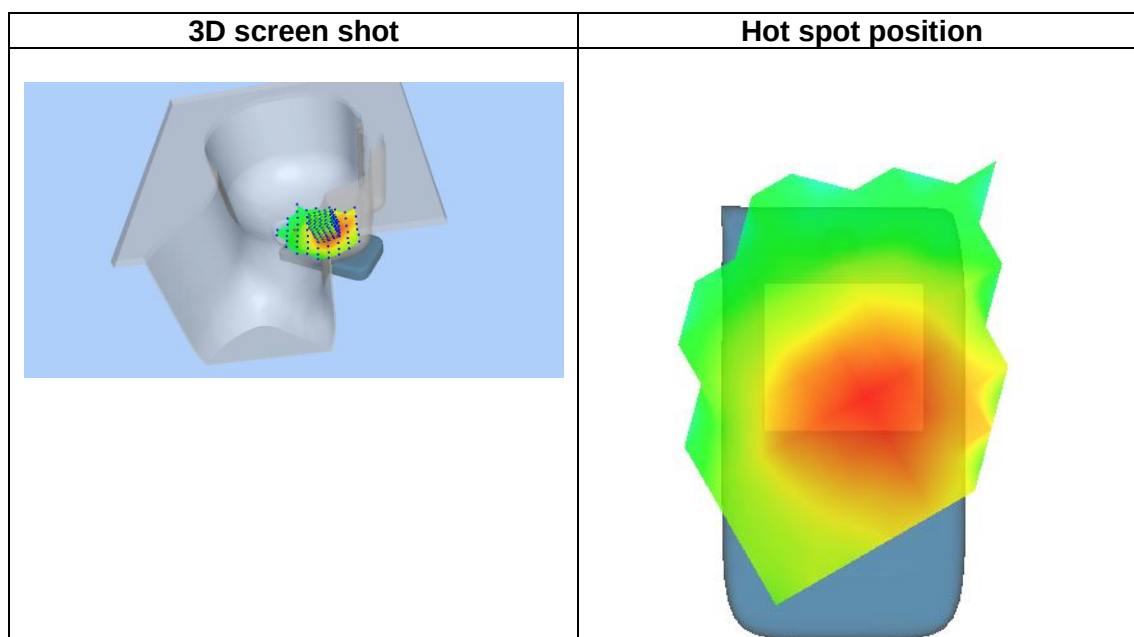
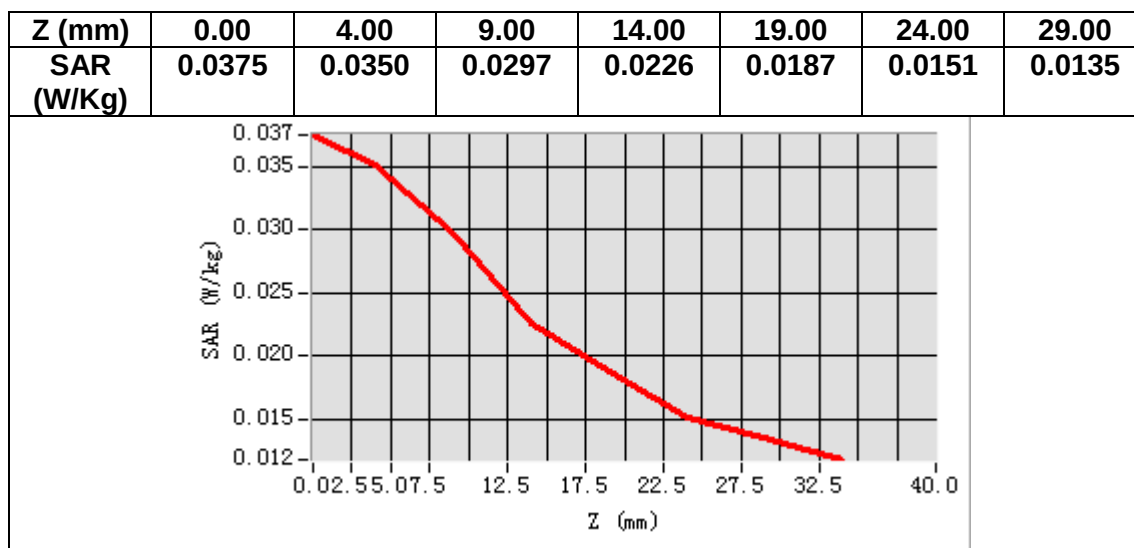
VOLUME SAR



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

SAR Peak: 0.04 W/kg

SAR 10g (W/Kg)	0.025830
SAR 1g (W/Kg)	0.033025



MEASUREMENT 8

Date of measurement: 24/7/2024

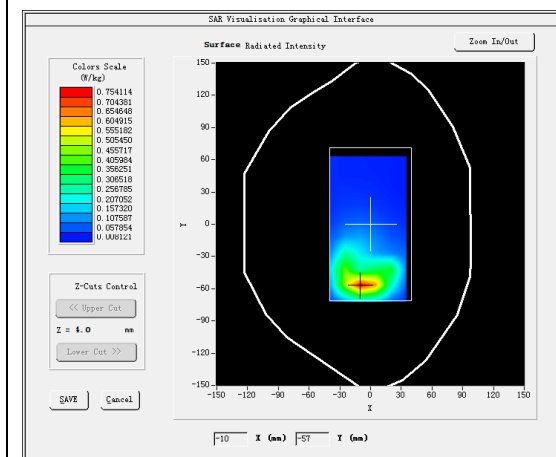
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band8_WCDMA900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

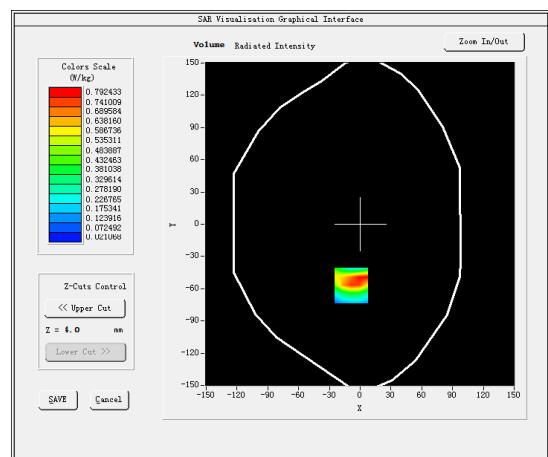
B. SAR Measurement Results

Frequency (MHz)	897.600000
Relative permittivity (real part)	41.235565
Relative permittivity (imaginary part)	19.681707
Conductivity (S/m)	0.980805
Variation (%)	-2.230000

SURFACE SAR



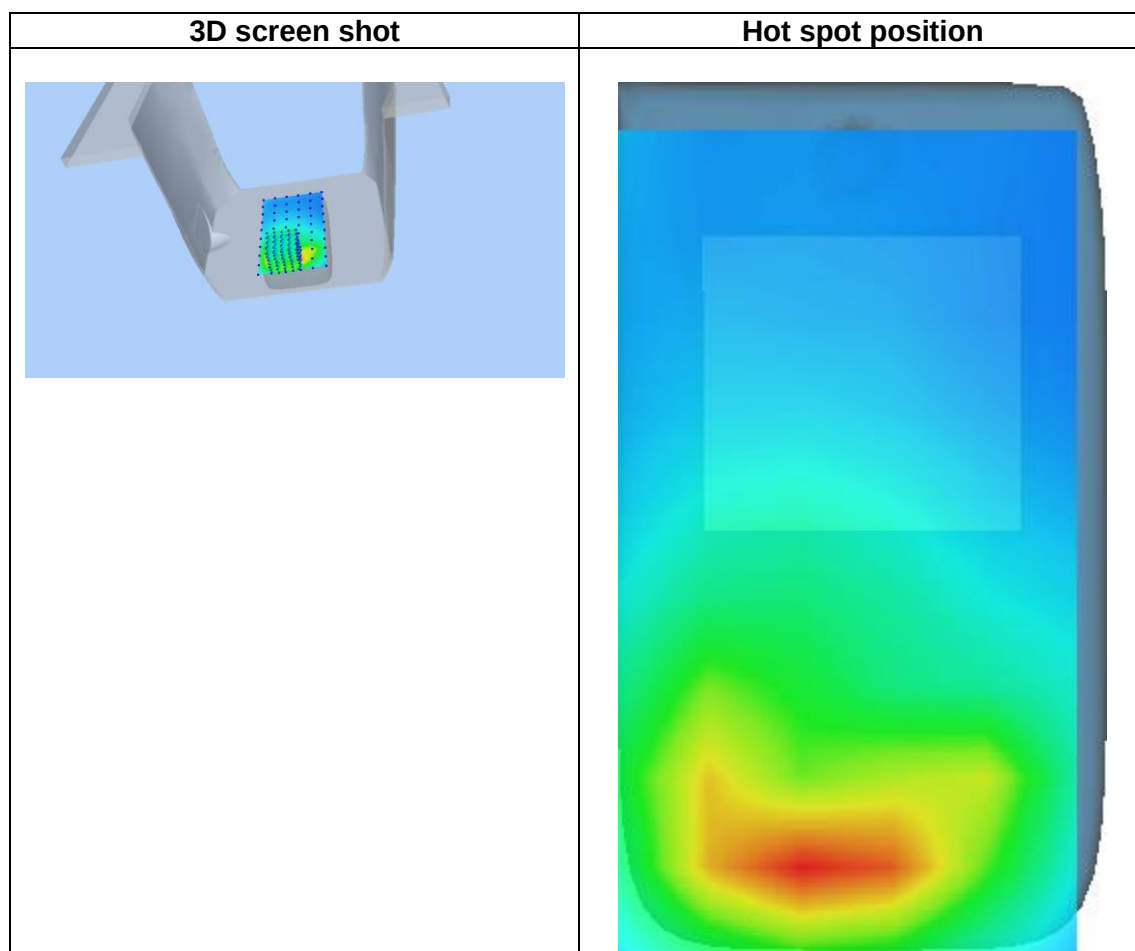
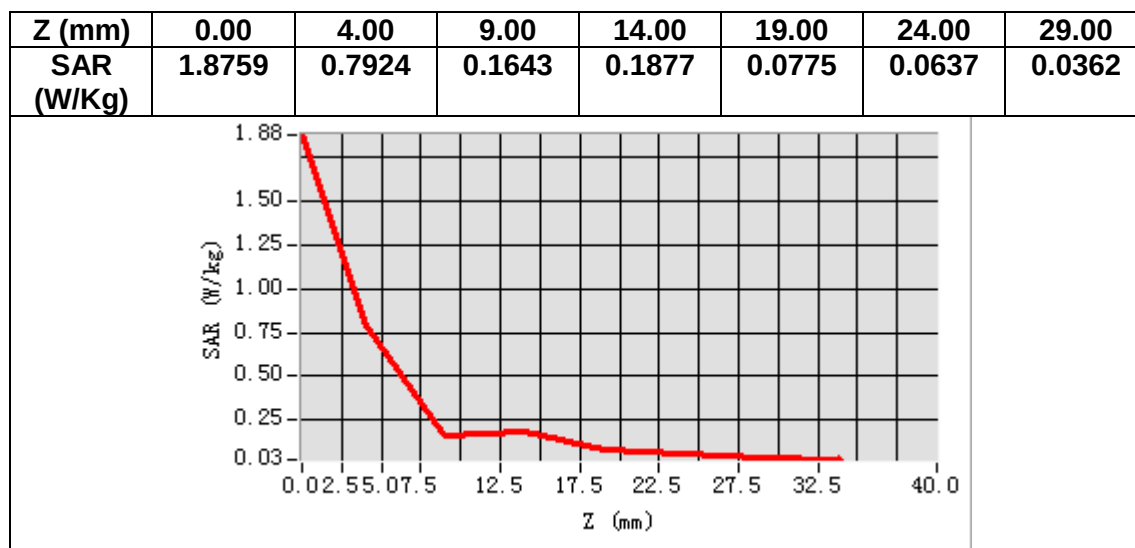
VOLUME SAR



Maximum location: X=-9.00, Y=-57.00

SAR Peak: 1.50 W/kg

SAR 10g (W/Kg)	0.377445
SAR 1g (W/Kg)	0.797729



MEASUREMENT 9

Date of measurement: 30/7/2024

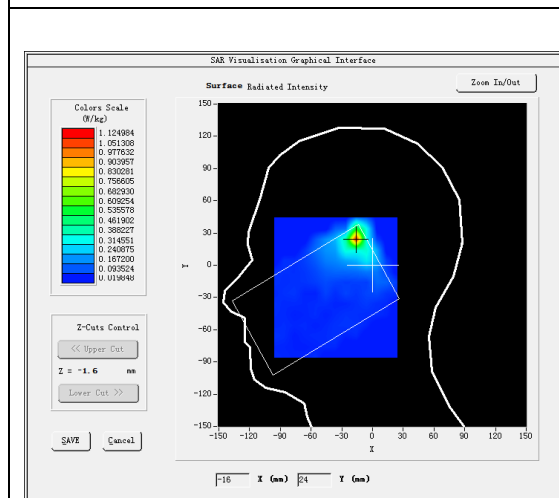
A. Experimental conditions.

<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 802.11n U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11n (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.07</u>

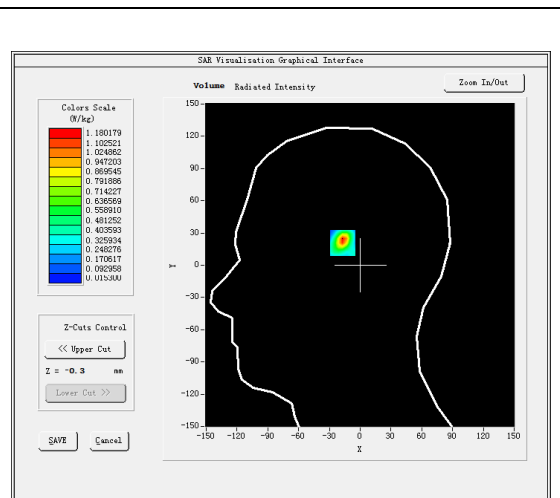
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.481365
Relative permittivity (imaginary part)	15.578307
Conductivity (S/m)	4.500400
Variation (%)	2.200000

SURFACE SAR



VOLUME SAR

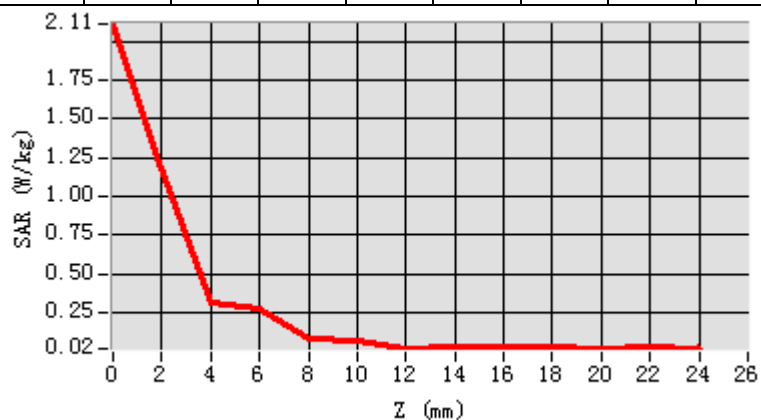


Maximum location: X=-16.00, Y=24.00

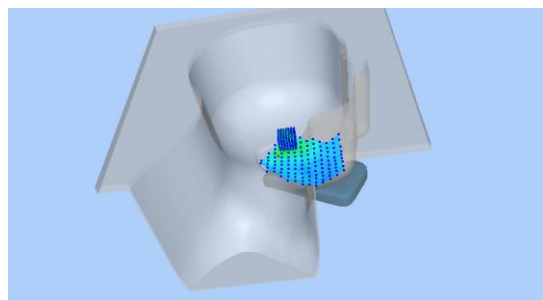
SAR Peak: 3.39 W/kg

SAR 10g (W/Kg)	0.311648
SAR 1g (W/Kg)	1.075761

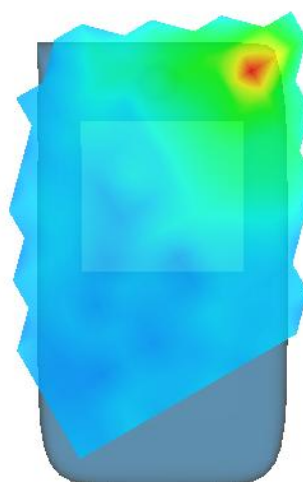
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	2.11 26	1.18 02	0.32 29	0.27 39	0.08 30	0.06 74	0.02 53	0.02 79	0.03 33	0.03 37	0.02 18	0.03 62



3D screen shot



Hot spot position



MEASUREMENT 10

Date of measurement: 31/7/2024

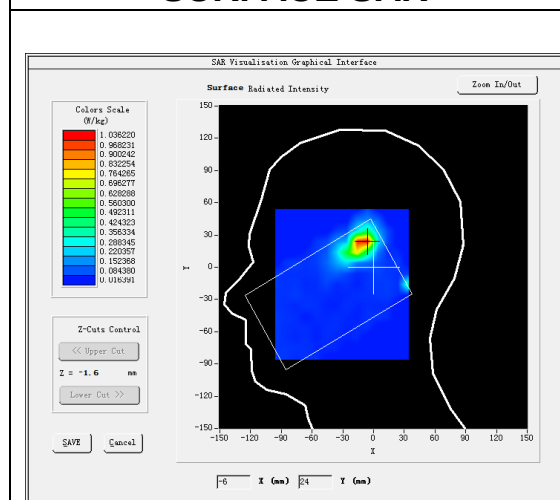
A. Experimental conditions.

<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 802.11n U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11n (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.04</u>

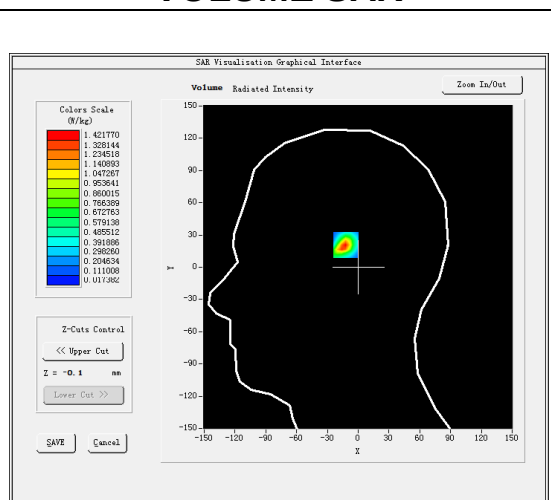
B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	33.988464
Relative permittivity (imaginary part)	15.840635
Conductivity (S/m)	5.091004
Variation (%)	-4.880000

SURFACE SAR



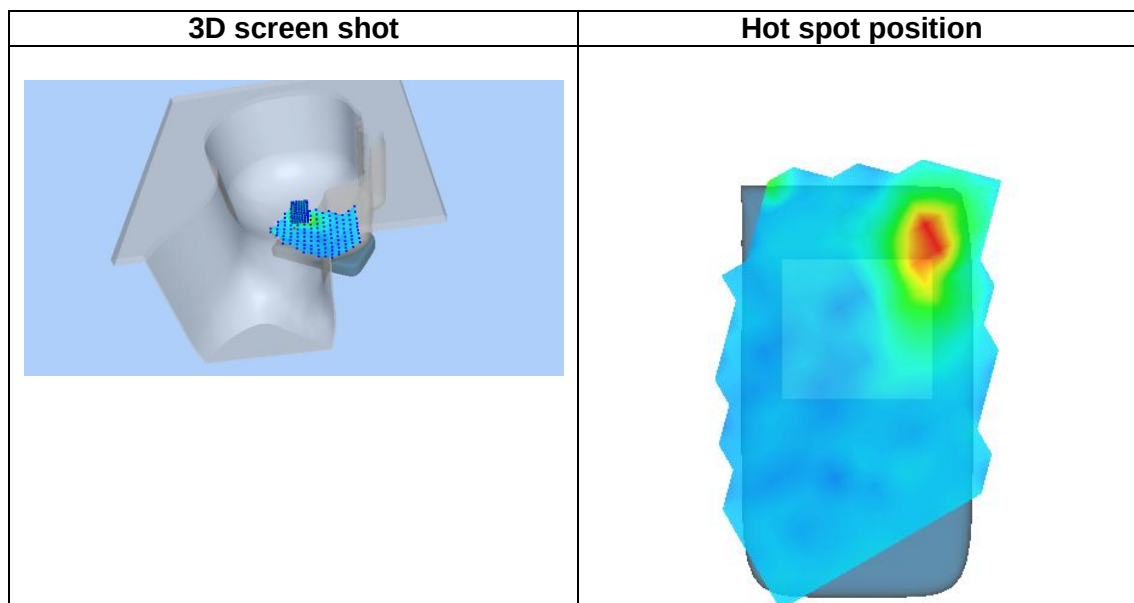
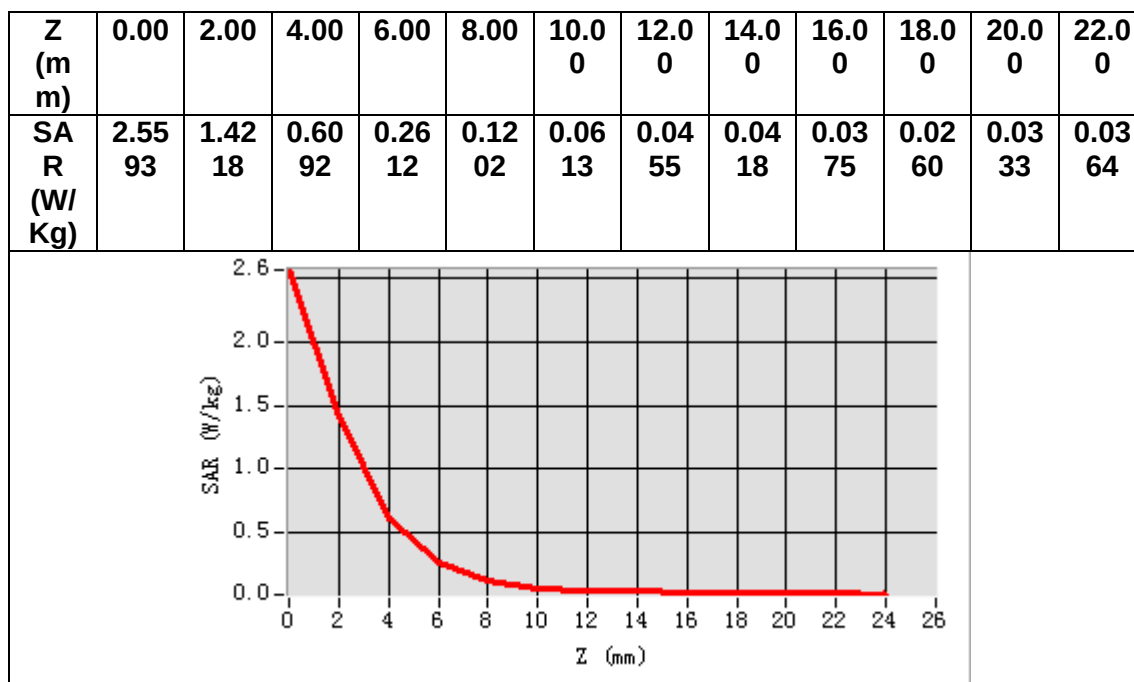
VOLUME SAR



Maximum location: X=-10.00, Y=23.00

SAR Peak: 4.27 W/kg

SAR 10g (W/Kg)	0.403117
SAR 1g (W/Kg)	1.358432



MEASUREMENT 11

Date of measurement: 30/7/2024

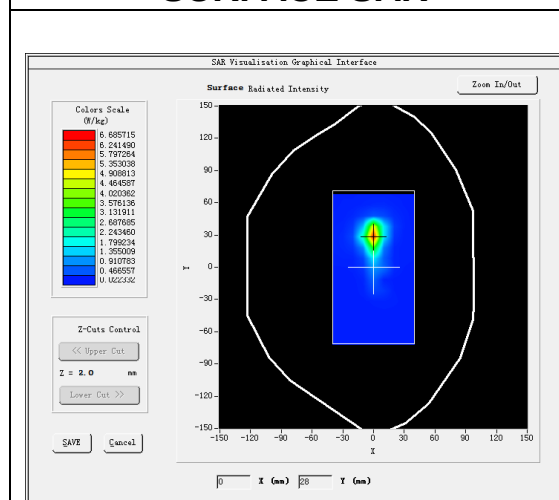
A. Experimental conditions.

<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 802.11n U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11n (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.07</u>

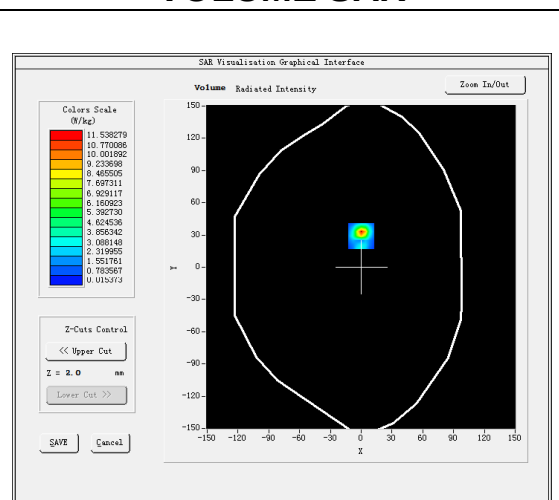
B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.481365
Relative permittivity (imaginary part)	15.578307
Conductivity (S/m)	4.500400
Variation (%)	4.480000

SURFACE SAR



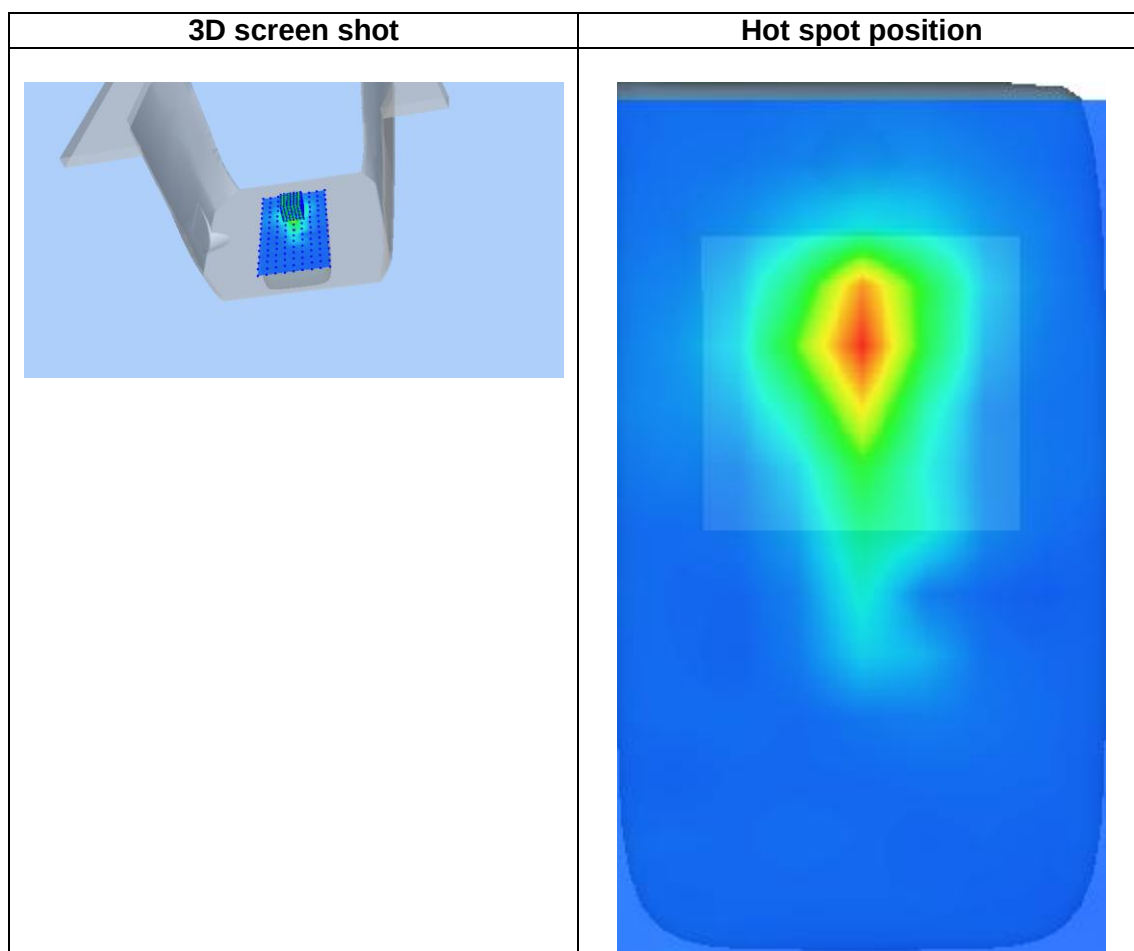
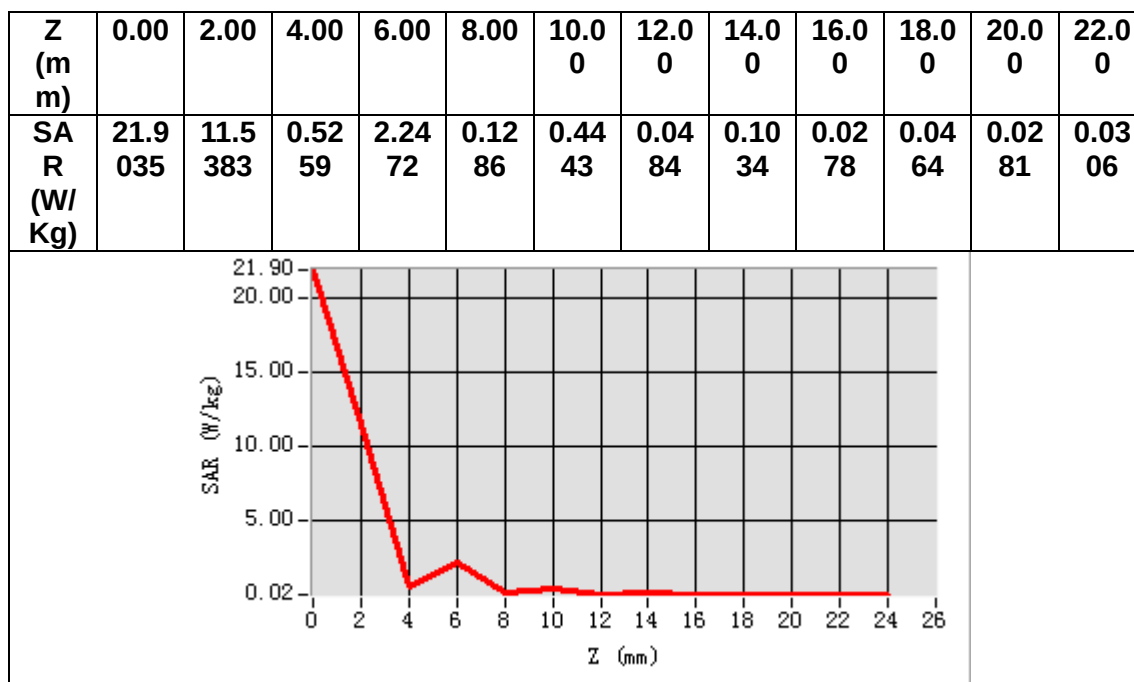
VOLUME SAR



Maximum location: X=0.00, Y=29.00

SAR Peak: 22.42 W/kg

SAR 10g (W/Kg)	1.119053
SAR 1g (W/Kg)	5.065280



MEASUREMENT 12

Date of measurement: 31/7/2024

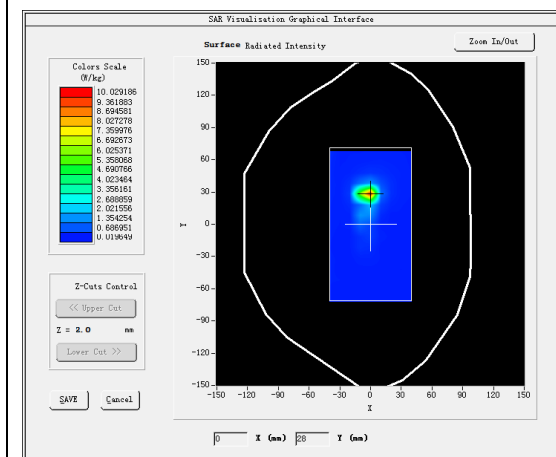
A. Experimental conditions.

<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 802.11n U-NII</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11n (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.04</u>

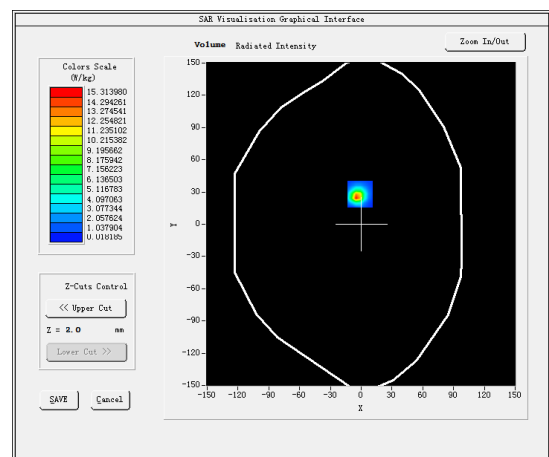
B. SAR Measurement Results

Frequency (MHz)	5785.000000
Relative permittivity (real part)	33.988464
Relative permittivity (imaginary part)	15.840635
Conductivity (S/m)	5.091004
Variation (%)	-11.880000

SURFACE SAR



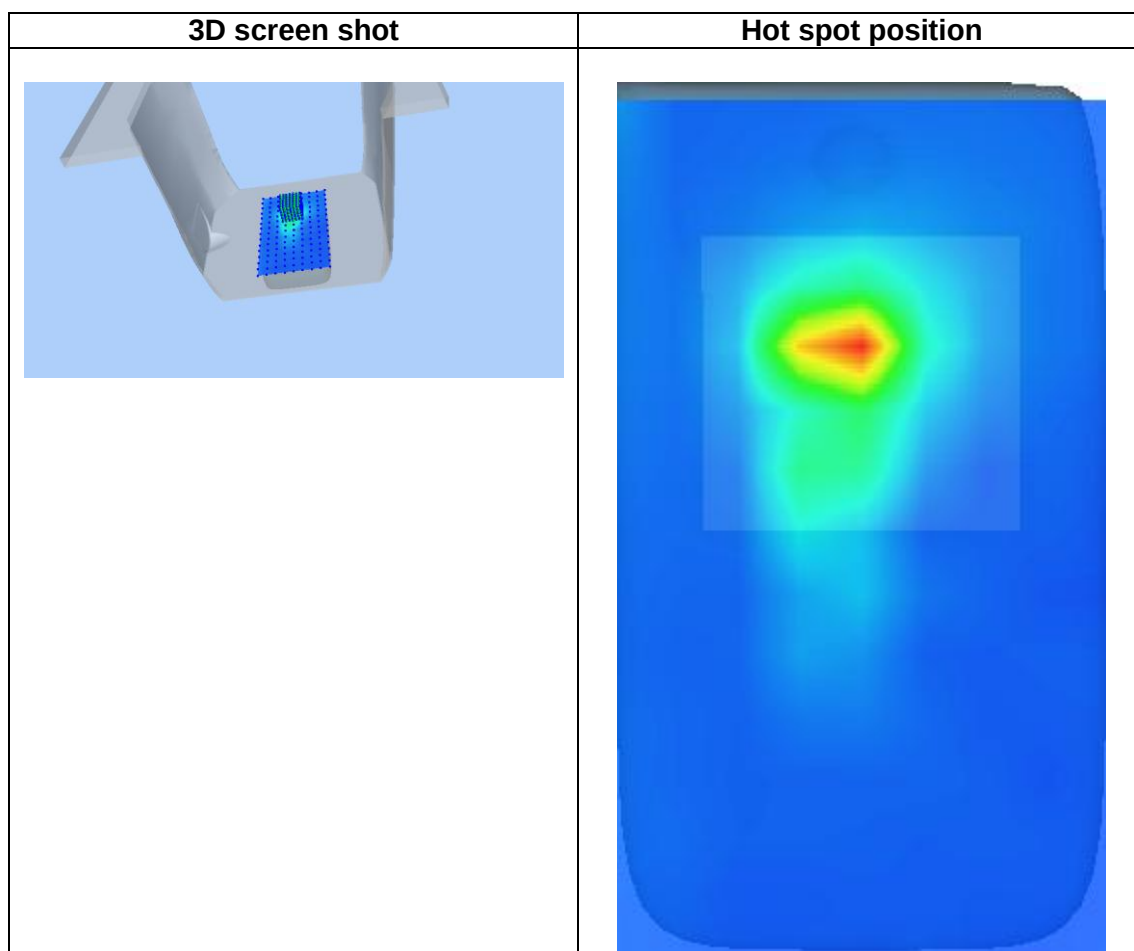
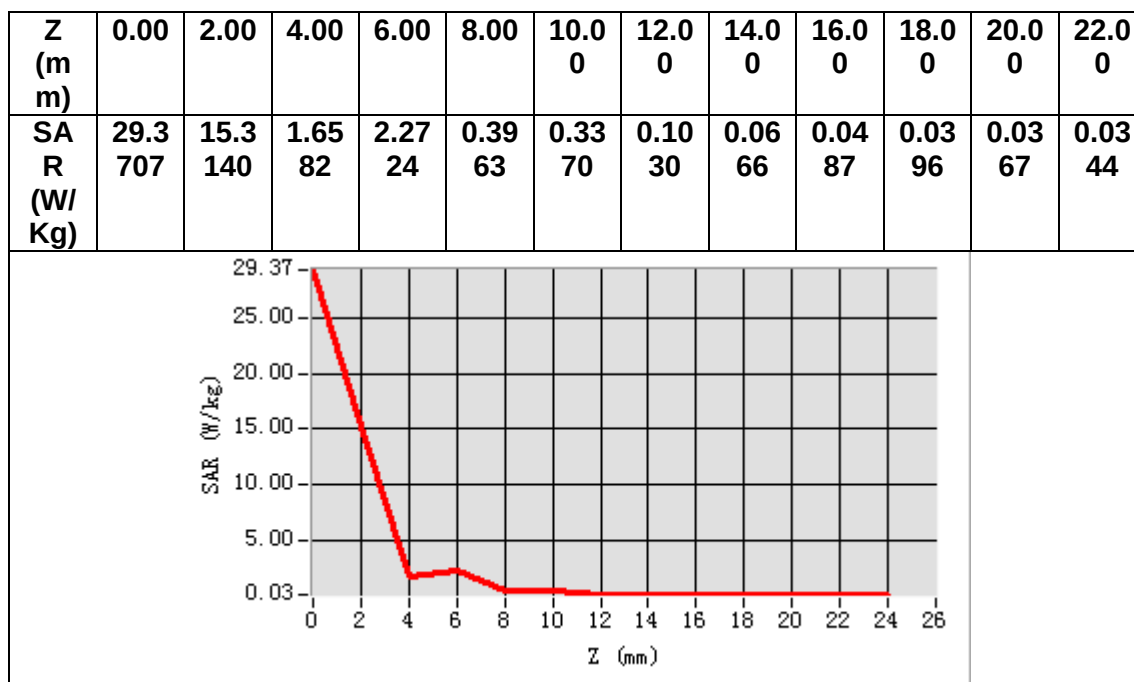
VOLUME SAR



Maximum location: X=-1.00, Y=28.00

SAR Peak: 31.59 W/kg

SAR 10g (W/Kg)	1.362604
SAR 1g (W/Kg)	6.658507



MEASUREMENT 13

Date of measurement: 18/7/2024

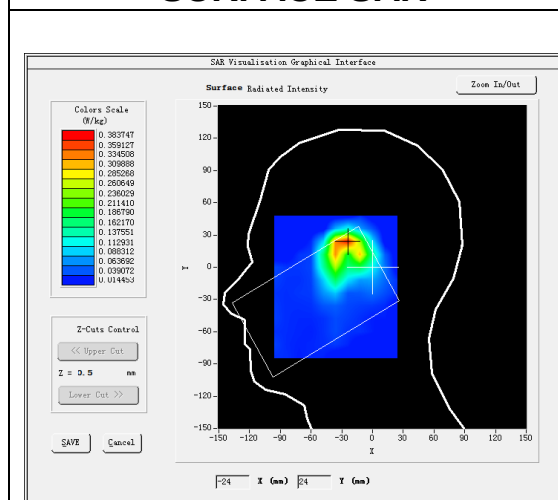
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>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>

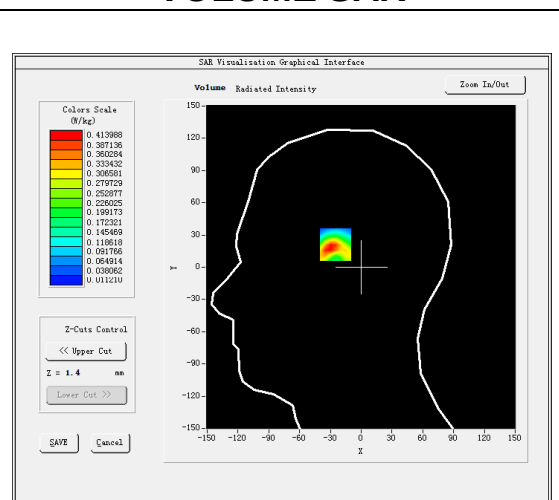
B. SAR Measurement Results

Frequency (MHz)	2442.000000
Relative permittivity (real part)	37.866764
Relative permittivity (imaginary part)	13.021621
Conductivity (S/m)	1.766600
Variation (%)	-3.580000

SURFACE SAR



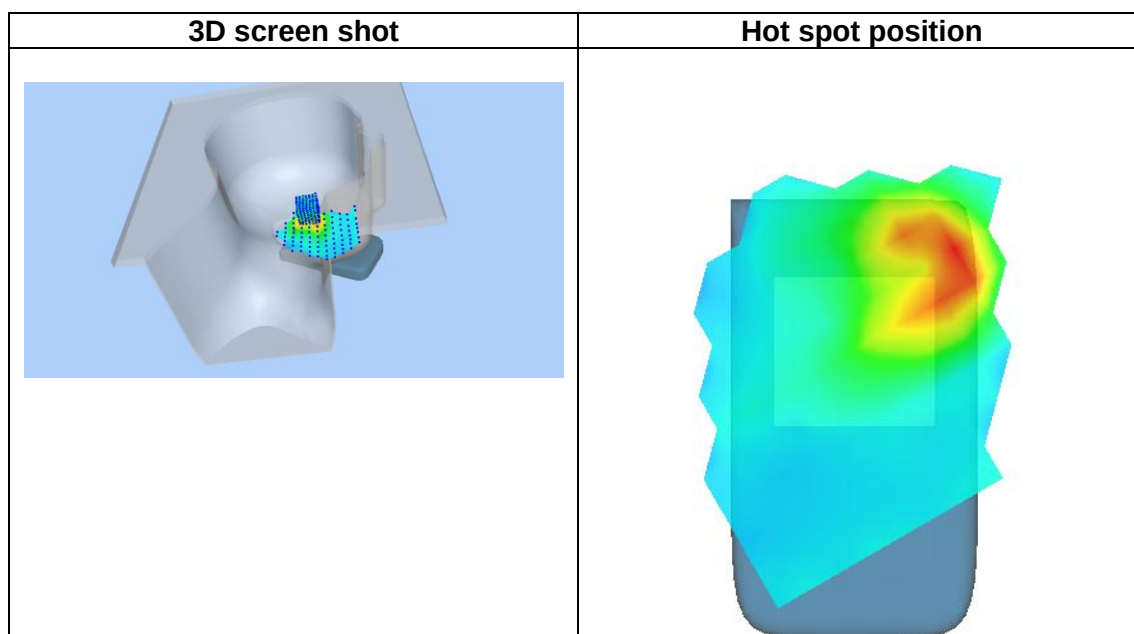
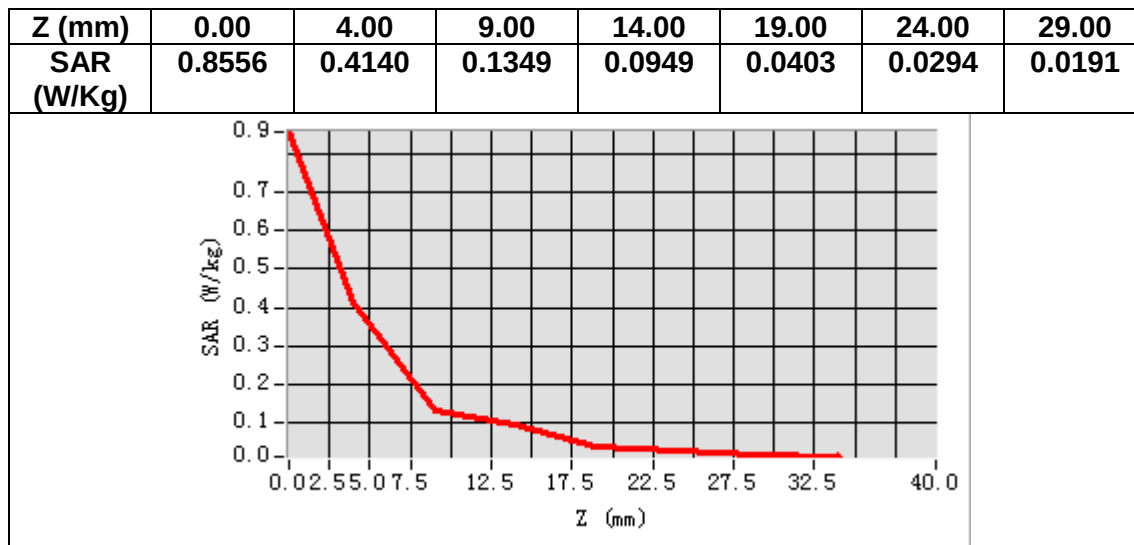
VOLUME SAR



Maximum location: X=-25.00, Y=24.00

SAR Peak: 0.75 W/kg

SAR 10g (W/Kg)	0.177457
SAR 1g (W/Kg)	0.390978



MEASUREMENT 14

Date of measurement: 18/7/2024

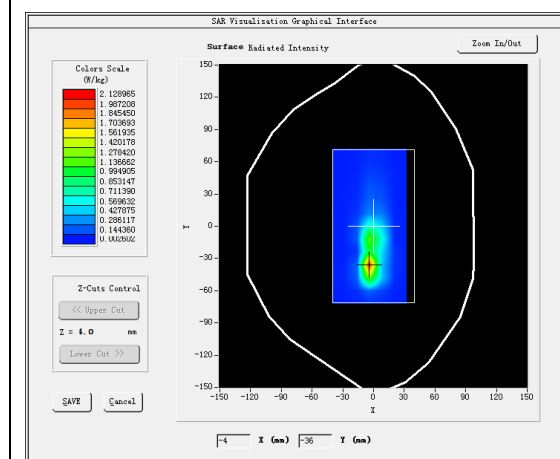
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>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>

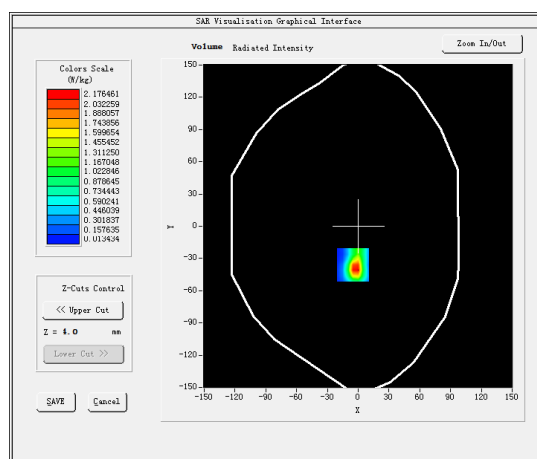
B. SAR Measurement Results

Frequency (MHz)	2442.000000
Relative permittivity (real part)	37.866764
Relative permittivity (imaginary part)	13.021621
Conductivity (S/m)	1.766600
Variation (%)	0.180000

