

FCC SAR EVALUATION REPORT

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

Product Name: Smart phone

Model No.: S25 Ultra

Serial Model: S26 Ultra, C25 Ultra, K25 Ultra, X25 Ultra, U25
Ultra, G25 Ultra, A25 Ultra, X26ULTRA

Brand Name: N/A

Report No.: AiTSZ-250217041FW6

FCC ID: 2BM9D-X25ULTRA

Prepared for

Shenzhen Jiaqi Technology Co., Ltd.
Room 108, Building E, Bantian International Center, Bantian Street,
Longgang District, Shenzhen, China

Prepared by

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai
Street, Bao'an District, Shenzhen, Guangdong, China
Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Jiaqi Technology Co., Ltd.

Address : Room 108, Building E, Bantian International Center,
Bantian Street, Longgang District, Shenzhen, China

Manufacturer's Name : Shenzhen Jiaqi Technology Co., Ltd.

Address : Room 108, Building E, Bantian International Center,
Bantian Street, Longgang District, Shenzhen, China

Product description

Product name : Smart phone

Trademark : N/A

Model and/or type reference : S25 Ultra

Serial Model..... : S26 Ultra, C25 Ultra, K25 Ultra, X25 Ultra, U25 Ultra, G25 Ultra,
A25 Ultra,X26ULTRA
FCC 47 CFR Part 2(2.1093)

Standards : IEEE Std 1528-2013

Published RF exposure KDB procedures

This device described above has been tested by Guangdong Asia Hongke Test Technology Limited. In accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 and KDB 865664 D01. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in FCC 47 CFR Part 2(2.1093). The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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Date of Test

Date (s) of performance of tests..... : Feb. 10, 2025 ~ Feb. 17, 2025

Date of Issue..... : Mar. 17, 2025

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

Reviewed by: 
Simba Huang

Approved by: 
Seal.chen

※ ※ **Revision History** ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Mar. 17, 2025	Seal.chen

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1. General Information

1.1. RF exposure limits

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

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

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

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

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

Occupational/Controlled Environments:

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

General Population/Uncontrolled Environments:

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

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

1.2. Statement of Compliance

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

Band	Max SAR Value Reported(W/kg)		
	1-g Head (Separation distance of 0mm)	1-g Body&Hotspot (Separation distance of 10mm)	Max SAR Summation
GSM850	0.303	0.625	Head: 1.099 Body: 1.030 Hotspot: 1.030
GSM1900	0.470	0.333	
WCDMA Band II	0.437	0.365	
WCDMA Band V	0.318	0.269	
LTE band 2	0.469	0.412	
LTE band 4	0.496	0.400	
LTE band 5	0.328	0.314	
LTE band 12	0.312	0.256	
LTE band 17	0.315	0.279	
LTE band 41	0.669	0.616	
LTE band 66	0.498	0.410	
2.4GHz WLAN	0.430	0.405	

NOTE: The Max SAR Summation is calculated based on the same configuration and test position.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR Part 2(2.1093), and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 & KDB 865664 D01.

1.3. EUT Description

Device Information			
Product Name	Smart phone		
Model Name	S25 Ultra		
Family Model	S26 Ultra, C25 Ultra, K25 Ultra, X25 Ultra, U25 Ultra, G25 Ultra, A25 Ultra,X26ULTRA		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna Type	PIFA Antenna		
Power rating:	DC 3.8V 4000mAh 15.2Wh Rechargeable Li-ion battery		
Hardware version	N/A		
Software version	N/A		
Sample(s) Status:	AiTSZ-250217041-3(Engineer sample)		
Device Operating Configurations			
Supporting Mode(s)	GSM850/1900,WCDMABand2/5,LTEBand2/4/5/12/17/41/66, WLAN 2.4G, Bluetooth		
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	LTE Band 41	2555-2655	
	LTE Band 66	1710-1780	2110-2200
	WLAN 2.4G	2412-2462	
	Bluetooth	2402-2480	
	GPRS Multislot Class(12)	Max Number of Timeslots in Uplink	
Max Number of Timeslots in Downlink		4	
Max Total Timeslot		5	
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control “all 1”(WCDMA Band 2)		

	3, tested with power control "all 1"(WCDMA Band 5)
	3, tested with power control all Max.(LTE Band 2)
	3, tested with power control all Max.(LTE Band 4)
	3, tested with power control all Max.(LTE Band 5)
	3, tested with power control all Max.(LTE Band 12)
	3, tested with power control all Max.(LTE Band 17)
	3, tested with power control all Max.(LTE Band 41)
	3, tested with power control all Max.(LTE Band 66)

1.4. Test specification(s)

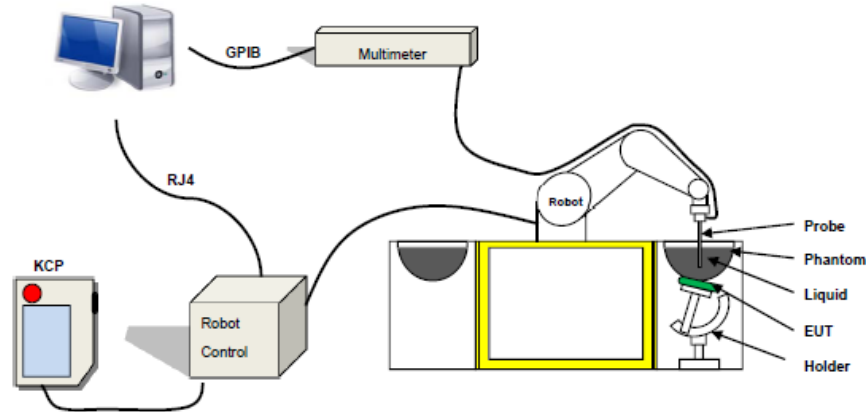
FCC 47 CFR Part 2(2.1093)
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 941225 D06 Hotspot SAR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

1.5. Ambient Condition

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

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



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

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

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

2.2. Robot

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



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

2.3. 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 EPGO 0523-403 with following specifications is used.



- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 150 MHz to 6 GHz for head & body simulating liquid.
- 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 $\pm 0.25\text{dB}$. 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.

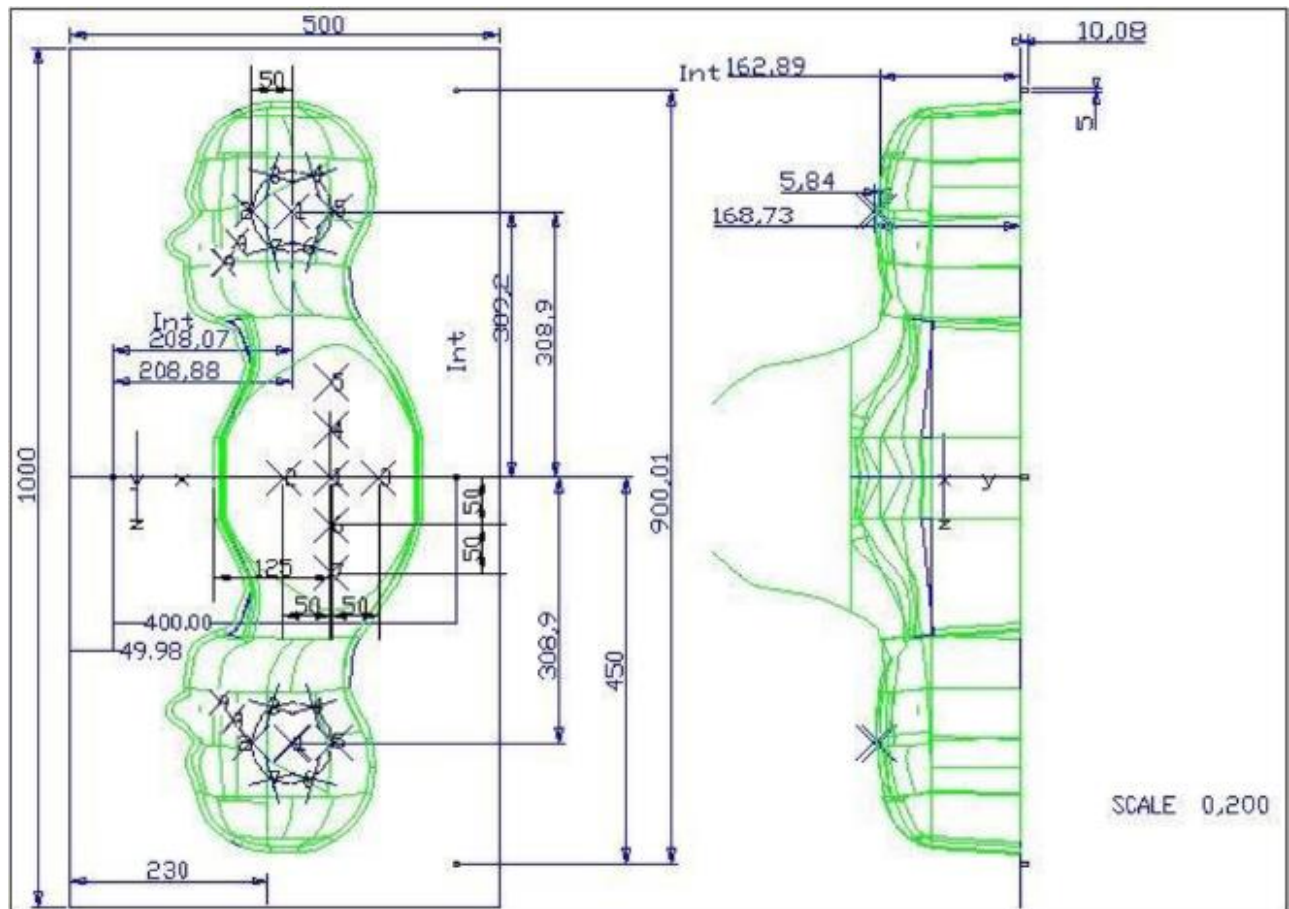
2.4. Phantoms

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.