SURFACE SAR



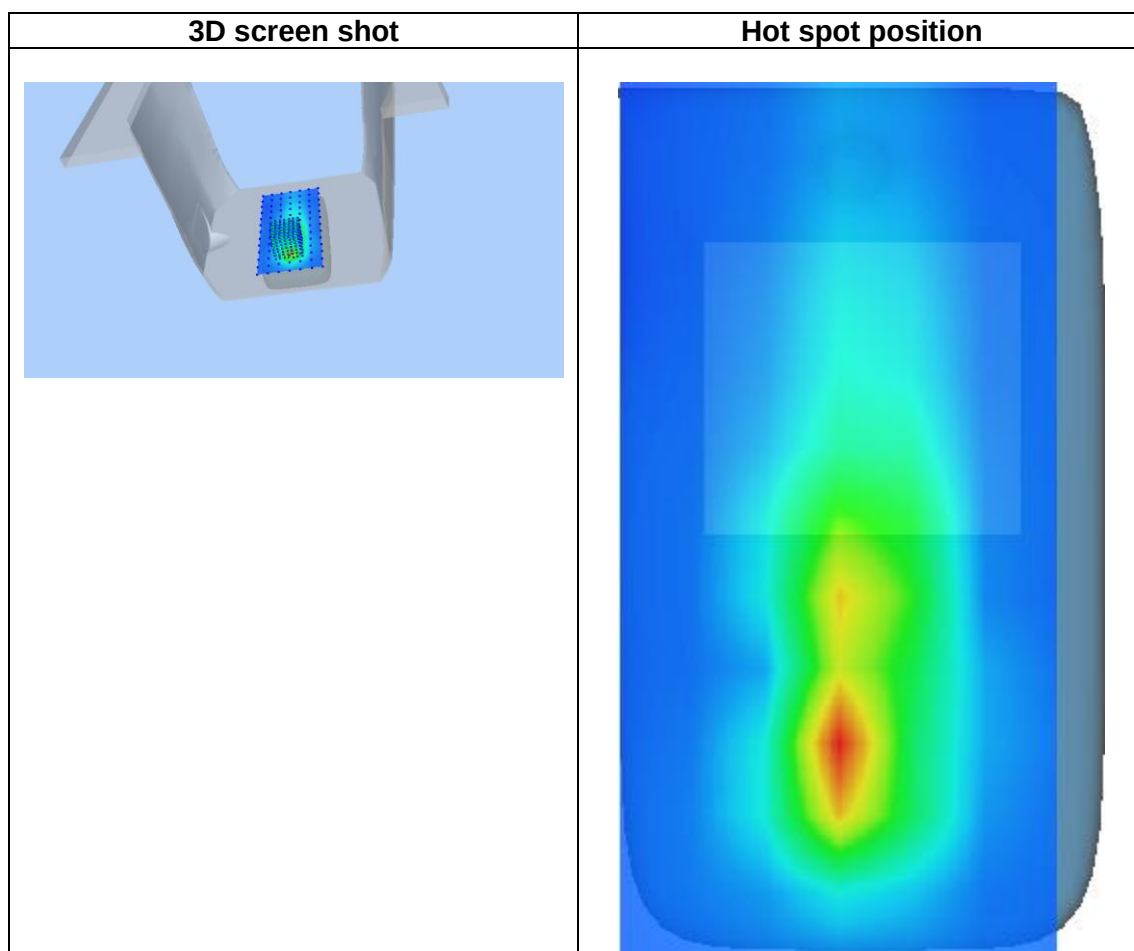
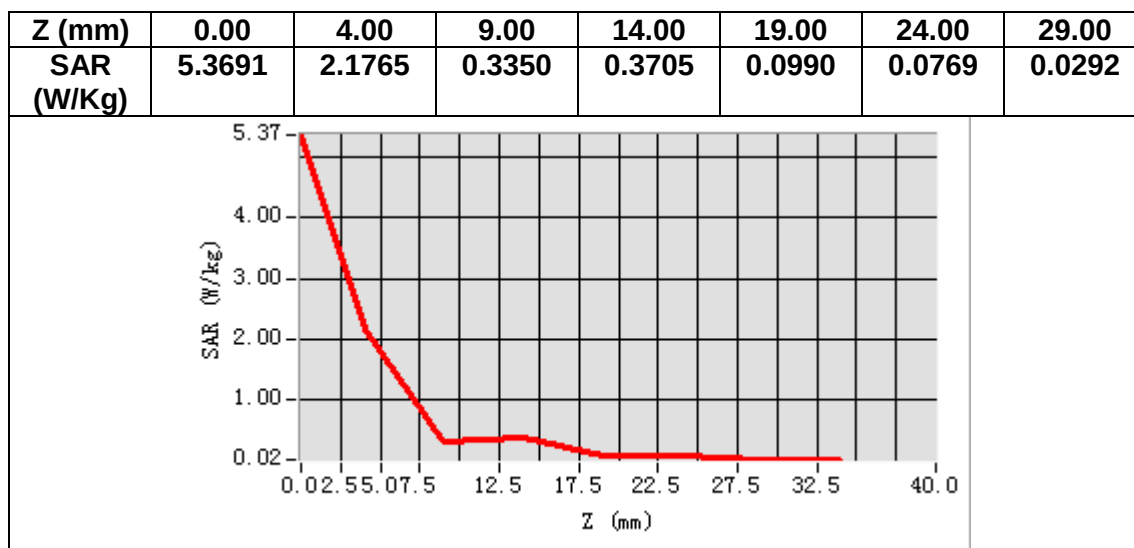
VOLUME SAR



Maximum location: X=-5.00, Y=-36.00

SAR Peak: 4.44 W/kg

SAR 10g (W/Kg)	0.674633
SAR 1g (W/Kg)	2.005845



MEASUREMENT 15

Date of measurement: 26/7/2024

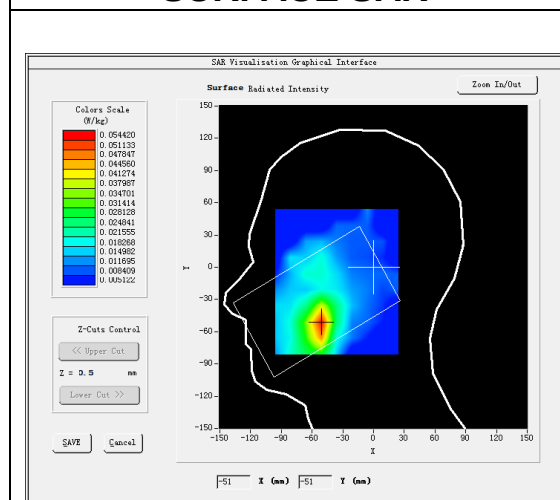
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 1</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

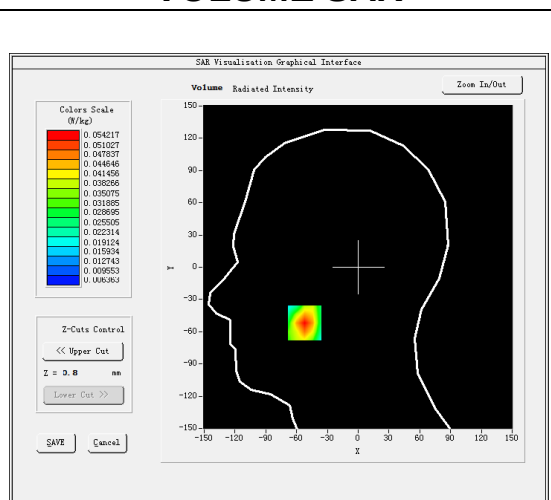
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	3.039993

SURFACE SAR



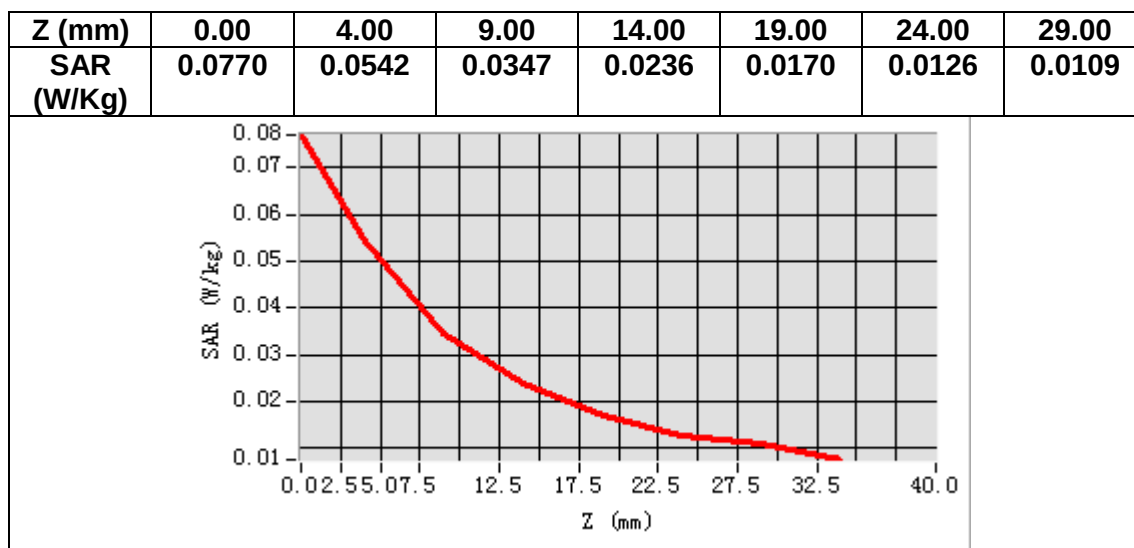
VOLUME SAR



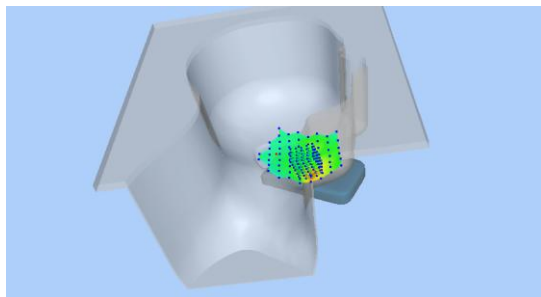
Maximum location: X=-52.00, Y=-52.00

SAR Peak: 0.08 W/kg

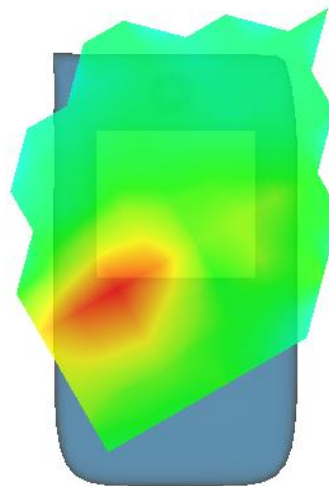
SAR 10g (W/Kg)	0.030663
SAR 1g (W/Kg)	0.051462



3D screen shot



Hot spot position



MEASUREMENT 16

Date of measurement: 26/7/2024

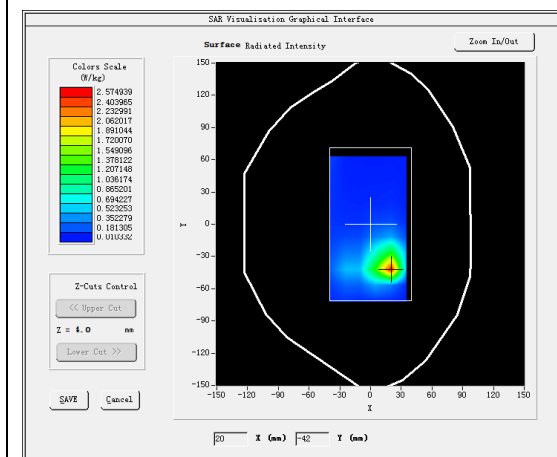
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 1</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

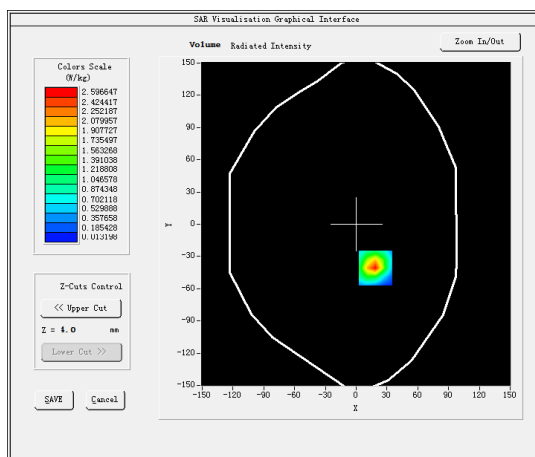
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	4.730000

SURFACE SAR



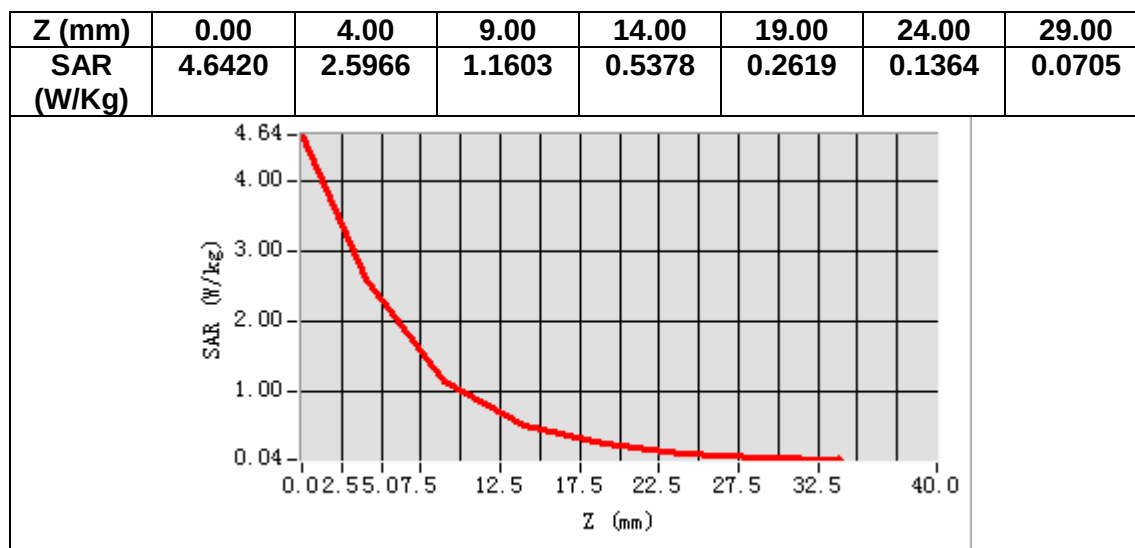
VOLUME SAR



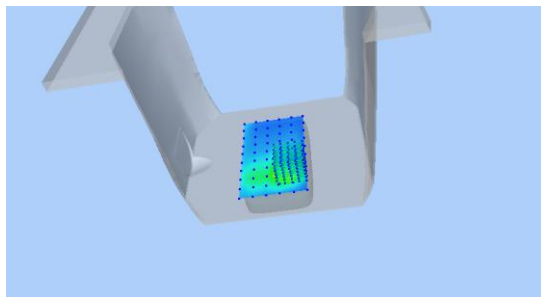
Maximum location: X=19.00, Y=-41.00

SAR Peak: 4.64 W/kg

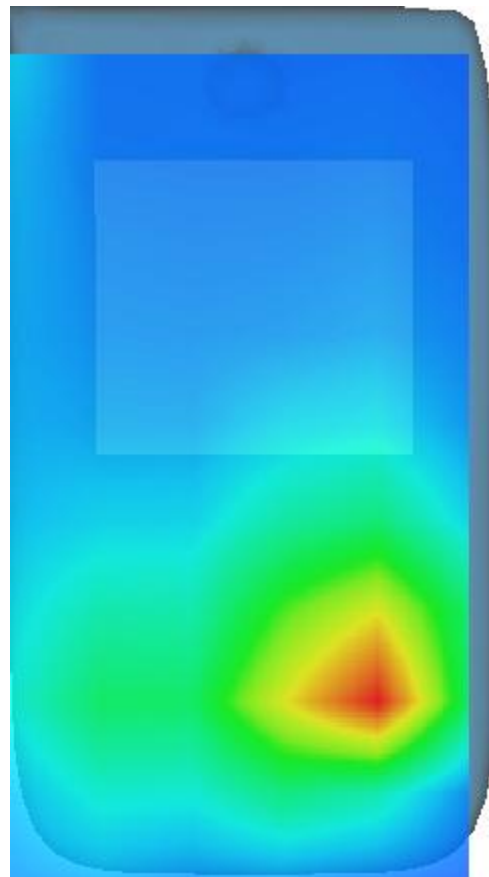
SAR 10g (W/Kg)	1.009514
SAR 1g (W/Kg)	2.404282



3D screen shot



Hot spot position



MEASUREMENT 17

Date of measurement: 25/7/2024

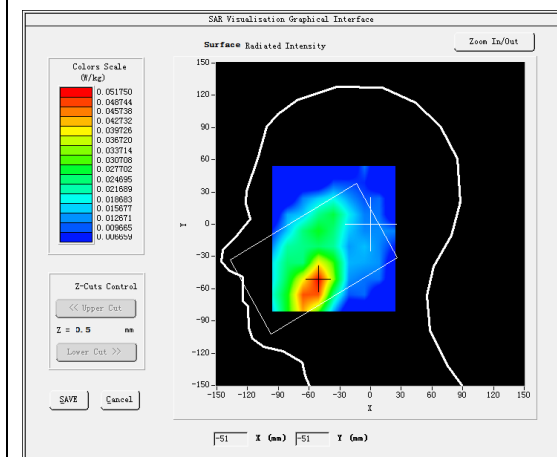
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 3</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

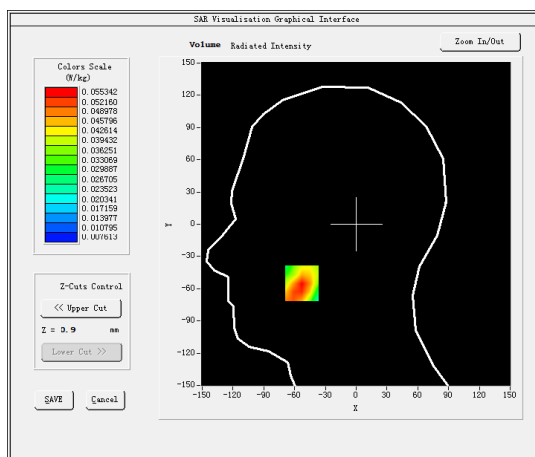
B. SAR Measurement Results

Frequency (MHz)	1747.500000
Relative permittivity (real part)	39.244083
Relative permittivity (imaginary part)	13.728342
Conductivity (S/m)	1.332412
Variation (%)	2.130000

SURFACE SAR



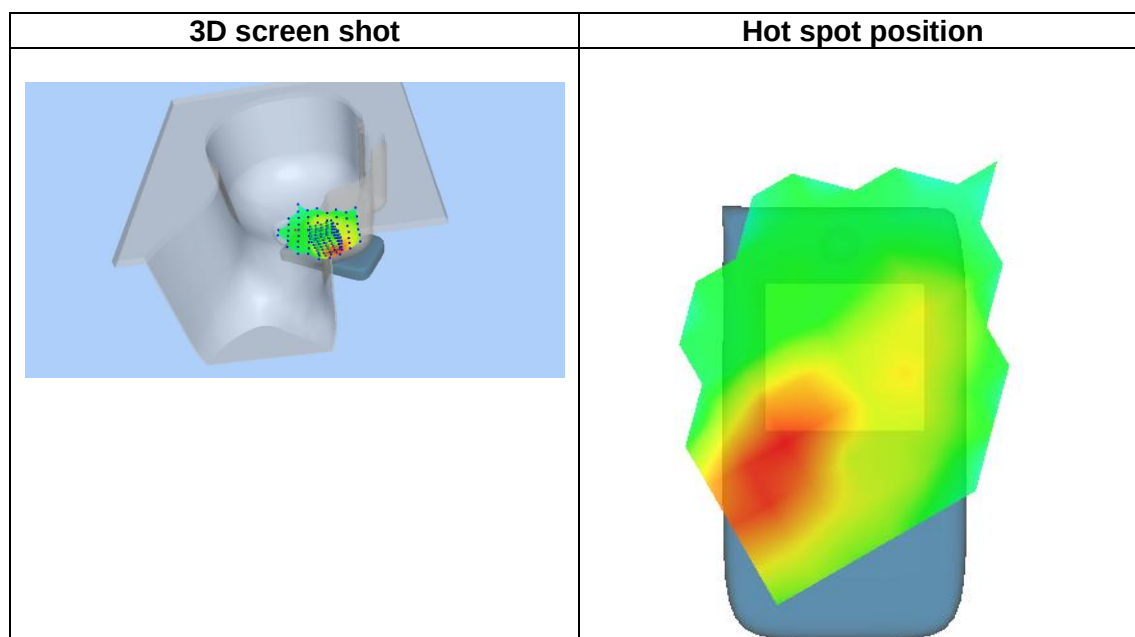
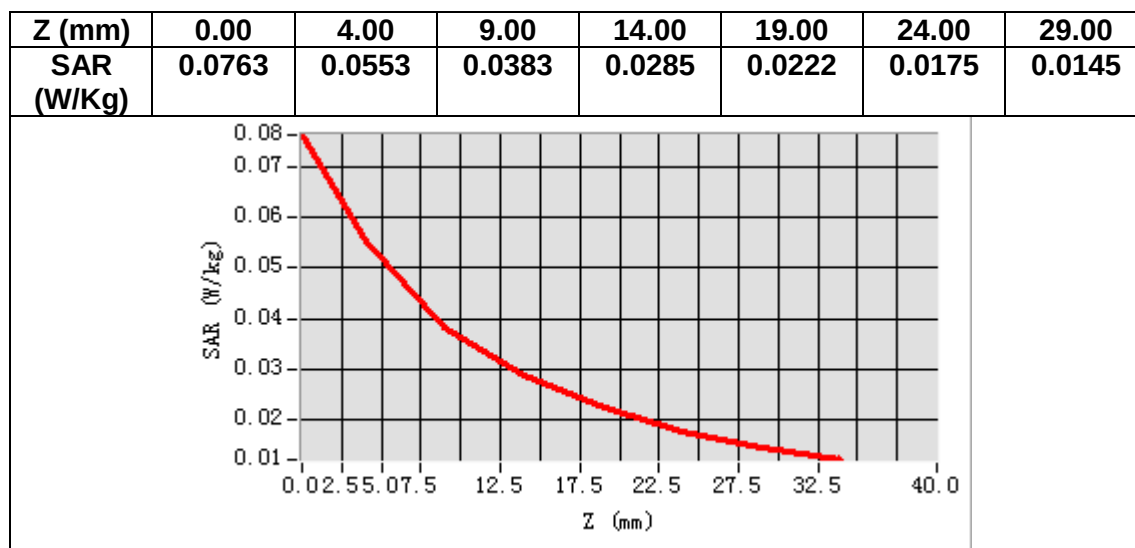
VOLUME SAR



Maximum location: X=-53.00, Y=-55.00

SAR Peak: 0.08 W/kg

SAR 10g (W/Kg)	0.035575
SAR 1g (W/Kg)	0.053688



MEASUREMENT 18

Date of measurement: 25/7/2024

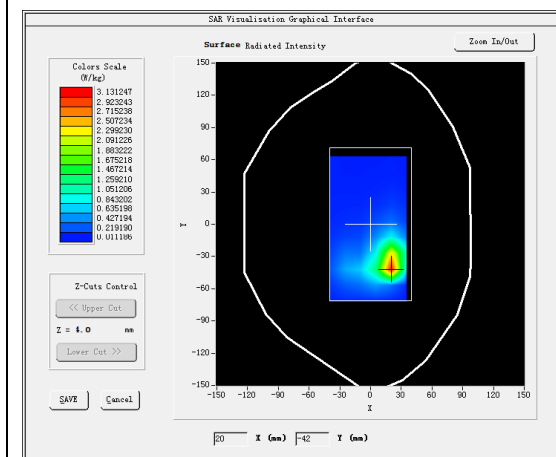
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 3</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

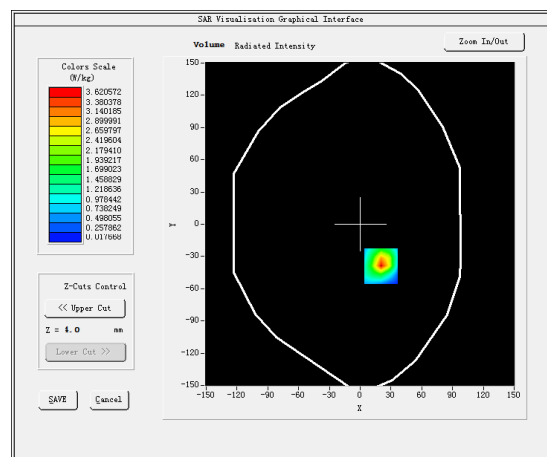
B. SAR Measurement Results

Frequency (MHz)	1747.500000
Relative permittivity (real part)	39.244083
Relative permittivity (imaginary part)	13.728342
Conductivity (S/m)	1.332412
Variation (%)	-3.300000

SURFACE SAR



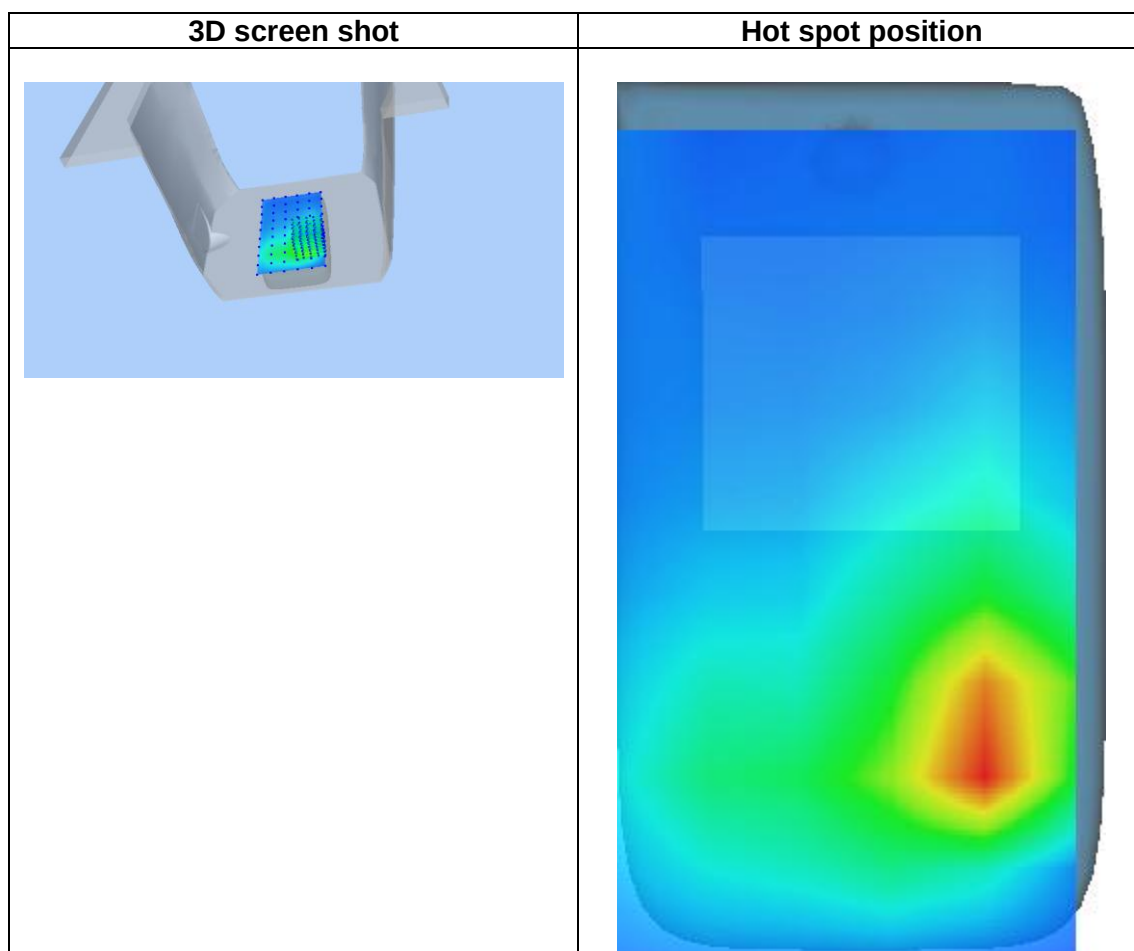
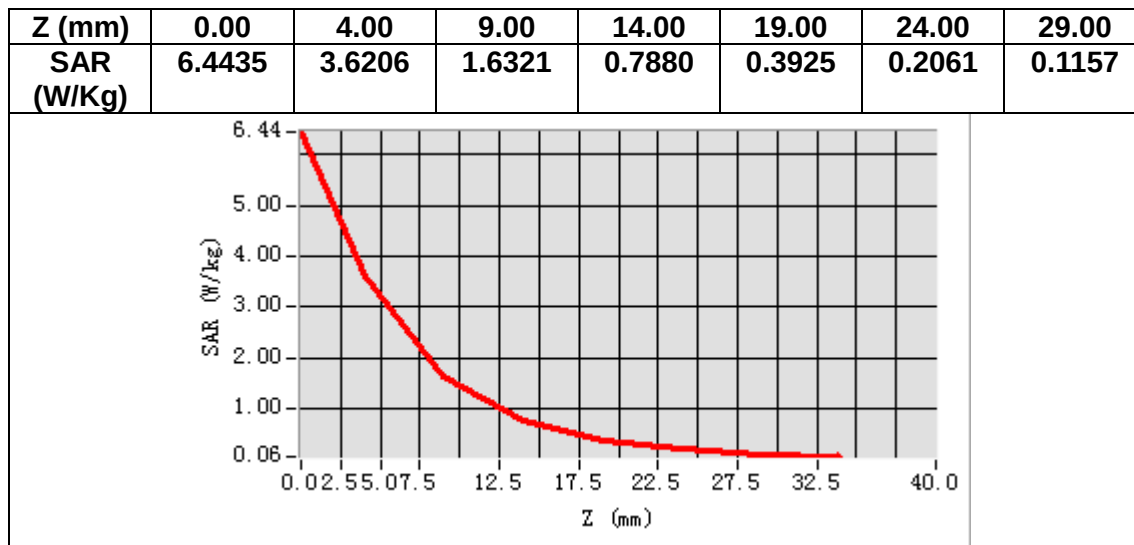
VOLUME SAR



Maximum location: X=20.00, Y=-39.00

SAR Peak: 6.53 W/kg

SAR 10g (W/Kg)	1.394559
SAR 1g (W/Kg)	3.333169



MEASUREMENT 19

Date of measurement: 19/7/2024

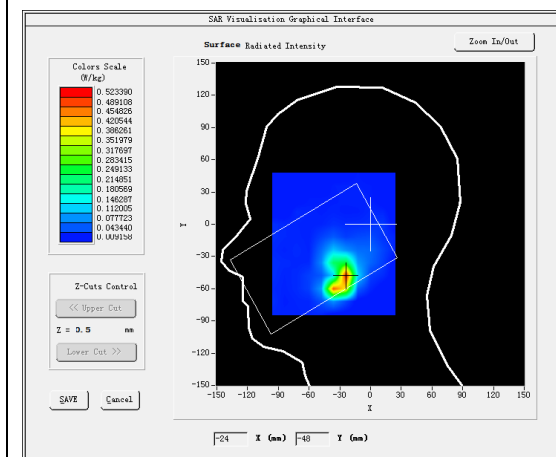
A. Experimental conditions.

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

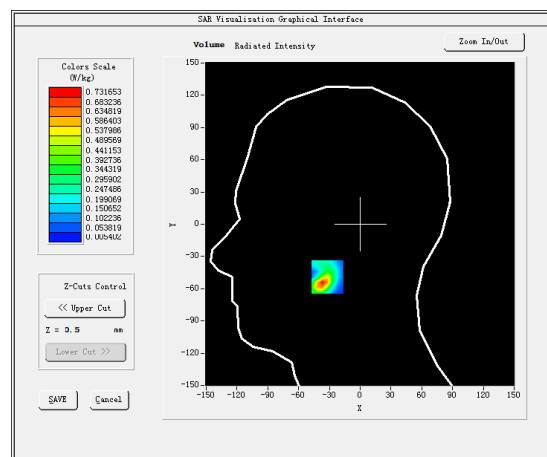
B. SAR Measurement Results

Frequency (MHz)	2560.000000
Relative permittivity (real part)	39.308762
Relative permittivity (imaginary part)	13.844530
Conductivity (S/m)	1.969000
Variation (%)	0.840000

SURFACE SAR



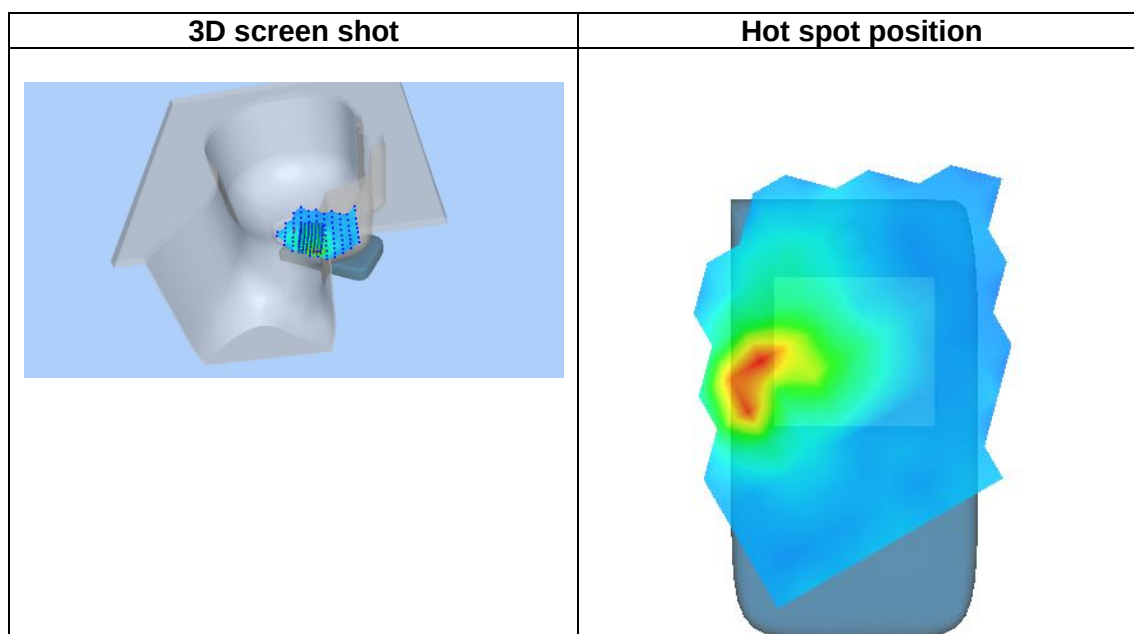
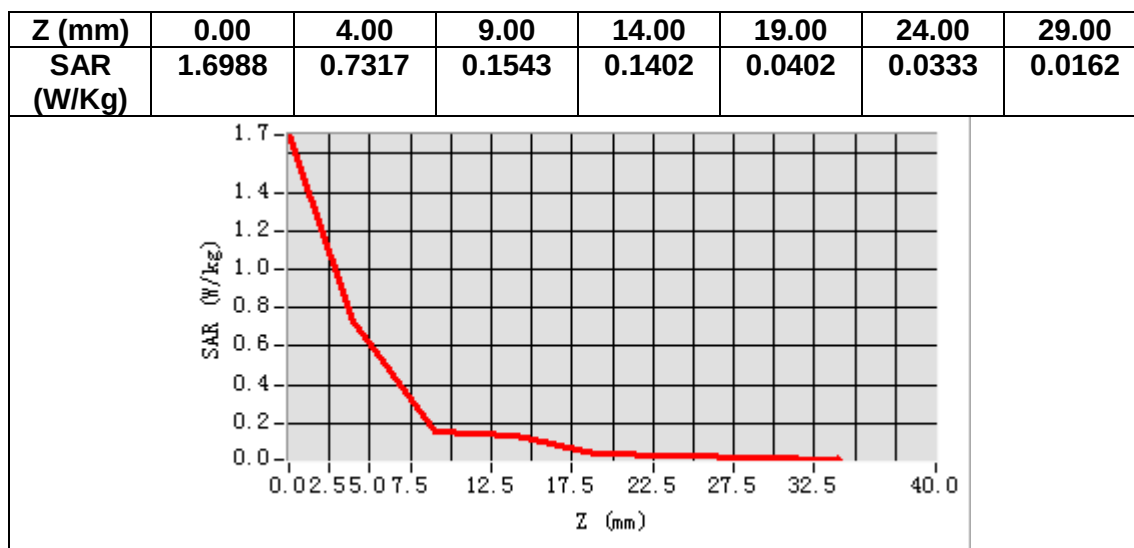
VOLUME SAR



Maximum location: X=-24.00, Y=-49.00

SAR Peak: 1.33 W/kg

SAR 10g (W/Kg)	0.228770
SAR 1g (W/Kg)	0.634952



MEASUREMENT 20

Date of measurement: 19/7/2024

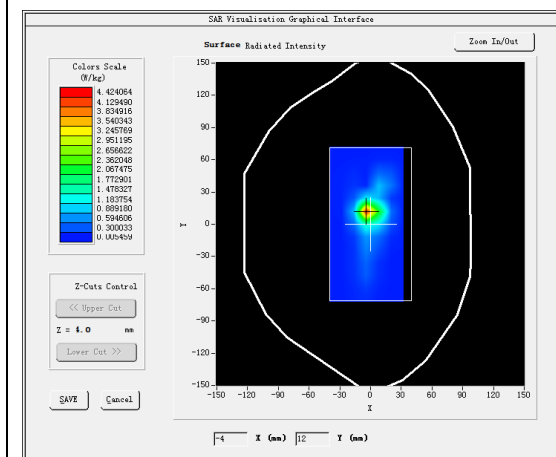
A. Experimental conditions.

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

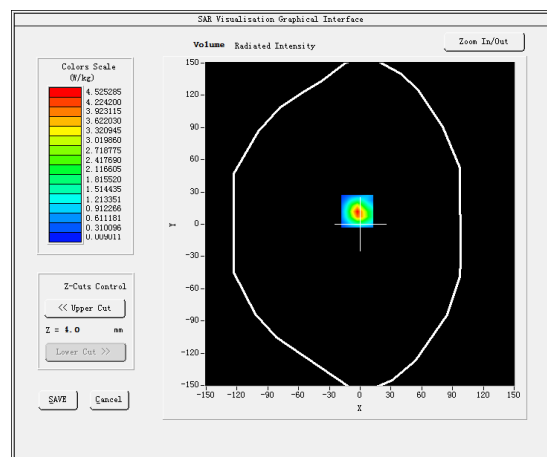
B. SAR Measurement Results

Frequency (MHz)	2560.000000
Relative permittivity (real part)	39.308762
Relative permittivity (imaginary part)	13.844530
Conductivity (S/m)	1.969000
Variation (%)	0.030000

SURFACE SAR



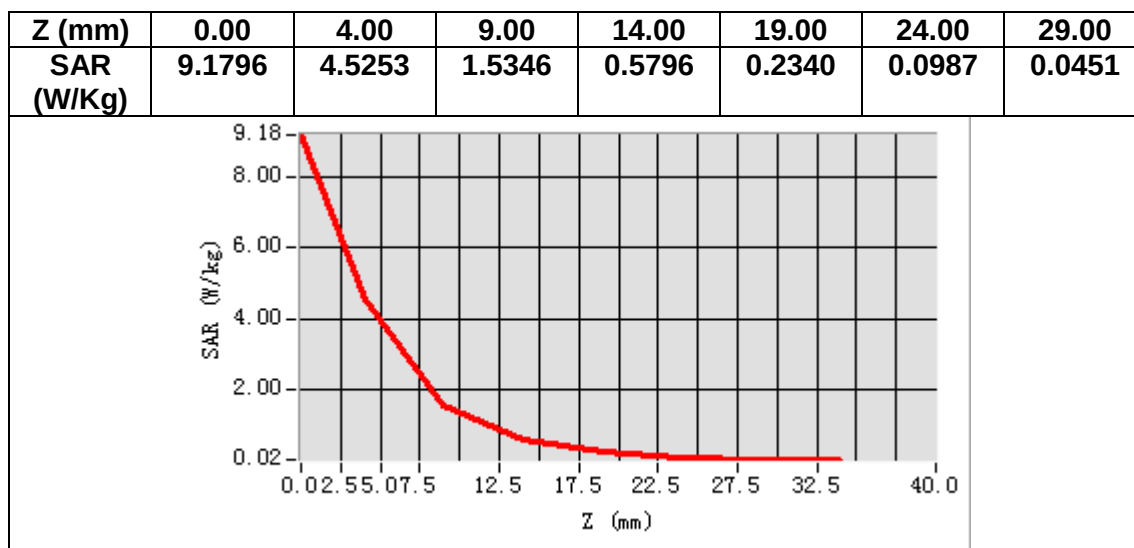
VOLUME SAR



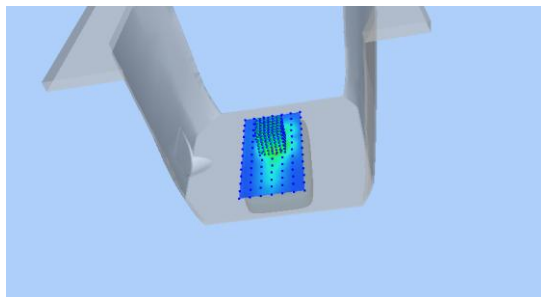
Maximum location: X=-3.00, Y=12.00

SAR Peak: 8.98 W/kg

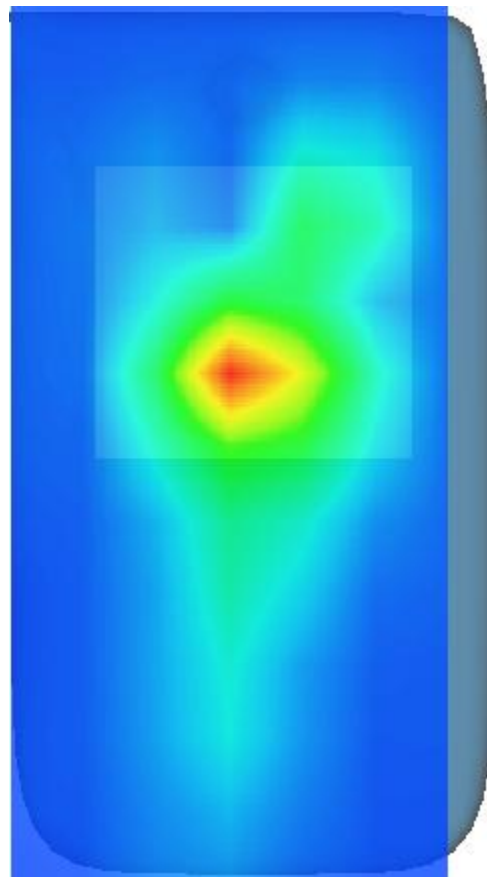
SAR 10g (W/Kg)	1.325775
SAR 1g (W/Kg)	3.949198



3D screen shot



Hot spot position



MEASUREMENT 21

Date of measurement: 24/7/2024

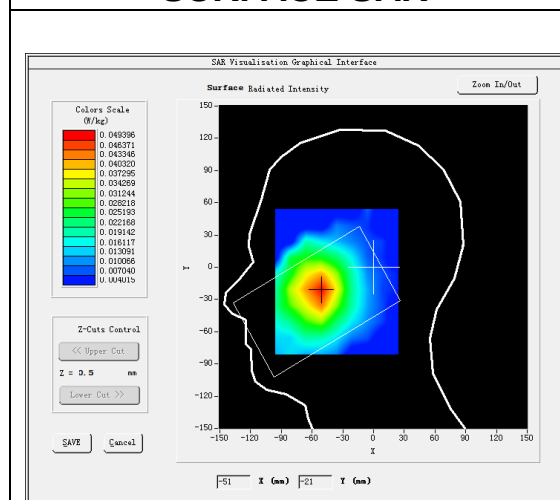
A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>LTE band 8</u>
Channels	<u>Middle</u>
Signal	<u>LTE (Crest factor: 1.0)</u>
ConvF	<u>2.23</u>

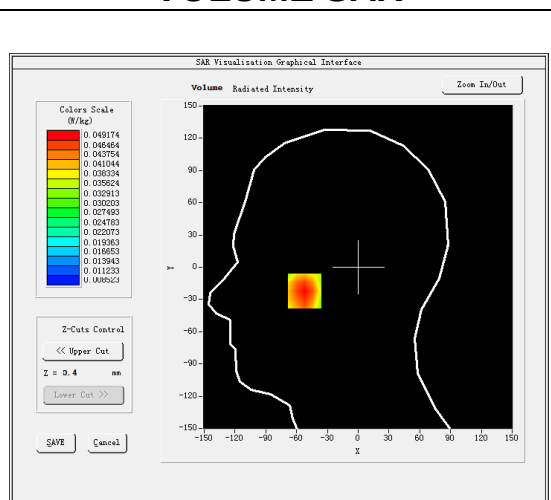
B. SAR Measurement Results

Frequency (MHz)	897.500000
Relative permittivity (real part)	41.235565
Relative permittivity (imaginary part)	19.681707
Conductivity (S/m)	0.980805
Variation (%)	-4.970000

SURFACE SAR



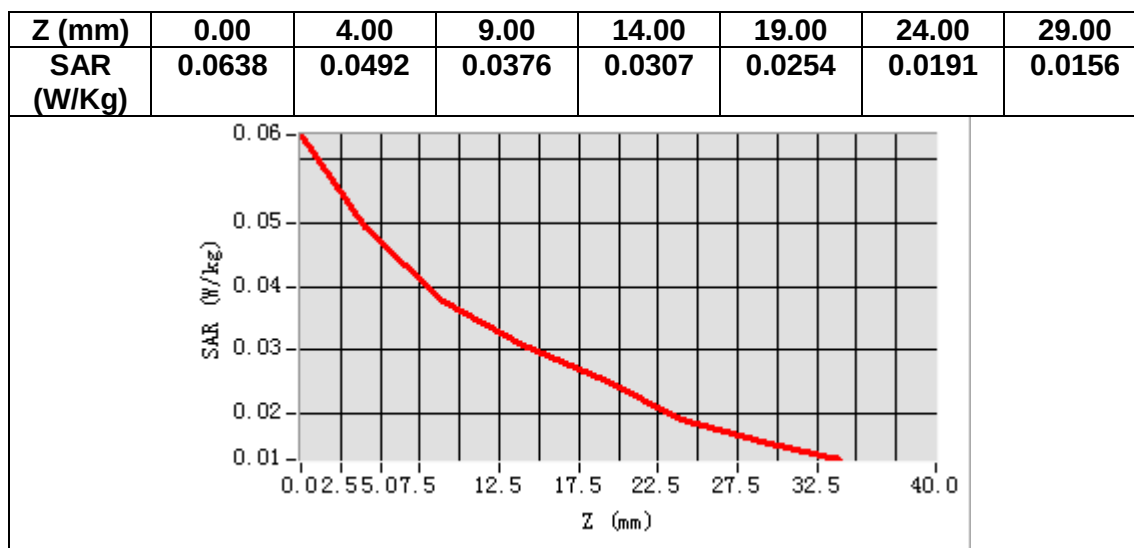
VOLUME SAR



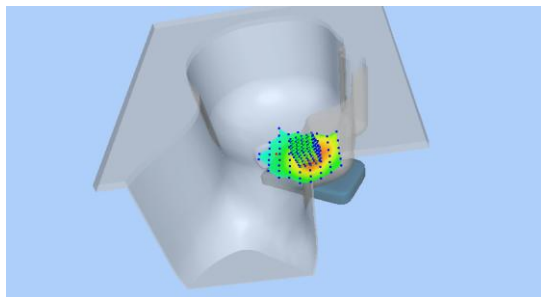
Maximum location: X=-52.00, Y=-22.00

SAR Peak: 0.06 W/kg

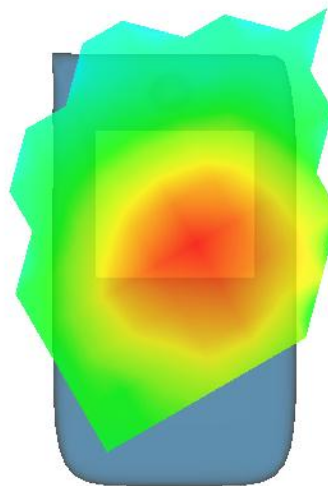
SAR 10g (W/Kg)	0.035582
SAR 1g (W/Kg)	0.048760



3D screen shot



Hot spot position



MEASUREMENT 22

Date of measurement: 24/7/2024

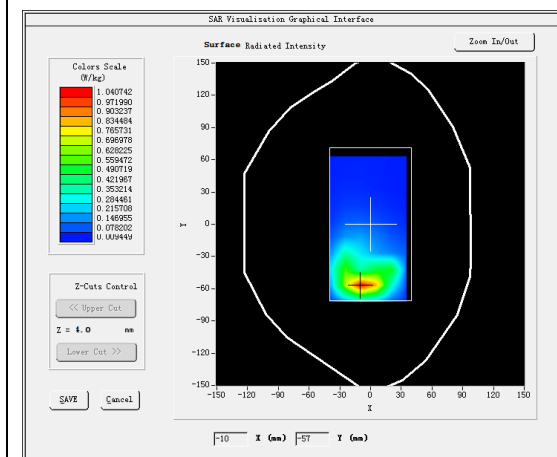
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 8</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

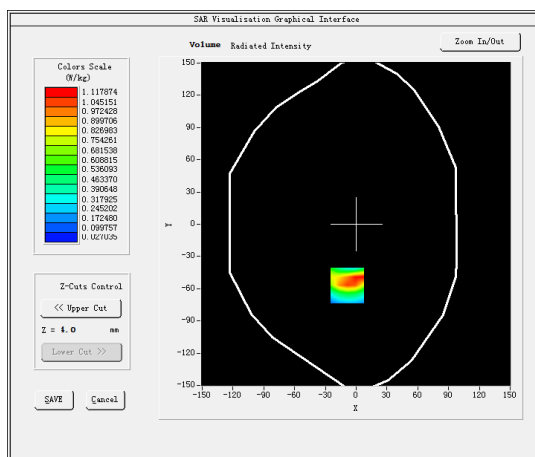
B. SAR Measurement Results

Frequency (MHz)	897.500000
Relative permittivity (real part)	41.235565
Relative permittivity (imaginary part)	19.681707
Conductivity (S/m)	0.980805
Variation (%)	0.350000