SAM

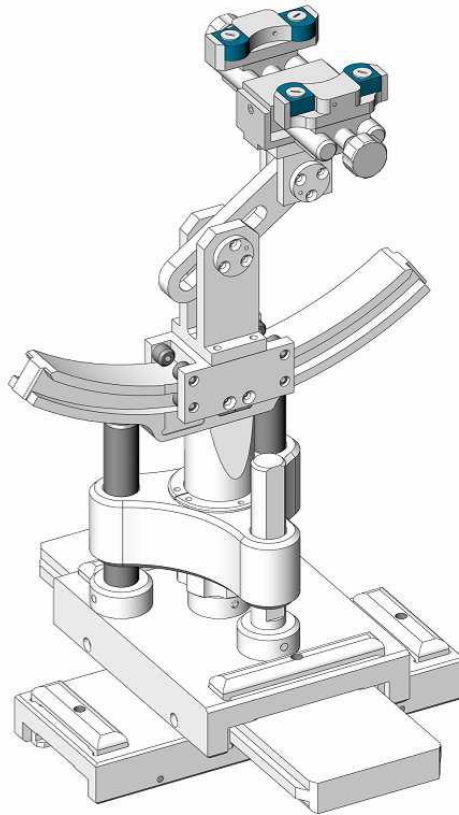
2.5. Technical Data



Left Head(mm)		Right Head(mm)		Flat Part(mm)	
2	2.02	2	2.08	1	2.09
3	2.05	3	2.06	2	2.06
4	2.07	4	2.07	3	2.08
5	2.08	5	2.08	4	2.10
6	2.05	6	2.07	5	2.10
7	2.05	7	2.05	6	2.07
8	2.07	8	2.06	7	2.07
9	2.08	9	2.06	-	-

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

2.6. Device Holder



The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

2.7. 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	EPGO 0523-403	Sep. 11, 2024	Sep. 10, 2025
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DI P 0G900-348	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	Jul. 01, 2024	Jun. 30, 2025
☒	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
☒	KEITHLEY	Millivoltmeter	2000	4072790	Jul. 01, 2024	Jun. 30, 2025
☒	R&S	Universal radio communication tester	CMU200	117858	Jul. 01, 2024	Jun. 30, 2025
☒	R&S	Wideband radio communication tester	CMW500	116581	Jul. 01, 2024	Jun. 30, 2025
☒	HP	Network Analyzer	8753D	3410J01136	Jul. 01, 2024	Jun. 30, 2025

☒	Agilent	PSG Analog Signal Generator	E8257D	MY51110112	Jul. 01, 2024	Jun. 30, 2025
☒	Agilent	Power meter	E4419B	MY45102538	Jul. 01, 2024	Jun. 30, 2025
☒	Agilent	Power meter	E4419B	MY45102140	Jul. 01, 2024	Jun. 30, 2025
☒	Agilent	Power meter	E4419B	MY45102215	Jul. 01, 2024	Jun. 30, 2025
☒	JFW	attenuator	50FPE-006	4360846-494-4	Jul. 01, 2024	Jun. 30, 2025
☒	JFW	attenuator	50FPE-006	4360846-492-1	Jul. 01, 2024	Jun. 30, 2025
☒	JFW	attenuator	50FPE-006	4360846-490-6	Jul. 01, 2024	Jun. 30, 2025
☒	Agilent	Power sensor	E9301A	MY41495644	Jul. 01, 2024	Jun. 30, 2025
☒	Agilent	Power sensor	E9301A	US39212148	Jul. 01, 2024	Jun. 30, 2025
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Jul. 17, 2024	Jul. 16, 2027
☒	MVG	SAR Phantom	SSM2	SN 24/11 SAM87	NCR	NCR
☒	MVG	Device Holder	SMPPD	SN 24/11 MSH73	NCR	NCR

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

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

<SAR measurement>

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

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

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

3.1. Power Reference

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

3.2. Area scan & Zoom scan

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

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

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

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

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

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx _{Area} , Δy _{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx _{Zoom} , Δy _{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: Δz _{Zoom} (n)		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	Δz _{Zoom} (1): between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		Δz _{Zoom} (n>1): between subsequent points	≤ 1.5 · Δz _{Zoom} (n-1)	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.				
* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

3.3. Description of interpolation/extrapolation scheme

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

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

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

3.4. Volumetric Scan

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

3.5. Power Drift

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

4. System Verification Procedure

4.1. Tissue Verification

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

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

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



4.1.1. Tissue Dielectric Parameter Check Results

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

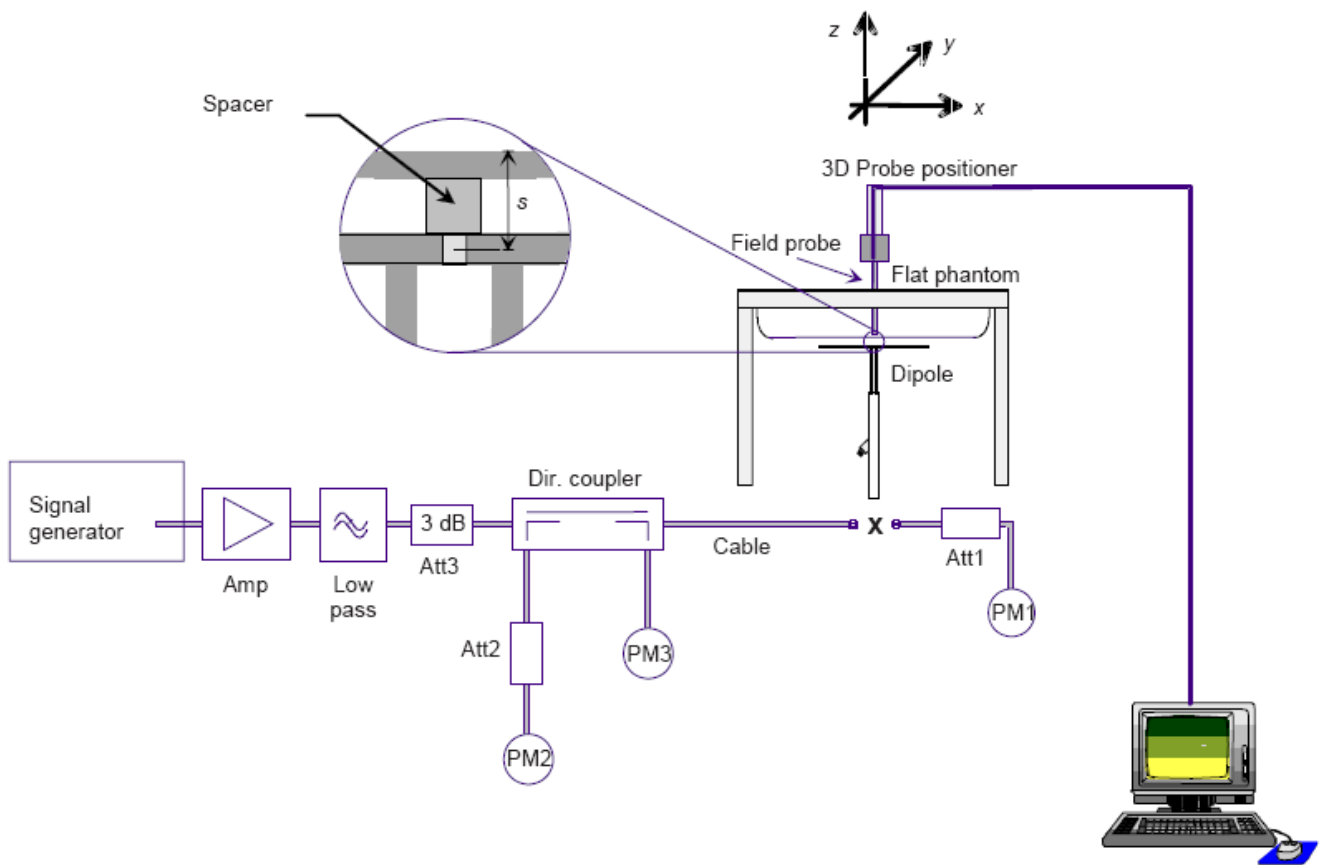
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	$\sigma \text{ (S/m)} (\pm 5\%)$	ϵ_r	$\sigma \text{ (S/m)}$		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	42.56	0.91	21.3 °C	Feb. 11, 2025
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	42.01	0.94	21.2 °C	Feb. 10, 2025
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.61	1.41	21.0 °C	Feb. 12, 2025
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	41.42	1.39	21.1 °C	Feb. 14, 2025
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.41	1.82	21.4 °C	Feb. 16, 2025
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	39.43	1.99	21.6 °C	Feb. 17, 2025

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	Power fed to reference dipole (mW)	Measured SAR Value		Measured SAR (Normalized to 1W)		Target SAR Value (1W)		Deviation (%)		Test Date
		1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)	
750MHz	100	0.930	0.621	9.30	6.21	8.60	5.78	8.14%	7.44%	Feb. 11, 2025
835MHz	100	1.011	0.612	10.11	6.12	9.40	6.28	7.55%	-2.55%	Feb. 10, 2025
1800MHz	100	3.832	2.025	38.32	20.25	37.06	20.01	3.40%	1.20%	Feb. 12, 2025
1900MHz	100	4.154	2.153	41.54	21.53	39.69	20.92	4.66%	2.92%	Feb. 14, 2025
2450MHz	100	5.184	2.359	51.84	23.59	50.05	23.80	3.58%	-0.88%	Feb. 16, 2025
2600MHz	100	5.433	2.523	54.33	25.23	54.16	24.85	0.31%	1.53%	Feb. 17, 2025

5. SAR measurement variability

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

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

6. SAR Measurement Uncertainty

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

7. RF Exposure Positions

7.1. Ear and handset reference point

Figure 7.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE”.