SURFACE SAR



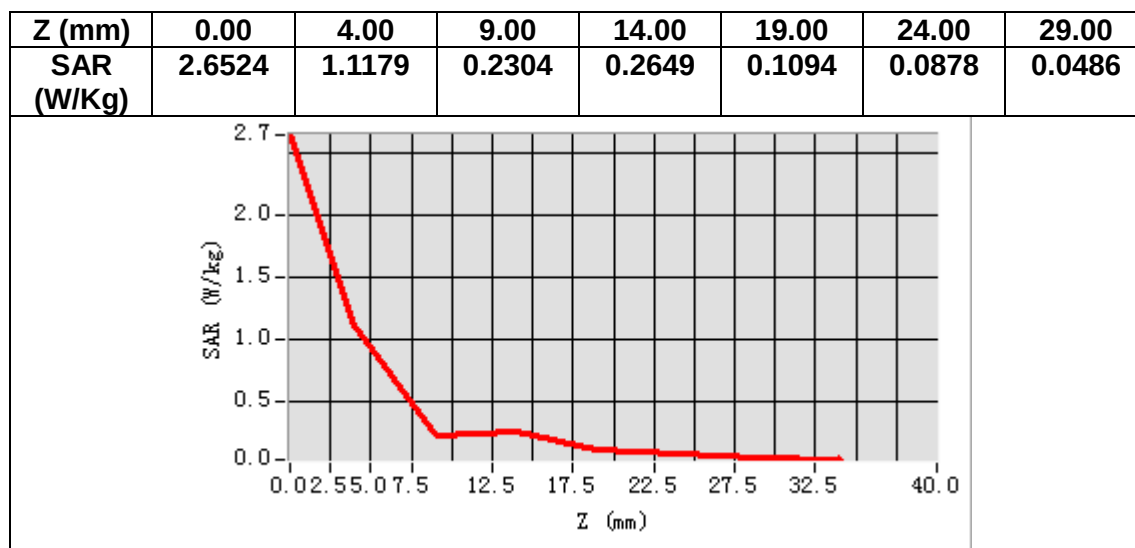
VOLUME SAR



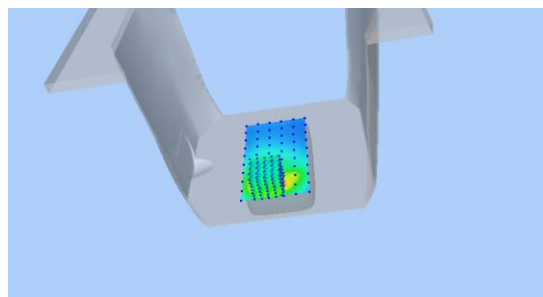
Maximum location: X=-9.00, Y=-57.00

SAR Peak: 2.09 W/kg

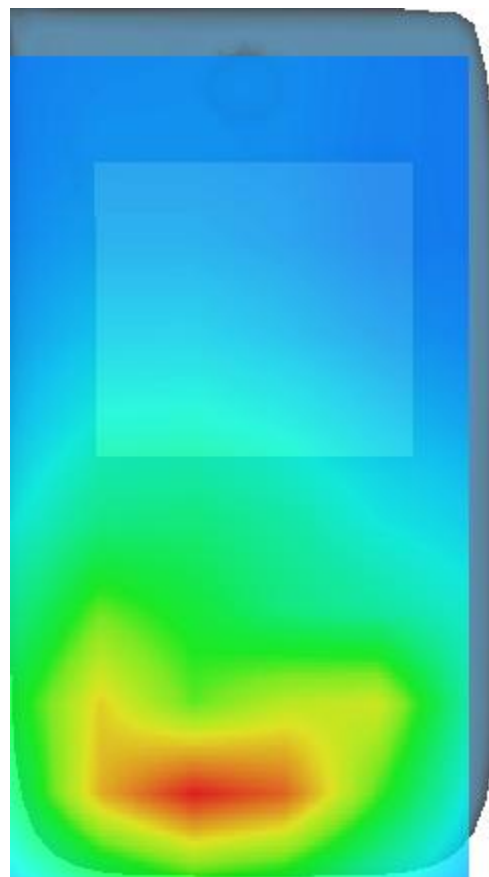
SAR 10g (W/Kg)	0.523596
SAR 1g (W/Kg)	1.104972



3D screen shot



Hot spot position



MEASUREMENT 23

Date of measurement: 24/7/2024

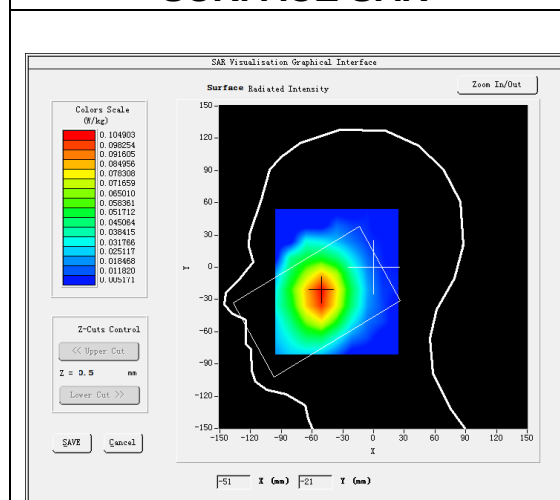
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 20</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

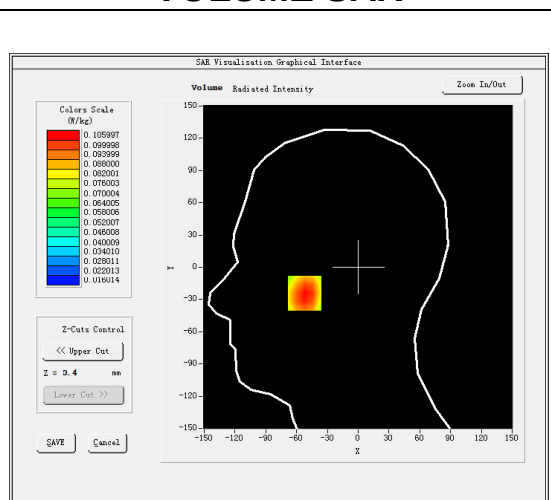
B. SAR Measurement Results

Frequency (MHz)	847.000000
Relative permittivity (real part)	41.854362
Relative permittivity (imaginary part)	19.466806
Conductivity (S/m)	0.916021
Variation (%)	-0.460000

SURFACE SAR



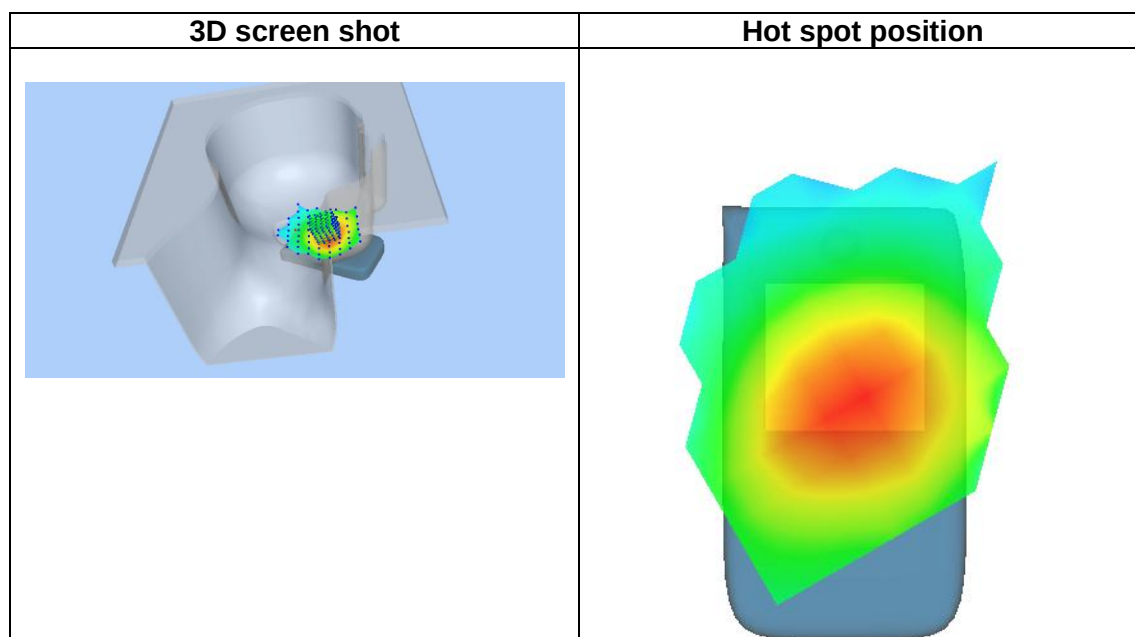
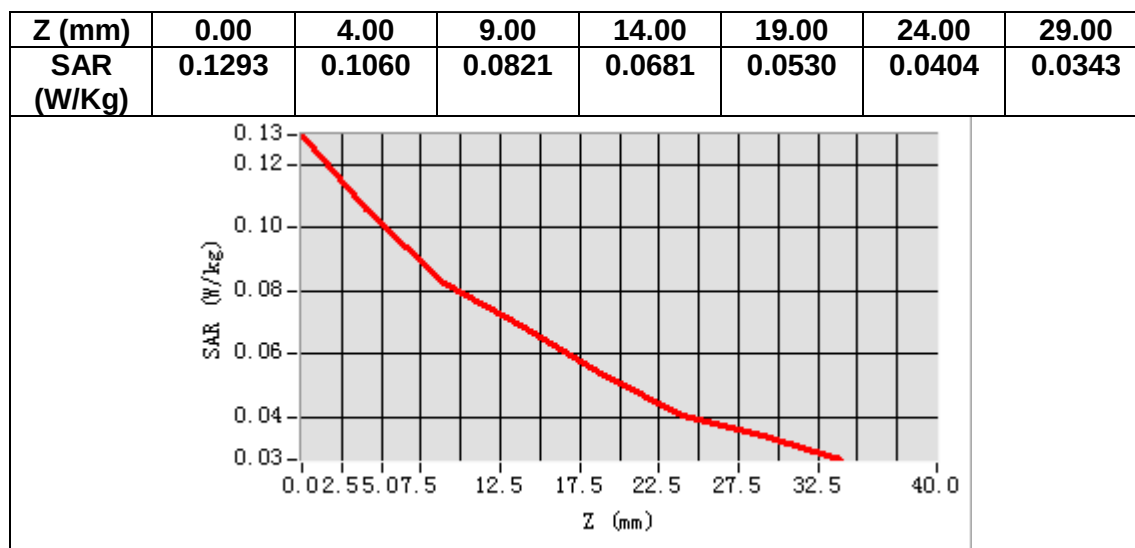
VOLUME SAR



Maximum location: X=-52.00, Y=-24.00

SAR Peak: 0.13 W/kg

SAR 10g (W/Kg)	0.075712
SAR 1g (W/Kg)	0.102920



MEASUREMENT 24

Date of measurement: 24/7/2024

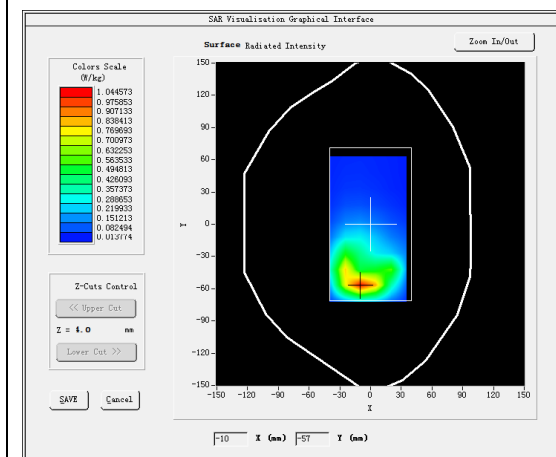
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 20</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

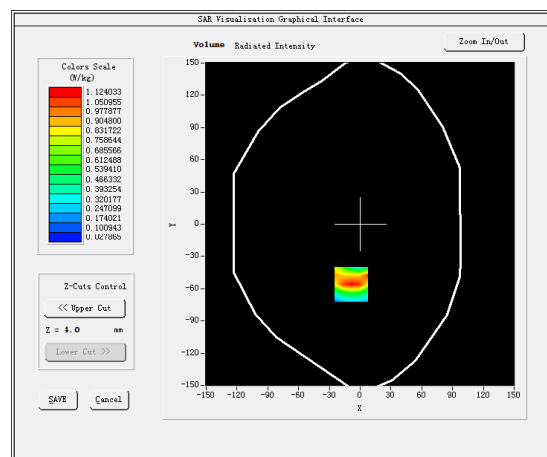
B. SAR Measurement Results

Frequency (MHz)	847.000000
Relative permittivity (real part)	41.854362
Relative permittivity (imaginary part)	19.466806
Conductivity (S/m)	0.916021
Variation (%)	-0.210000

SURFACE SAR



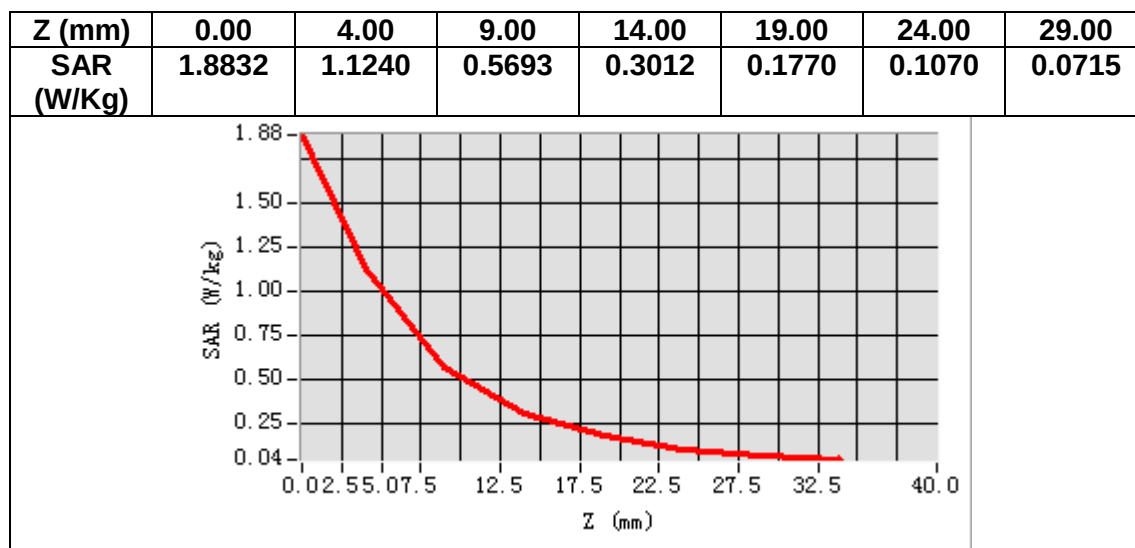
VOLUME SAR



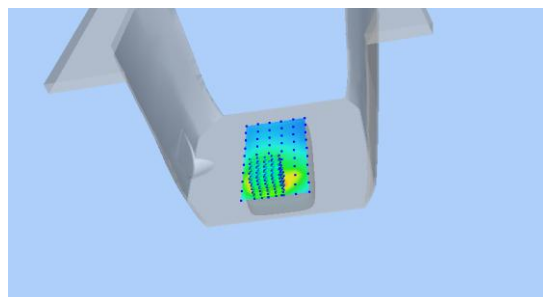
Maximum location: X=-9.00, Y=-56.00

SAR Peak: 1.96 W/kg

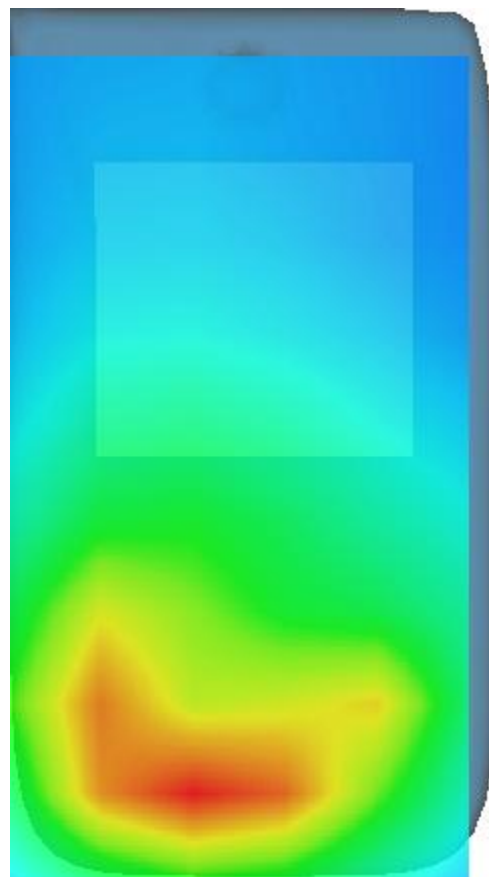
SAR 10g (W/Kg)	0.514531
SAR 1g (W/Kg)	1.030395



3D screen shot



Hot spot position



MEASUREMENT 25

Date of measurement: 19/7/2024

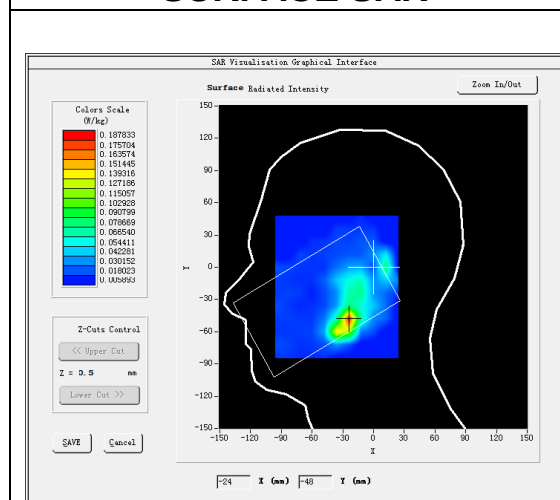
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 38</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

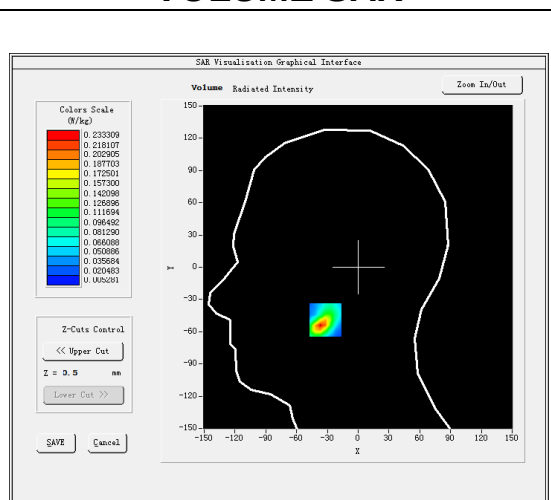
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	39.093365
Relative permittivity (imaginary part)	13.990630
Conductivity (S/m)	2.016982
Variation (%)	-2.750000

SURFACE SAR



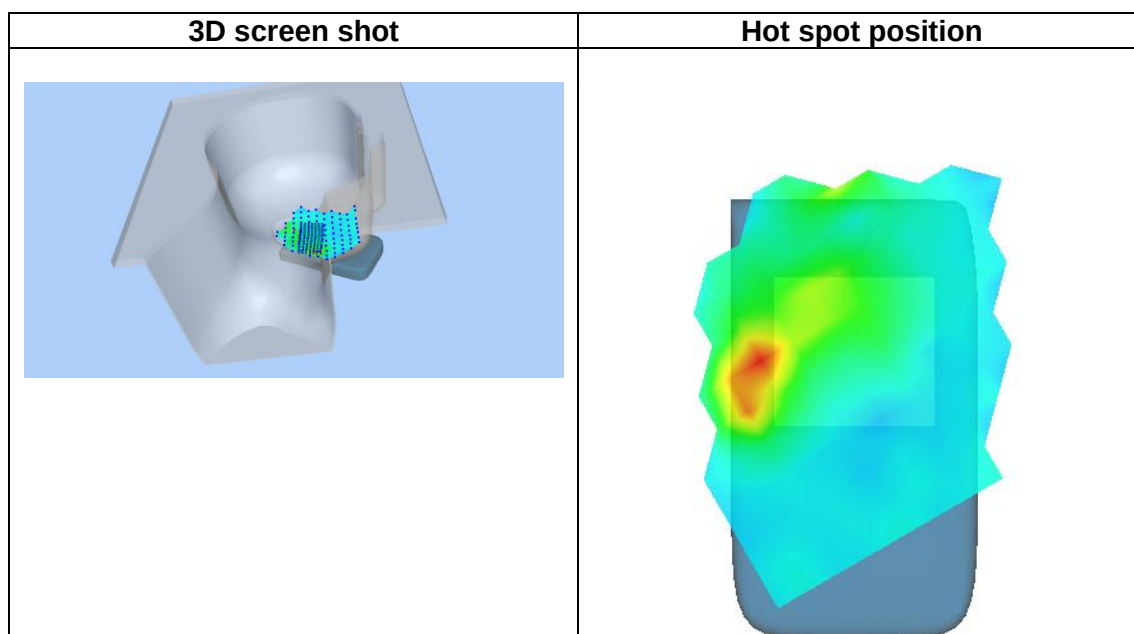
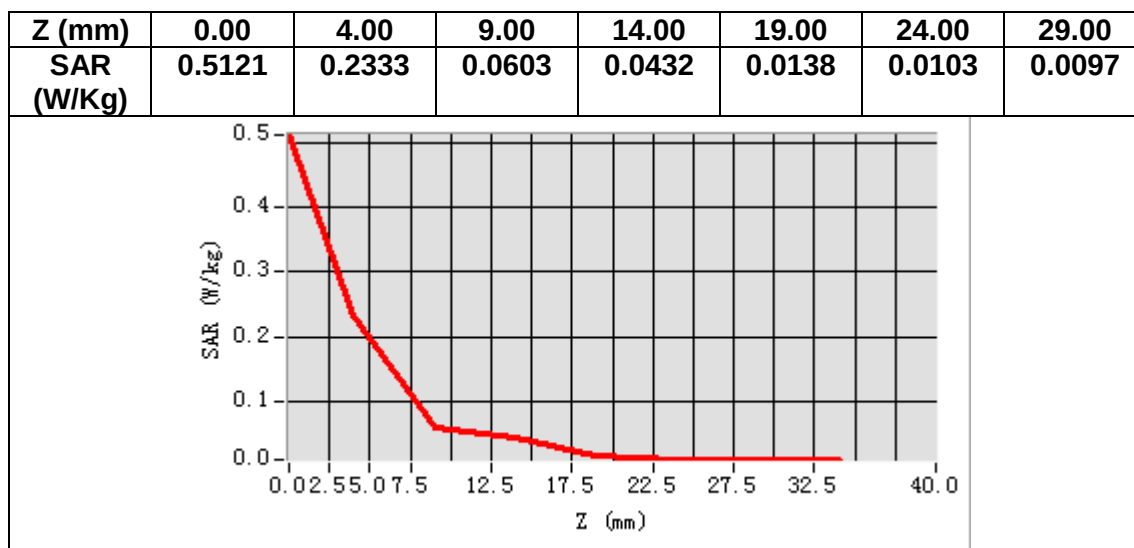
VOLUME SAR



Maximum location: X=-24.00, Y=-49.00

SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)	0.077026
SAR 1g (W/Kg)	0.204818



MEASUREMENT 26

Date of measurement: 19/7/2024

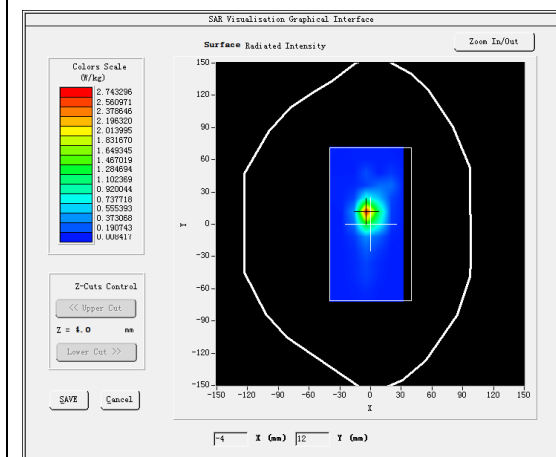
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 38</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

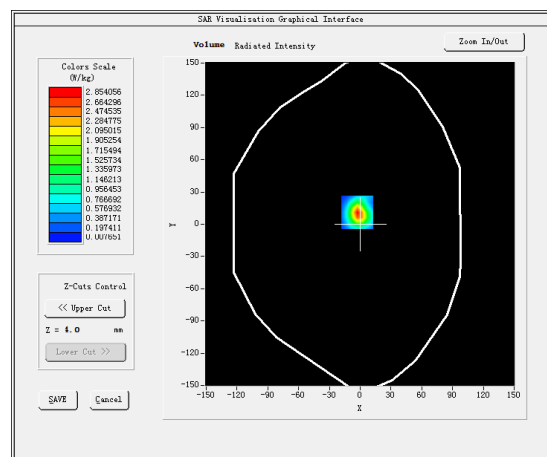
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	39.093365
Relative permittivity (imaginary part)	13.990630
Conductivity (S/m)	2.016982
Variation (%)	0.140000

SURFACE SAR



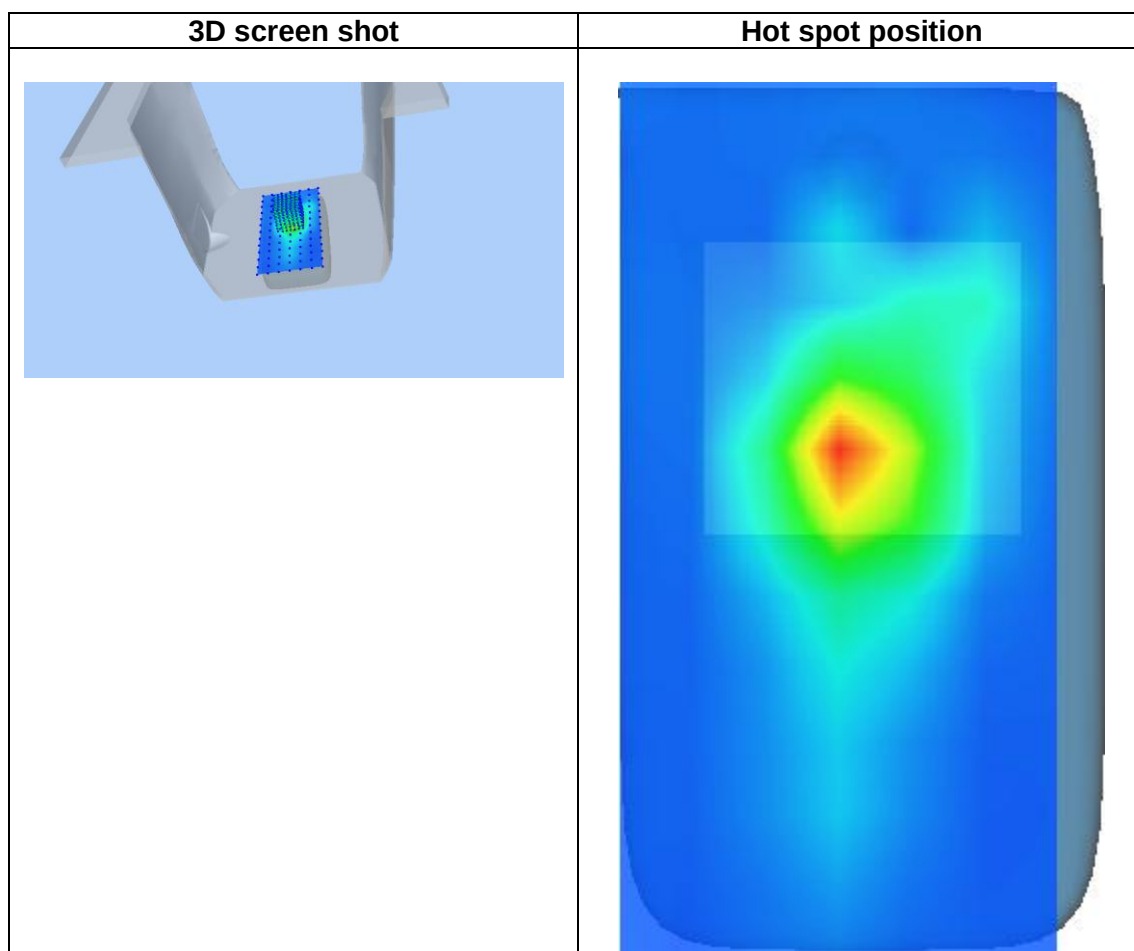
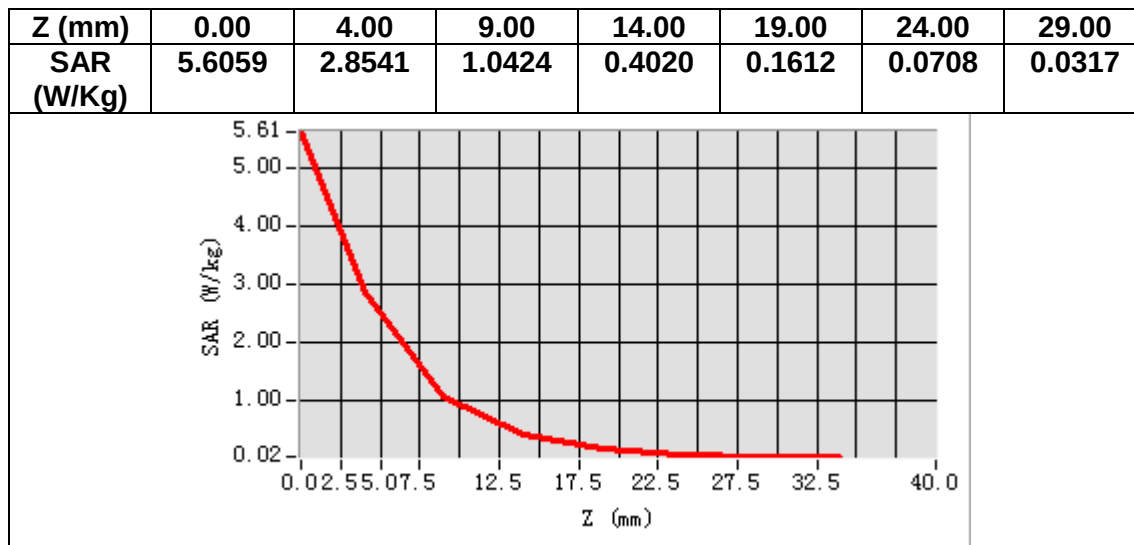
VOLUME SAR



Maximum location: X=-3.00, Y=11.00

SAR Peak: 5.53 W/kg

SAR 10g (W/Kg)	0.886272
SAR 1g (W/Kg)	2.541778



MEASUREMENT 27

Date of measurement: 29/7/2024

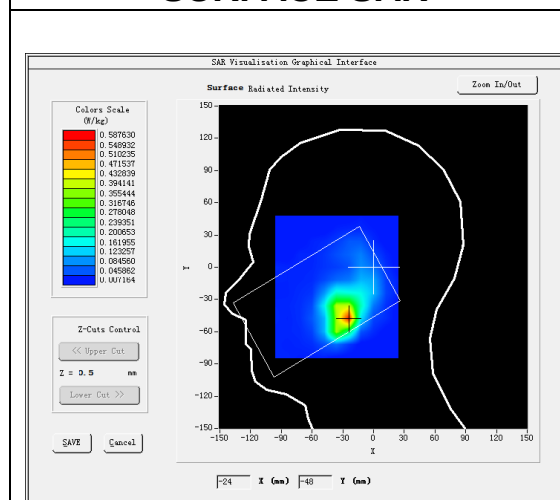
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 40</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.81</u>

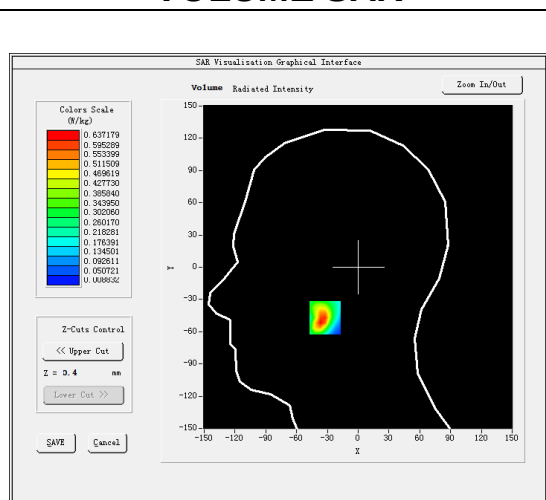
B. SAR Measurement Results

Frequency (MHz)	2350.000000
Relative permittivity (real part)	39.139011
Relative permittivity (imaginary part)	12.981014
Conductivity (S/m)	1.694743
Variation (%)	-0.650000

SURFACE SAR



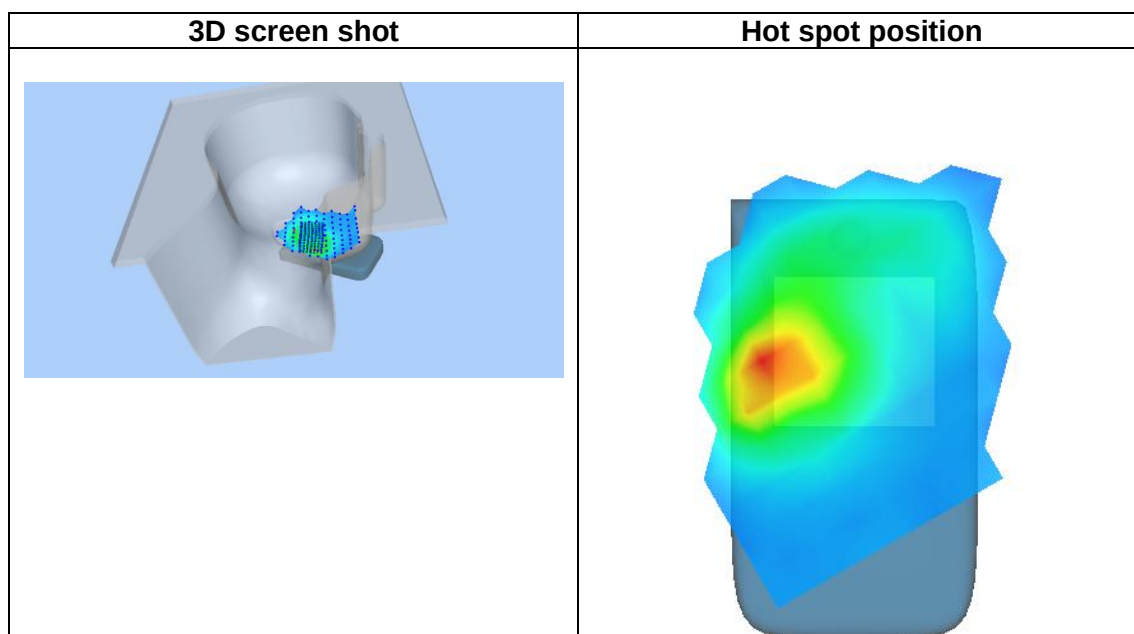
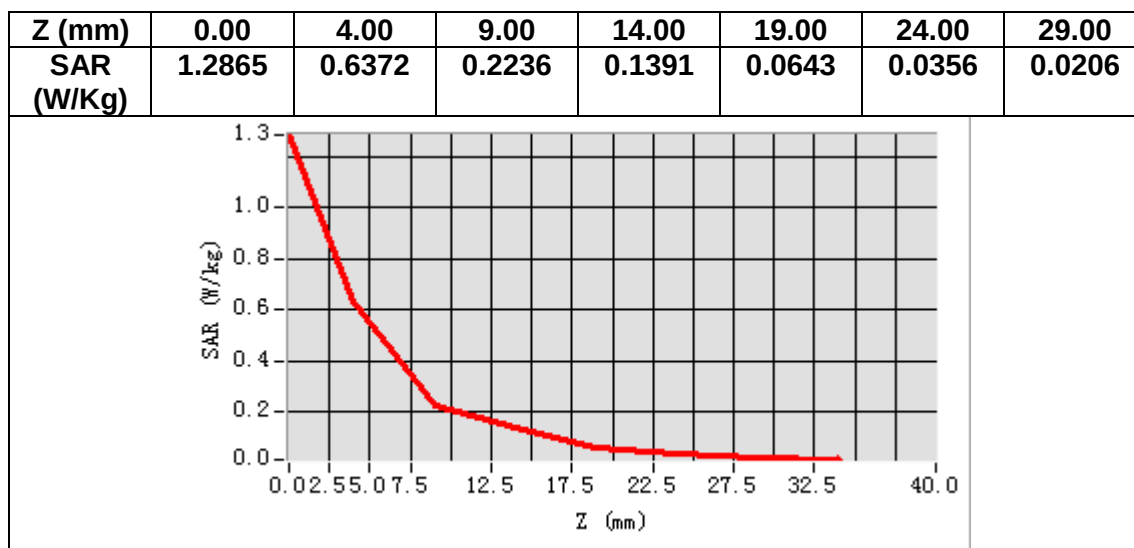
VOLUME SAR



Maximum location: X=-25.00, Y=-47.00

SAR Peak: 1.10 W/kg

SAR 10g (W/Kg)	0.254130
SAR 1g (W/Kg)	0.582399



MEASUREMENT 28

Date of measurement: 29/7/2024

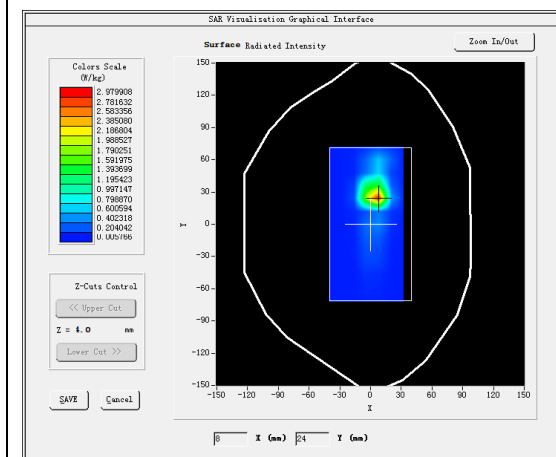
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 40</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.81</u>

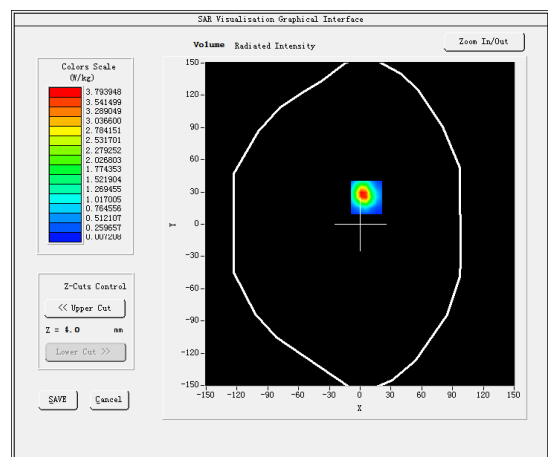
B. SAR Measurement Results

Frequency (MHz)	2350.000000
Relative permittivity (real part)	39.139011
Relative permittivity (imaginary part)	12.981014
Conductivity (S/m)	1.694743
Variation (%)	2.420000

SURFACE SAR



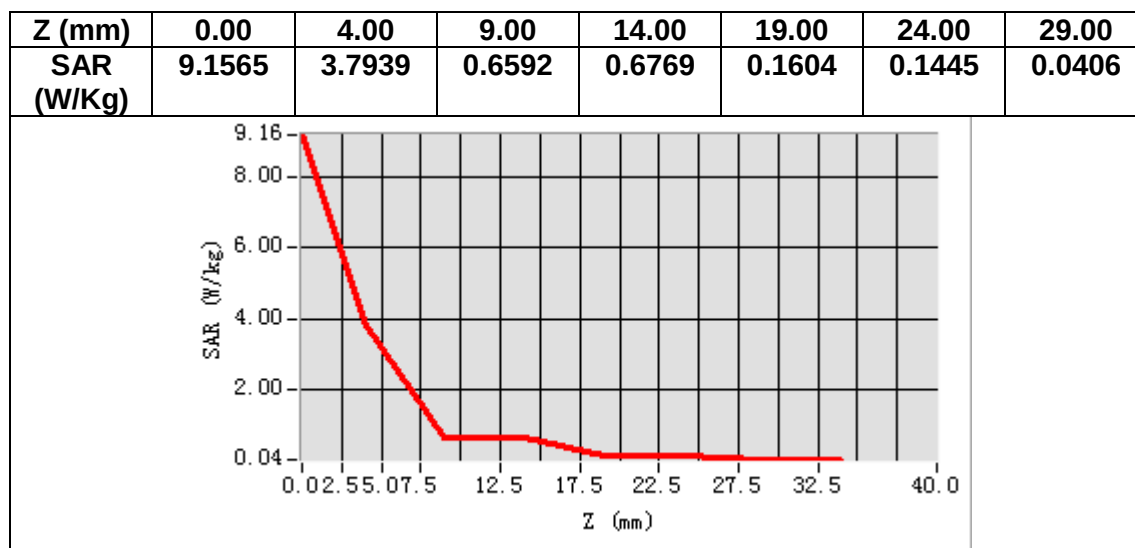
VOLUME SAR



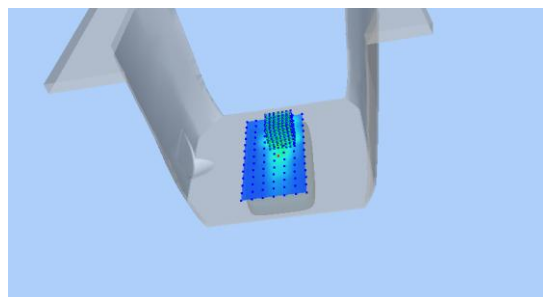
Maximum location: X=6.00, Y=25.00

SAR Peak: 7.60 W/kg

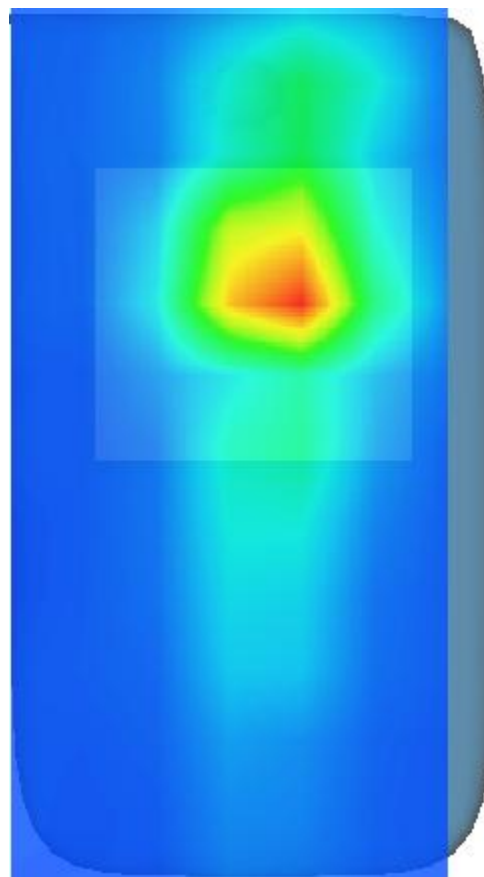
SAR 10g (W/Kg)	1.153508
SAR 1g (W/Kg)	3.493971



3D screen shot



Hot spot position



MEASUREMENT 29

Date of measurement: 19/7/2024

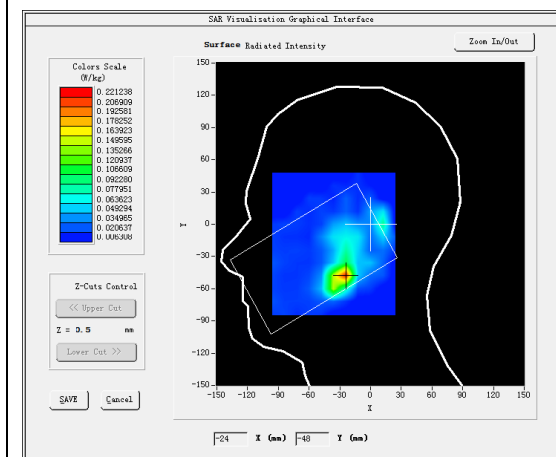
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

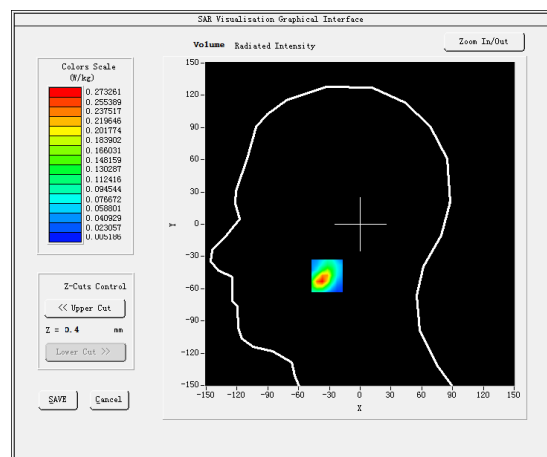
B. SAR Measurement Results

Frequency (MHz)	2593.000000
Relative permittivity (real part)	39.179764
Relative permittivity (imaginary part)	13.940430
Conductivity (S/m)	2.008196
Variation (%)	3.800000

SURFACE SAR



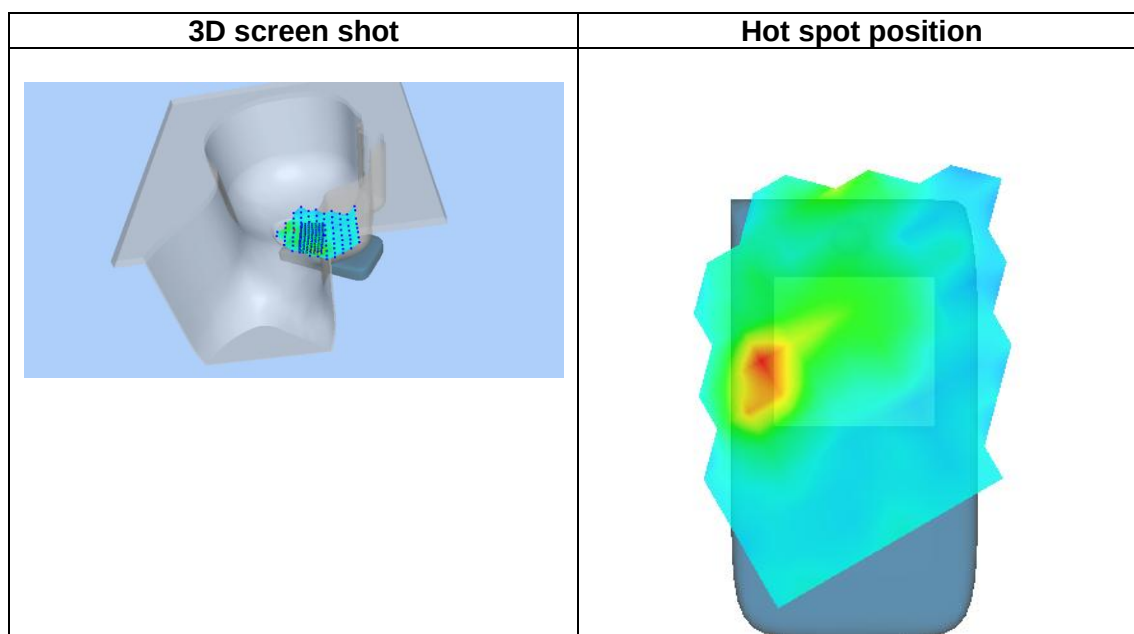
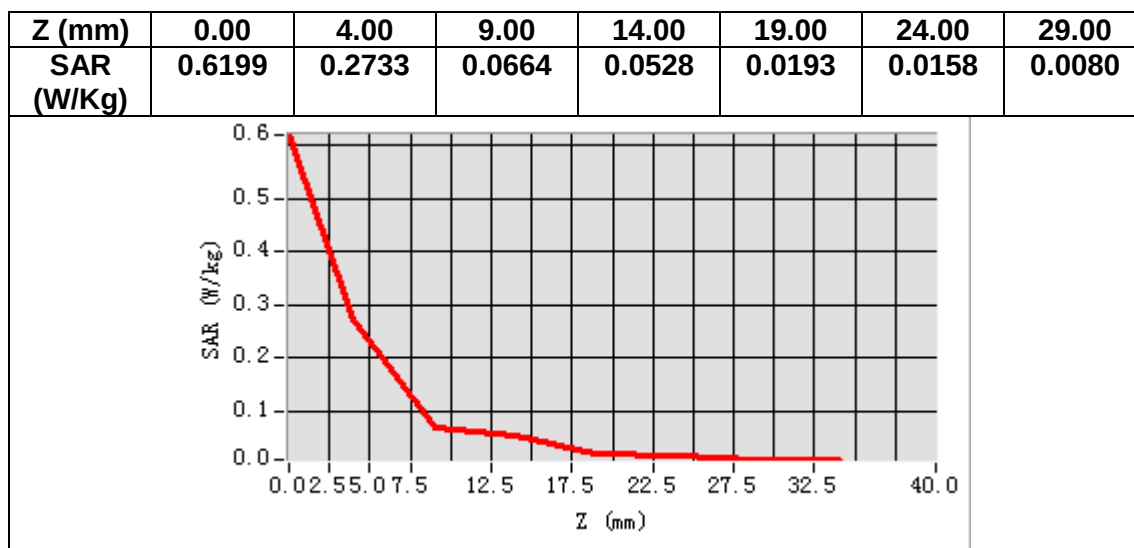
VOLUME SAR