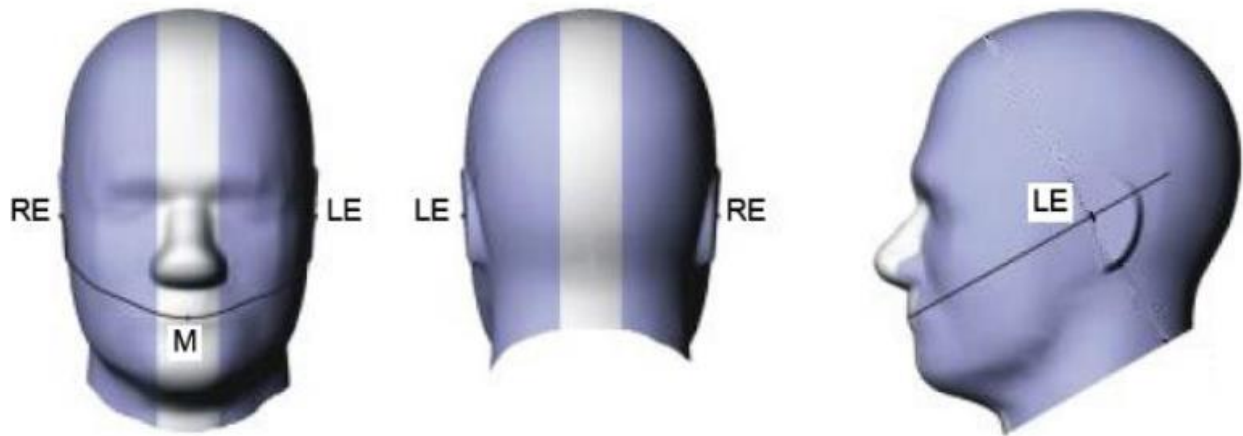


Fig 7.1.1 Front, back, and side views of SAM phantom

7.2. Definition of the cheek position

1. Define two imaginary lines on the handset, the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset: the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 7.2.1 and Figure 7.2.2), 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 7.2.1). 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 7.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
2. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 7.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
3. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP
4. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
5. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.

6. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 7.2.3. The actual rotation angles should be documented in the test report.

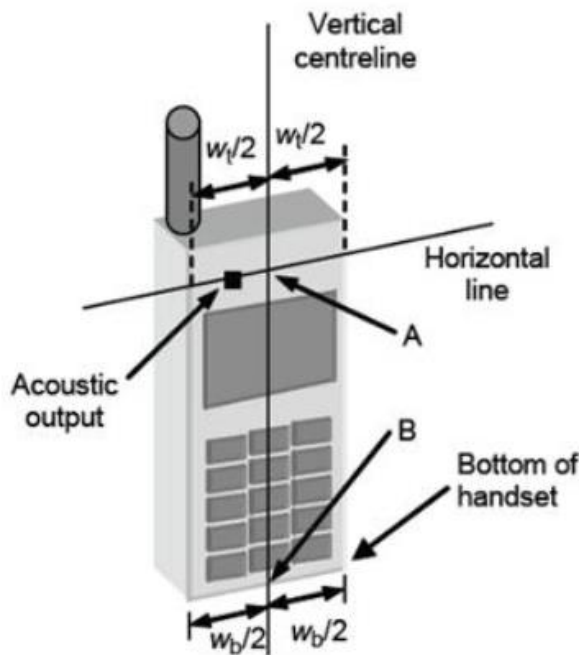


Fig 7.2.1 Handset vertical and horizontal reference lines—fixed case

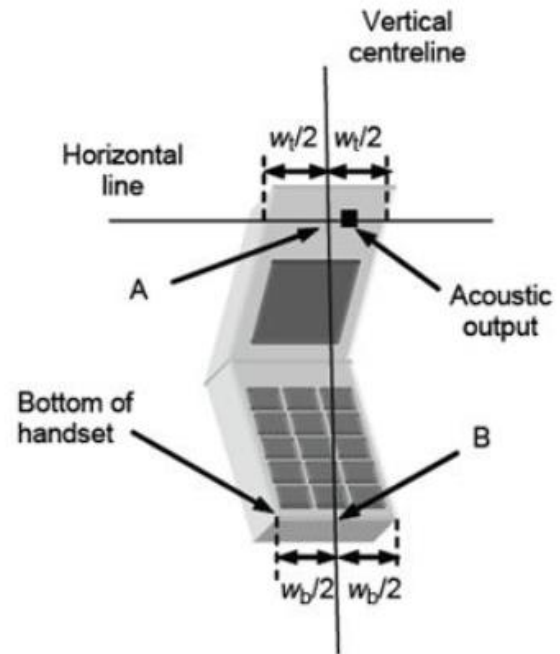


Fig 7.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

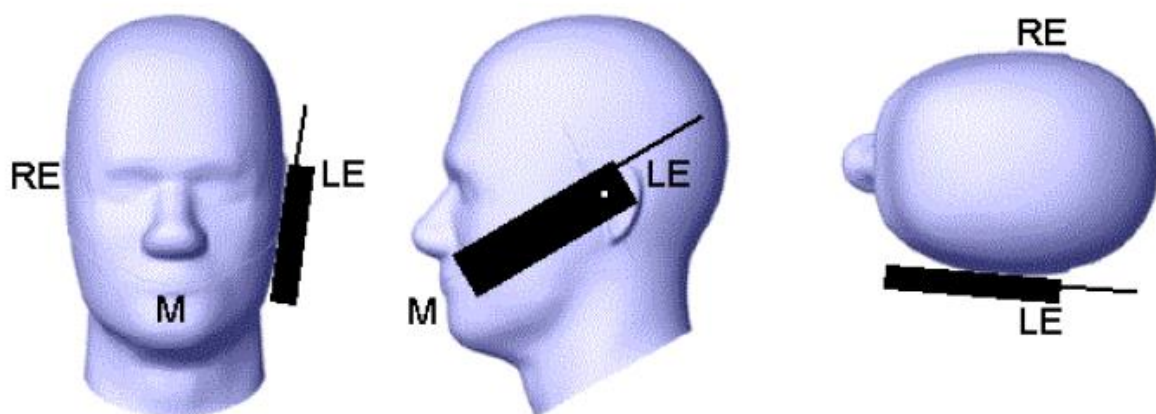


Fig 7.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

7.3. Definition of the tilt position

1. While maintaining the orientation of the handset, retract the handset parallel to the reference plane far enough away from the phantom to enable a rotation of the device by 15 degree.
2. Rotate the Handset around the horizontal line by 15 degree (see Figure 7.3.1).
3. While maintaining the orientation of the handset, move the handset towards the phantom on a line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna, e.g., the antenna with the back of the phantom head, the angle of the handset shall be reduced. In this case, the tilt position is obtained if any part of the handset is in contact with the pinna as well as a second part of the handset is in contact with the phantom, e.g., the antenna with the back of the head.

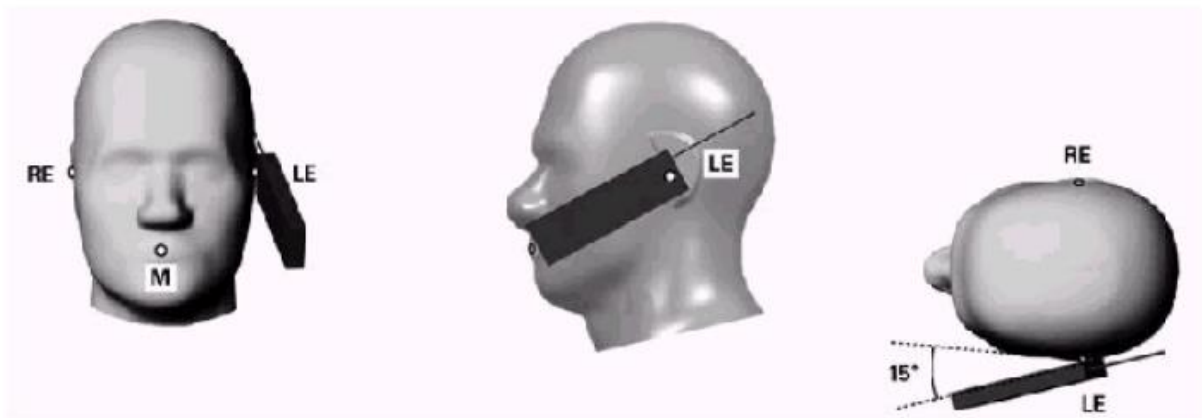


Figure 7.3.1 – Tilt position of the wireless device on the left side of SAM

7.4. Body Worn Accessory

1. Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 7.4.1). Per KDB 648474 D04, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is $< 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.
2. Accessories for body-worn operation configurations are divided into two categories: those that do