Maximum location: X=-25.00, Y=-48.00

SAR Peak: 0.50 W/kg

SAR 10g (W/Kg)	0.088605
SAR 1g (W/Kg)	0.238570



MEASUREMENT 30

Date of measurement: 19/7/2024

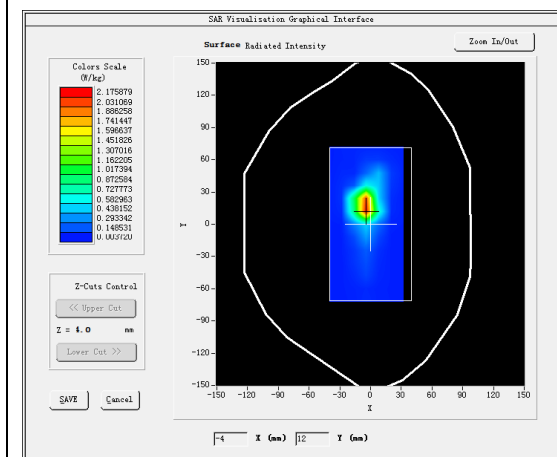
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

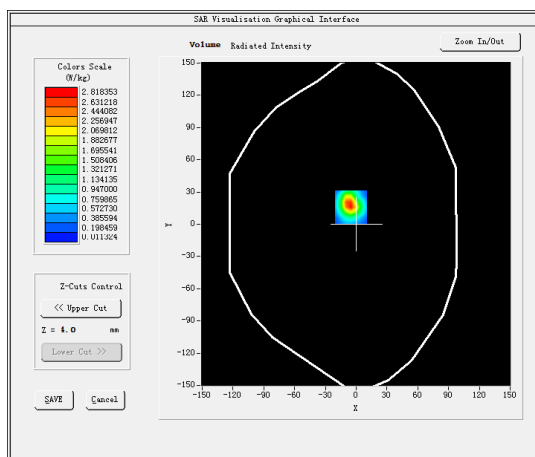
B. SAR Measurement Results

Frequency (MHz)	2593.000000
Relative permittivity (real part)	39.179764
Relative permittivity (imaginary part)	13.940430
Conductivity (S/m)	2.008196
Variation (%)	2.370000

SURFACE SAR



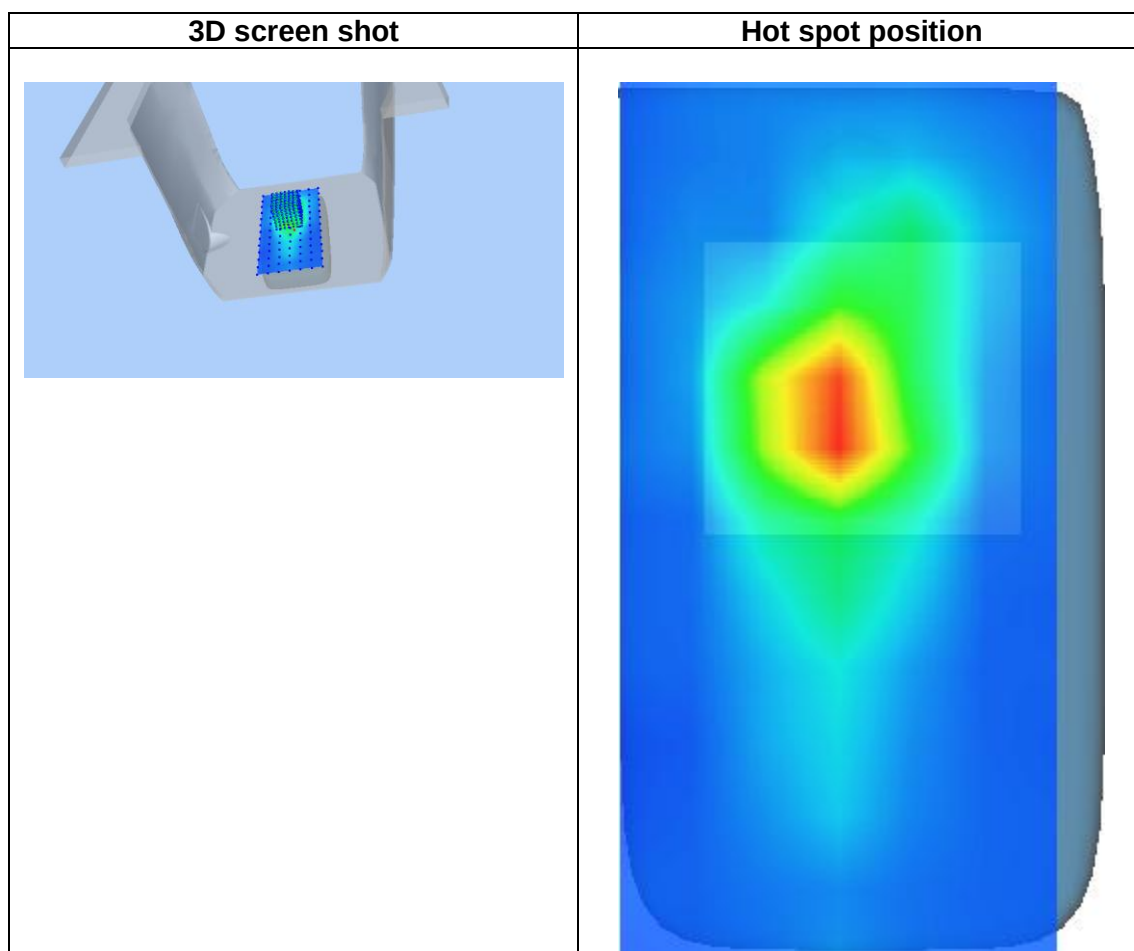
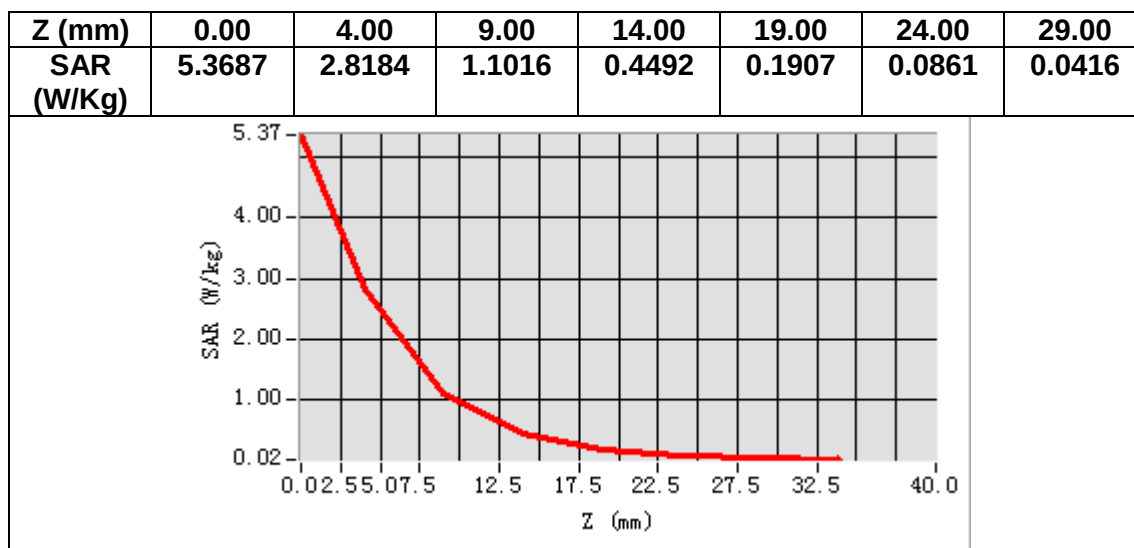
VOLUME SAR



Maximum location: X=-5.00, Y=16.00

SAR Peak: 5.49 W/kg

SAR 10g (W/Kg)	0.923100
SAR 1g (W/Kg)	2.586629



MEASUREMENT 31

Date of measurement: 29/7/2024

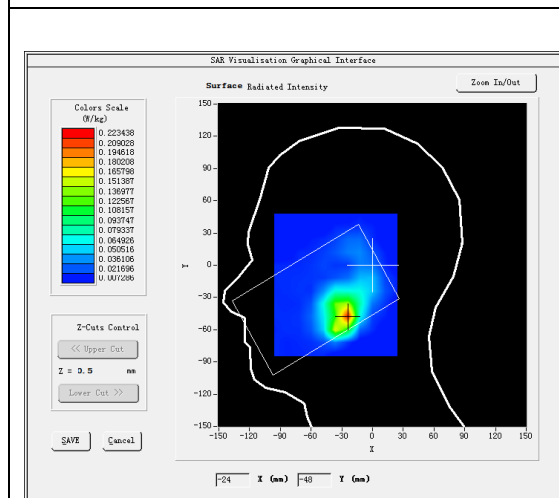
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n40</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.81</u>

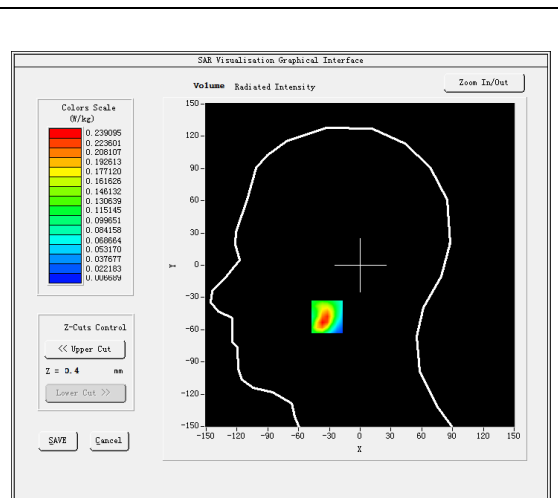
B. SAR Measurement Results

Frequency (MHz)	2350.000000
Relative permittivity (real part)	39.139011
Relative permittivity (imaginary part)	12.981014
Conductivity (S/m)	1.694743
Variation (%)	0.250000

SURFACE SAR



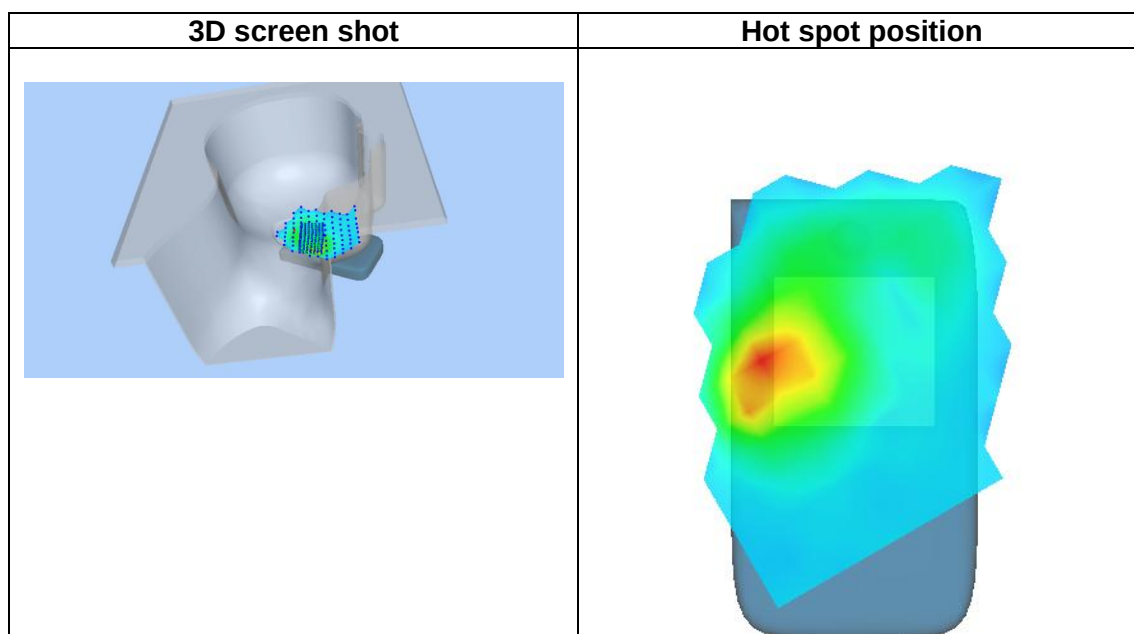
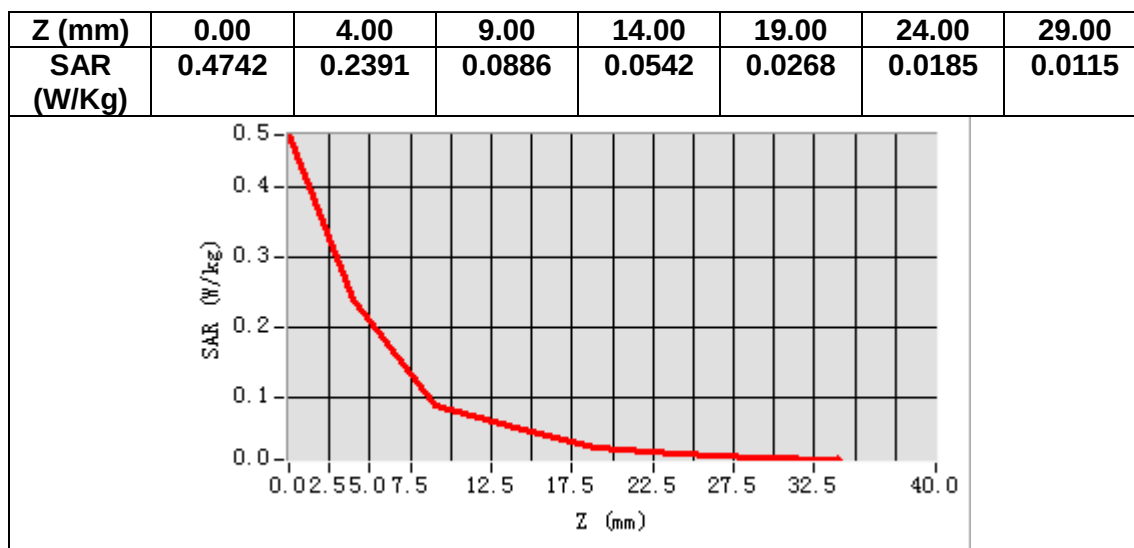
VOLUME SAR



Maximum location: X=-25.00, Y=-48.00

SAR Peak: 0.42 W/kg

SAR 10g (W/Kg)	0.095475
SAR 1g (W/Kg)	0.218251



MEASUREMENT 32

Date of measurement: 29/7/2024

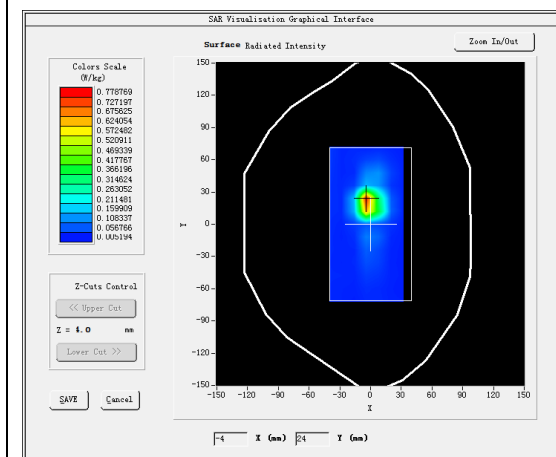
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n40</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.81</u>

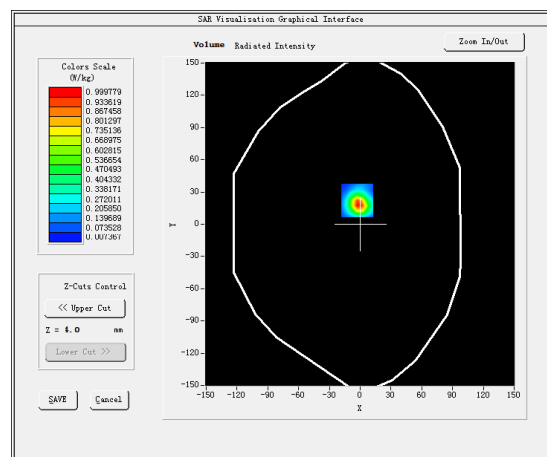
B. SAR Measurement Results

Frequency (MHz)	2350.000000
Relative permittivity (real part)	39.139011
Relative permittivity (imaginary part)	12.981014
Conductivity (S/m)	1.694743
Variation (%)	-0.060000

SURFACE SAR



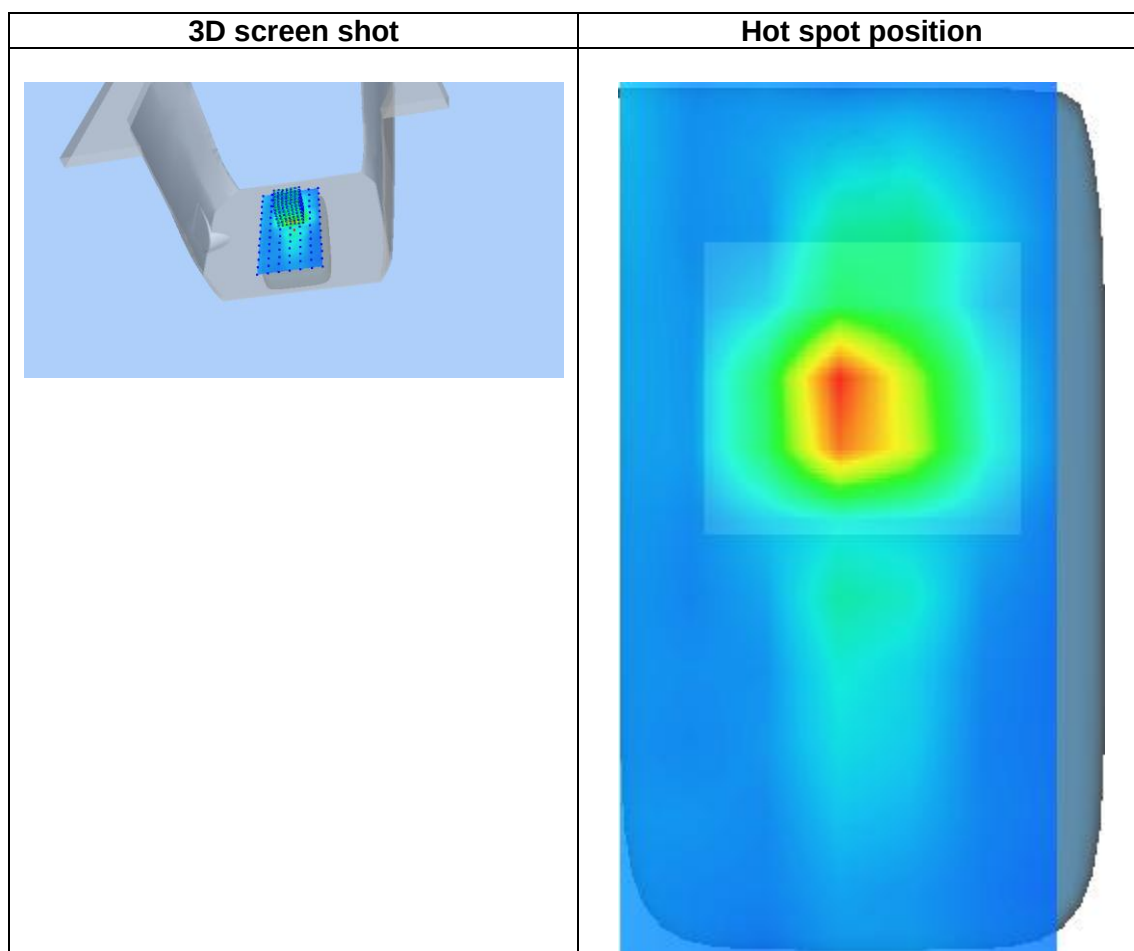
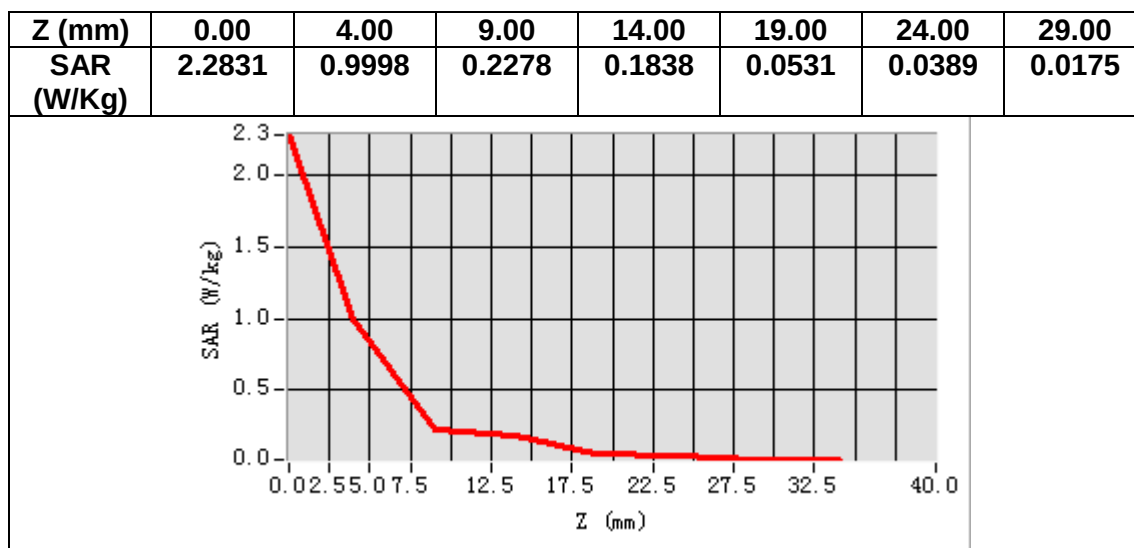
VOLUME SAR



Maximum location: X=-3.00, Y=22.00

SAR Peak: 1.89 W/kg

SAR 10g (W/Kg)	0.308553
SAR 1g (W/Kg)	0.891389



MEASUREMENT 33

Date of measurement: 6/8/2024

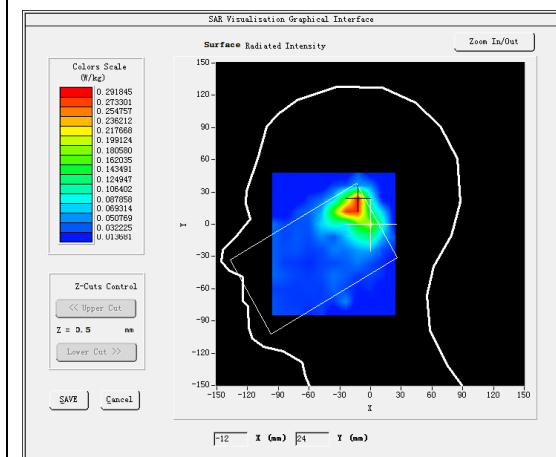
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n77</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.11</u>

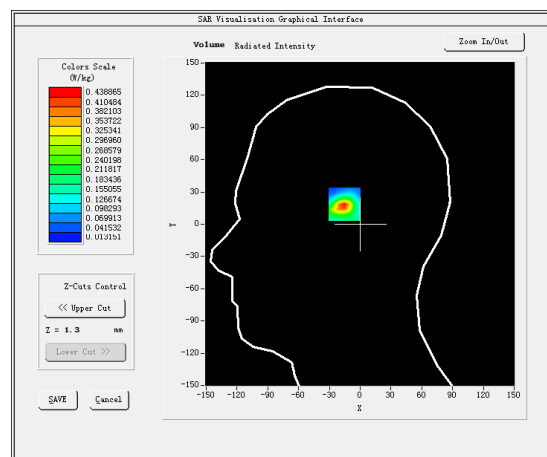
B. SAR Measurement Results

Frequency (MHz)	3750.000000
Relative permittivity (real part)	37.121483
Relative permittivity (imaginary part)	15.235740
Conductivity (S/m)	3.174113
Variation (%)	-3.780000

SURFACE SAR



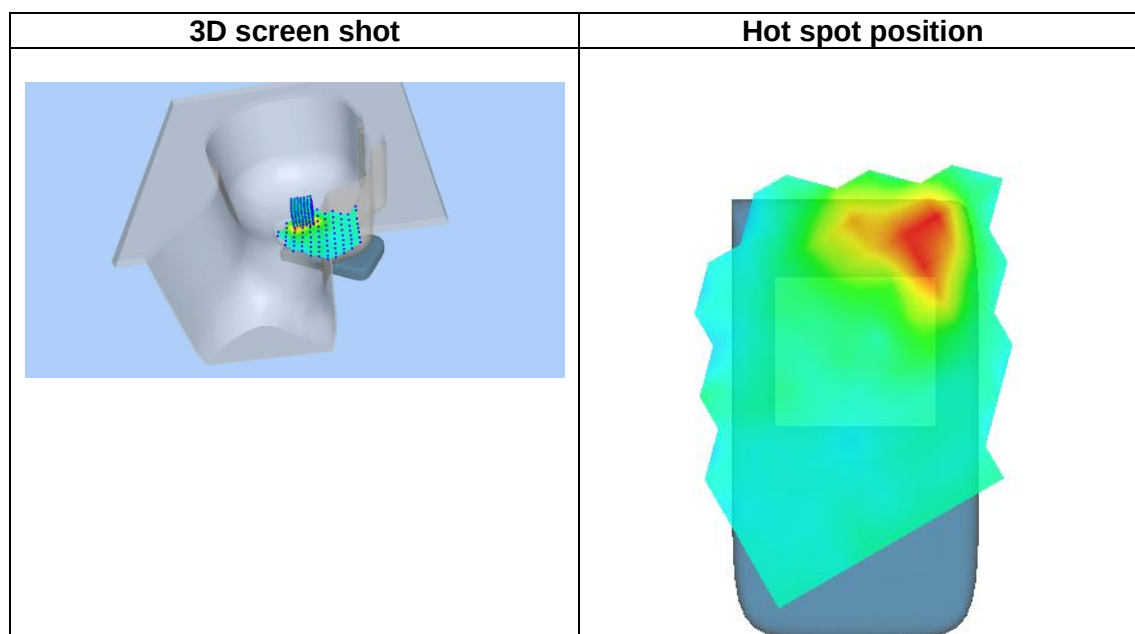
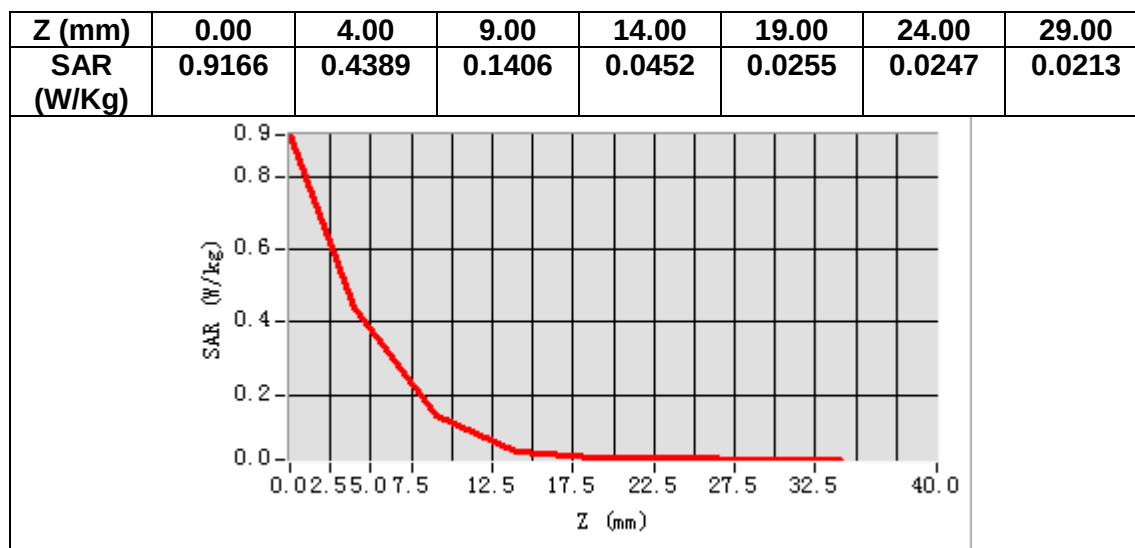
VOLUME SAR



Maximum location: X=-14.00, Y=20.00

SAR Peak: 0.93 W/kg

SAR 10g (W/Kg)	0.141509
SAR 1g (W/Kg)	0.399254



MEASUREMENT 34

Date of measurement: 6/8/2024

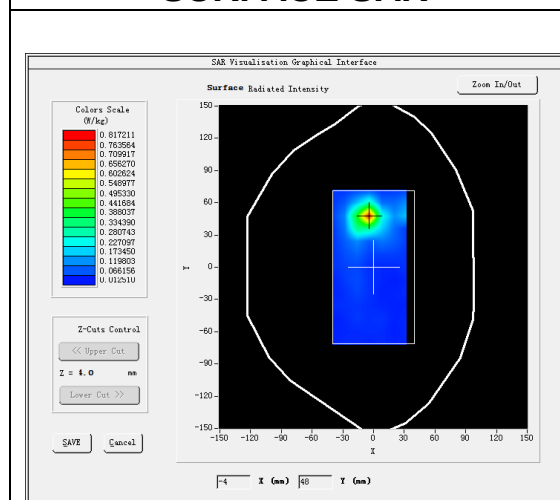
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n77</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.11</u>

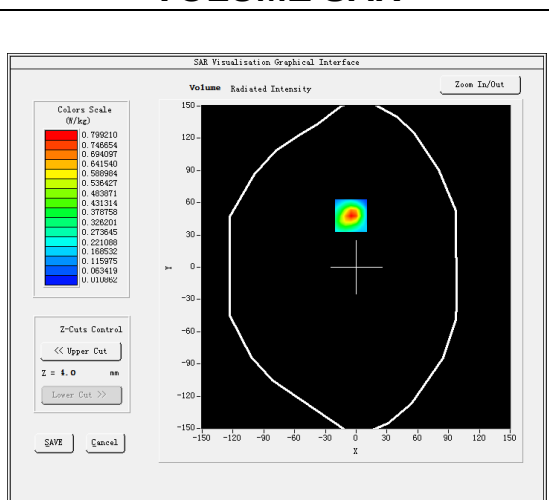
B. SAR Measurement Results

Frequency (MHz)	3750.000000
Relative permittivity (real part)	37.121483
Relative permittivity (imaginary part)	15.235740
Conductivity (S/m)	3.174113
Variation (%)	0.530000

SURFACE SAR



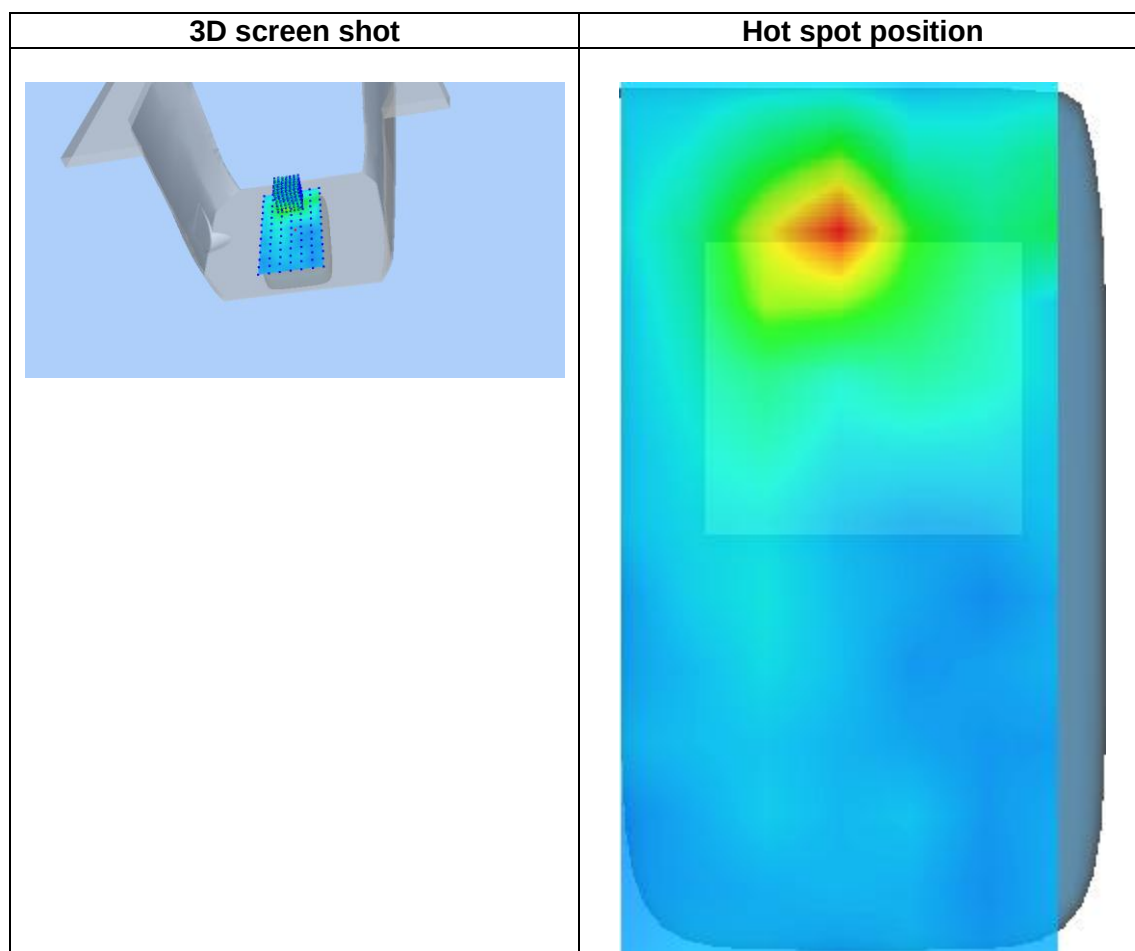
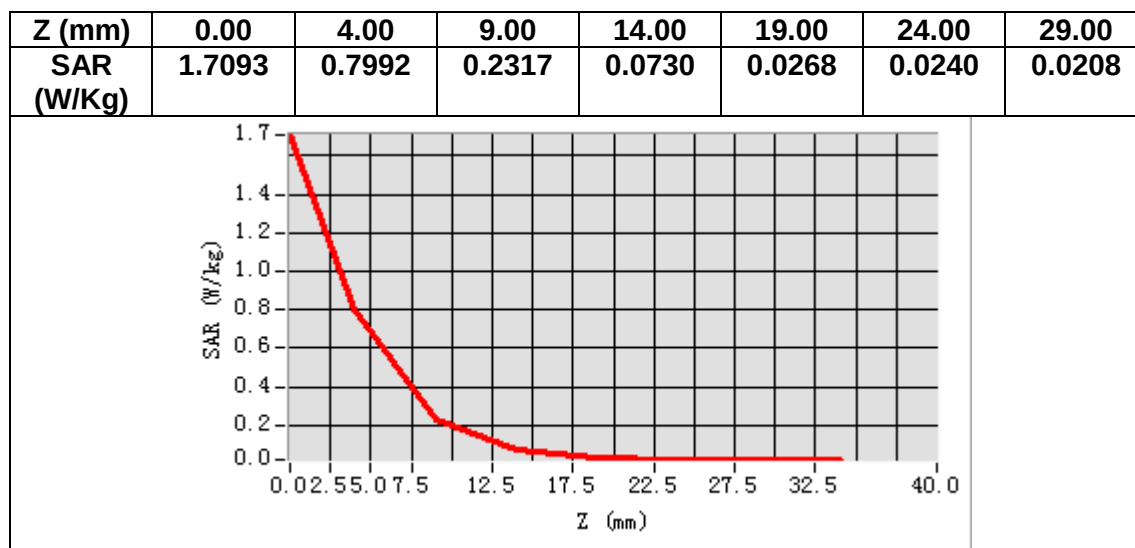
VOLUME SAR



Maximum location: X=-5.00, Y=48.00

SAR Peak: 1.72 W/kg

SAR 10g (W/Kg)	0.254215
SAR 1g (W/Kg)	0.741325



MEASUREMENT 35

Date of measurement: 1/8/2024

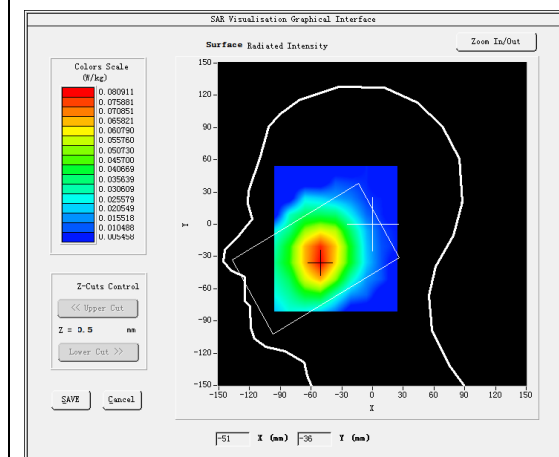
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>FDDBand28</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

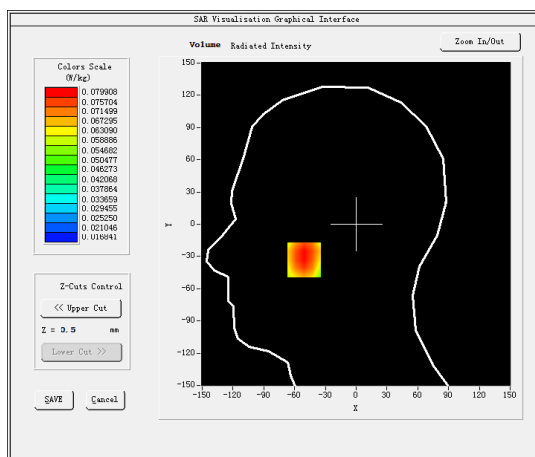
B. SAR Measurement Results

Frequency (MHz)	728.000000
Relative permittivity (real part)	41.144524
Relative permittivity (imaginary part)	21.874163
Conductivity (S/m)	0.884688
Variation (%)	-4.559999

SURFACE SAR



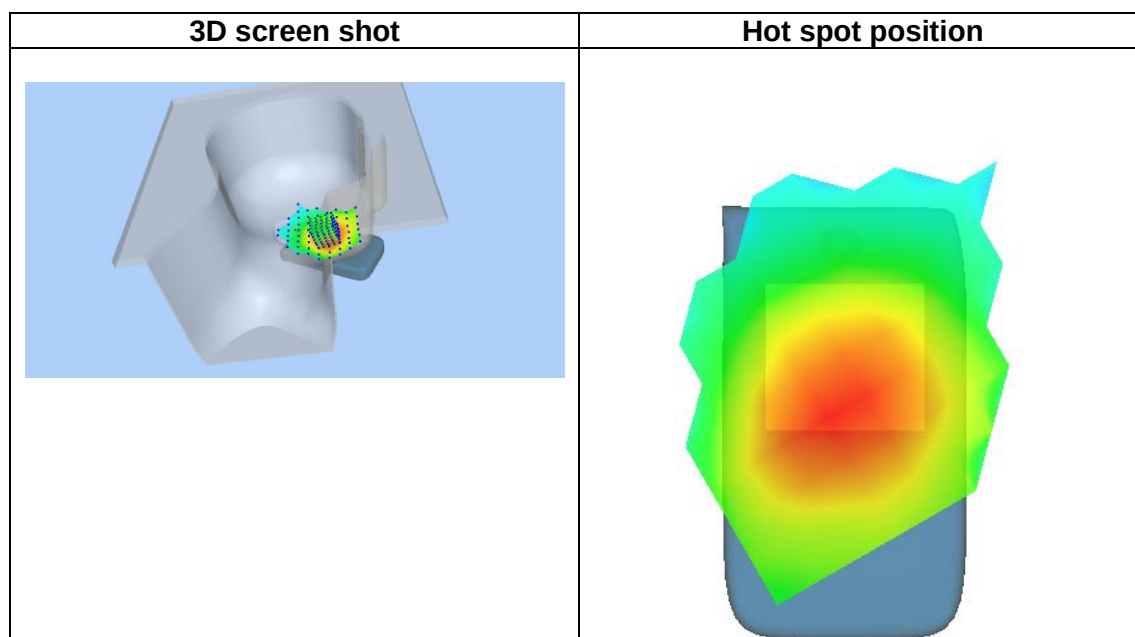
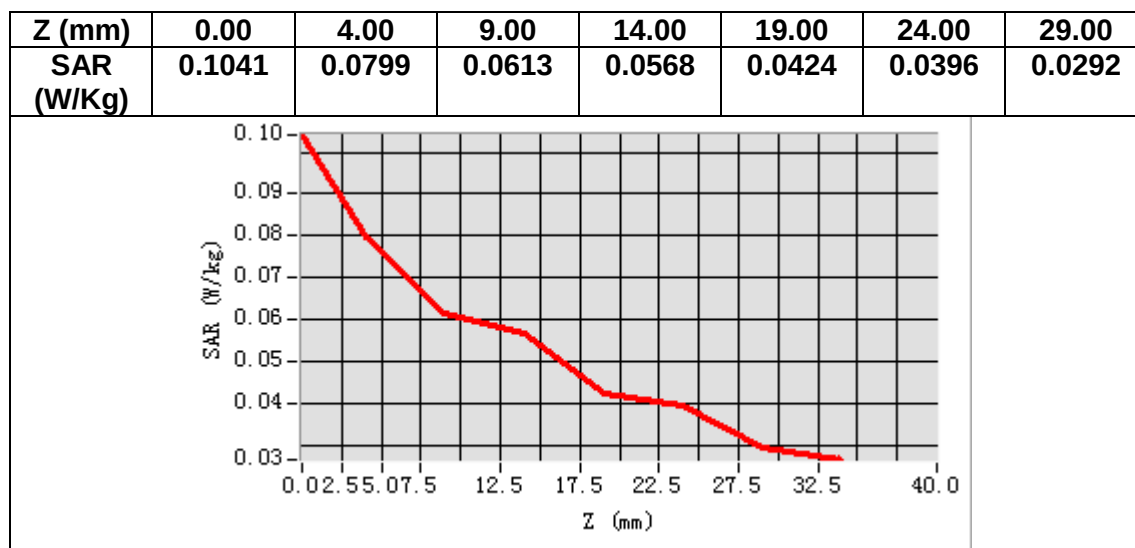
VOLUME SAR



Maximum location: X=-51.00, Y=-33.00

SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.061849
SAR 1g (W/Kg)	0.078261



MEASUREMENT 36

Date of measurement: 5/8/2024

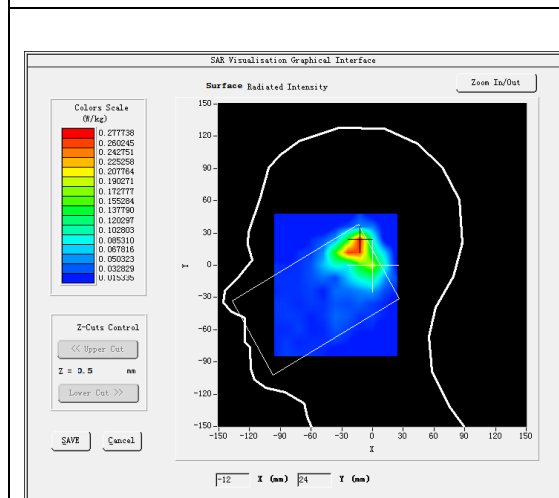
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n78</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.20</u>

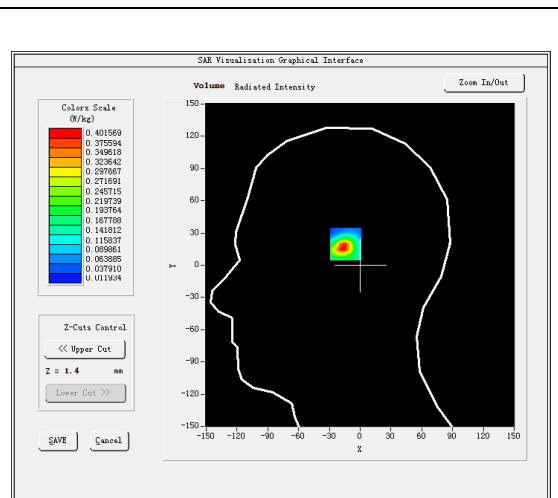
B. SAR Measurement Results

Frequency (MHz)	3549.990000
Relative permittivity (real part)	37.661186
Relative permittivity (imaginary part)	14.925950
Conductivity (S/m)	2.943721
Variation (%)	0.050000

SURFACE SAR



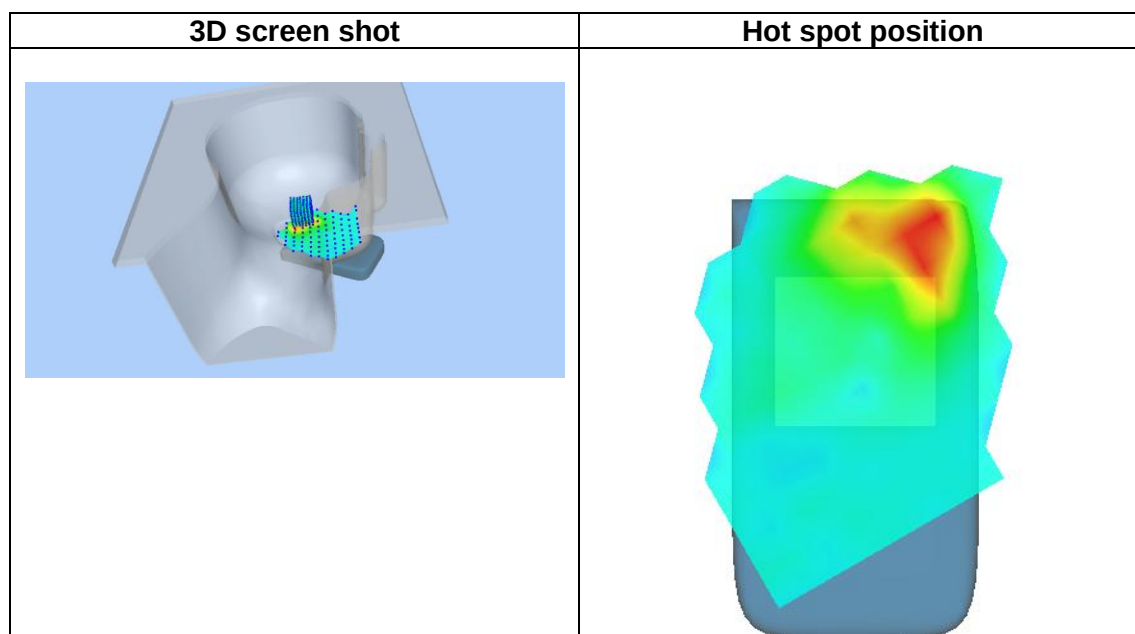
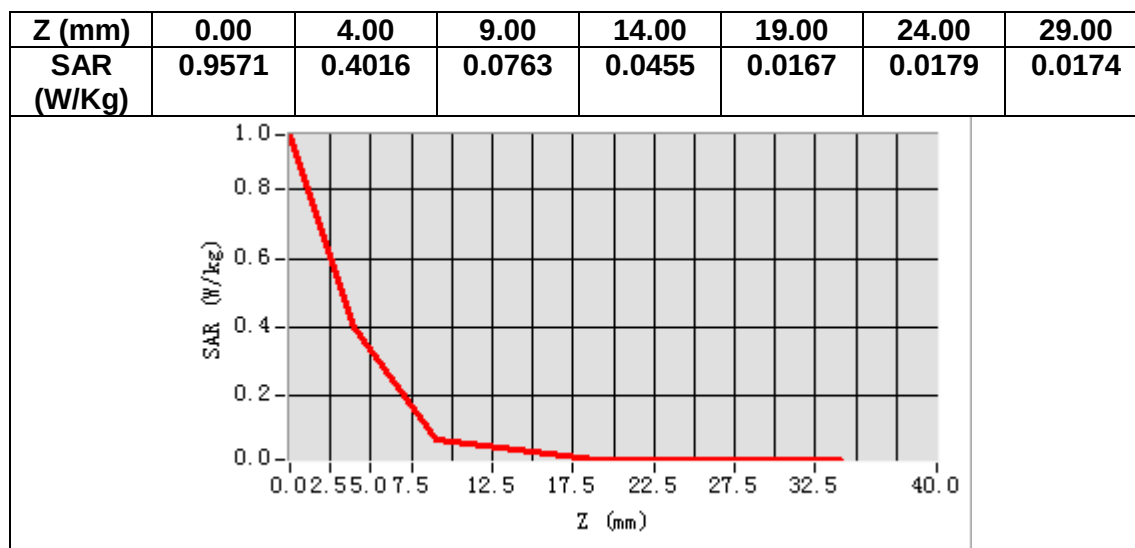
VOLUME SAR