not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

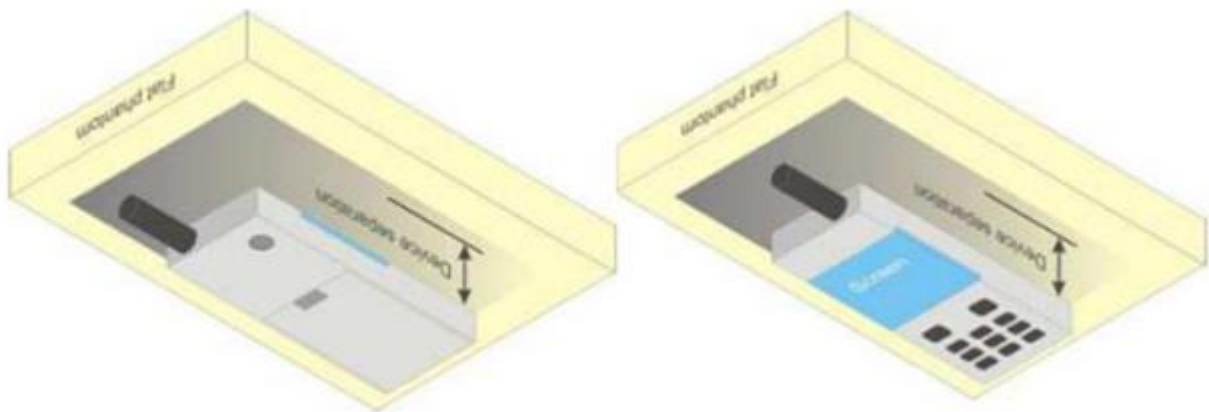


Figure 7.4.1 – Test positions for body-worn devices

7.5. Wireless Router Devices

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

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

8. RF Output Power

8.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Factor	Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	128	189	251		Tune-up	128	189	251
Frequency (MHz)		824.2	836.4	848.8			824.2	836.4	848.8
GSM (GMSK)	32.50	32.36	32.34	32.16	/	/	/	/	/
GPRS(GMSK,1 Tx slot)	32.50	32.32	32.33	32.13	-9.03	23.47	23.29	23.30	23.10
GPRS(GMSK,2 Tx slot)	30.50	30.31	30.16	29.94	-6.02	24.48	24.29	24.14	23.92
GPRS(GMSK,3 Tx slot)	28.50	28.36	28.26	28.07	-4.26	24.24	24.10	24.00	23.81
GPRS(GMSK,4 Tx slot)	26.50	26.22	26.09	25.87	-3.01	23.49	23.21	23.08	22.86

Band GSM1900	Burst-Averaged output Power (dBm)				Factor	Frame-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	512	661	810		Tune-up	512	661	810
Frequency (MHz)		1850.2	1880	1909.8			1850.2	1880	1909.8
GSM (GMSK)	28.50	28.08	28.16	28.26	/	/	/	/	/
GPRS(GMSK,1 Tx slot)	28.50	28.23	28.02	28.10	-9.03	19.47	19.20	18.99	19.07
GPRS(GMSK,2 Tx slot)	26.00	25.84	25.66	25.45	-6.02	19.98	19.82	19.64	19.43
GPRS(GMSK,3 Tx slot)	24.50	24.19	24.02	23.80	-4.26	20.24	19.93	19.76	19.54
GPRS(GMSK,4 Tx slot)	22.50	22.09	21.91	21.71	-3.01	19.49	19.08	18.90	18.70

Note:

Remark: GPRS, CS4 coding scheme. EGPRS, MCS5 coding scheme.

Multi-Slot Class 8, Support Max 4 downlink, 1 uplink, 5 working link

Multi-Slot Class 10, Support Max 4 downlink, 2 uplink, 5 working link

Multi-Slot Class 12, Support Max 4 downlink, 4 uplink, 5 working link

SAR testing was performed on the maximum frame-averaged power mode.

The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum

Burst-averaged power based on time slots. The calculated method is shown as below:

Frame-averaged power = Burst averaged power (1 TX Slot) – 9.03 dB

Frame-averaged power = Burst averaged power (2 TX Slots) – 6.02 dB

Frame-averaged power = Burst averaged power (3 TX Slots) - 4.26 dB

Frame-averaged power = Burst averaged power (4 TX Slots) – 3.01 dB

8.2. WCDMA Conducted Power

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

1. Release99 Setup Configuration

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm1
	β_c/β_d	8/15

2. HSDPA Setup Configuration

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
HSDPA Specific Settings	β_{hs}	4/15	24/15	30/15	30/15
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

3. HSUPA Setup Configuration

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm1				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
HSDPA Specific Settings	D_{ACK}	8				
	D_{NAK}	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				

HSUPA Specific Settings	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = β_{hs}/β_c	30/15				
	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9

4. WCDMA Conducted Power Results

Choose the highest output power mode RMC 12.2Kbps for Band VIII/I at middle channel to test SAR and determine the worst configuration for further high/low channel test.

WCDMA Band II	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	9262	9400	9538
Frequency (MHz)		1852.4	1880	1907.6
RMC12.2K	21.50	21.42	21.44	21.33
HSDPA Sub 1	22.00	21.40	21.59	21.22
HSDPA Sub 2	22.00	21.41	21.60	21.22
HSDPA Sub 3	22.00	21.40	21.61	21.21
HSDPA Sub 4	22.00	21.38	21.58	21.19
HSUPA Sub 1	19.50	19.22	19.17	18.55
HSUPA Sub 2	19.50	19.19	19.46	18.54
HSUPA Sub 3	20.00	19.18	19.64	18.53
HSUPA Sub 4	19.50	19.20	19.39	18.69
HSUPA Sub 5	19.50	19.26	19.15	18.68

WCDMA Band V	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6
RMC12.2K	23.00	22.51	22.64	22.65
HSDPA Sub 1	22.50	22.15	22.02	21.69
HSDPA Sub 2	22.50	22.18	22.00	21.68
HSDPA Sub 3	22.50	22.20	22.02	21.68
HSDPA Sub 4	22.50	22.18	22.03	21.76
HSUPA Sub 1	20.50	20.21	19.62	19.20
HSUPA Sub 2	20.00	19.79	19.63	19.36
HSUPA Sub 3	20.00	19.71	19.63	19.66
HSUPA Sub 4	20.00	19.70	19.92	19.64
HSUPA Sub 5	20.50	20.05	19.92	19.64

8.3. LTE Conducted Power

- The following tests were conducted according to the test requirements outlines in 3GPP TS 36.521-1 specification. A summary of these configurations are illustrated below:

Test Parameters for Channel Bandwidths				
Ch BW	Downlink Configuration	Mod'n	Uplink Configuration	
	N/A for Max UE output power testing		RB allocation	
			FDD	TDD
1.4MHz		QPSK	1	1
1.4MHz		QPSK	5	5
3MHz		QPSK	1	1
3MHz		QPSK	4	4
5MHz		QPSK	1	1
5MHz		QPSK	8	8
10MHz		QPSK	1	1
10MHz		QPSK	12	12
15MHz		QPSK	1	1
15MHz		QPSK	16	16
20MHz		QPSK	1	1
20MHz		QPSK	18	18

Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable channel bandwidths are specified in Table 5.4.2.1-1.