Maximum location: X=-13.00, Y=21.00

SAR Peak: 0.88 W/kg

SAR 10g (W/Kg)	0.135159
SAR 1g (W/Kg)	0.383089



MEASUREMENT 37

Date of measurement: 1/8/2024

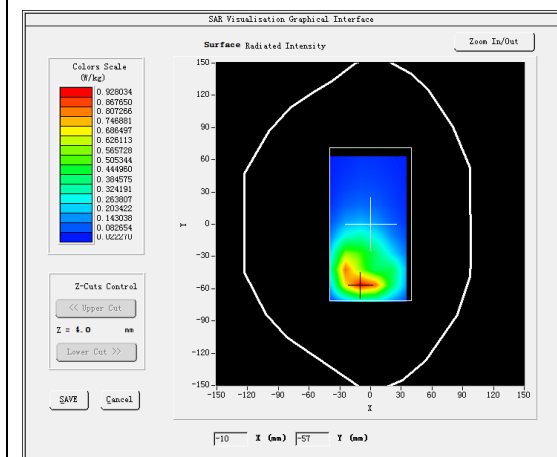
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>FDDBand28</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

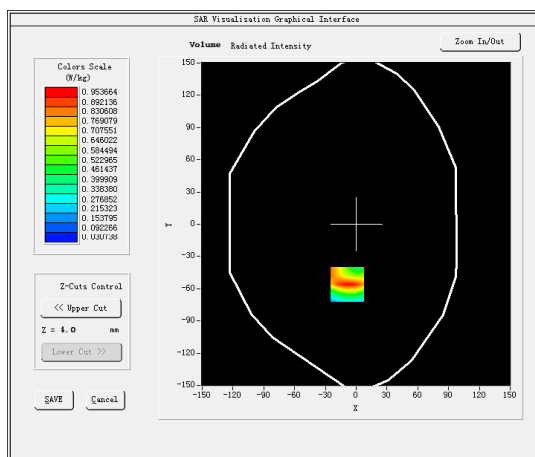
B. SAR Measurement Results

Frequency (MHz)	728.000000
Relative permittivity (real part)	41.144524
Relative permittivity (imaginary part)	21.874163
Conductivity (S/m)	0.884688
Variation (%)	-1.430000

SURFACE SAR



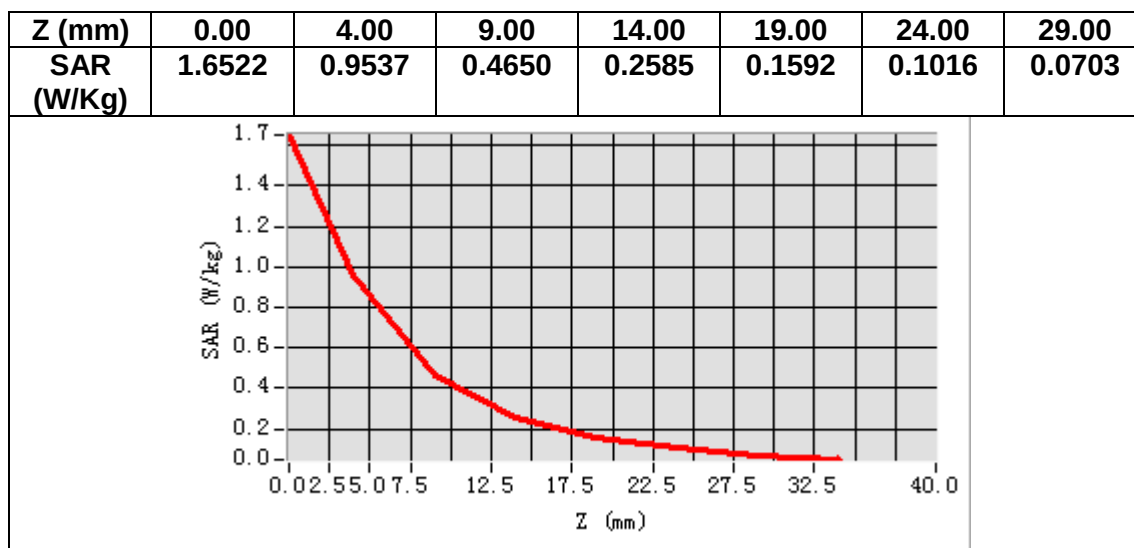
VOLUME SAR



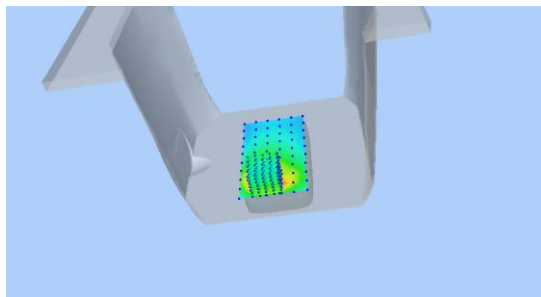
Maximum location: X=-9.00, Y=-56.00

SAR Peak: 1.64 W/kg

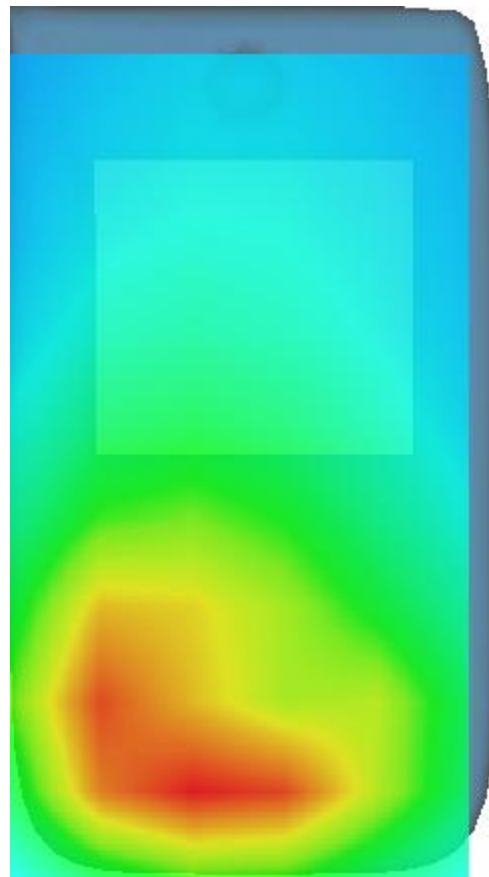
SAR 10g (W/Kg)	0.441911
SAR 1g (W/Kg)	0.876622



3D screen shot



Hot spot position



MEASUREMENT 38

Date of measurement: 5/8/2024

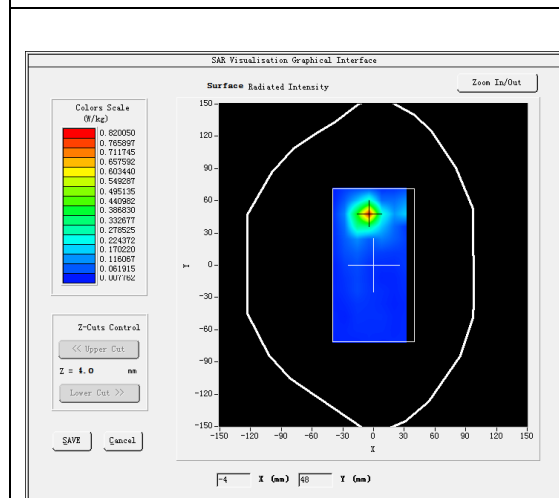
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n78</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.20</u>

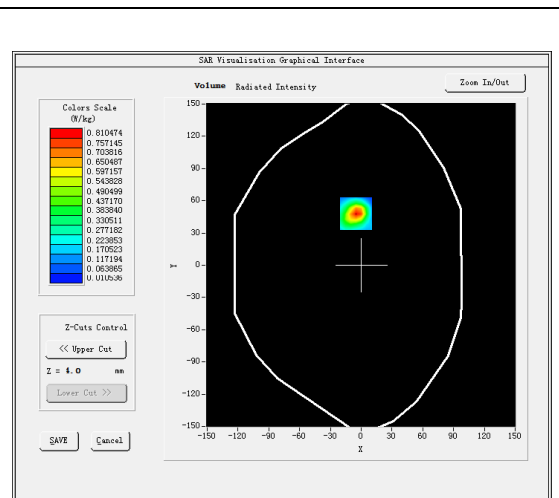
B. SAR Measurement Results

Frequency (MHz)	3549.990000
Relative permittivity (real part)	37.661186
Relative permittivity (imaginary part)	14.925950
Conductivity (S/m)	2.943721
Variation (%)	4.339996

SURFACE SAR



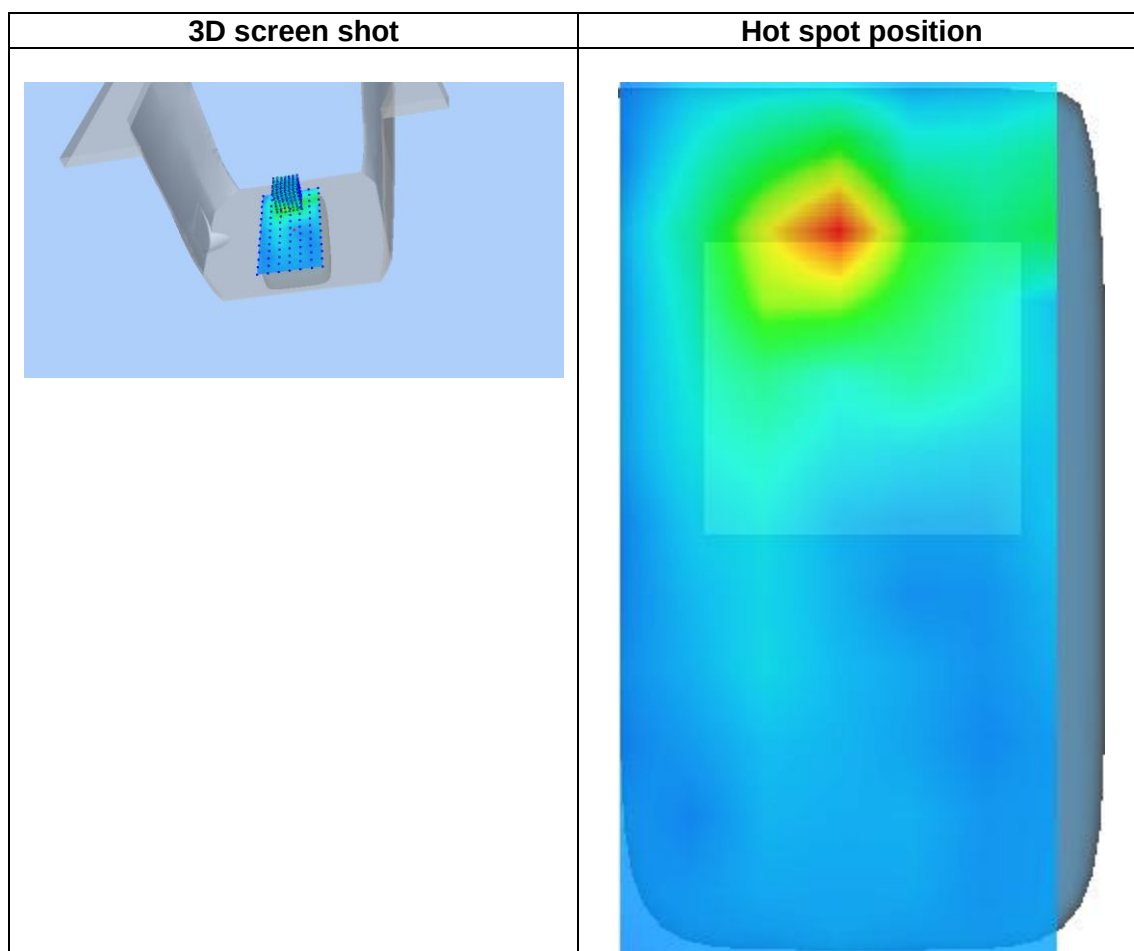
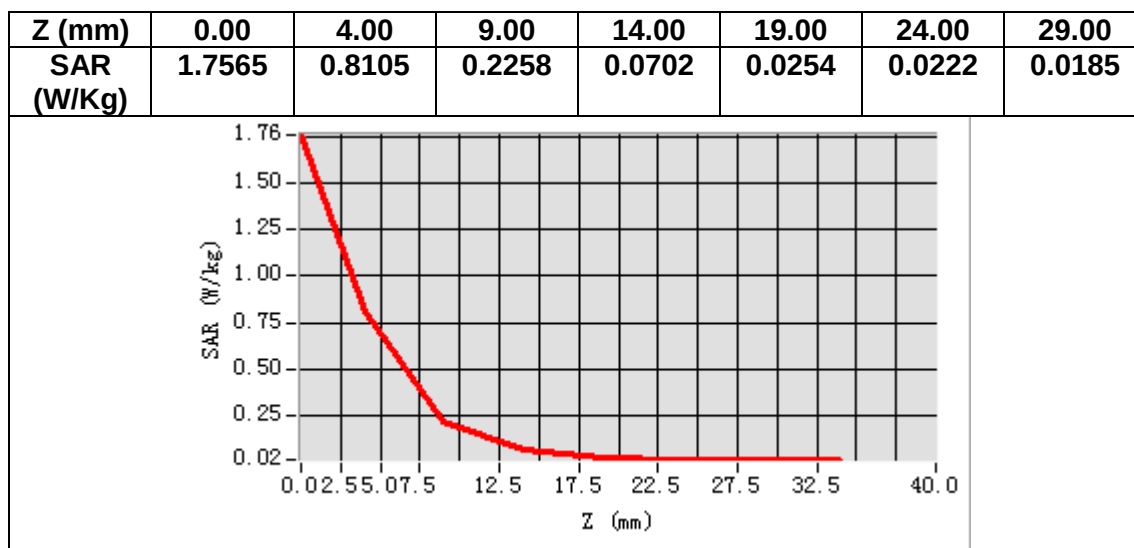
VOLUME SAR



Maximum location: X=-5.00, Y=48.00

SAR Peak: 1.74 W/kg

SAR 10g (W/Kg)	0.255044
SAR 1g (W/Kg)	0.743895



MEASUREMENT 39

Date of measurement: 19/7/2024

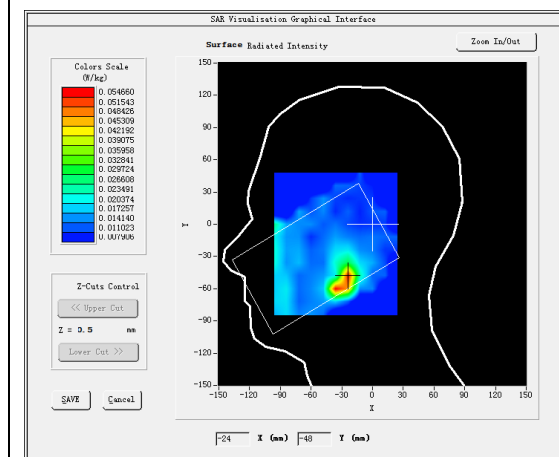
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n38</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

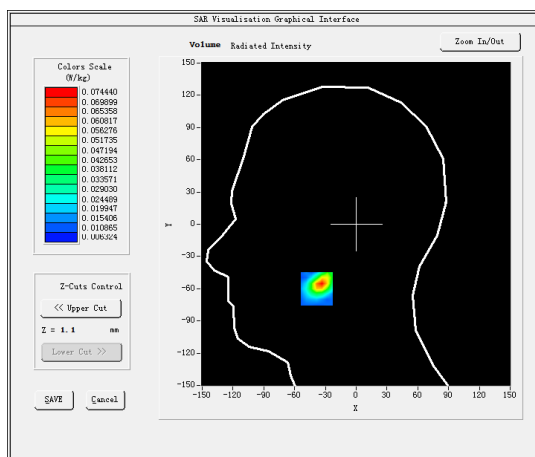
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	39.093365
Relative permittivity (imaginary part)	13.990630
Conductivity (S/m)	2.016982
Variation (%)	-3.360000

SURFACE SAR



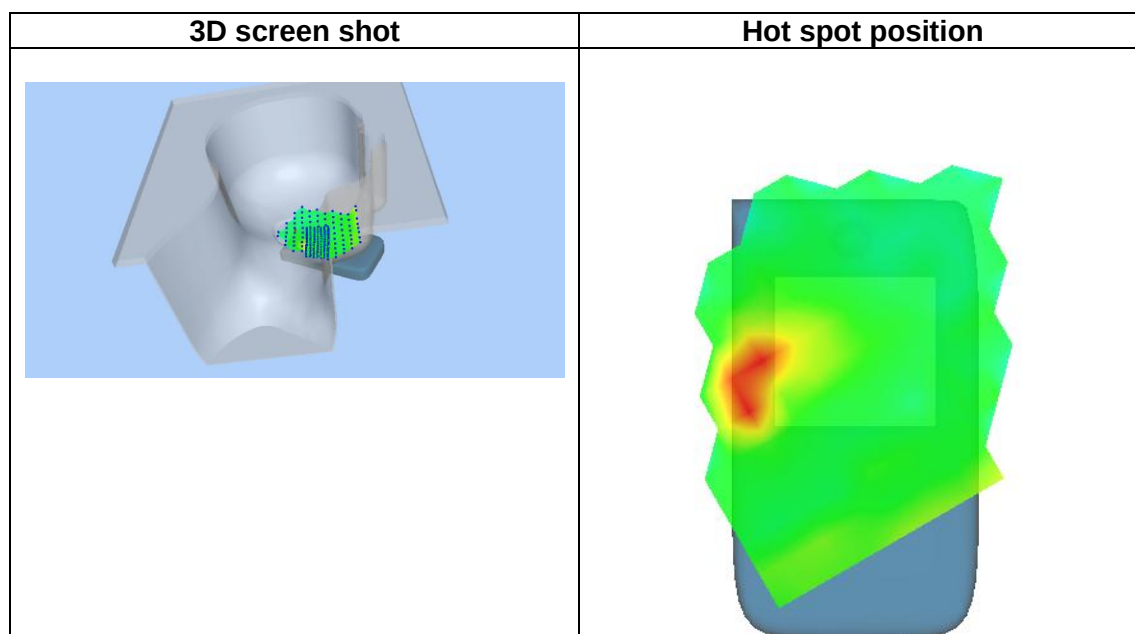
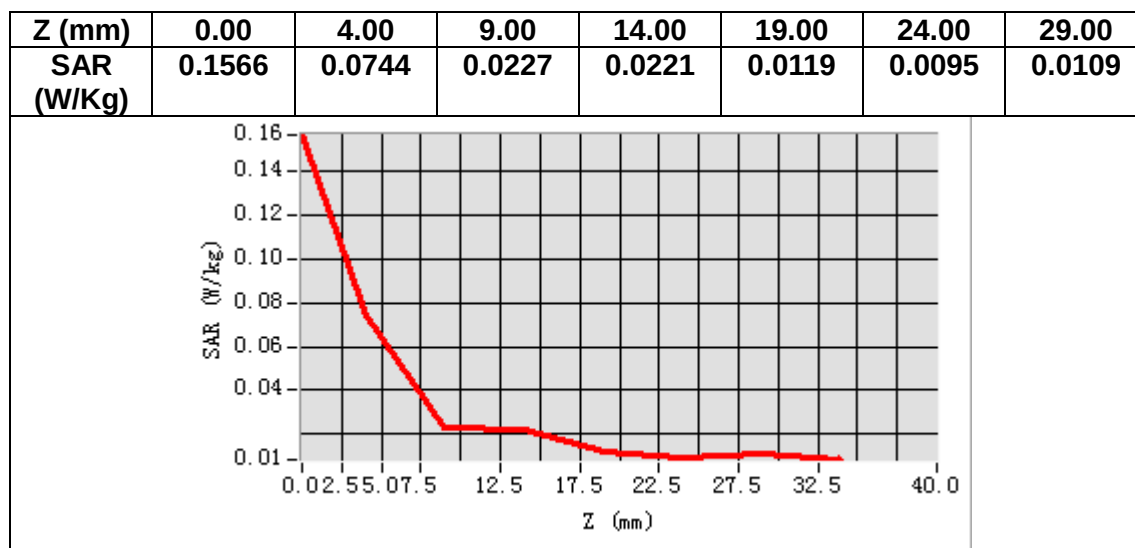
VOLUME SAR



Maximum location: X=-33.00, Y=-60.00

SAR Peak: 0.12 W/kg

SAR 10g (W/Kg)	0.028659
SAR 1g (W/Kg)	0.064745



MEASUREMENT 40

Date of measurement: 19/7/2024

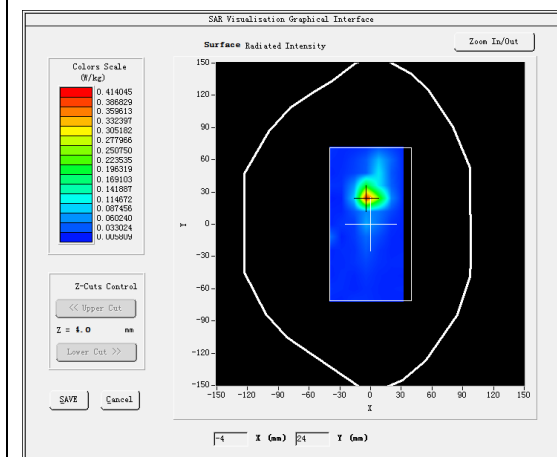
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n38</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

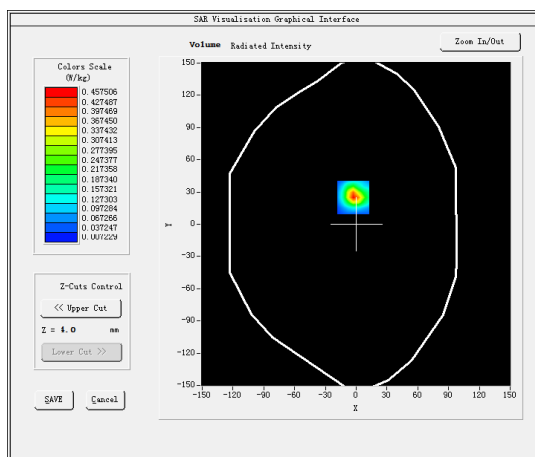
B. SAR Measurement Results

Frequency (MHz)	2595.000000
Relative permittivity (real part)	39.093365
Relative permittivity (imaginary part)	13.990630
Conductivity (S/m)	2.016982
Variation (%)	1.020000

SURFACE SAR



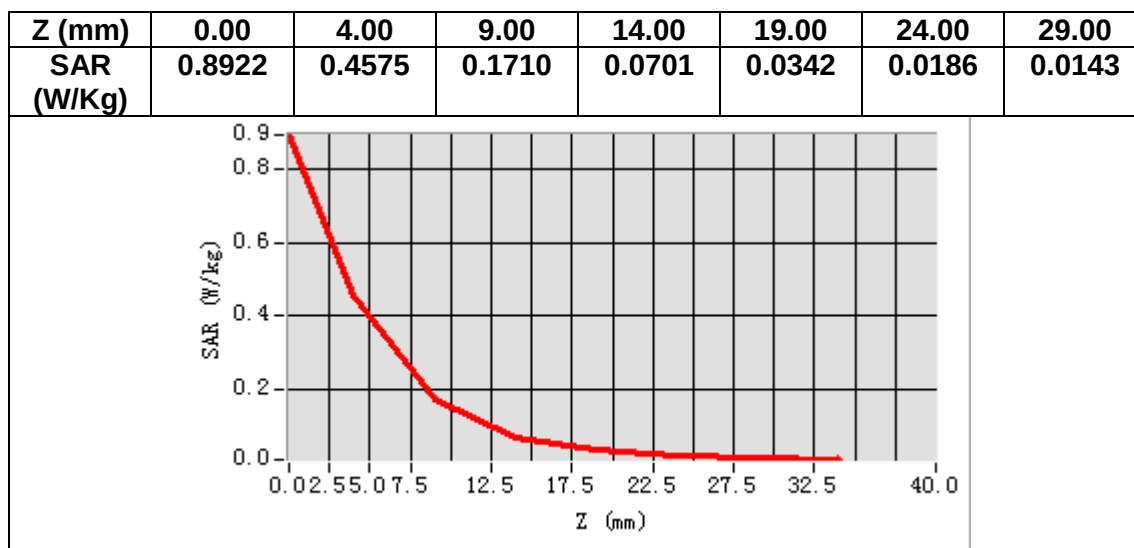
VOLUME SAR



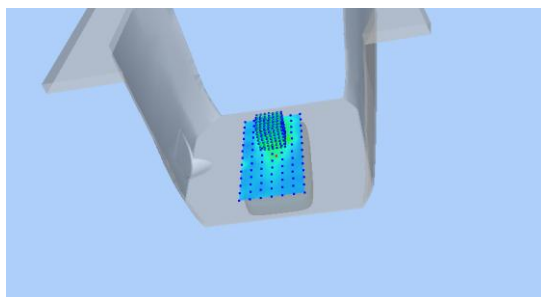
Maximum location: X=-3.00, Y=25.00

SAR Peak: 0.89 W/kg

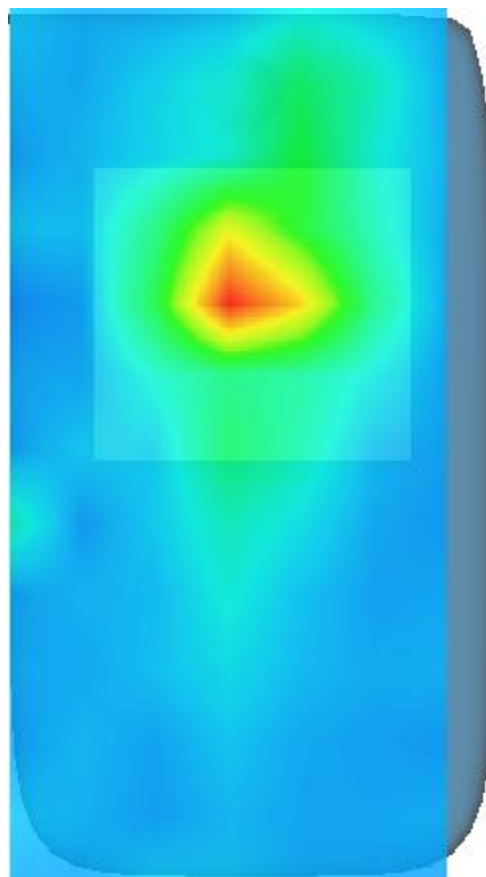
SAR 10g (W/Kg)	0.141788
SAR 1g (W/Kg)	0.404309



3D screen shot



Hot spot position



MEASUREMENT 41

Date of measurement: 26/7/2024

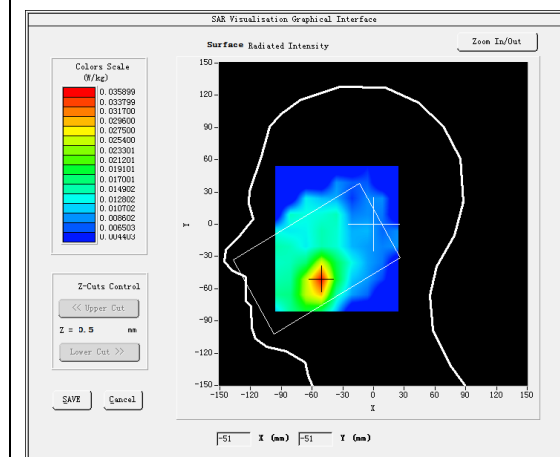
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n1</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

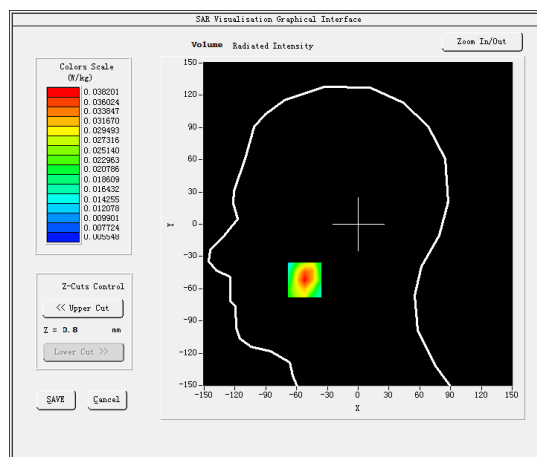
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	3.560000

SURFACE SAR



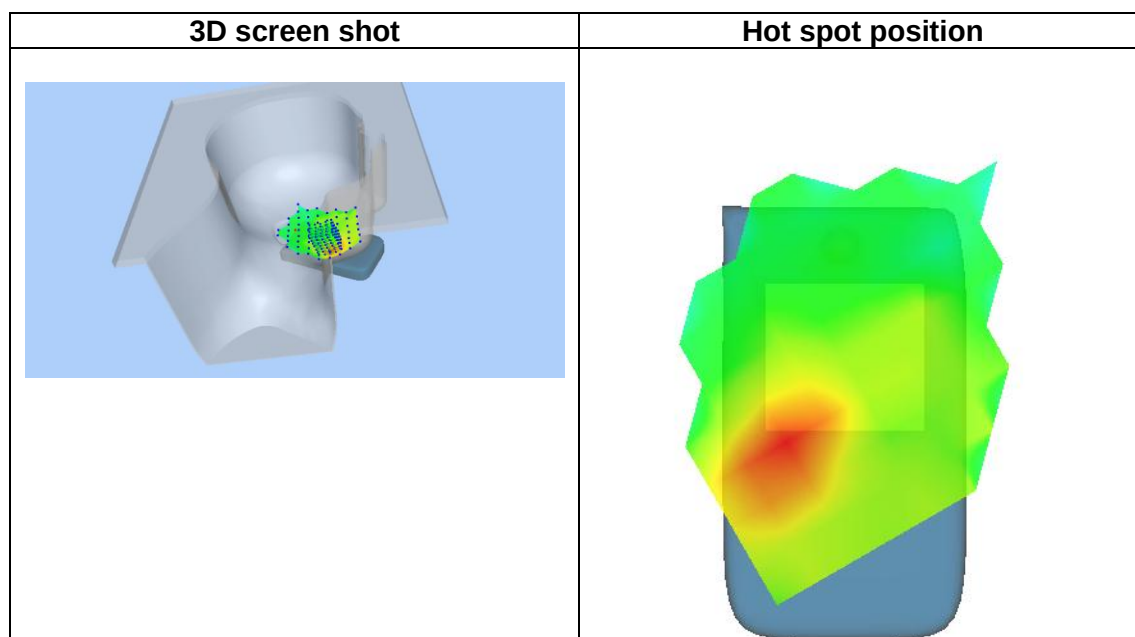
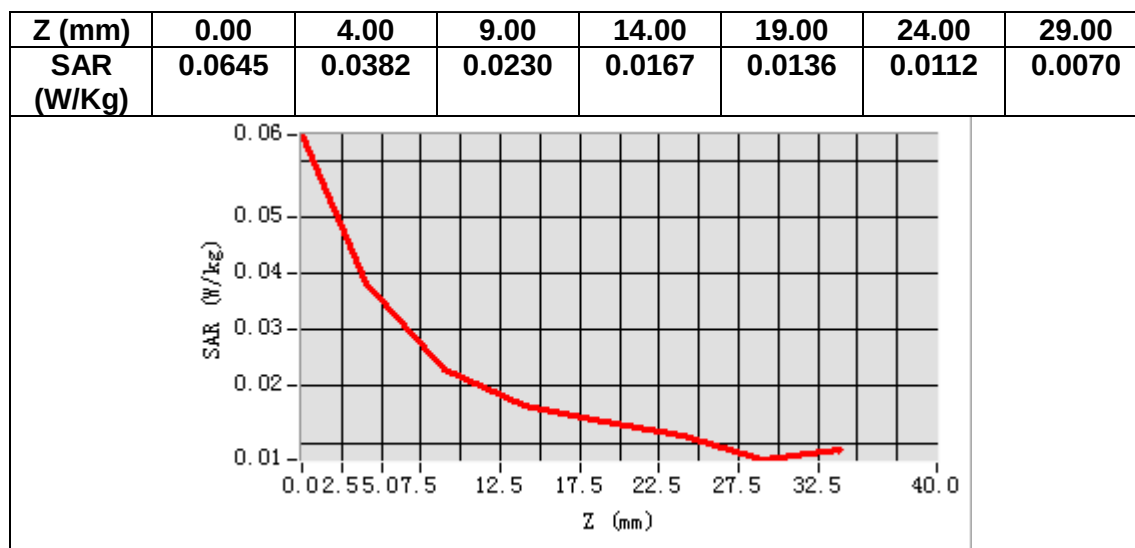
VOLUME SAR



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

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.022186
SAR 1g (W/Kg)	0.037930



MEASUREMENT 42

Date of measurement: 26/7/2024

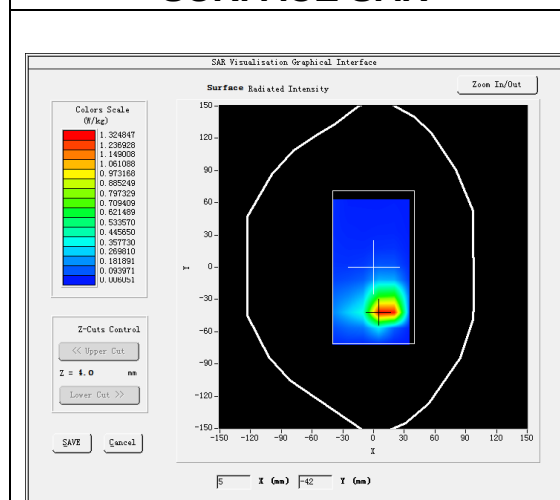
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n1</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.83</u>

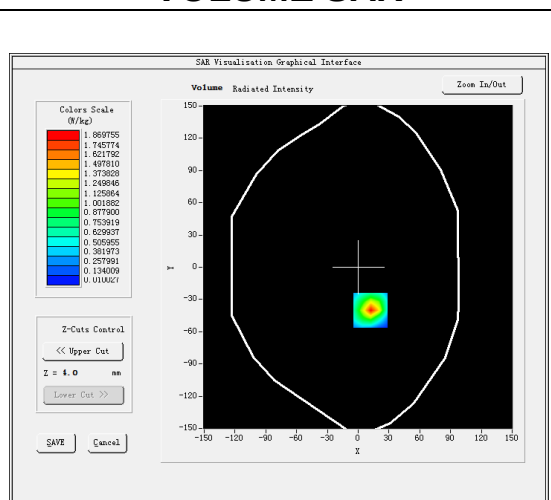
B. SAR Measurement Results

Frequency (MHz)	1950.000000
Relative permittivity (real part)	38.953915
Relative permittivity (imaginary part)	12.937650
Conductivity (S/m)	1.401579
Variation (%)	-4.219999

SURFACE SAR



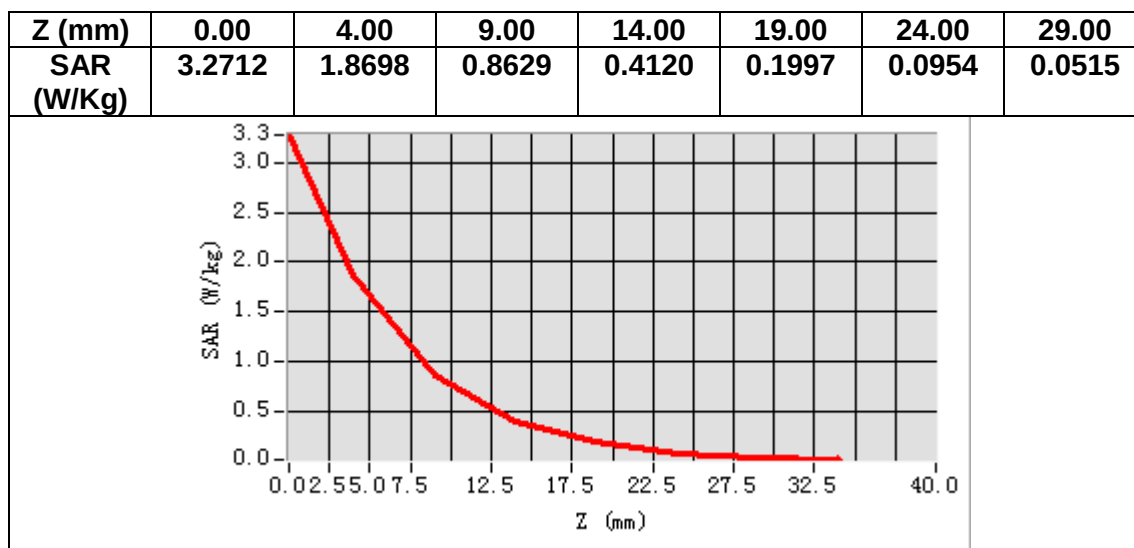
VOLUME SAR



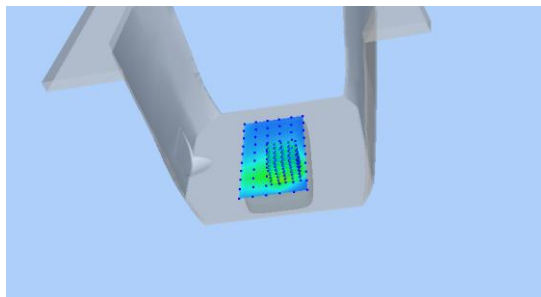
Maximum location: X=12.00, Y=-40.00

SAR Peak: 3.28 W/kg

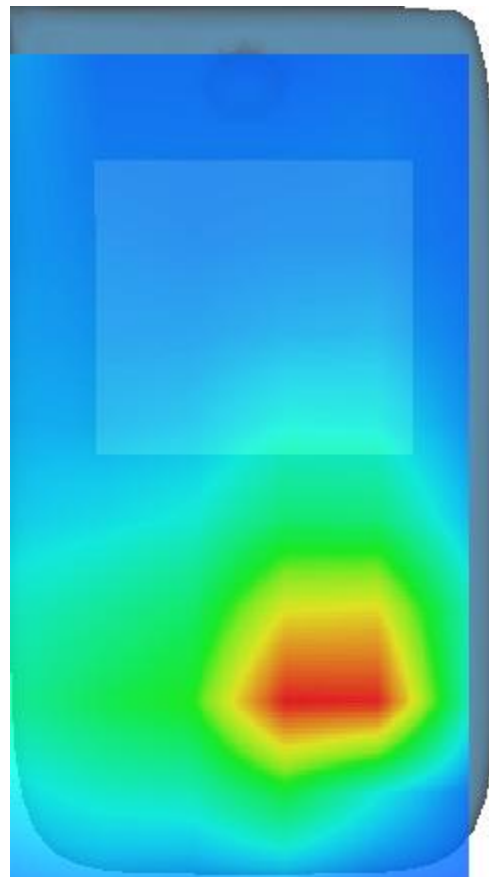
SAR 10g (W/Kg)	0.706188
SAR 1g (W/Kg)	1.689747



3D screen shot



Hot spot position



MEASUREMENT 43

Date of measurement: 1/8/2024

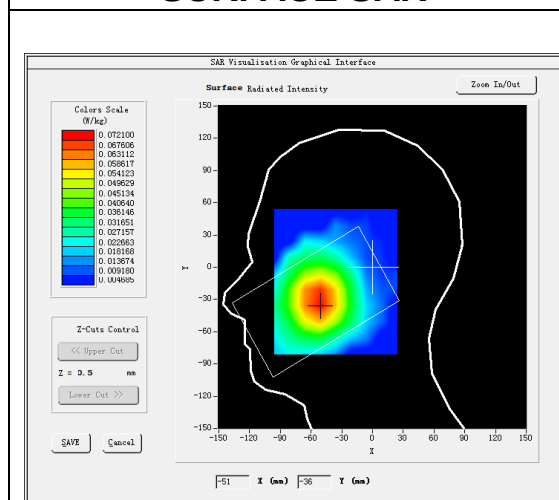
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n28</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

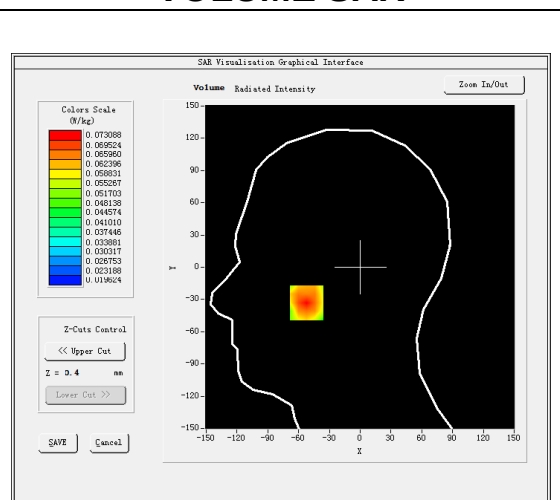
B. SAR Measurement Results

Frequency (MHz)	725.500000
Relative permittivity (real part)	42.030666
Relative permittivity (imaginary part)	22.457600
Conductivity (S/m)	0.905166
Variation (%)	2.640000

SURFACE SAR



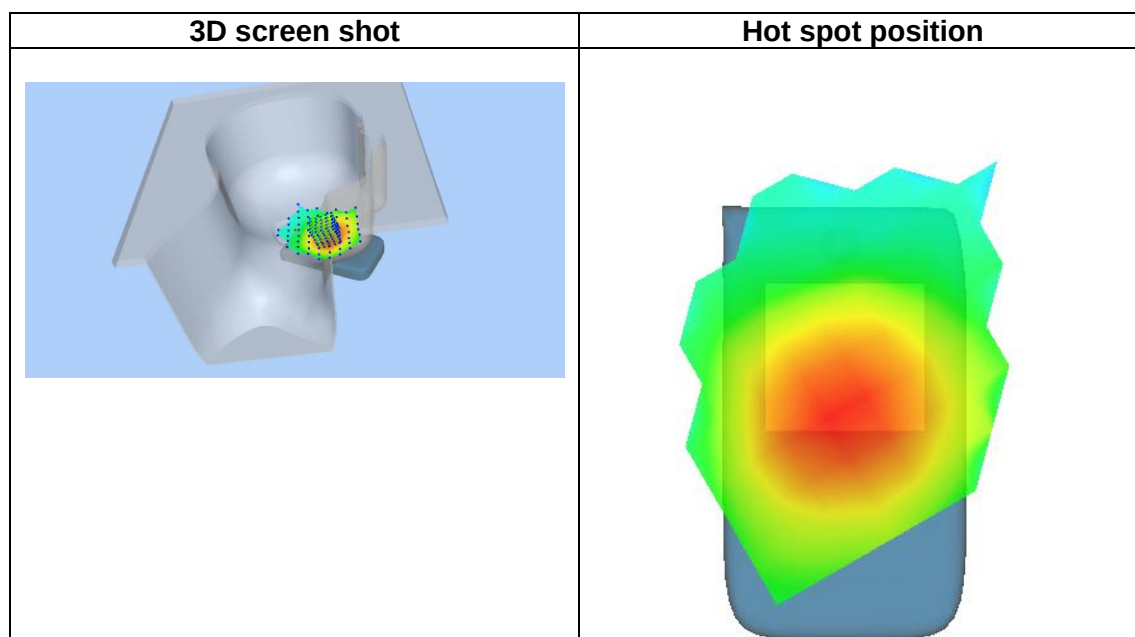
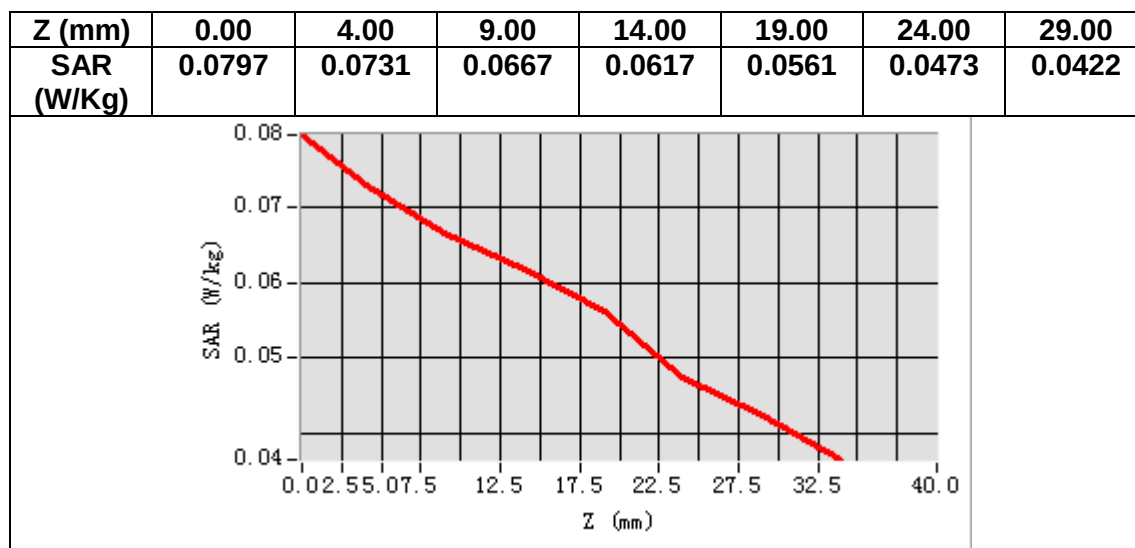
VOLUME SAR



Maximum location: X=-52.00, Y=-33.00

SAR Peak: 0.10 W/kg

SAR 10g (W/Kg)	0.061776
SAR 1g (W/Kg)	0.073694



MEASUREMENT 44

Date of measurement: 1/8/2024

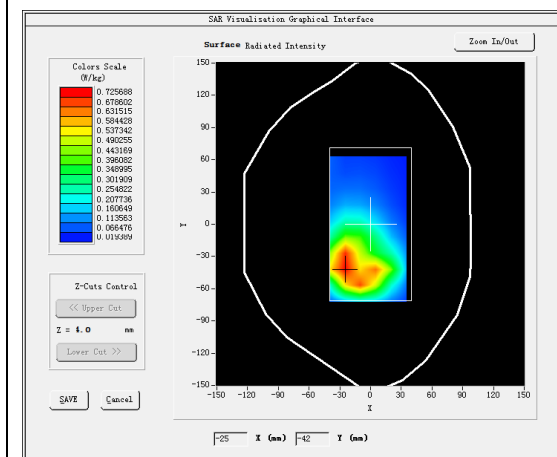
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n28</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.37</u>

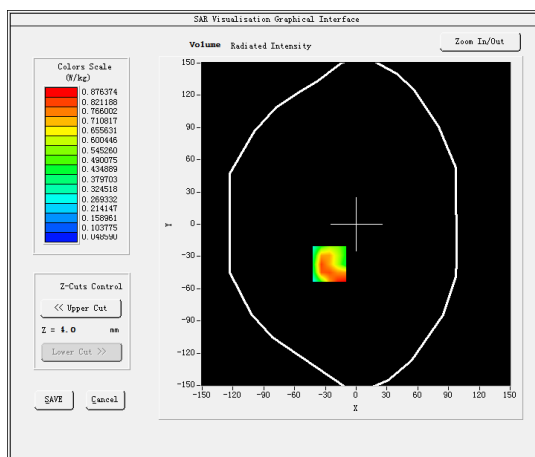
B. SAR Measurement Results

Frequency (MHz)	725.500000
Relative permittivity (real part)	42.030666
Relative permittivity (imaginary part)	22.457600
Conductivity (S/m)	0.905166
Variation (%)	-4.310000

SURFACE SAR



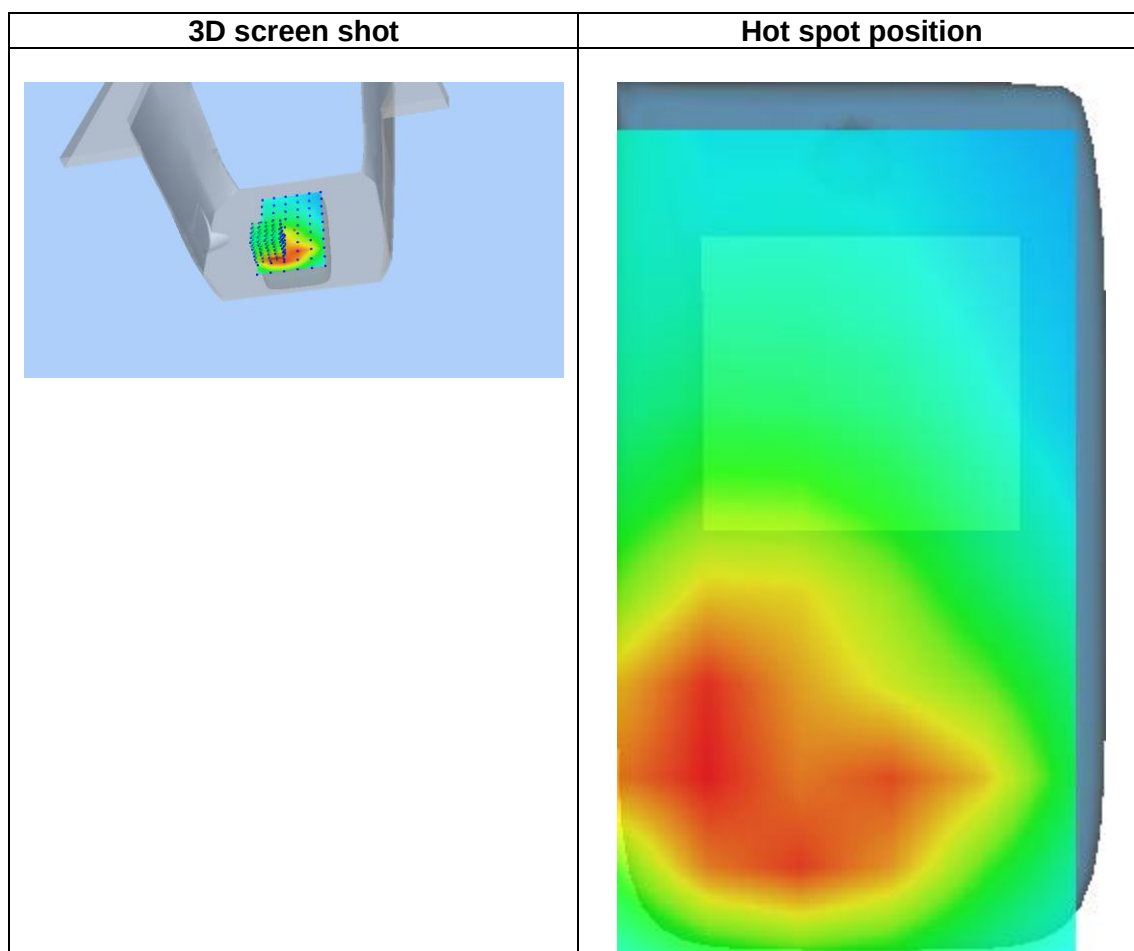
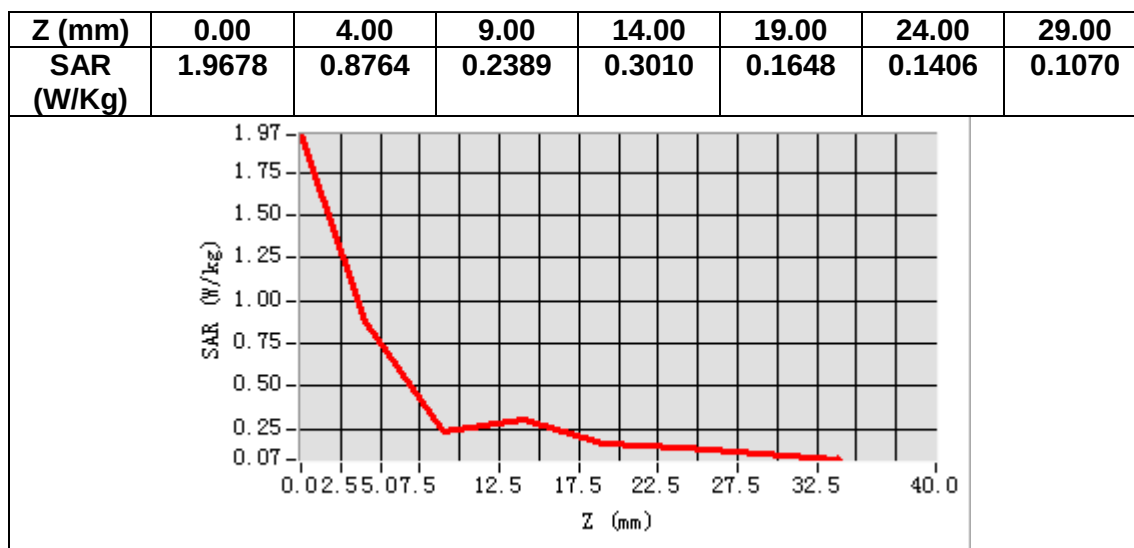
VOLUME SAR



Maximum location: X=-26.00, Y=-37.00

SAR Peak: 1.48 W/kg

SAR 10g (W/Kg)	0.480549
SAR 1g (W/Kg)	0.834961



MEASUREMENT 45

Date of measurement: 25/7/2024

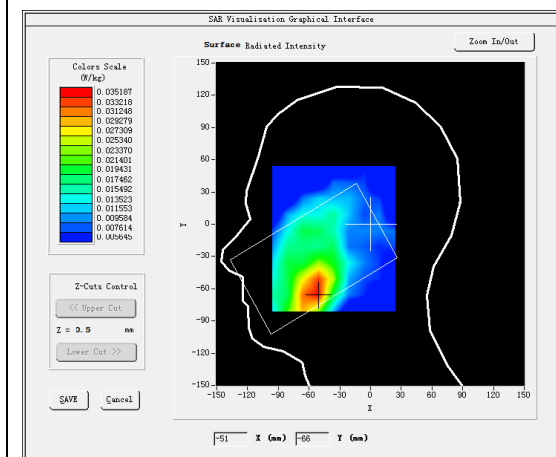
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n3</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

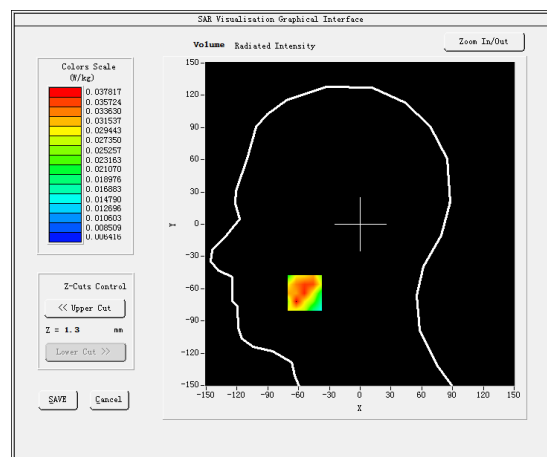
B. SAR Measurement Results

Frequency (MHz)	1747.500000
Relative permittivity (real part)	40.102272
Relative permittivity (imaginary part)	14.096591
Conductivity (S/m)	1.368544
Variation (%)	0.430000

SURFACE SAR



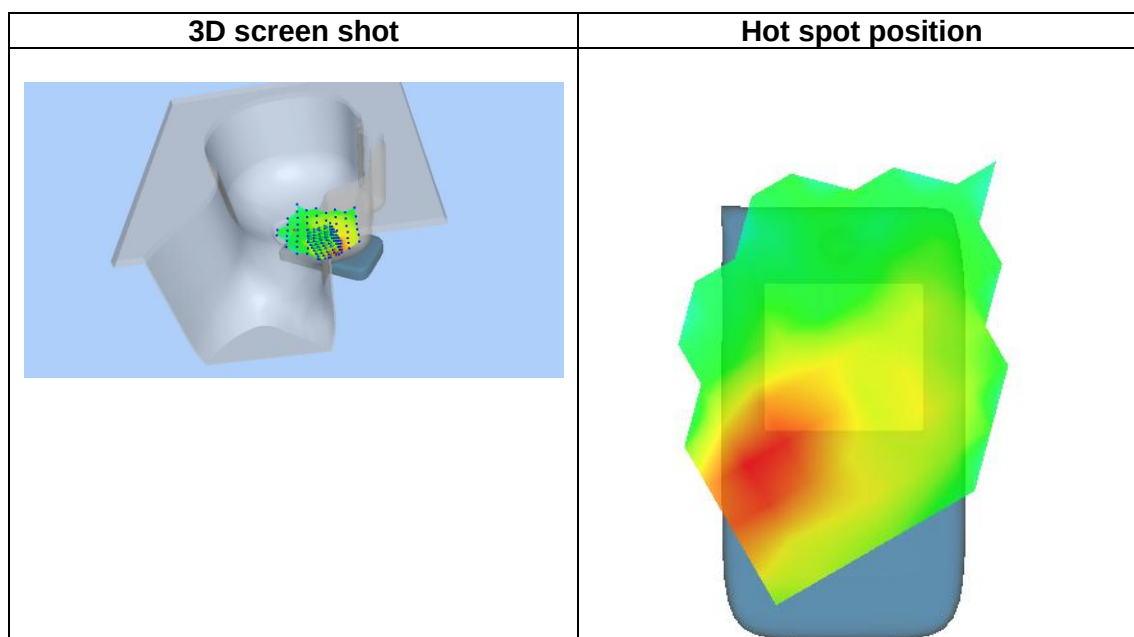
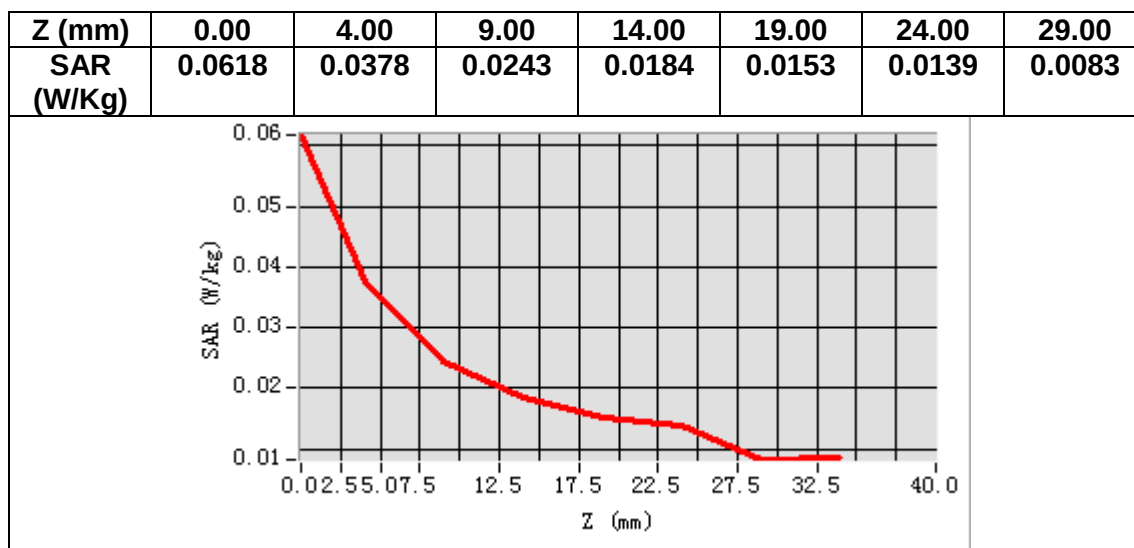
VOLUME SAR



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

SAR Peak: 0.06 W/kg

SAR 10g (W/Kg)	0.023615
SAR 1g (W/Kg)	0.035784



MEASUREMENT 46

Date of measurement: 25/7/2024

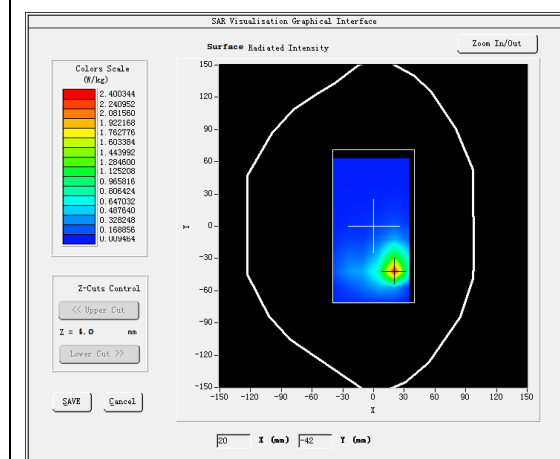
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n3</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.45</u>

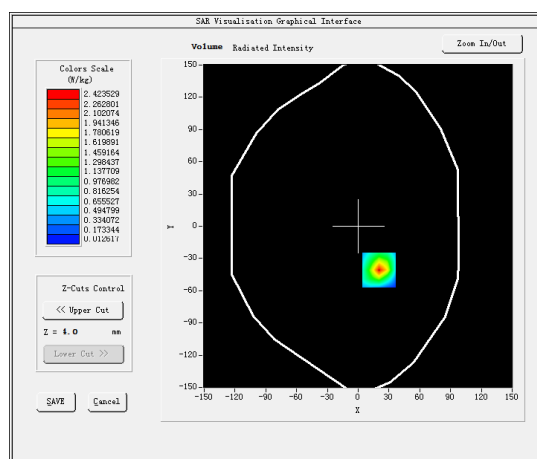
B. SAR Measurement Results

Frequency (MHz)	1747.500000
Relative permittivity (real part)	40.102272
Relative permittivity (imaginary part)	14.096591
Conductivity (S/m)	1.368544
Variation (%)	-0.050000

SURFACE SAR



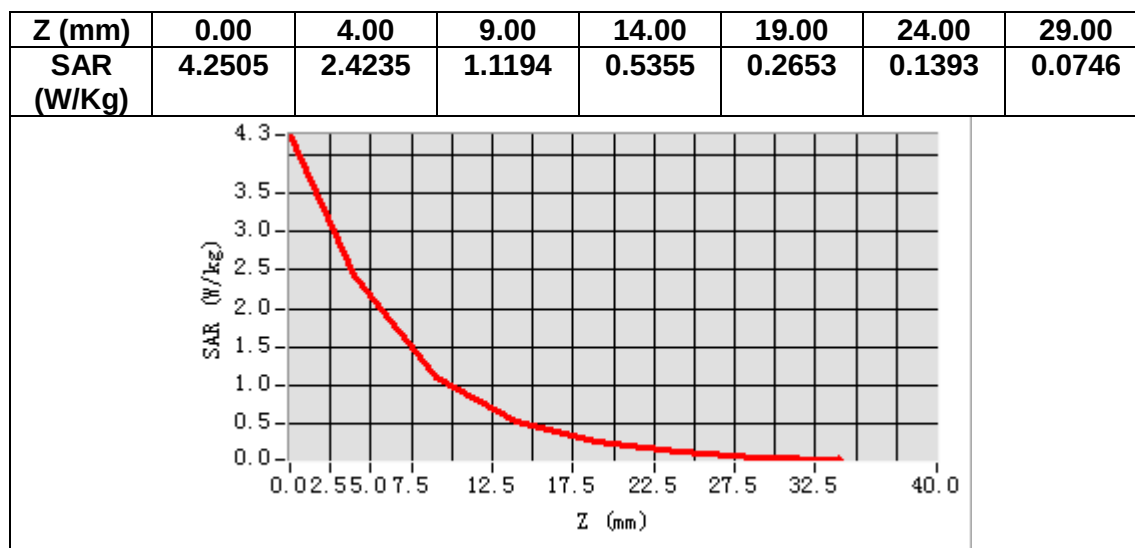
VOLUME SAR



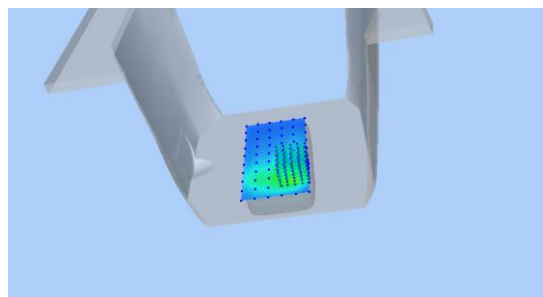
Maximum location: X=20.00, Y=-41.00

SAR Peak: 4.26 W/kg

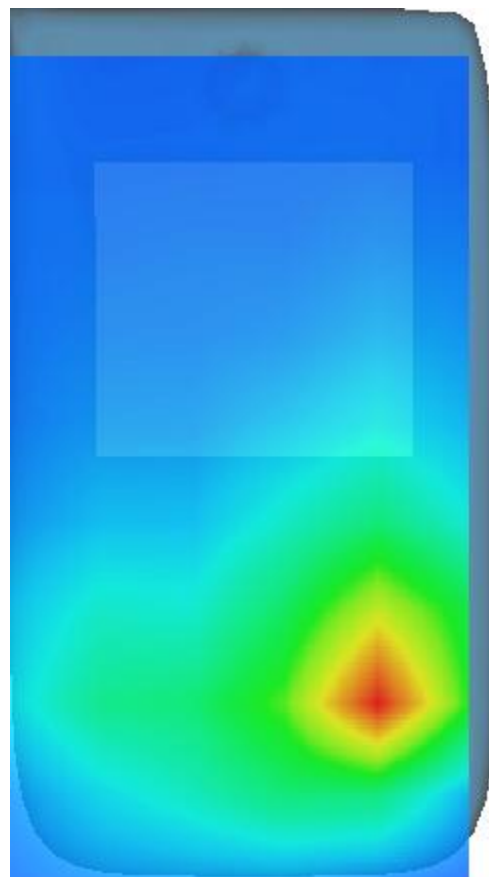
SAR 10g (W/Kg)	0.914662
SAR 1g (W/Kg)	2.176552



3D screen shot



Hot spot position



MEASUREMENT 47

Date of measurement: 19/7/2024

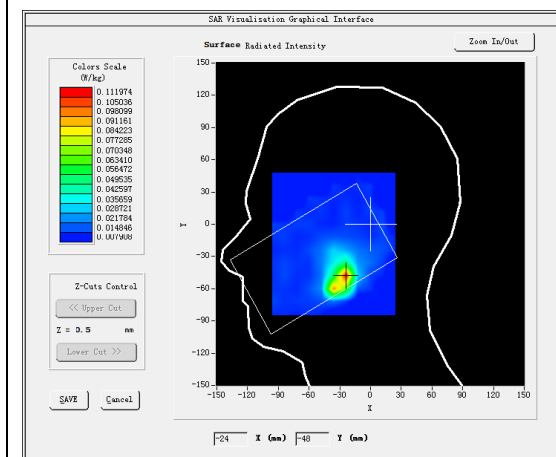
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

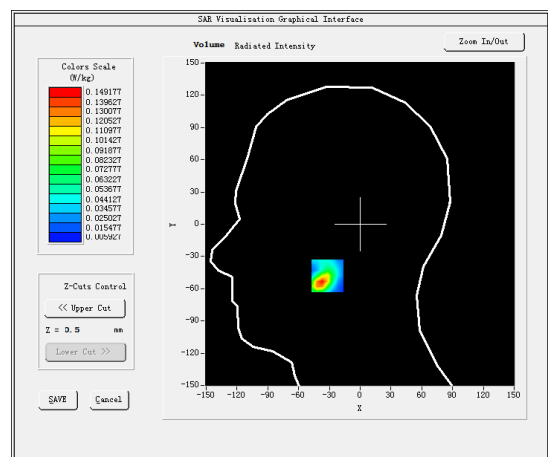
B. SAR Measurement Results

Frequency (MHz)	2592.990000
Relative permittivity (real part)	39.179081
Relative permittivity (imaginary part)	13.940671
Conductivity (S/m)	2.008223
Variation (%)	-1.080000

SURFACE SAR



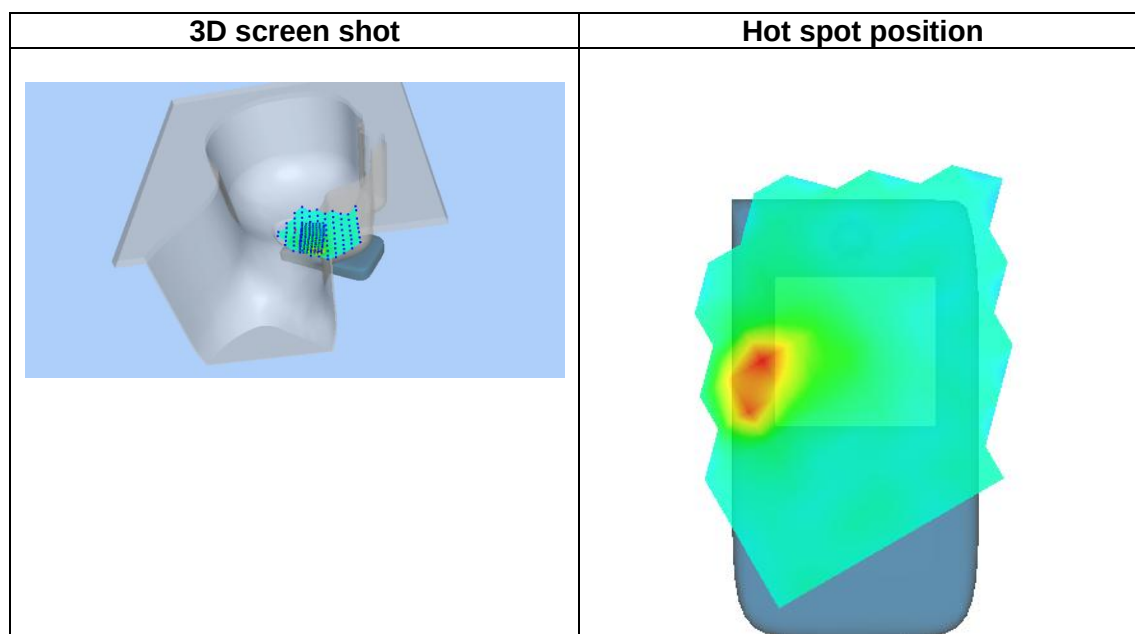
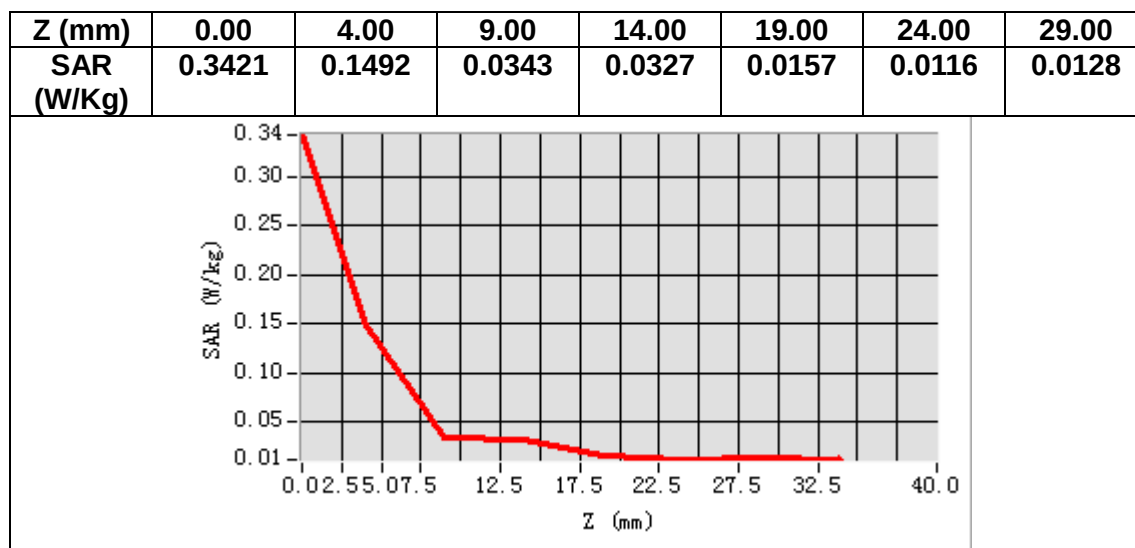
VOLUME SAR



Maximum location: X=-24.00, Y=-48.00

SAR Peak: 0.27 W/kg

SAR 10g (W/Kg)	0.051096
SAR 1g (W/Kg)	0.131823



MEASUREMENT 48

Date of measurement: 19/7/2024

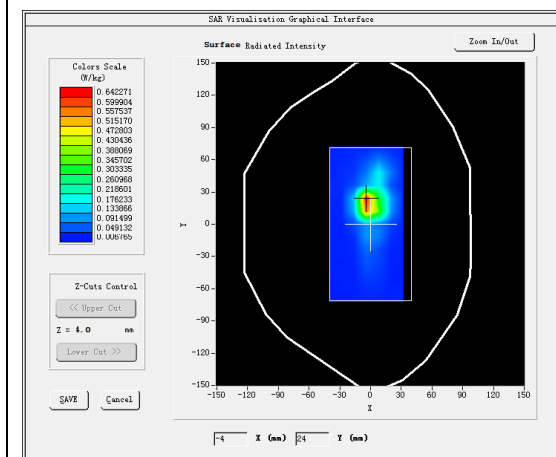
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.6)</u>
<u>ConvF</u>	<u>2.65</u>

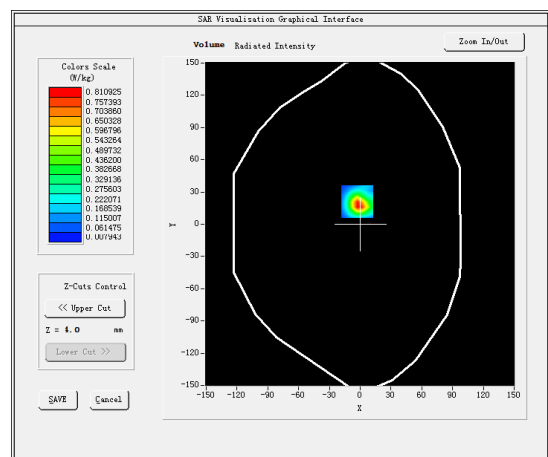
B. SAR Measurement Results

Frequency (MHz)	2592.990000
Relative permittivity (real part)	39.179081
Relative permittivity (imaginary part)	13.940671
Conductivity (S/m)	2.008223
Variation (%)	-1.530000

SURFACE SAR



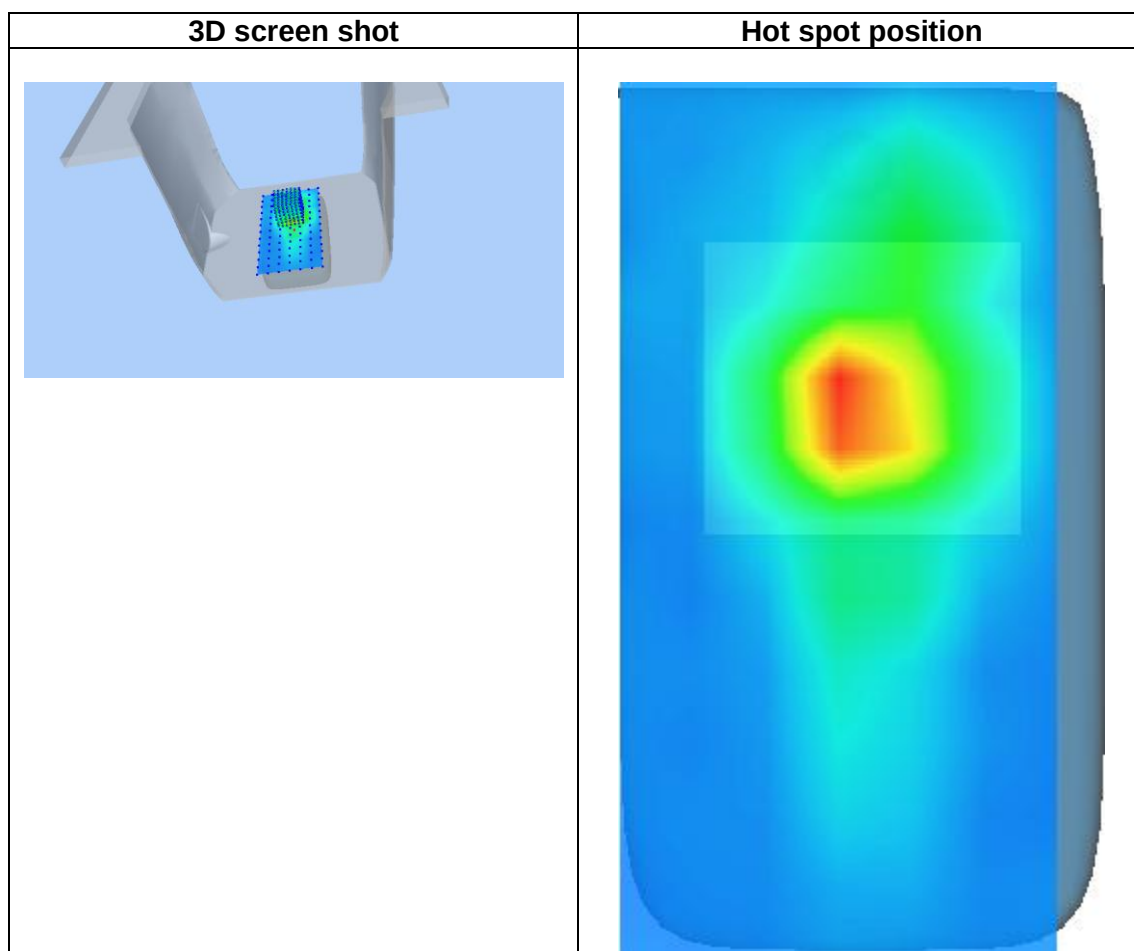
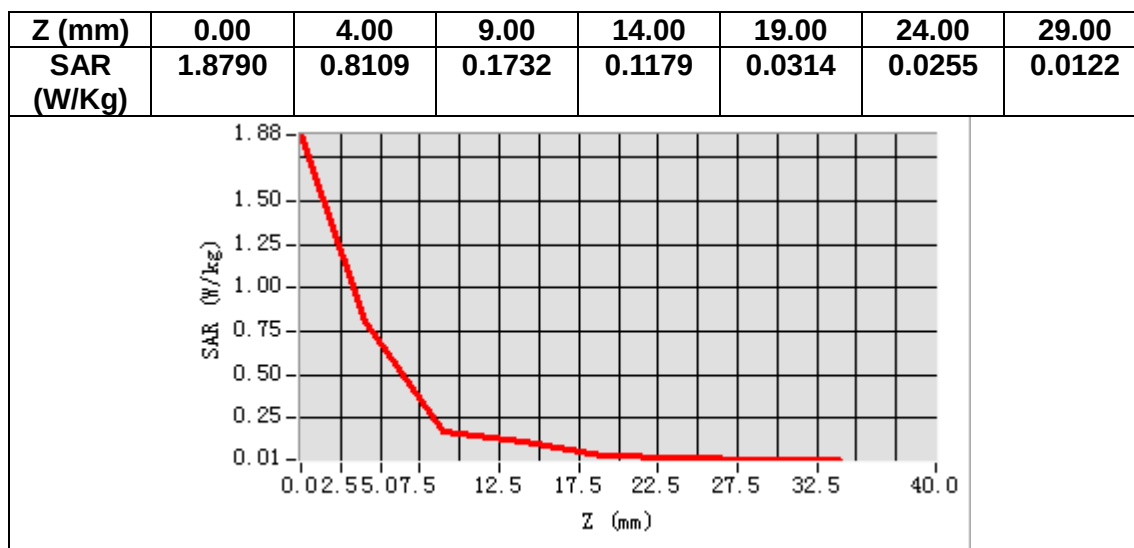
VOLUME SAR



Maximum location: X=-3.00, Y=21.00

SAR Peak: 1.65 W/kg

SAR 10g (W/Kg)	0.256796
SAR 1g (W/Kg)	0.754722



MEASUREMENT 49

Date of measurement: 24/7/2024

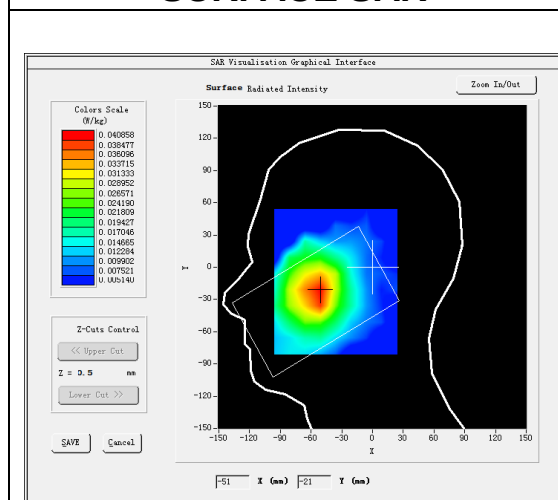
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n8</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

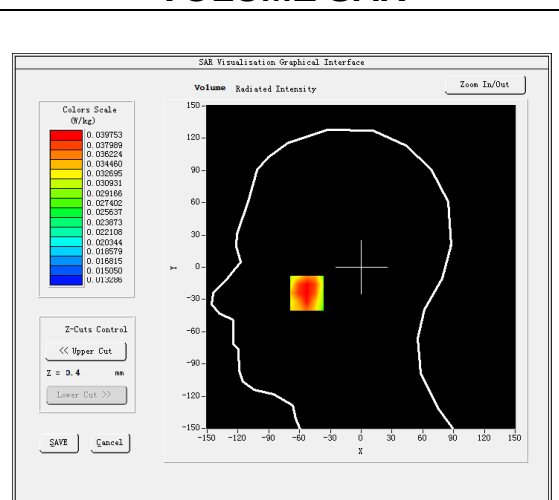
B. SAR Measurement Results

Frequency (MHz)	897.500000
Relative permittivity (real part)	41.223366
Relative permittivity (imaginary part)	19.714558
Conductivity (S/m)	0.982990
Variation (%)	-3.740000

SURFACE SAR



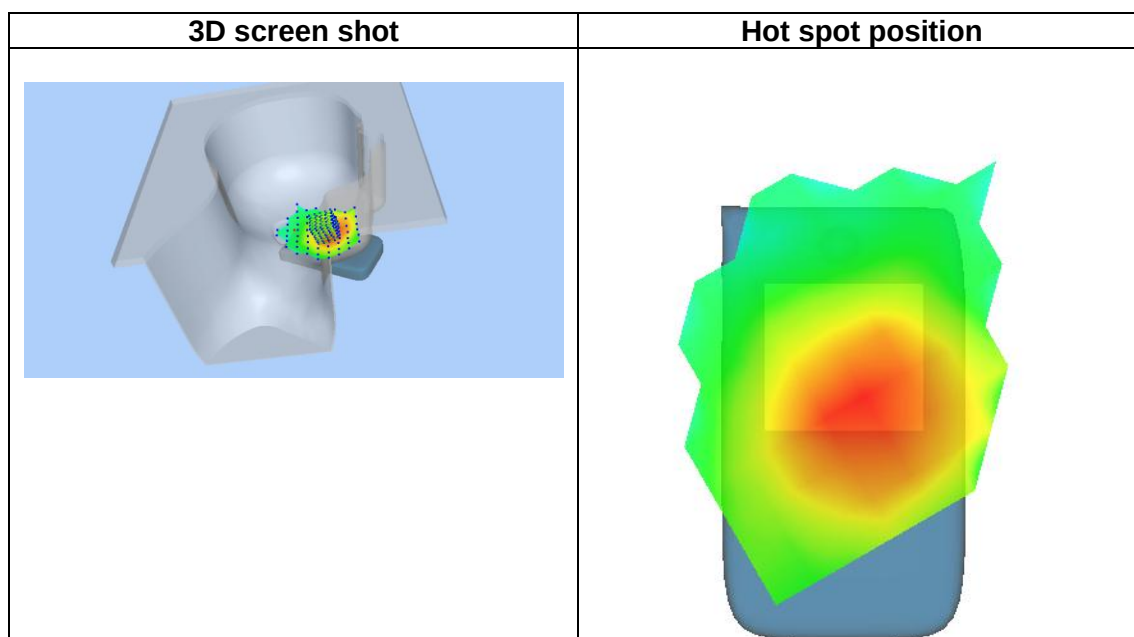
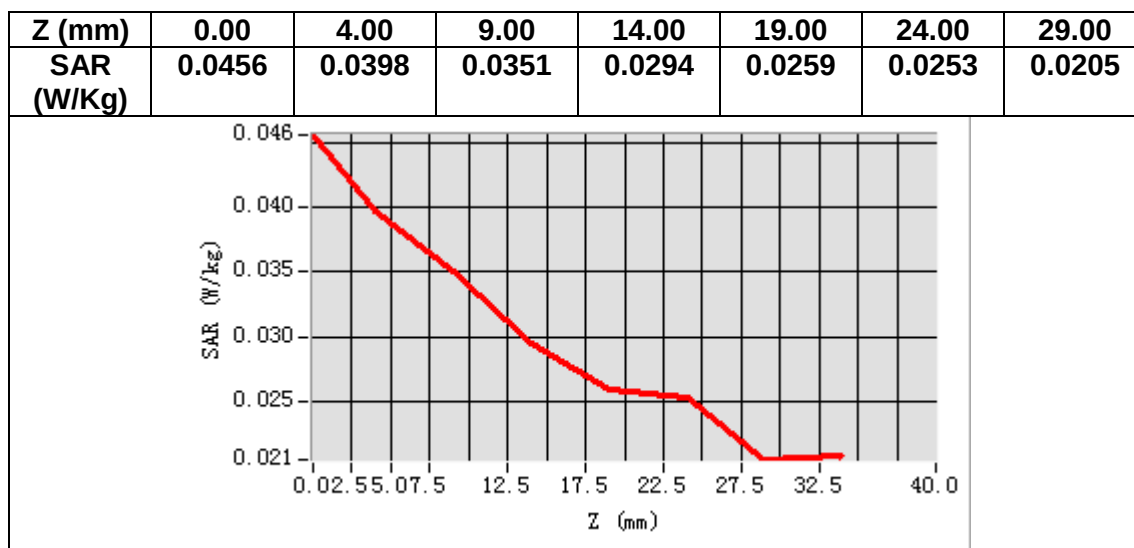
VOLUME SAR



Maximum location: X=-53.00, Y=-24.00

SAR Peak: 0.05 W/kg

SAR 10g (W/Kg)	0.033471
SAR 1g (W/Kg)	0.039605



MEASUREMENT 50

Date of measurement: 24/7/2024

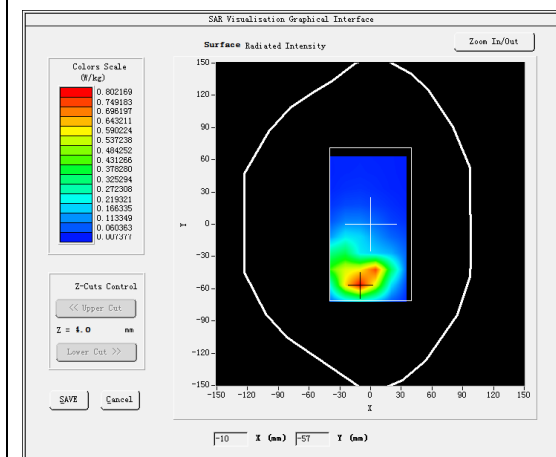
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n8</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

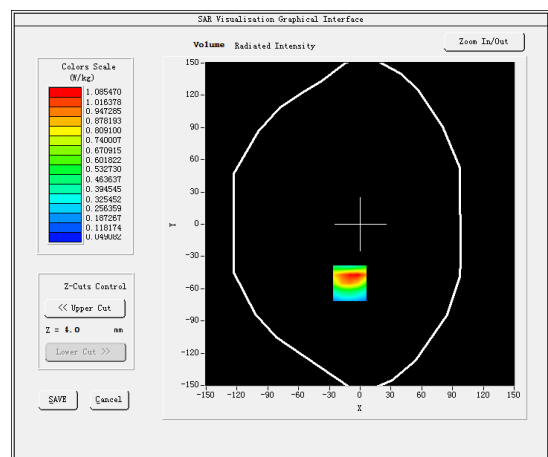
B. SAR Measurement Results

Frequency (MHz)	897.500000
Relative permittivity (real part)	41.223366
Relative permittivity (imaginary part)	19.714558
Conductivity (S/m)	0.982990
Variation (%)	1.520000

SURFACE SAR



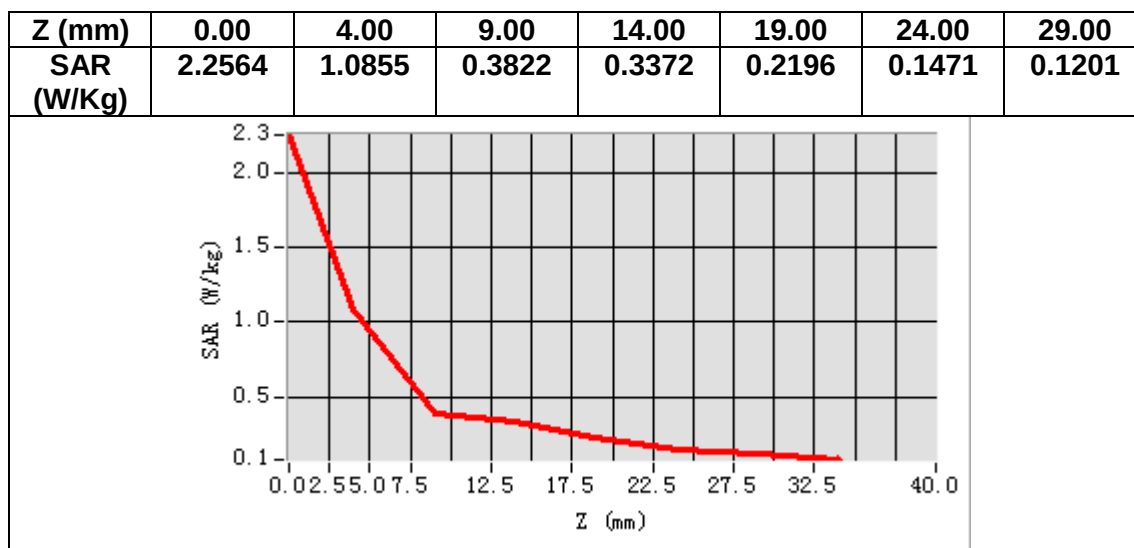
VOLUME SAR



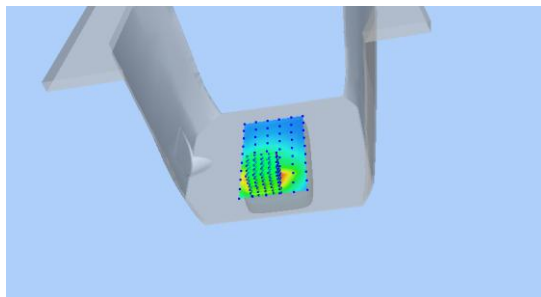
Maximum location: X=-10.00, Y=-55.00

SAR Peak: 1.91 W/kg

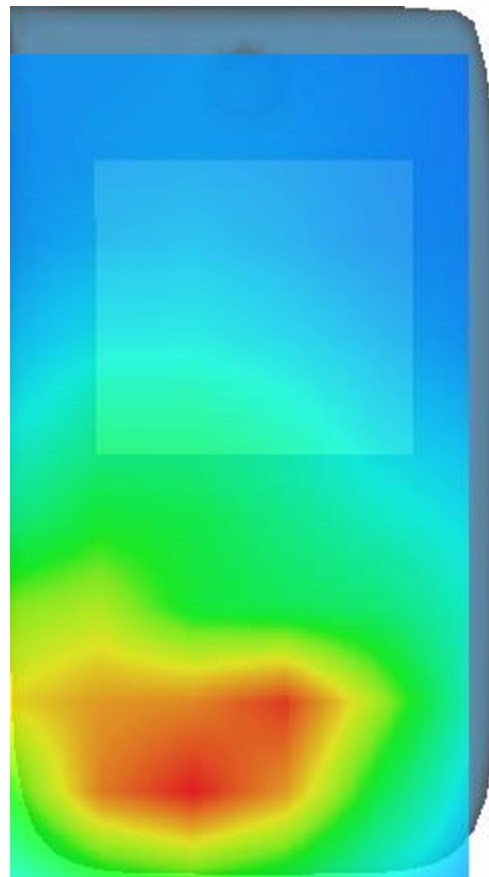
SAR 10g (W/Kg)	0.536448
SAR 1g (W/Kg)	1.050885



3D screen shot



Hot spot position



MEASUREMENT 51

Date of measurement: 19/7/2024

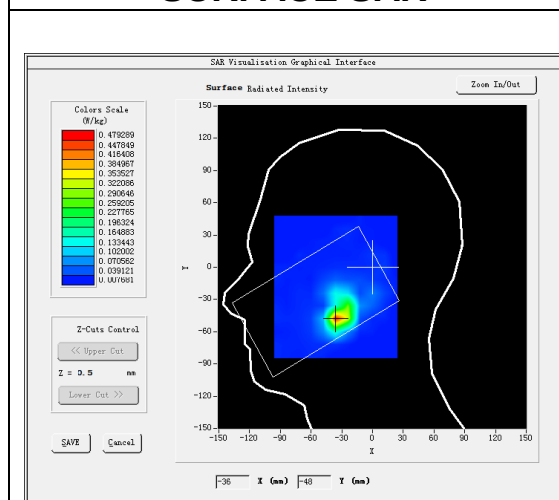
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

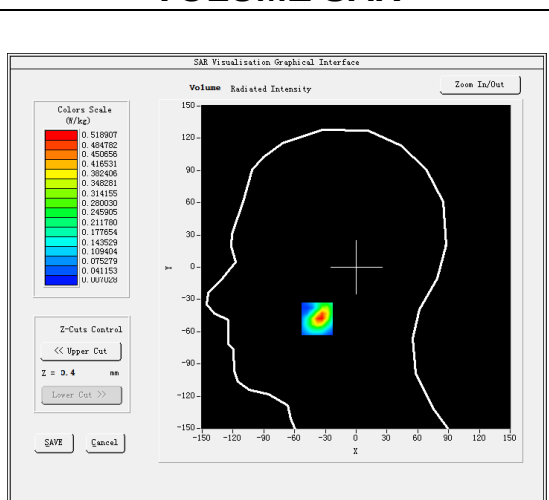
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.461262
Relative permittivity (imaginary part)	13.776830
Conductivity (S/m)	1.940237
Variation (%)	-2.050000

SURFACE SAR



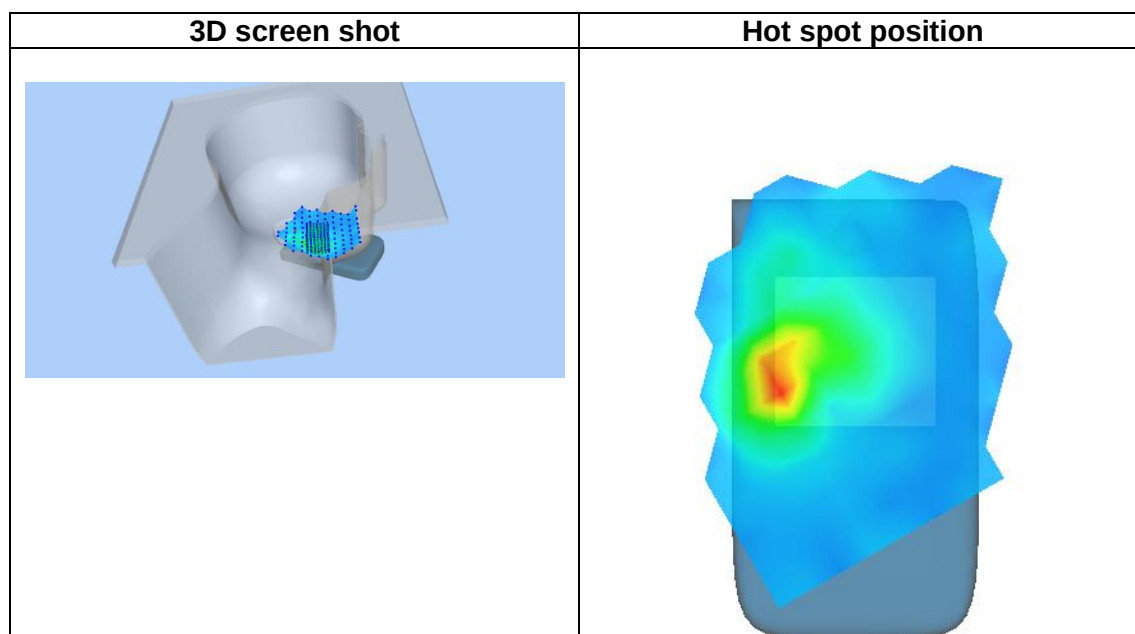
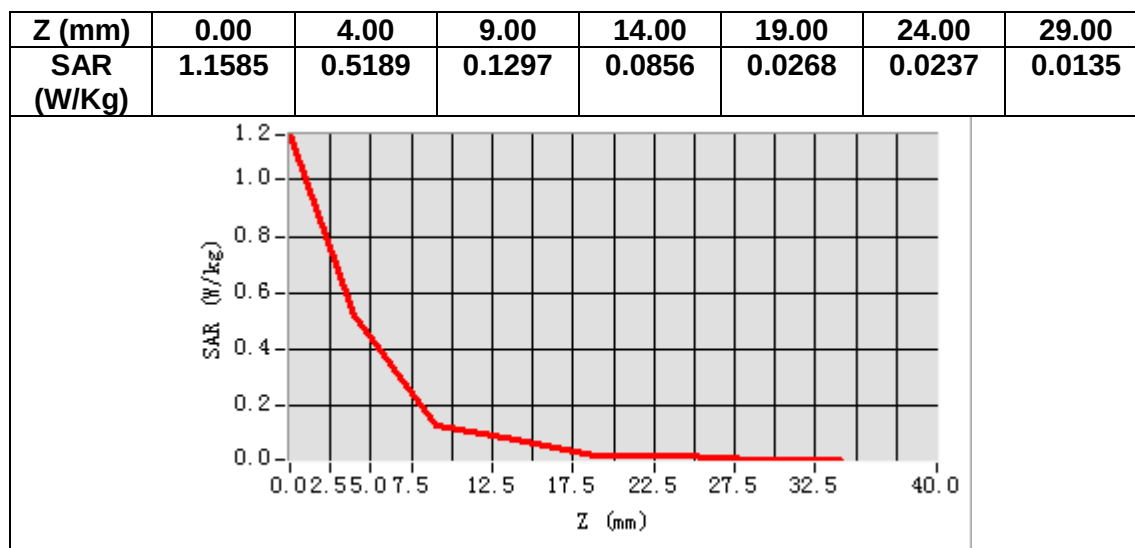
VOLUME SAR



Maximum location: X=-35.00, Y=-48.00

SAR Peak: 1.01 W/kg

SAR 10g (W/Kg)	0.171977
SAR 1g (W/Kg)	0.473226



MEASUREMENT 52

Date of measurement: 19/7/2024

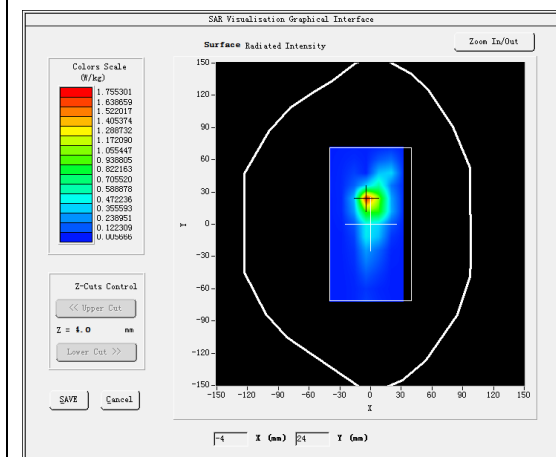
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.65</u>

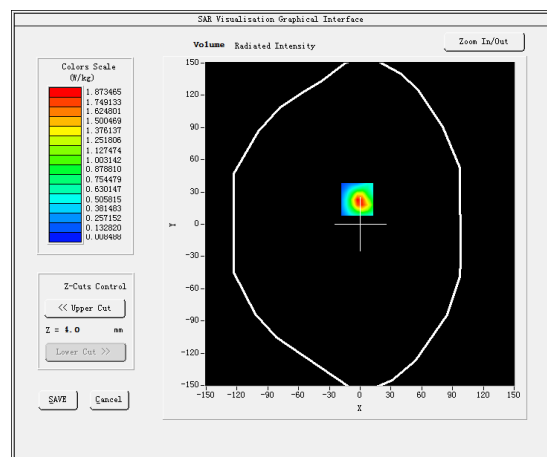
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.461262
Relative permittivity (imaginary part)	13.776830
Conductivity (S/m)	1.940237
Variation (%)	-1.270000

SURFACE SAR



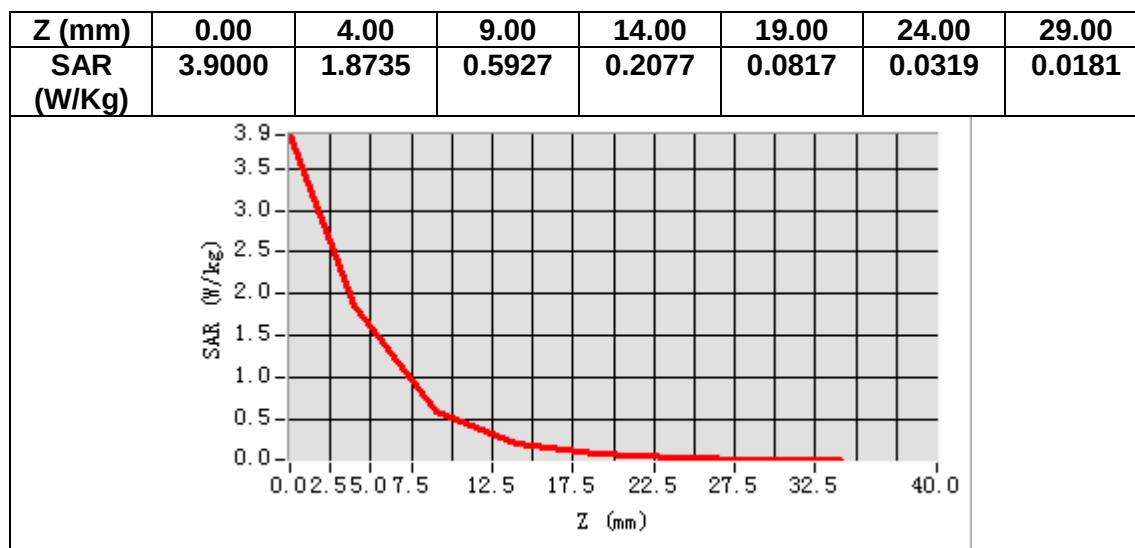
VOLUME SAR



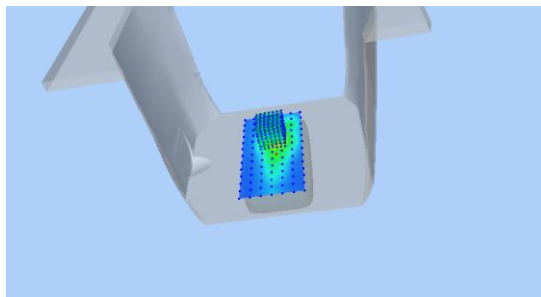
Maximum location: X=-3.00, Y=23.00

SAR Peak: 3.97 W/kg

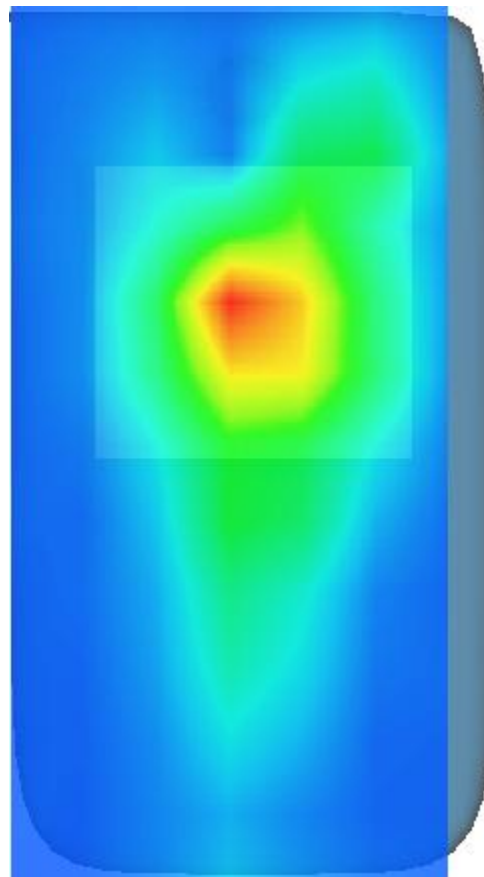
SAR 10g (W/Kg)	0.625688
SAR 1g (W/Kg)	1.772021



3D screen shot



Hot spot position



MEASUREMENT 53

Date of measurement: 24/7/2024

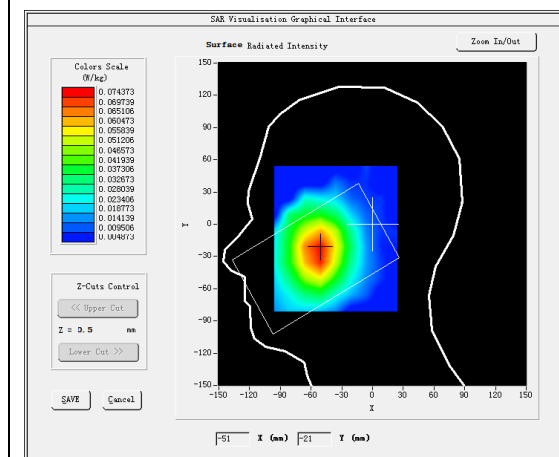
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>SA_n20</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

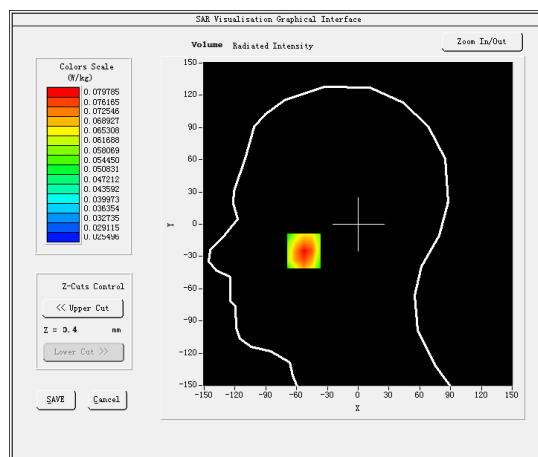
B. SAR Measurement Results

Frequency (MHz)	847.000000
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.912878
Variation (%)	-1.790000

SURFACE SAR



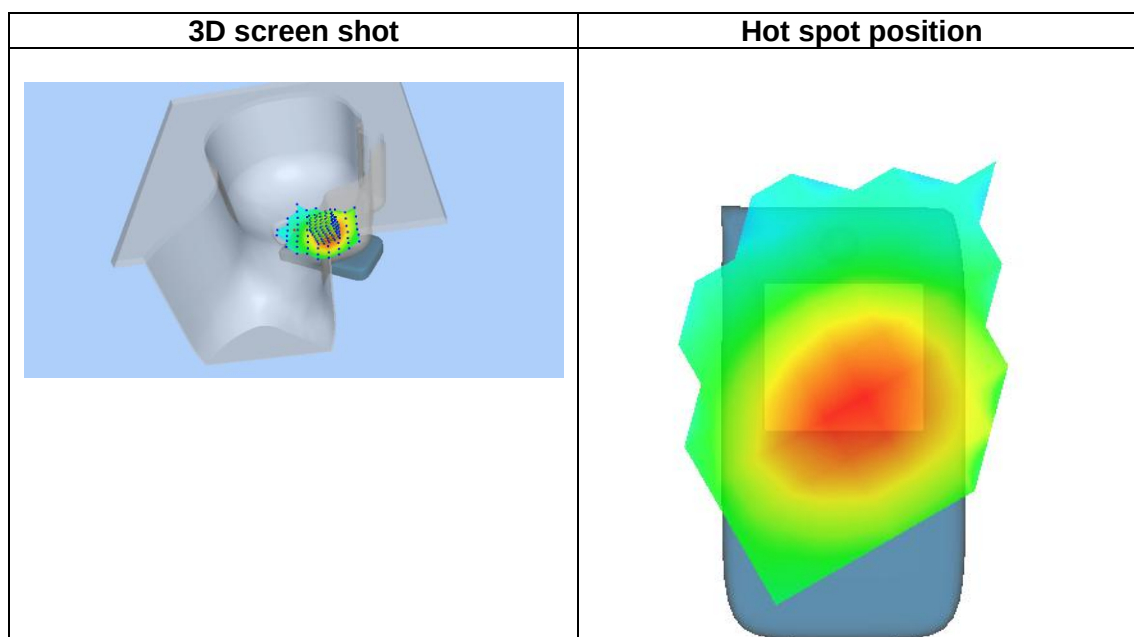
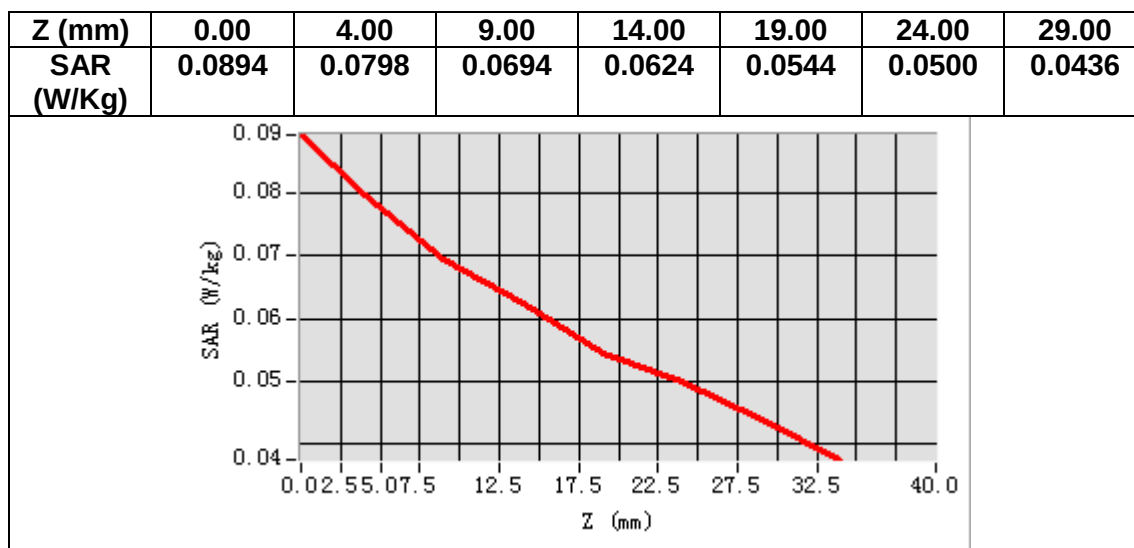
VOLUME SAR



Maximum location: X=-53.00, Y=-25.00

SAR Peak: 0.09 W/kg

SAR 10g (W/Kg)	0.063010
SAR 1g (W/Kg)	0.076925



MEASUREMENT 54

Date of measurement: 24/7/2024

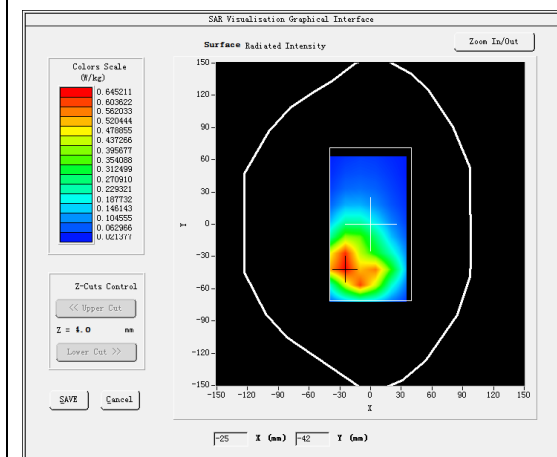
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>SA_n20</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.23</u>

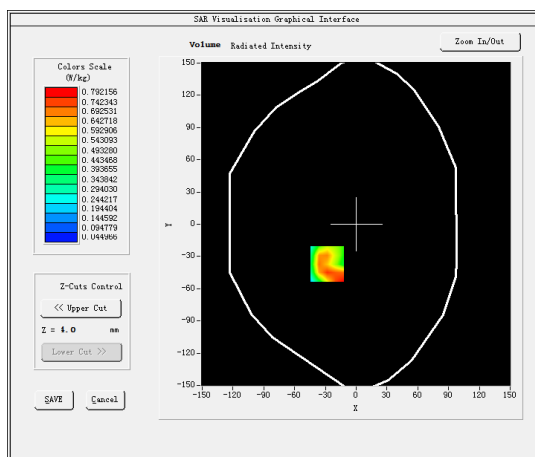
B. SAR Measurement Results

Frequency (MHz)	847.000000
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.912878
Variation (%)	-0.140000

SURFACE SAR



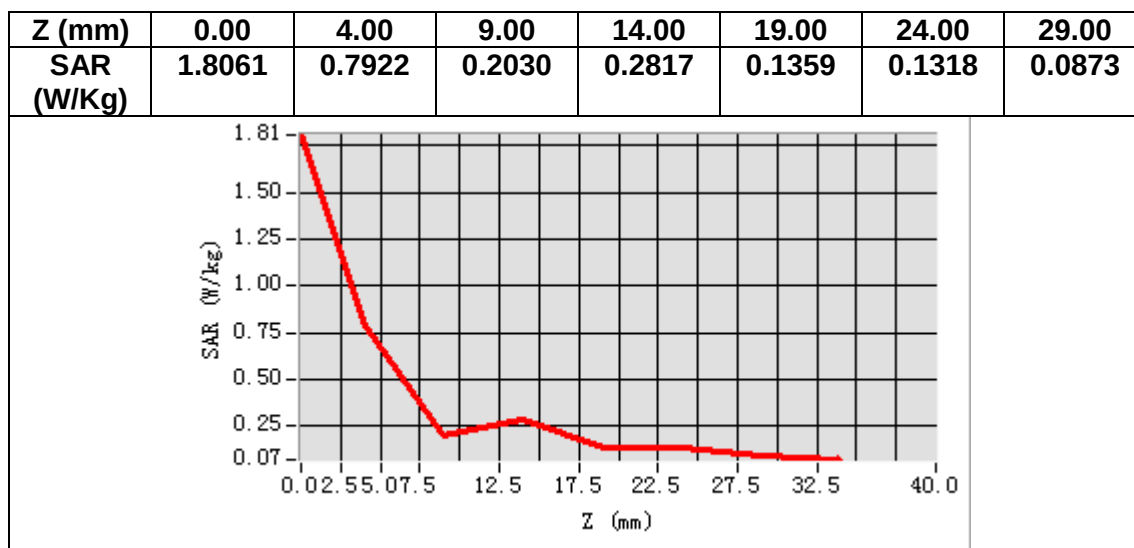
VOLUME SAR



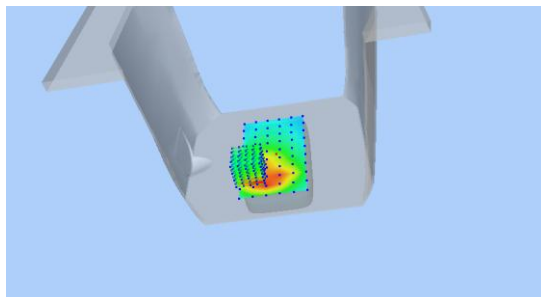
Maximum location: X=-28.00, Y=-37.00

SAR Peak: 1.26 W/kg

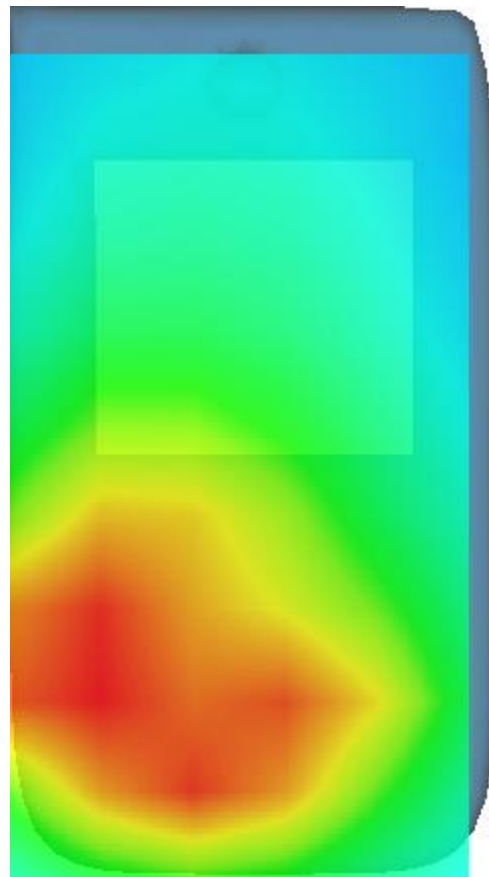
SAR 10g (W/Kg)	0.436728
SAR 1g (W/Kg)	0.728674



3D screen shot



Hot spot position



13. Appendix D. Calibration Certificate

Table of contents
E Field Probe - 3423-EPGO-426
750 MHz Dipole - SN 03/15 DIP 0G750-355
900 MHz Dipole - SN 03/15 DIP 0G900-348
1800 MHz Dipole - SN 03/15 DIP 1G800-349
2000 MHz Dipole - SN 03/15 DIP 2G000-351
2300 MHz Dipole - SN 03/16 DIP 2G300-358
2450 MHz Dipole - SN 03/15 DIP 2G450-352
2600 MHz Dipole - SN 03/15 DIP 2G600-356
3300 MHz Dipole - SN 03/21 DIP 3G300-359
3500 MHz Dipole - SN 09/12 DIP 3G500-360
3700 MHz Dipole - SN 09/12 DIP 3G700-361
4200 MHz Dipole - SN 03/21 DIP 4G200-363
5000-6000 MHz Dipole - SN 13/14 WGA 33



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



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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

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

Yann
Toutain ID

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

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

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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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:

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

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

Ref: ACR.261.11.23.BES.A

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.

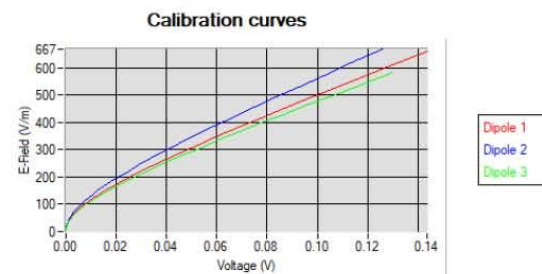
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

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

Vi=voltage readings on the 3 channels of the probe

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

Normi=dipole sensitivity given below for the 3 channels of the probe



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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.

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

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

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

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:

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

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:

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

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



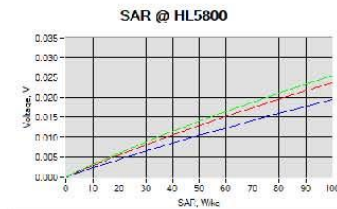
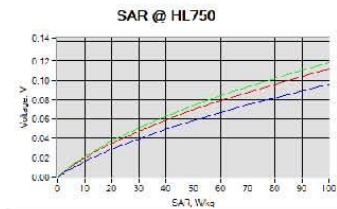
COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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.

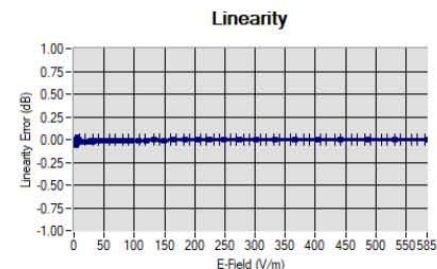
Liquid	Frequency (MHz*)	ConvF
HL750	750	2.37
HL850	835	2.32
HL900	900	2.23
HL1800	1800	2.45
HL1900	1900	2.63
HL2000	2000	2.83
HL2300	2300	2.81
HL2450	2450	2.85
HL2600	2600	2.65
HL3300	3300	2.21
HL3500	3500	2.20
HL3700	3700	2.11
HL3900	3900	2.40
HL4200	4200	2.40
HL4600	4600	2.33
HL4900	4900	2.37
HL5200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

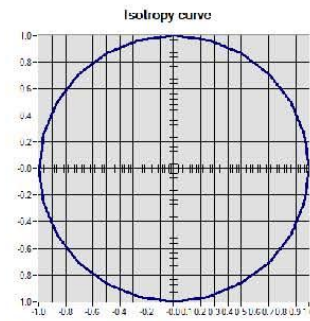


6 VERIFICATION RESULTS

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.



Linearity: +/-1.42% (+/-0.06dB)



Isotropy: +/-0.21% (+/-0.01dB)



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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.

Page: 9/10

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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.53.23.24.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 REFERENCE DIPOLE**

FREQUENCY: 750 MHZ

SERIAL NO.: SN 03/15DIP0G750-355

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

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Toutain ID

Signature
numérique de
Yann Toutain ID
Date : 2024.02.27
08:54:37 +01'00'

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

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 03/15DIP0G 750-355
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

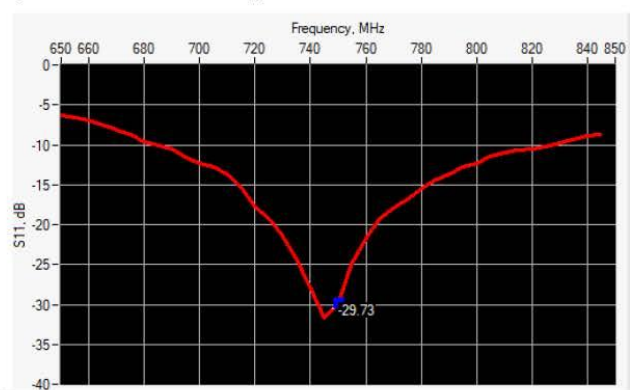
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	176.00 +/- 2%	-	100.00 +/- 2%	-	6.35 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
750	-29.73	-20	$52.5\Omega + 2.2j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

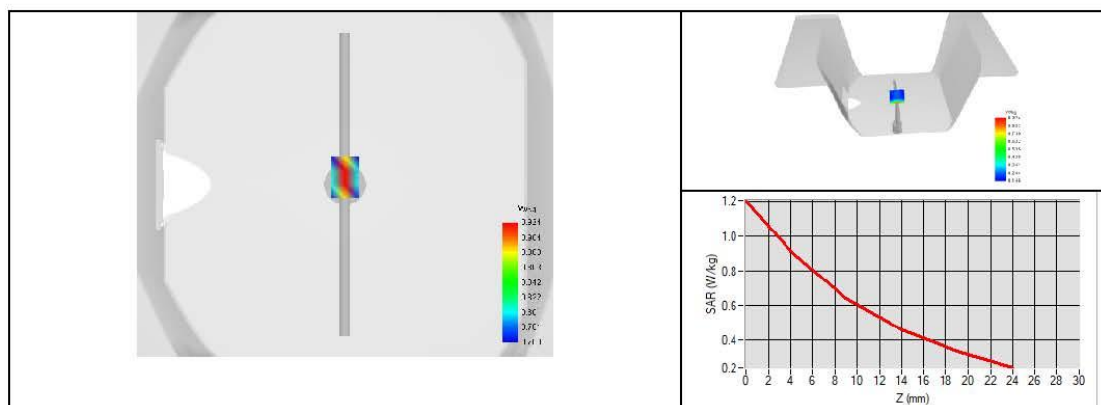


SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: $\epsilon_{ps}' : 45.0$ $\sigma : 0.87$
Distance between dipole center and liquid	15.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=8mm/dy=8mm/dz=5mm$
Frequency	750 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
750 MHz	0.86	8.60	8.49	0.58	5.78	5.55





SAR REFERENCE DIPOLE CALIBRATION REPORT

REF : ACR.53.23.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.25.24.BES.A

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CO., LTD.**

**BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE**

FREQUENCY: 900 MHZ

SERIAL NO.: SN 03/15DIP0G900-348

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 21/02/2024



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

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

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.25.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

Yann
Toutain ID

Signature
numérique de
Yann Toutain ID
Date : 2024.02.27
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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.25.24.BES.A

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7	List of Equipment	8



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.25.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 900 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID900
Serial Number	SN 03/15DIP0G900-348
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.25.24.BES.A

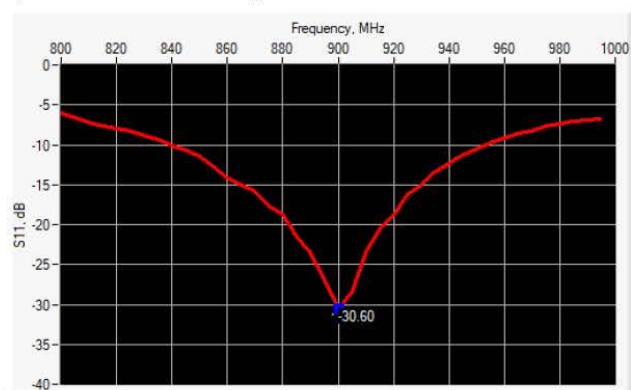
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	149.00 +/- 2%	-	83.30 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
900	-30.60	-20	$51.5\Omega + 2.6j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

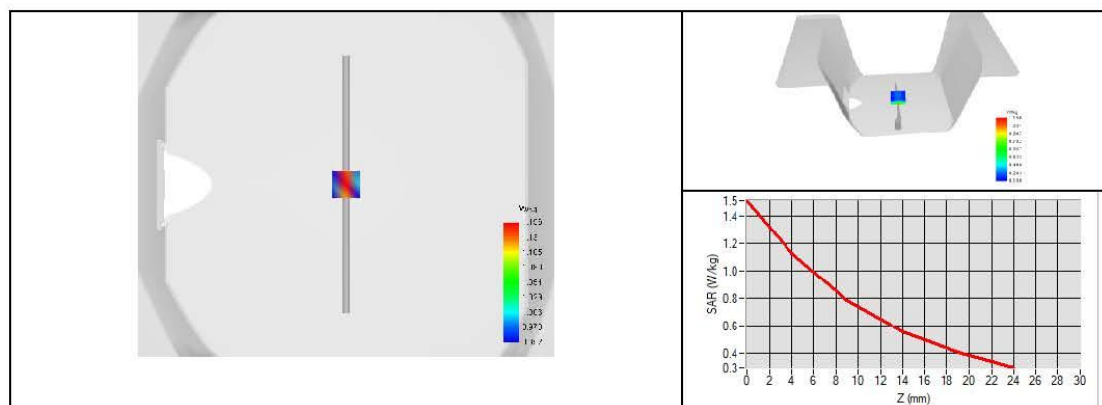


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.25.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: $\epsilon_{ps}' : 44.6$ $\sigma : 0.92$
Distance between dipole center and liquid	15.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=8mm/dy=8mm/dz=5mm$
Frequency	900 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
900 MHz	1.06	10.63	10.90	0.70	7.01	6.99





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.25.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.26.24.BES.A

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COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE**

FREQUENCY: 1800 MHZ

SERIAL NO.: SN 03/15DIP1G800-349

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.26.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

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Toutain IDSignature
numérique de
Yann Toutain ID
Date : 2024.02.27
08:56:12 +01'00'

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

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.26.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.26.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 1800 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID1800
Serial Number	SN 03/15DIP1G800-349
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.26.24.BES.A

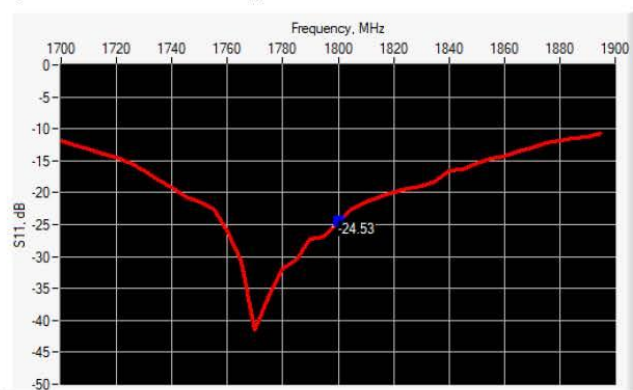
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	72.00 +/- 2%	-	41.70 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
1800	-24.53	-20	$44.8\Omega + 2.0j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

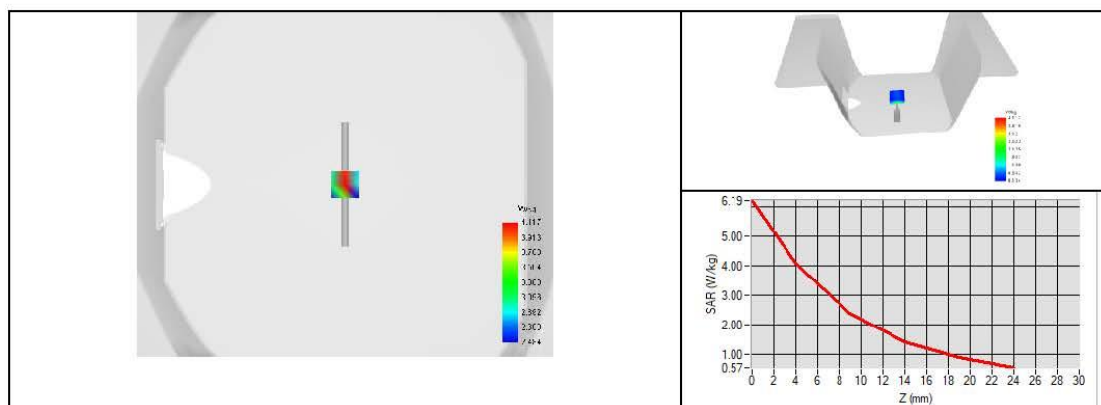


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.26.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: ϵ_p' : 42.7 σ : 1.36
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=8mm/dy=8mm/dz=5mm$
Frequency	1800 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
1800 MHz	3.71	37.06	38.40	2.00	20.01	20.10





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.26.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.28.24.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 REFERENCE DIPOLE**

FREQUENCY: 2000 MHZ

SERIAL NO.: SN 03/15DIP2G000-351

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



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

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

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.28.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

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Date : 2024.02.27
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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.28.24.BES.A

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5.2	S11 Parameter	5
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7	List of Equipment	8



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.28.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 2000 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID2000
Serial Number	SN 03/15DIP2G000-351
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.28.24.BES.A

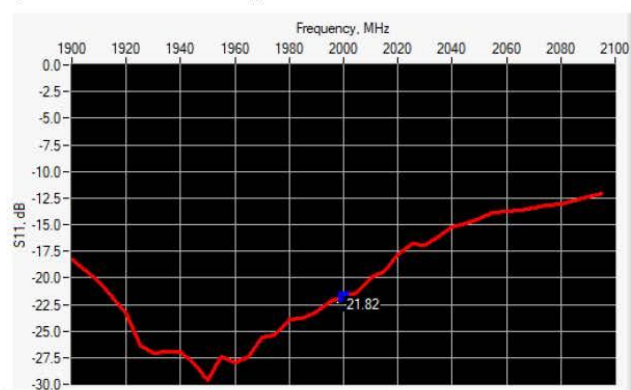
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	64.50 +/- 2%	-	37.50 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
2000	-21.82	-20	$58.3\Omega + 2.9j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

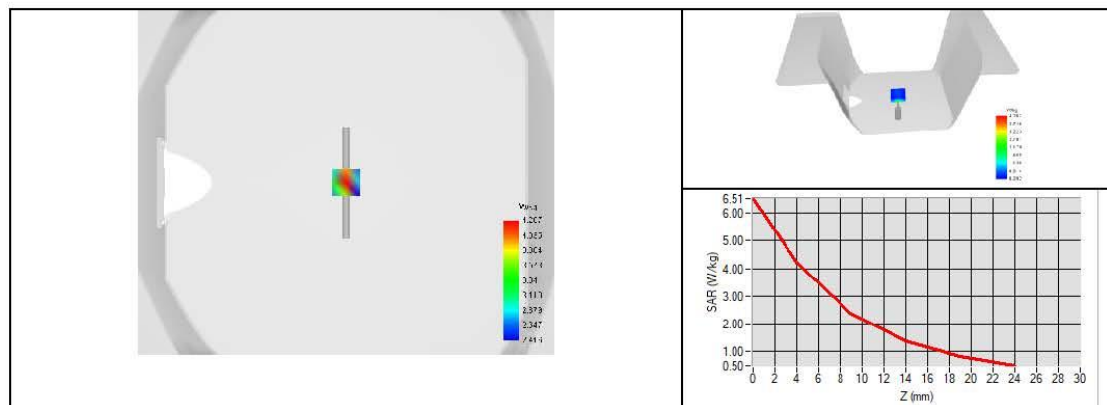


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.28.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: ϵ_p' : 42.6 σ : 1.46
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=5mm$
Frequency	2000 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
2000 MHz	3.83	38.27	41.10	1.98	19.79	21.10





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.28.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.32.24.BES.A

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**BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE**

FREQUENCY: 2300 MHZ

SERIAL NO.: SN 03/16DIP2G300-358

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 02/21/2024



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

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

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.32.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

Yann
Toutain ID

Signature
numérique de
Yann Toutain ID
Date : 2024.02.27
08:57:39 +01'00'

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

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.32.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.32.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 2300 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID2300
Serial Number	SN 03/16DIP2G300-358
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.32.24.BES.A

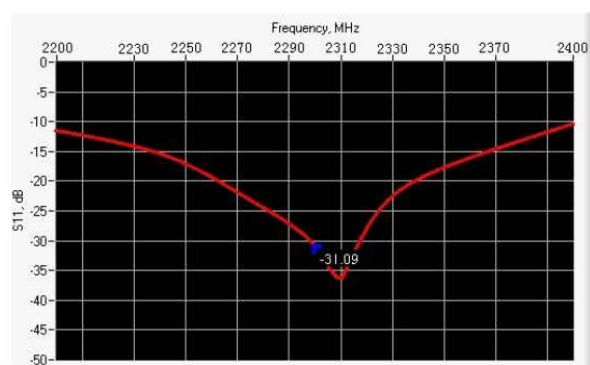
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	55.50 +/- 2%	-	32.60 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
2300	-31.09	-20	$56.3\Omega - 2.9j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

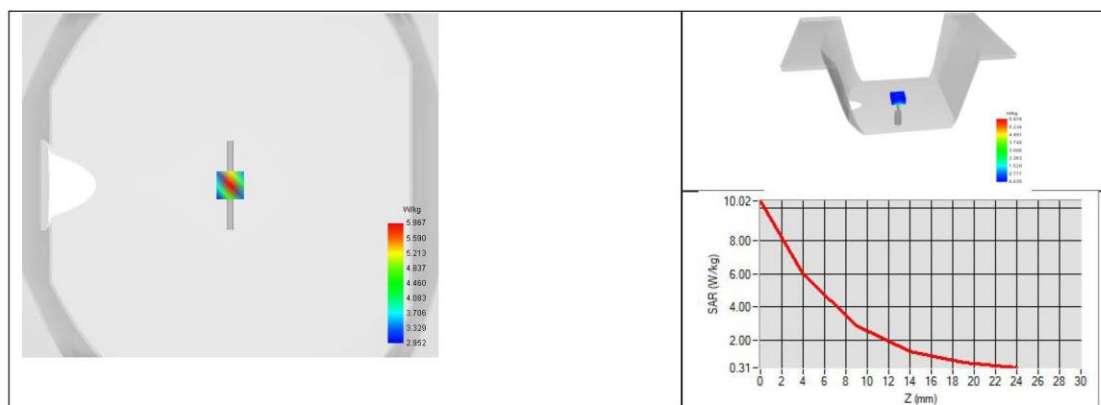


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.32.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: eps' : 42.0 sigma : 1.80
Distance between dipole center and liquid	10.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=5mm/dy=5mm/dz=5mm
Frequency	2300 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
2300 MHz	5.06	50.63	48.70	2.35	23.51	23.30





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.32.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024

Page: 8/8

Template: ACR.DDD.N.YY.MVGB.ISSUE_SAR Reference Dipole v1

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SAR Reference Dipole Calibration Report

Ref : ACR.53.29.24.BES.A

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**BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE**

FREQUENCY: 2450 MHZ

SERIAL NO.: SN 03/15DIP2G450-352

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.29.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

Yann
Toutain ID

Signature
numérique de
Yann Toutain ID
Date : 2024.02.27
08:57:39 +01'00'

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

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.29.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.29.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 2450 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID2450
Serial Number	SN 03/15DIP2G450-352
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.29.24.BES.A

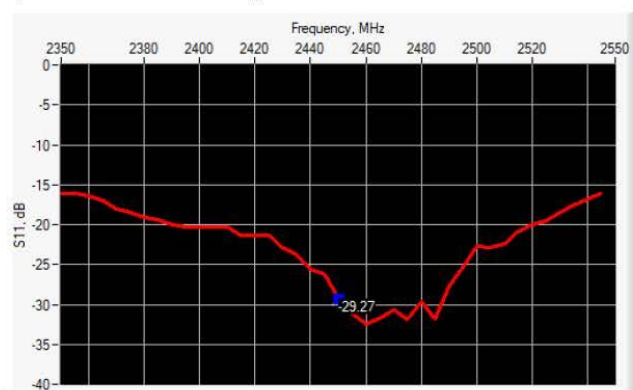
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	51.50 +/- 2%	-	30.40 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
2450	-29.27	-20	$53.6\Omega + 0.1j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

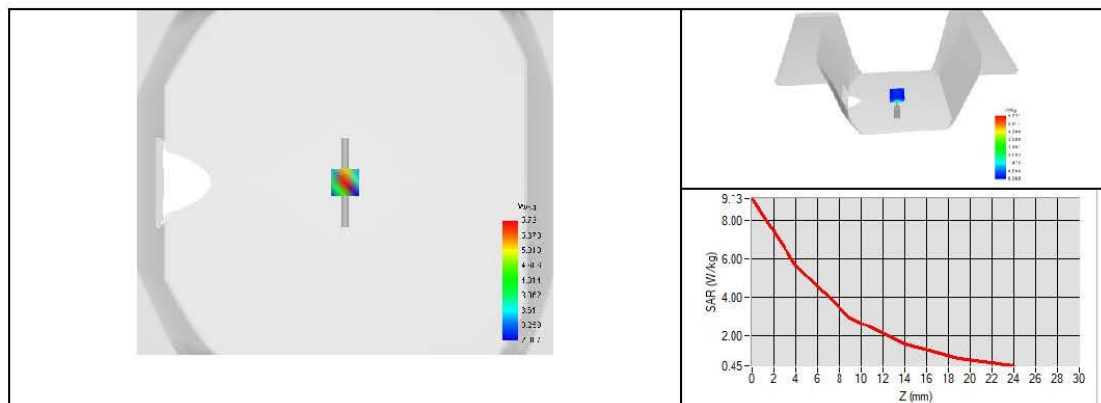


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.29.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: $\epsilon_p' : 42.1$ $\sigma : 1.83$
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=5mm$
Frequency	2450 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
2450 MHz	5.00	50.05	52.40	2.38	23.80	24.00





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.29.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.53.30.24.BES.A

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**BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE**

FREQUENCY: 2600 MHZ

SERIAL NO.: SN 03/15DIP2G600-356

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 02/21/2024



Accreditations #2-6789 and #2-6814
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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.30.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

Yann
Toutain
IDSignature
numérique de
Yann Toutain ID
Date : 2024.02.27
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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.30.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.30.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 2600 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID2600
Serial Number	SN 03/15DIP2G600-356
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -20 dB or better. The S11 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.

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

For the measurement in the range 0-300mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

For the measurement in the range 300-450mm, the estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.44 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.30.24.BES.A

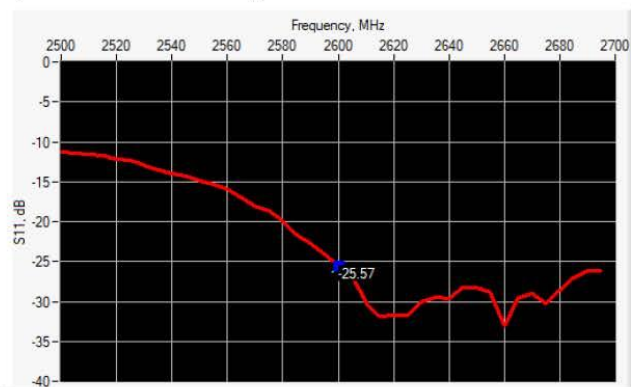
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	48.50 +/- 2%	-	28.80 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
2600	-25.57	-20	$54.5\Omega - 3.2j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

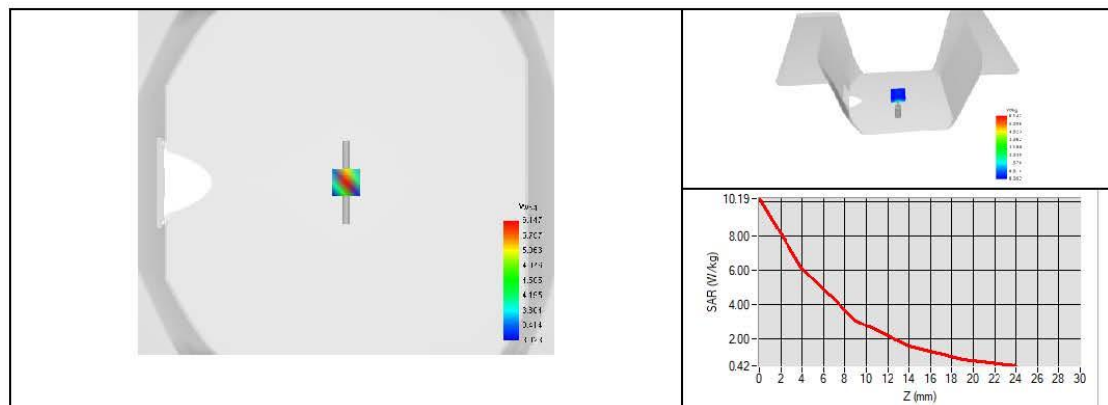


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.30.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: ϵ_p' : 41.3 σ : 1.95
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=5mm$
Frequency	2600 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
2600 MHz	5.42	54.16	55.30	2.49	24.85	24.60





SAR Reference Dipole Calibration Report

Ref : ACR.53.33.24.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 REFERENCE DIPOLE

FREQUENCY: 3300 MHZ

SERIAL NO.: SN 03/21DIP3G300-359

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 5/18/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	5/18/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	5/18/2024	
Authorized by:	Yann Toutain	Laboratory Director	5/19/2024	

Yann
Toutain IDSignature numérique
de Yann Toutain ID
Date : 2024.05.19
08:51:11 +01'00'

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

Issue	Name	Date	Modifications
A	Pedro Ruiz	5/19/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

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8	List of Equipment	11



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 3300 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID3300
Serial Number	SN 03/21 DIP 3G.300-359
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

4 MEASUREMENT METHOD

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 IEC/IEEE 62209-1528 and FCC KDB865664 D01 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



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

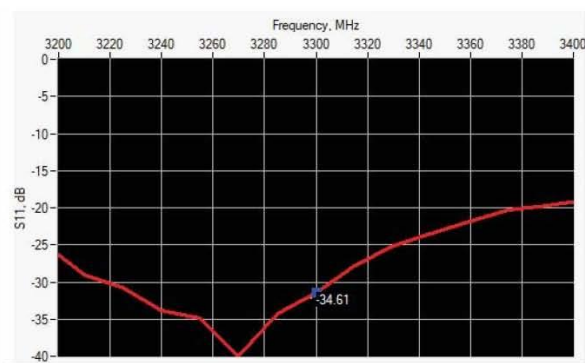
5.3 VALIDATION MEASUREMENT

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

Scan Volume	Expanded Uncertainty
1 g	19 % (SAR)
10 g	19 % (SAR)

6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
3300	-34.61	-20	$50.7 \Omega + 2.6 j\Omega$



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

6.2 MECHANICAL DIMENSIONS

Frequency MHz	L mm		h mm		d mm	
	required	measured	required	measured	required	measured
300	420.0 ±1 %.		250.0 ±1 %.		6.35 ±1 %.	
450	290.0 ±1 %.		166.7 ±1 %.		6.35 ±1 %.	
750	176.0 ±1 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.		89.8 ±1 %.		3.6 ±1 %.	
900	149.0 ±1 %.		83.3 ±1 %.		3.6 ±1 %.	
1450	89.1 ±1 %.		51.7 ±1 %.		3.6 ±1 %.	
1500	80.5 ±1 %.		50.0 ±1 %.		3.6 ±1 %.	
1640	79.0 ±1 %.		45.7 ±1 %.		3.6 ±1 %.	
1750	75.2 ±1 %.		42.9 ±1 %.		3.6 ±1 %.	
1800	72.0 ±1 %.		41.7 ±1 %.		3.6 ±1 %.	
1900	68.0 ±1 %.		39.5 ±1 %.		3.6 ±1 %.	
1950	66.3 ±1 %.		38.5 ±1 %.		3.6 ±1 %.	
2000	64.5 ±1 %.		37.5 ±1 %.		3.6 ±1 %.	
2100	61.0 ±1 %.		35.7 ±1 %.		3.6 ±1 %.	
2300	55.5 ±1 %.		32.6 ±1 %.		3.6 ±1 %.	
2450	51.5 ±1 %.		30.4 ±1 %.		3.6 ±1 %.	
2600	48.5 ±1 %.		28.8 ±1 %.		3.6 ±1 %.	
3000	41.5 ±1 %.		25.0 ±1 %.		3.6 ±1 %.	
3300	-	39.65	-	25.41	-	3.63
3500	37.0 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3700	34.7 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3900	-		-		-	
4200	-		-		-	
4600	-		-		-	
4900	-		-		-	

7 VALIDATION MEASUREMENT

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

7.1 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r)		Conductivity (σ) S/m	
	required	measured	required	measured
300	45.3 $\pm$ 10 %		0.87 $\pm$ 10 %	
450	43.5 $\pm$ 10 %		0.87 $\pm$ 10 %	
750	41.9 $\pm$ 10 %		0.89 $\pm$ 10 %	
835	41.5 $\pm$ 10 %		0.90 $\pm$ 10 %	
900	41.5 $\pm$ 10 %		0.97 $\pm$ 10 %	
1450	40.5 $\pm$ 10 %		1.20 $\pm$ 10 %	
1500	40.4 $\pm$ 10 %		1.23 $\pm$ 10 %	
1640	40.2 $\pm$ 10 %		1.31 $\pm$ 10 %	
1750	40.1 $\pm$ 10 %		1.37 $\pm$ 10 %	
1800	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
1900	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
1950	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
2000	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
2100	39.8 $\pm$ 10 %		1.49 $\pm$ 10 %	
2300	39.5 $\pm$ 10 %		1.67 $\pm$ 10 %	
2450	39.2 $\pm$ 10 %		1.80 $\pm$ 10 %	
2600	39.0 $\pm$ 10 %		1.96 $\pm$ 10 %	
3000	38.5 $\pm$ 10 %		2.40 $\pm$ 10 %	
3300	38.2 $\pm$ 10 %	37.8	2.71 $\pm$ 10 %	2.85
3500	37.9 $\pm$ 10 %		2.91 $\pm$ 10 %	
3700	37.7 $\pm$ 10 %		3.12 $\pm$ 10 %	
3900	37.5 $\pm$ 10 %		3.32 $\pm$ 10 %	
4200	37.1 $\pm$ 10 %		3.63 $\pm$ 10 %	
4600	36.7 $\pm$ 10 %		4.04 $\pm$ 10 %	
4900	36.3 $\pm$ 10 %		4.35 $\pm$ 10 %	

7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Page: 8/11

Template_ACR.DDD.N.YY.MVGB.ISSUE_SAR Reference Dipole vJ

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A

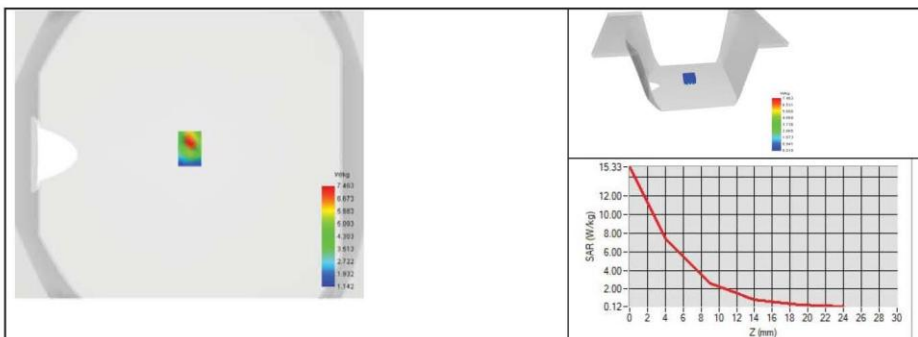
Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: $\epsilon_s' : 37.8$ $\sigma : 2.85$
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=4mm$
Frequency	3300 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency MHz	1 g SAR (W/kg/W)		10 g SAR (W/kg/W)	
	required	measured	required	measured
300	2.85		1.94	
450	4.58		3.06	
750	8.49		5.55	
835	9.56		6.22	
900	10.9		6.99	
1450	29		16	
1500	30.5		16.8	
1640	34.2		18.4	
1750	36.4		19.3	
1800	38.4		20.1	
1900	39.7		20.5	
1950	40.5		20.9	
2000	41.1		21.1	
2100	43.6		21.9	
2300	48.7		23.3	
2450	52.4		24	
2600	55.3		24.6	
3000	63.8		25.7	
3300	-	67.61 (6.76)	-	26.04 (2.60)
3500	67.1		25	
3700	67.4		24.2	
3900	-		-	
4200	-		-	
4600	-		-	
4900	-		-	



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.33.24.BES.A





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR 53.33.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref.: ACR.53.30.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Dipole Calibration Report

Ref : ACR.139.15.20.SATU.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.
BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE
FREQUENCY: 3500 MHZ
SERIAL NO.: SN 09/12 DIP 3G500-360

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



10/15/2022

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG USA using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.15.20.SATU.A

	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Jérôme LUC	Product Manager	10/15/2022	<i>JS</i>
<i>Checked by :</i>	Jérôme LUC	Product Manager	10/15/2022	<i>JS</i>
<i>Approved by :</i>	Kim RUTKOWSKI	Quality Manager	10/15/2022	<i>Kim Rutkowski</i>

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

<i>Issue</i>	<i>Date</i>	<i>Modifications</i>
A	10/15/2022	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.15.20.SATU.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.15.20.SATU.A

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 3500 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID3500
Serial Number	SN 09/12 DIP 3G500-360
Product Condition (new / used)	New

A yearly calibration interval is recommended.

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

Ref: ACR.139.15.20.SATU.A

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.

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 dimensions 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.

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	0.1 dB

5.2 DIMENSION MEASUREMENT

The following uncertainties apply to the dimension measurements:

Length (mm)	Expanded Uncertainty on Length
3 - 300	0.05 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
1 g	20.3 %



SAR REFERENCE DIPOLE CALIBRATION REPORT

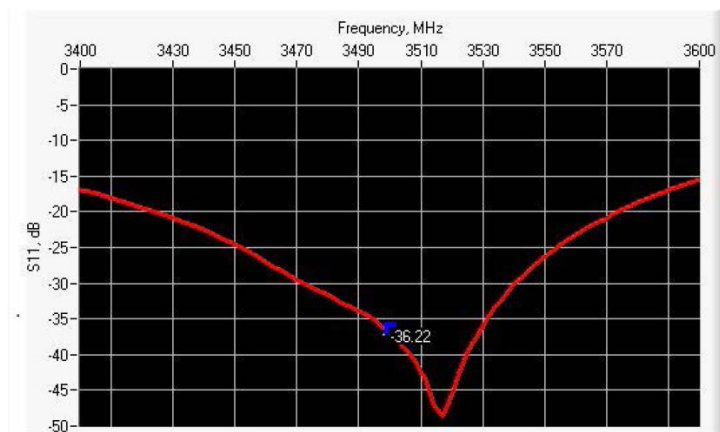
Ref: ACR.139.15.20.SATU.A

10 g

20.1 %

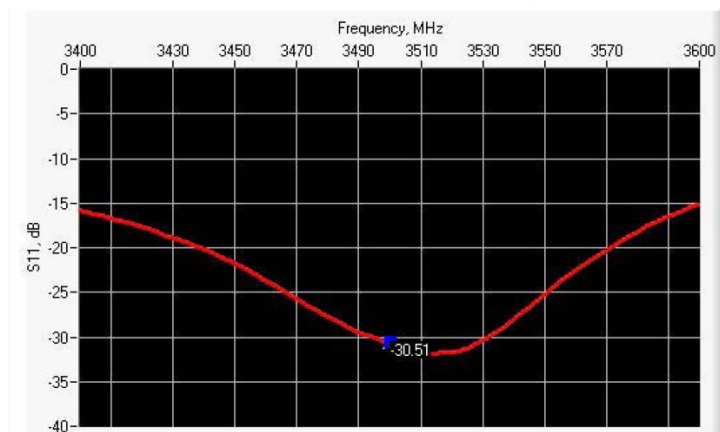
6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
3500	-36.22	-20	$48.9 \Omega + 1.1 j\Omega$

6.2 RETURN LOSS AND IMPEDANCE IN BODY LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
3500	-30.51	-20	$52.2 \Omega + 2.0 j\Omega$

6.3 MECHANICAL DIMENSIONS

Frequency MHz	L mm		h mm		d mm	
	required	measured	required	measured	required	measured
300	$420.0 \pm 1 \%$		$250.0 \pm 1 \%$		$6.35 \pm 1 \%$	

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450	290.0 ±1 %.		166.7 ±1 %.		6.35 ±1 %.	
750	176.0 ±1 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.		89.8 ±1 %.		3.6 ±1 %.	
900	149.0 ±1 %.		83.3 ±1 %.		3.6 ±1 %.	
1450	89.1 ±1 %.		51.7 ±1 %.		3.6 ±1 %.	
1500	80.5 ±1 %.		50.0 ±1 %.		3.6 ±1 %.	
1640	79.0 ±1 %.		45.7 ±1 %.		3.6 ±1 %.	
1750	75.2 ±1 %.		42.9 ±1 %.		3.6 ±1 %.	
1800	72.0 ±1 %.		41.7 ±1 %.		3.6 ±1 %.	
1900	68.0 ±1 %.		39.5 ±1 %.		3.6 ±1 %.	
1950	66.3 ±1 %.		38.5 ±1 %.		3.6 ±1 %.	
2000	64.5 ±1 %.		37.5 ±1 %.		3.6 ±1 %.	
2100	61.0 ±1 %.		35.7 ±1 %.		3.6 ±1 %.	
2300	55.5 ±1 %.		32.6 ±1 %.		3.6 ±1 %.	
2450	51.5 ±1 %.		30.4 ±1 %.		3.6 ±1 %.	
2600	48.5 ±1 %.		28.8 ±1 %.		3.6 ±1 %.	
3400	41.5 ±1 %.		25.0 ±1 %.		3.6 ±1 %.	
3500	37.0 ±1 %.	PASS	26.4 ±1 %.	PASS	3.6 ±1 %.	PASS
3800	34.7 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	

7 VALIDATION MEASUREMENT

The IEEE Std. 1528, FCC KDBs and CEI/IEC 62209 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

7.1 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r')		Conductivity (σ) S/m	
	required	measured	required	measured
300	45.3 ±5 %		0.87 ±5 %	
450	43.5 ±5 %		0.87 ±5 %	
750	41.9 ±5 %		0.89 ±5 %	
835	41.5 ±5 %		0.90 ±5 %	
900	41.5 ±5 %		0.97 ±5 %	
1450	40.5 ±5 %		1.20 ±5 %	
1500	40.4 ±5 %		1.23 ±5 %	
1640	40.2 ±5 %		1.31 ±5 %	
1750	40.1 ±5 %		1.37 ±5 %	

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1800	40.0 ±5 %		1.40 ±5 %	
1900	40.0 ±5 %		1.40 ±5 %	
1950	40.0 ±5 %		1.40 ±5 %	
2000	40.0 ±5 %		1.40 ±5 %	
2100	39.8 ±5 %		1.49 ±5 %	
2300	39.5 ±5 %		1.67 ±5 %	
2450	39.2 ±5 %		1.80 ±5 %	
2600	39.0 ±5 %		1.96 ±5 %	
3400	38.0 ±5 %		2.81 ±5 %	
3500	37.9 ±5 %	PASS	2.91 ±5 %	PASS

7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Software	OPENSAR V4
Phantom	SN 20/09 SAM71
Probe	SN 18/11 EPG122
Liquid	Head Liquid Values: eps' : 37.9 sigma : 2.95
Distance between dipole center and liquid	10.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=5mm/dy=5mm/dz=5mm
Frequency	3500 MHz
Input power	20 dBm
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

Frequency MHz	1 g SAR (W/kg/W)		10 g SAR (W/kg/W)	
	required	measured	required	measured
300	2.85		1.94	
450	4.58		3.06	
750	8.49		5.55	
835	9.56		6.22	
900	10.9		6.99	
1450	29		16	
1500	30.5		16.8	
1640	34.2		18.4	
1750	36.4		19.3	
1800	38.4		20.1	

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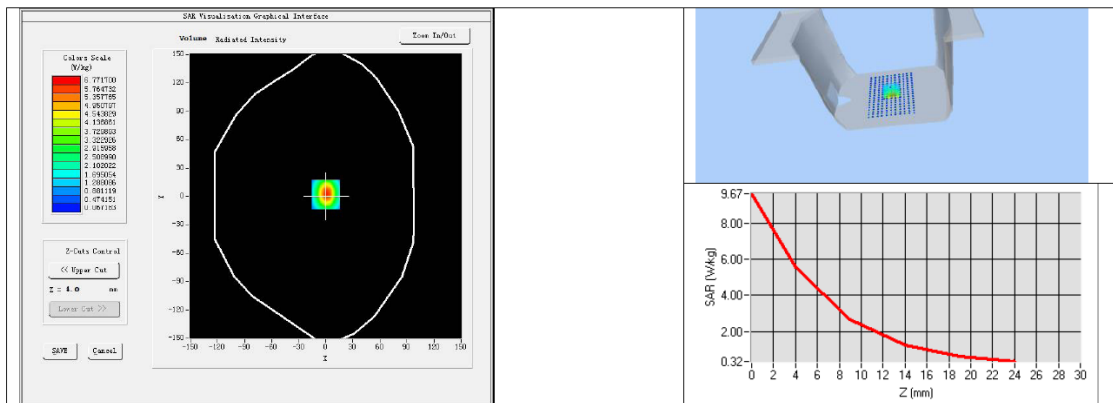
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Ref: ACR.139.15.20.SATU.A

1900	39.7		20.5	
1950	40.5		20.9	
2000	41.1		21.1	
2100	43.6		21.9	
2300	48.7		23.3	
2450	52.4		24	
2600	55.3		24.6	
3400	66.4		25.1	
3500	67.1	67.18 (6.72)	25	24.50 (2.45)



7.3 BODY LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r')		Conductivity (σ) S/m	
	required	measured	required	measured
150	61.9 ± 5 %		0.80 ± 5 %	
300	58.2 ± 5 %		0.92 ± 5 %	
450	56.7 ± 5 %		0.94 ± 5 %	
750	55.5 ± 5 %		0.96 ± 5 %	
835	55.2 ± 5 %		0.97 ± 5 %	
900	55.0 ± 5 %		1.05 ± 5 %	
915	55.0 ± 5 %		1.06 ± 5 %	
1450	54.0 ± 5 %		1.30 ± 5 %	
1610	53.8 ± 5 %		1.40 ± 5 %	
1800	53.3 ± 5 %		1.52 ± 5 %	
1900	53.3 ± 5 %		1.52 ± 5 %	
2000	53.3 ± 5 %		1.52 ± 5 %	
2100	53.2 ± 5 %		1.62 ± 5 %	
2450	52.7 ± 5 %		1.95 ± 5 %	

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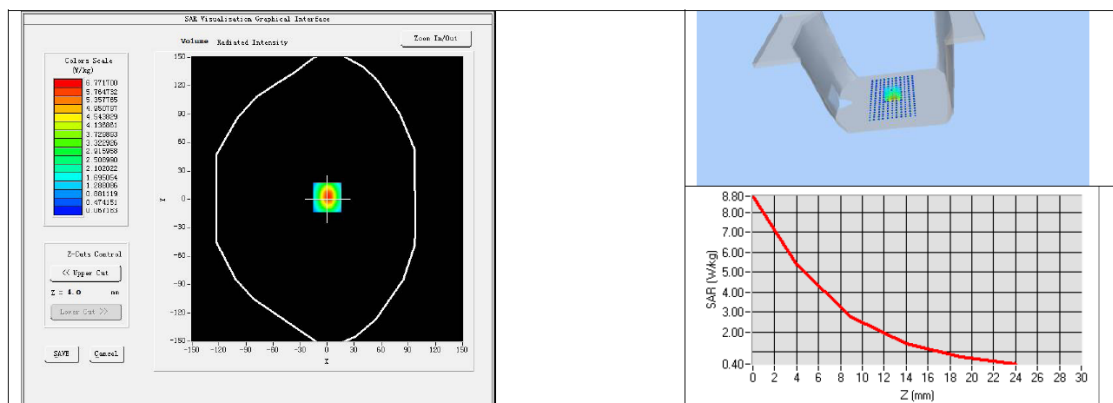
Ref: ACR.139.15.20.SATU.A

3400	51.5 ±5 %		3.20 ±5 %	
3500	51.3 ±5 %	PASS	3.31 ±5 %	PASS
3800	50.9 ±5 %		3.66 ±5 %	
5200	49.0 ±10 %		5.30 ±10 %	
5300	48.9 ±10 %		5.42 ±10 %	
5400	48.7 ±10 %		5.53 ±10 %	
5500	48.6 ±10 %		5.65 ±10 %	
5600	48.5 ±10 %		5.77 ±10 %	
5800	48.2 ±10 %		6.00 ±10 %	

7.4 SAR MEASUREMENT RESULT WITH BODY LIQUID

Software	OPENSAR V4
Phantom	SN 20/09 SAM71
Probe	SN 18/11 EPG122
Liquid	Body Liquid Values: eps' : 51.4 sigma : 3.40
Distance between dipole center and liquid	10.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=5mm/dy=5mm/dz=5mm
Frequency	3500 MHz
Input power	20 dBm
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

Frequency MHz	1 g SAR (W/kg/W)	10 g SAR (W/kg/W)
	measured	measured
3500	59.22(5.92)	23.80 (2.38)



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8 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rhode & Schwarz ZVA	SN100132	02/2020	02/2023
Calipers	Carrera	CALIPER-01	01/2020	01/2023
Reference Probe	MVG	EPG122 SN 18/11	06/2022	06/2023
Multimeter	Keithley 2000	1188656	01/2020	01/2023
Signal Generator	Agilent E4438C	MY49070581	01/2020	01/2023
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	HP E4418A	US38261498	01/2020	01/2023
Power Sensor	HP ECP-E26A	US37181460	01/2020	01/2023
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Temperature and Humidity Sensor	Control Company	11-661-9	11/2019	11/2022



SAR Reference Dipole Calibration Report

Ref : ACR.139.16.20.SATU.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.
BUILDING E, FENDA SCIENCE PARK, SANWEI
COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA
MVG COMOSAR REFERENCE DIPOLE
FREQUENCY: 3700 MHZ
SERIAL NO.: SN 09/12 DIP 3G700-361

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



10/15/2022

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG USA using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.16.20.SATU.A

	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Jérôme LUC	Product Manager	10/15/2022	<i>JS</i>
<i>Checked by :</i>	Jérôme LUC	Product Manager	10/15/2022	<i>JS</i>
<i>Approved by :</i>	Kim RUTKOWSKI	Quality Manager	10/15/2022	<i>Kim Rutkowski</i>

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

<i>Issue</i>	<i>Date</i>	<i>Modifications</i>
A	10/15/2022	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.16.20.SATU.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.16.20.SATU.A

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 3700 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID3700
Serial Number	SN 09/12 DIP 3G700-361
Product Condition (new / used)	New

A yearly calibration interval is recommended.

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.

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 dimensions 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.

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	0.1 dB

5.2 DIMENSION MEASUREMENT

The following uncertainties apply to the dimension measurements:

Length (mm)	Expanded Uncertainty on Length
3 - 300	0.05 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
1 g	20.3 %

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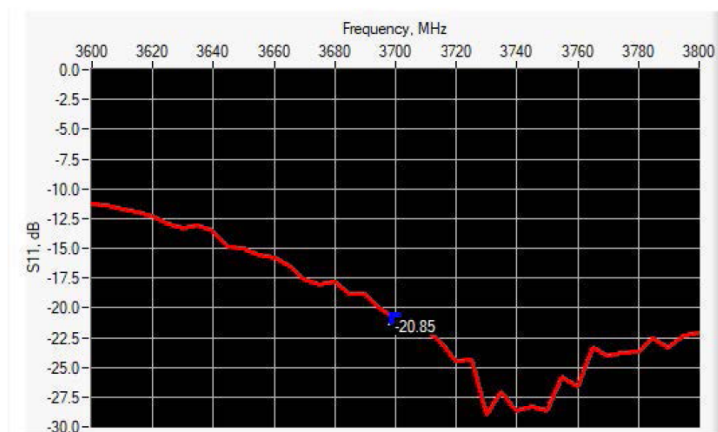
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Ref: ACR.139.16.20.SATU.A

10 g	20.1 %
------	--------

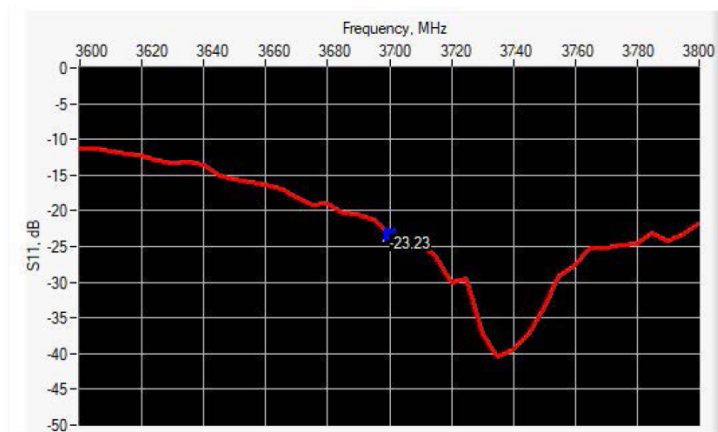
6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
3700	-20.85	-20	54.9 Ω - 8.3 j Ω

6.2 RETURN LOSS AND IMPEDANCE IN BODY LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
3700	-23.23	-20	50.6 Ω - 7.0 j Ω

6.3 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 %.	

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450	290.0 ±1 %.		166.7 ±1 %.		6.35 ±1 %.	
750	176.0 ±1 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.		89.8 ±1 %.		3.6 ±1 %.	
900	149.0 ±1 %.		83.3 ±1 %.		3.6 ±1 %.	
1450	89.1 ±1 %.		51.7 ±1 %.		3.6 ±1 %.	
1500	80.5 ±1 %.		50.0 ±1 %.		3.6 ±1 %.	
1640	79.0 ±1 %.		45.7 ±1 %.		3.6 ±1 %.	
1750	75.2 ±1 %.		42.9 ±1 %.		3.6 ±1 %.	
1800	72.0 ±1 %.		41.7 ±1 %.		3.6 ±1 %.	
1900	68.0 ±1 %.		39.5 ±1 %.		3.6 ±1 %.	
1950	66.3 ±1 %.		38.5 ±1 %.		3.6 ±1 %.	
2000	64.5 ±1 %.		37.5 ±1 %.		3.6 ±1 %.	
2100	61.0 ±1 %.		35.7 ±1 %.		3.6 ±1 %.	
2300	55.5 ±1 %.		32.6 ±1 %.		3.6 ±1 %.	
2450	51.5 ±1 %.		30.4 ±1 %.		3.6 ±1 %.	
2600	48.5 ±1 %.		28.8 ±1 %.		3.6 ±1 %.	
3400	41.5 ±1 %.		25.0 ±1 %.		3.6 ±1 %.	
3600	37.0 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3700	34.7 ±1 %.	PASS	26.4 ±1 %.	PASS	3.6 ±1 %.	PASS

7 VALIDATION MEASUREMENT

The IEEE Std. 1528, FCC KDBs and CEI/IEC 62209 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.

7.1 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r')		Conductivity (σ) S/m	
	required	measured	required	measured
300	45.3 ±5 %		0.87 ±5 %	
450	43.5 ±5 %		0.87 ±5 %	
750	41.9 ±5 %		0.89 ±5 %	
835	41.5 ±5 %		0.90 ±5 %	
900	41.5 ±5 %		0.97 ±5 %	
1450	40.5 ±5 %		1.20 ±5 %	
1500	40.4 ±5 %		1.23 ±5 %	
1640	40.2 ±5 %		1.31 ±5 %	
1750	40.1 ±5 %		1.37 ±5 %	

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1800	40.0 ±5 %		1.40 ±5 %	
1900	40.0 ±5 %		1.40 ±5 %	
1950	40.0 ±5 %		1.40 ±5 %	
2000	40.0 ±5 %		1.40 ±5 %	
2100	39.8 ±5 %		1.49 ±5 %	
2300	39.5 ±5 %		1.67 ±5 %	
2450	39.2 ±5 %		1.80 ±5 %	
3400	38.0 ±5 %		2.81 ±5 %	
3600	37.8 ±5 %		3.02 ±5 %	
3700	37.7 ±5 %	PASS	3.12 ±5 %	PASS

7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Software	OPENSAR V4
Phantom	SN 20/09 SAM71
Probe	SN 18/11 EPG122
Liquid	Head Liquid Values: ϵ_p : 37.8 σ : 3.25
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=5mm$
Frequency	3700 MHz
Input power	20 dBm
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

Frequency MHz	1 g SAR (W/kg/W)		10 g SAR (W/kg/W)	
	required	measured	required	measured
300	2.85		1.94	
450	4.58		3.06	
750	8.49		5.55	
835	9.56		6.22	
900	10.9		6.99	
1450	29		16	
1500	30.5		16.8	
1640	34.2		18.4	
1750	36.4		19.3	
1800	38.4		20.1	

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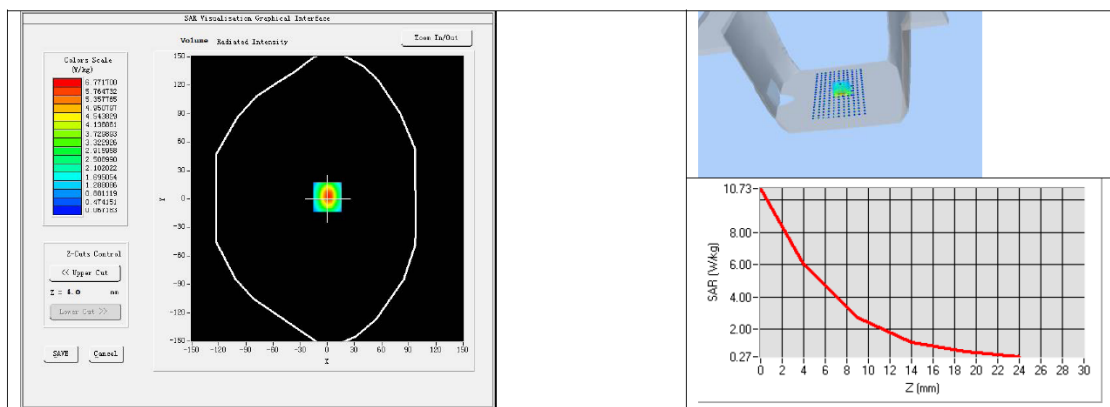
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Ref: ACR.139.16.20.SATU.A

1900	39.7		20.5	
1950	40.5		20.9	
2000	41.1		21.1	
2100	43.6		21.9	
2300	48.7		23.3	
2450	52.4		24	
2600	55.3		24.6	
3400	66.4		25.1	
3600	67.3		24.6	
3700	67.4	66.30 (6.63)	24.2	24.16 (2.42)



7.3 BODY LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r')		Conductivity (σ) S/m	
	required	measured	required	measured
150	61.9 $\pm$ 5 %		0.80 $\pm$ 5 %	
300	58.2 $\pm$ 5 %		0.92 $\pm$ 5 %	
450	56.7 $\pm$ 5 %		0.94 $\pm$ 5 %	
750	55.5 $\pm$ 5 %		0.96 $\pm$ 5 %	
835	55.2 $\pm$ 5 %		0.97 $\pm$ 5 %	
900	55.0 $\pm$ 5 %		1.05 $\pm$ 5 %	
915	55.0 $\pm$ 5 %		1.06 $\pm$ 5 %	
1450	54.0 $\pm$ 5 %		1.30 $\pm$ 5 %	
1610	53.8 $\pm$ 5 %		1.40 $\pm$ 5 %	
1800	53.3 $\pm$ 5 %		1.52 $\pm$ 5 %	
1900	53.3 $\pm$ 5 %		1.52 $\pm$ 5 %	
2000	53.3 $\pm$ 5 %		1.52 $\pm$ 5 %	
2100	53.2 $\pm$ 5 %		1.62 $\pm$ 5 %	

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SAR REFERENCE DIPOLE CALIBRATION REPORT

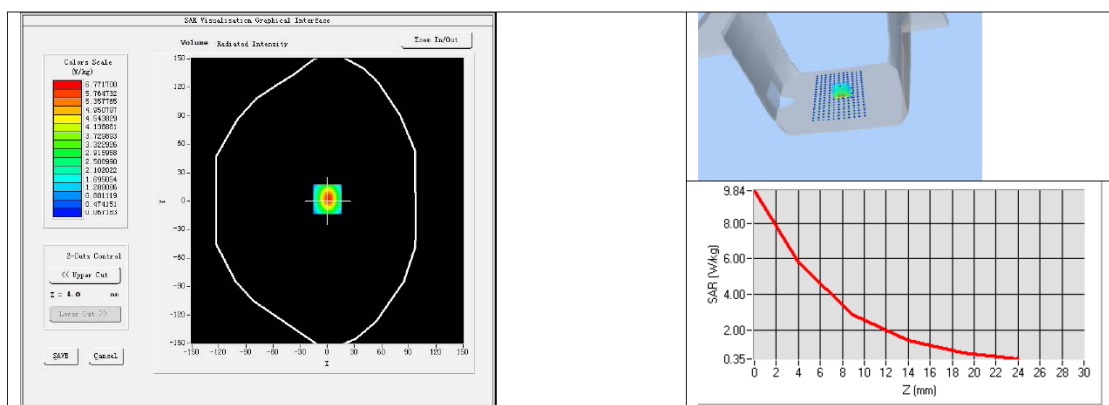
Ref: ACR.139.16.20.SATU.A

2300	52.9 ±5 %		1.81 ±5 %	
2450	52.7 ±5 %		1.95 ±5 %	
2600	52.5 ±5 %		2.16 ±5 %	
3400	51.5 ±5 %		3.20 ±5 %	
3600	51.2 ±5 %		3.43 ±5 %	
3700	51.1 ±5 %	PASS	3.55 ±5 %	PASS
5200	49.0 ±10 %		5.30 ±10 %	
5300	48.9 ±10 %		5.42 ±10 %	
5400	48.7 ±10 %		5.53 ±10 %	
5500	48.6 ±10 %		5.65 ±10 %	
5600	48.5 ±10 %		5.77 ±10 %	
5800	48.2 ±10 %		6.00 ±10 %	

7.4 SAR MEASUREMENT RESULT WITH BODY LIQUID

Software	OPENSAR V4
Phantom	SN 20/09 SAM71
Probe	SN 18/11 EPG122
Liquid	Body Liquid Values: eps' : 51.3 sigma : 3.56
Distance between dipole center and liquid	10.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=5mm/dy=5mm/dz=5mm
Frequency	3700 MHz
Input power	20 dBm
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

Frequency MHz	1 g SAR (W/kg/W)	10 g SAR (W/kg/W)
	measured	measured
3700	62.36 (6.24)	23.56 (2.35)



Page: 10/11

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.139.16.20.SATU.A

8 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rhode & Schwarz ZVA	SN100132	02/2020	02/2023
Calipers	Carrera	CALIPER-01	01/2020	01/2023
Reference Probe	MVG	EPG122 SN 18/11	06/2022	06/2023
Multimeter	Keithley 2000	1188656	01/2020	01/2023
Signal Generator	Agilent E4438C	MY49070581	01/2020	01/2023
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	HP E4418A	US38261498	01/2020	01/2023
Power Sensor	HP ECP-E26A	US37181460	01/2020	01/2023
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Temperature and Humidity Sensor	Control Company	11-661-9	11/2019	11/2022



SAR Reference Dipole Calibration Report

Ref : ACR.53.37.24.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 REFERENCE DIPOLE

FREQUENCY: 4200 MHZ

SERIAL NO.: SN 03/21DIP4G200-363

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 05/18/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.37.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	5/18/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	5/18/2024	
Authorized by:	Yann Toutain	Laboratory Director	5/19/2024	

Yann
Toutain IDSignature
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Yann Toutain ID
Date: 2024.05.19
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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Pedro Ruiz	5/19/2024	Initial release



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 4200 MHz REFERENCE DIPOLE
Manufacturer	MVG
Model	SID4200
Serial Number	SN 03/21 DIP 4G200-363
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

MVG's COMOSAR Validation Dipoles are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards. The product is designed for use with the COMOSAR test bench only.



Figure 1 – MVG COMOSAR Validation Dipole



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

4 MEASUREMENT METHOD

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 IEC/IEEE 62209-1528 and FCC KDB865664 D01 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



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

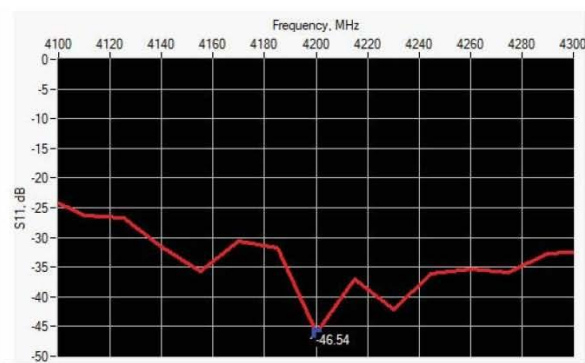
5.3 VALIDATION MEASUREMENT

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

Scan Volume	Expanded Uncertainty
1 g	19 % (SAR)
10 g	19 % (SAR)

6 CALIBRATION MEASUREMENT RESULTS

6.1 RETURN LOSS AND IMPEDANCE IN HEAD LIQUID



Frequency (MHz)	Return Loss (dB)	Requirement (dB)	Impedance
4200	-46.54	-20	$49.3 \Omega - 0.0 j \Omega$



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

6.2 MECHANICAL DIMENSIONS

Frequency MHz	L mm		h mm		d mm	
	required	measured	required	measured	required	measured
300	420.0 ±1 %.		250.0 ±1 %.		6.35 ±1 %.	
450	290.0 ±1 %.		166.7 ±1 %.		6.35 ±1 %.	
750	176.0 ±1 %.		100.0 ±1 %.		6.35 ±1 %.	
835	161.0 ±1 %.		89.8 ±1 %.		3.6 ±1 %.	
900	149.0 ±1 %.		83.3 ±1 %.		3.6 ±1 %.	
1450	89.1 ±1 %.		51.7 ±1 %.		3.6 ±1 %.	
1500	80.5 ±1 %.		50.0 ±1 %.		3.6 ±1 %.	
1640	79.0 ±1 %.		45.7 ±1 %.		3.6 ±1 %.	
1750	75.2 ±1 %.		42.9 ±1 %.		3.6 ±1 %.	
1800	72.0 ±1 %.		41.7 ±1 %.		3.6 ±1 %.	
1900	68.0 ±1 %.		39.5 ±1 %.		3.6 ±1 %.	
1950	66.3 ±1 %.		38.5 ±1 %.		3.6 ±1 %.	
2000	64.5 ±1 %.		37.5 ±1 %.		3.6 ±1 %.	
2100	61.0 ±1 %.		35.7 ±1 %.		3.6 ±1 %.	
2300	55.5 ±1 %.		32.6 ±1 %.		3.6 ±1 %.	
2450	51.5 ±1 %.		30.4 ±1 %.		3.6 ±1 %.	
2600	48.5 ±1 %.		28.8 ±1 %.		3.6 ±1 %.	
3000	41.5 ±1 %.		25.0 ±1 %.		3.6 ±1 %.	
3300	-		-		-	
3500	37.0 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3700	34.7 ±1 %.		26.4 ±1 %.		3.6 ±1 %.	
3900	-		-		-	
4200	-	30.24	-	22.49	-	3.65
4600	-		-		-	
4900	-		-		-	

7 VALIDATION MEASUREMENT

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

7.1 HEAD LIQUID MEASUREMENT

Frequency MHz	Relative permittivity (ϵ_r)		Conductivity (σ) S/m	
	required	measured	required	measured
300	45.3 $\pm$ 10 %		0.87 $\pm$ 10 %	
450	43.5 $\pm$ 10 %		0.87 $\pm$ 10 %	
750	41.9 $\pm$ 10 %		0.89 $\pm$ 10 %	
835	41.5 $\pm$ 10 %		0.90 $\pm$ 10 %	
900	41.5 $\pm$ 10 %		0.97 $\pm$ 10 %	
1450	40.5 $\pm$ 10 %		1.20 $\pm$ 10 %	
1500	40.4 $\pm$ 10 %		1.23 $\pm$ 10 %	
1640	40.2 $\pm$ 10 %		1.31 $\pm$ 10 %	
1750	40.1 $\pm$ 10 %		1.37 $\pm$ 10 %	
1800	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
1900	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
1950	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
2000	40.0 $\pm$ 10 %		1.40 $\pm$ 10 %	
2100	39.8 $\pm$ 10 %		1.49 $\pm$ 10 %	
2300	39.5 $\pm$ 10 %		1.67 $\pm$ 10 %	
2450	39.2 $\pm$ 10 %		1.80 $\pm$ 10 %	
2600	39.0 $\pm$ 10 %		1.96 $\pm$ 10 %	
3000	38.5 $\pm$ 10 %		2.40 $\pm$ 10 %	
3300	38.2 $\pm$ 10 %		2.71 $\pm$ 10 %	
3500	37.9 $\pm$ 10 %		2.91 $\pm$ 10 %	
3700	37.7 $\pm$ 10 %		3.12 $\pm$ 10 %	
3900	37.5 $\pm$ 10 %		3.32 $\pm$ 10 %	
4200	37.1 $\pm$ 10 %	37.5	3.63 $\pm$ 10 %	3.54
4600	36.7 $\pm$ 10 %		4.04 $\pm$ 10 %	
4900	36.3 $\pm$ 10 %		4.35 $\pm$ 10 %	

7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

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Template_ACR.DDD.N.YY.MVGB.ISSUE_SAR Reference Dipole vJ

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A

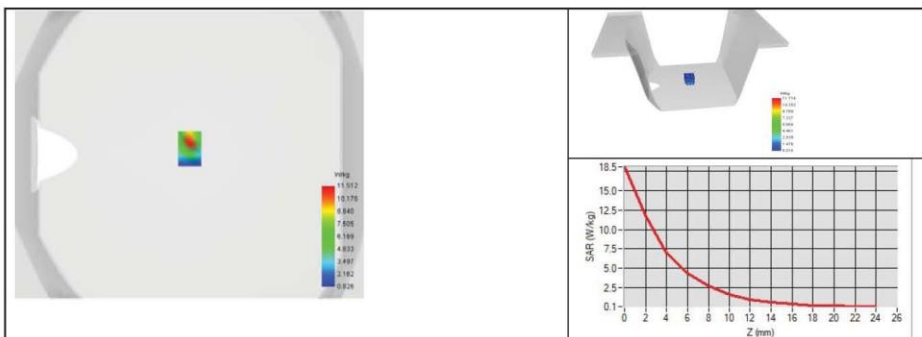
Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values: ϵ_p^* : 37.5 σ : 3.54
Distance between dipole center and liquid	10.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=5mm/dy=5mm/dz=4mm$
Frequency	4200 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency MHz	1 g SAR (W/kg/W)		10 g SAR (W/kg/W)	
	required	measured	required	measured
300	2.85		1.94	
450	4.58		3.06	
750	8.49		5.55	
835	9.56		6.22	
900	10.9		6.99	
1450	29		16	
1500	30.5		16.8	
1640	34.2		18.4	
1750	36.4		19.3	
1800	38.4		20.1	
1900	39.7		20.5	
1950	40.5		20.9	
2000	41.1		21.1	
2100	43.6		21.9	
2300	48.7		23.3	
2450	52.4		24	
2600	55.3		24.6	
3000	63.8		25.7	
3300	-		-	
3500	67.1		25	
3700	67.4		24.2	
3900	-		-	
4200	-	66.85 (6.69)	-	22.84 (2.28)
4600	-		-	
4900	-		-	



SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref : ACR.53.37.24.BES.A





SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.53.37.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3523-EPGO-429	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024



SAR Reference Waveguide Calibration Report

Ref : ACR.53.31.24.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 REFERENCE WAVEGUIDE**

FREQUENCY: 5000-6000 MHZ

SERIAL NO.: SN 13/14 WGA 33

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 02/21/2024



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

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Summary:

This document presents the method and results from an accredited SAR reference waveguide 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 WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Measurement Responsible	2/22/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	2/22/2024	
Authorized by:	Yann Toutain	Laboratory Director	2/27/2024	

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Toutain ID
Date : 2024.02.27
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	Customer Name
Distribution :	SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

Issue	Name	Date	Modifications
A	Pedro Ruiz	2/22/2024	Initial release



SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

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SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

1 INTRODUCTION

This document contains a summary of the requirements set forth by the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards for reference waveguides 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 5000-6000 MHz REFERENCE WAVEGUIDE
Manufacturer	MVG
Model	SWG5500
Serial Number	SN 13/14 WGA 33
Product Condition (new / used)	Used

3 PRODUCT DESCRIPTION

3.1 GENERAL INFORMATION

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

4 MEASUREMENT METHOD

4.1 MECHANICAL REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

4.2 S11 PARAMETER REQUIREMENTS

The dipole used for SAR system validation measurements and checks must have a S11 of -8 dB or better. The S11 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.



SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

4.3 SAR REQUIREMENTS

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 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.

5 MEASUREMENT UNCERTAINTY

5.1 MECHANICAL DIMENSIONS

The estimated expanded uncertainty ($k=2$) in calibration for the dimension measurement in mm is ± 0.20 mm with respect to measurement conditions.

5.2 S11 PARAMETER

The estimated expanded uncertainty ($k=2$) in calibration for the S11 parameter in linear is ± 0.08 with respect to measurement conditions.

5.3 SAR

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty for validation measurements.

The estimated expanded uncertainty ($k=2$) in calibration for the 1g and 10g SAR measurement in W/kg is $\pm 19\%$ with respect to measurement conditions.

6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

Frequency (MHz)	L (mm)		W (mm)		L _r (mm)		W _r (mm)	
	Required	Measured	Required	Measured	Required	Measured	Required	Measured
5800	40.39 $\pm$ 0.13	-	20.19 $\pm$ 0.13	-	81.03 $\pm$ 0.13	-	61.98 $\pm$ 0.13	-

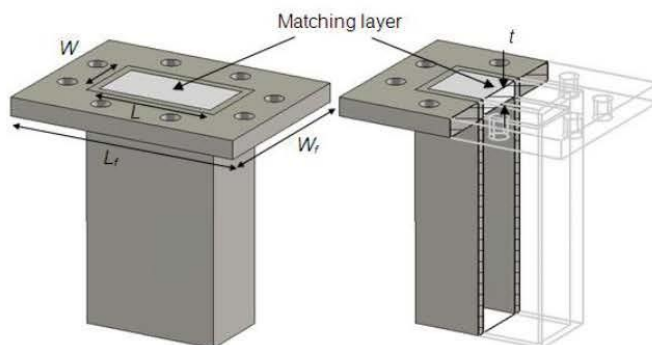


Figure 1: Validation Waveguide Dimensions

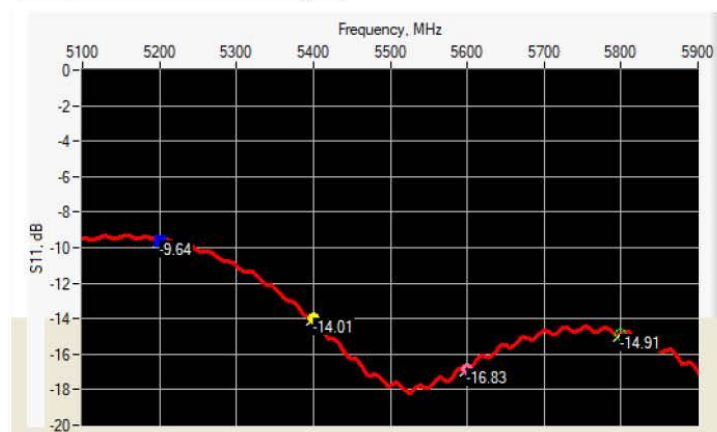


SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

6.2 S11 PARAMETER

6.2.1 S11 parameter In Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
5200	-9.64	-8	$25.80 \Omega - 6.58 j\Omega$
5400	-14.01	-8	$51.53 \Omega + 20.60 j\Omega$
5600	-16.83	-8	$44.12 \Omega - 12.35 j\Omega$
5800	-14.91	-8	$38.53 \Omega + 11.21 j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference waveguide meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed with the matching layer placed in the open end of the waveguide, with the waveguide and matching layer in direct contact with the phantom shell.

6.3.1 SAR With Head Liquid

At those frequencies, the target SAR value can not be generic. Hereunder is the target SAR value defined by MVG, within the uncertainty for the system validation. All SAR values are normalized to 1 W net power. In bracket, the measured SAR is given with the used input power.



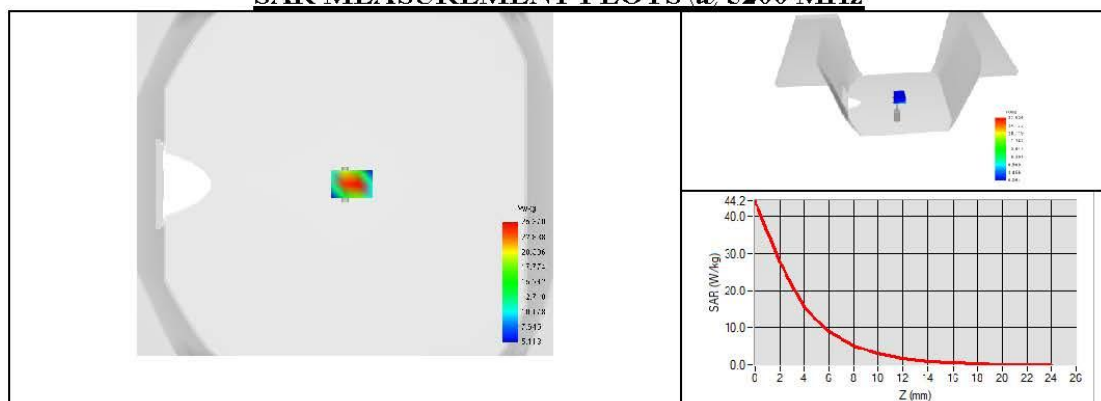
SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref : ACR.53.31.24.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	3523-EPGO-429
Liquid	Head Liquid Values 5200 MHz: eps' :34.16 sigma : 4.42 Head Liquid Values 5400 MHz: eps' :33.63 sigma : 4.64 Head Liquid Values 5600 MHz: eps' :33.12 sigma : 4.87 Head Liquid Values 5800 MHz: eps' :32.57 sigma : 5.12
Distance between dipole waveguide and liquid	0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=4mm/dy=4m/dz=2mm
Frequency	5200 MHz 5400 MHz 5600 MHz 5800 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

Frequency (MHz)	1 g SAR (W/kg)			10 g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
5200	16.26	162.59	159.00	5.62	56.21	56.90
5400	15.98	159.81	166.40	5.50	55.00	58.43
5600	17.91	179.15	173.80	6.10	61.01	59.97
5800	18.22	182.20	181.20	6.13	61.32	61.50

SAR MEASUREMENT PLOTS @ 5200 MHz

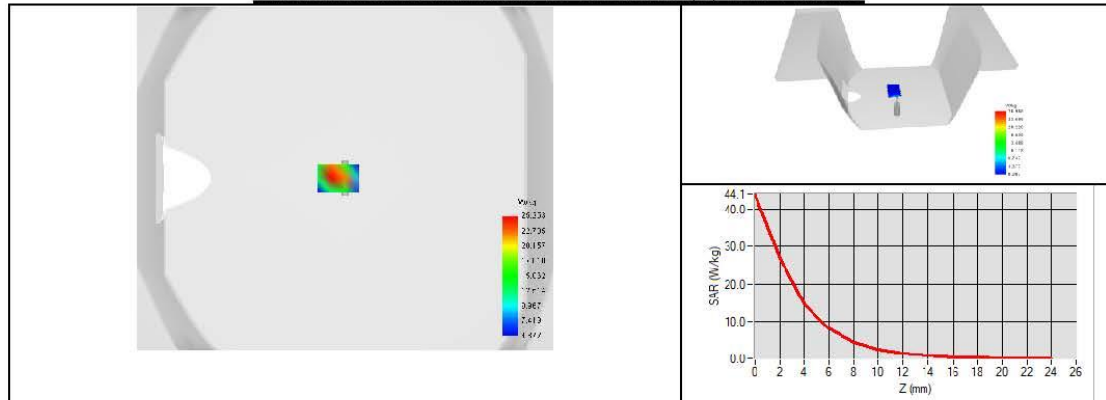




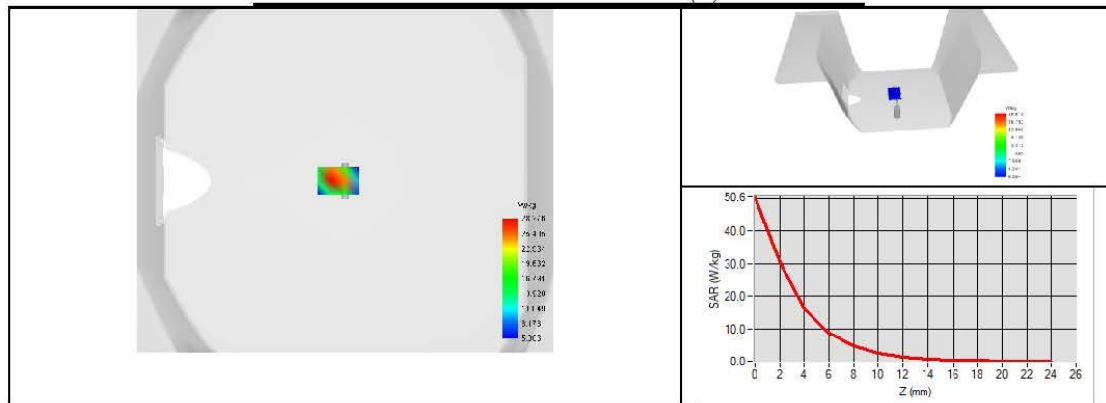
SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

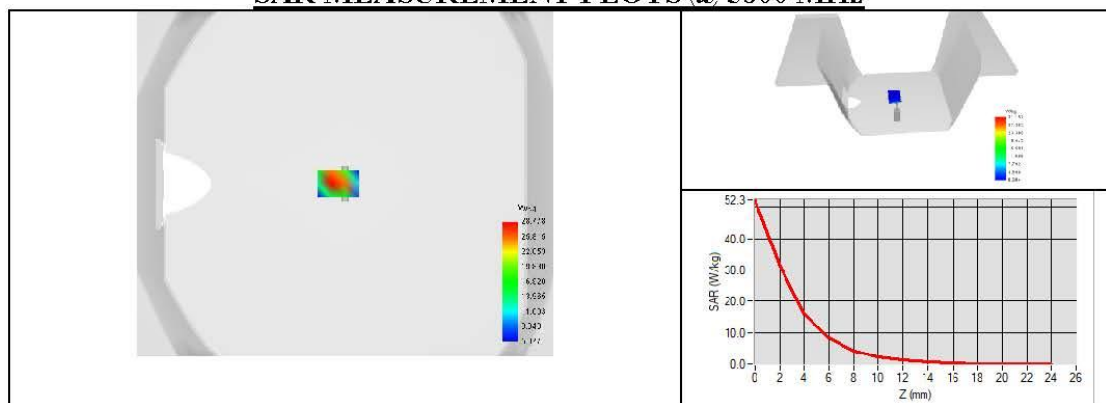
SAR MEASUREMENT PLOTS @ 5400 MHz



SAR MEASUREMENT PLOTS @ 5600 MHz



SAR MEASUREMENT PLOTS @ 5800 MHz





SAR REFERENCE WAVEGUIDE CALIBRATION REPORT

Ref.: ACR.53.31.24.BES.A

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	Manufacturer / Model	Identification No.	Current Calibration Date	Next Calibration Date
SAM Phantom	MVG	SN 13/09 SAM68	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Calipers	Mitutoyo	SN 0009732	11/2022	11/2025
Reference Probe	MVG	3623-EPGO-431	11/2023	11/2024
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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024

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