Note 2: For E-UTRA bands not applied with Note 2 in Table 6.2.2.3-1:

- The 1 RB allocation shall be tested at RB#0 for low and mid range, RB #max for high range test frequency.
- The RBstart of non-1RB allocation shall be RB #0 for low and mid range, RB# (max +1 - RB allocation) for high range test frequency.

Note 3: For E-UTRA bands applied with Note 2 in Table 6.2.2.3-1:

- If the test channel bandwidth is larger than 4MHz, then the 1 RB allocation shall be tested at both RB #0 and RB #max.
- If the test channel bandwidth is smaller or equal to 4MHz, then the 1 RB allocation shall be tested at RB #0.
- If the test channel bandwidth = (FUL_high - FUL_low) specified by the operating band, then only one frequency range shall be tested and the 1 RB allocation shall be tested at RB #0, RB # $\left\lceil N_{RB}^{UL} / 2 \right\rceil$ and RB #max.
- For non-1RB allocation, test frequency is middle range, and the RBstart shall be RB #0.

2. LTE Conducted Power Results

LTE output list

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	21.50	21.35	21.37	21.14
			1	2	21.50	21.38	21.20	21.13
			1	5	21.50	21.41	21.21	21.14
			3	0	21.50	21.22	21.30	21.21
			3	1	21.50	21.27	21.35	21.27
			3	2	21.50	21.31	21.28	21.22
			6	0	20.50	20.21	20.26	20.27
		16QAM	1	0	21.50	20.98	20.74	20.41
			1	2	21.50	21.04	20.78	20.27
			1	5	21.50	21.00	20.76	20.32
			3	0	20.50	20.37	20.13	20.04
			3	1	20.50	20.45	20.17	20.07
			3	2	20.50	20.39	20.19	20.05
			6	0	20.00	19.93	19.70	19.70
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5
LTE Band 2	3MHz	QPSK	1	0	21.50	21.21	21.23	21.30
			1	7	21.50	21.25	21.22	21.17
			1	14	21.50	21.36	21.17	21.19
			8	0	20.50	20.34	20.30	20.29
			8	4	20.50	20.23	20.33	20.35
			8	7	20.50	20.34	20.29	20.33
			15	0	20.50	20.26	20.28	20.31
		16QAM	1	0	22.00	20.94	20.51	21.52
			1	7	22.00	20.94	20.53	21.61
			1	14	22.00	21.09	20.61	21.65
			8	0	20.50	20.08	19.89	19.42
			8	4	20.50	20.00	19.28	19.88
			8	7	20.50	20.06	19.39	19.86
			15	0	20.00	19.75	19.89	19.80
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5
LTE Band 2	5MHz	QPSK	1	0	21.50	21.20	21.31	21.25
			1	12	21.50	21.34	21.24	21.31
			1	24	21.50	21.40	21.29	21.27
			12	0	20.50	20.29	20.33	20.37
			12	6	20.50	20.35	20.33	20.18
			12	11	20.50	20.36	20.37	20.37
			25	0	20.50	20.44	20.32	20.40
		16QAM	1	0	21.50	19.99	20.96	20.90
			1	12	21.50	20.07	20.90	20.84
			1	24	21.50	20.12	20.96	21.02
			12	0	20.00	19.77	19.83	19.35

			12	6	20.00	19.76	19.84	19.41
			12	11	20.00	19.79	19.43	19.77
			25	0	20.00	19.91	19.88	19.35
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18650/1855	18900/1880	19150/1905
LTE Band 2	10MHz	QPSK	1	0	21.50	21.32	21.47	21.43
			1	24	21.50	21.47	21.46	21.45
			1	49	21.50	21.47	21.43	21.48
			25	0	20.50	20.40	20.42	20.34
			25	12	20.50	20.40	20.34	20.25
			25	24	20.50	20.23	20.34	20.30
			50	0	20.50	20.45	20.34	20.25
		16QAM	1	0	21.50	21.29	20.49	21.30
			1	24	21.50	21.39	20.43	21.05
			1	49	21.50	21.35	20.45	21.13
			25	0	20.00	19.82	19.56	19.54
			25	12	20.00	19.83	19.97	19.80
			25	24	20.00	19.92	19.96	19.48
			50	0	20.00	19.86	19.86	19.80
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5
LTE Band 2	15MHz	QPSK	1	0	21.50	21.34	21.40	21.29
			1	37	21.50	21.34	21.35	21.16
			1	74	21.50	21.46	21.31	21.28
			36	0	21.00	20.42	20.50	20.32
			36	18	21.00	20.36	20.31	20.29
			36	37	21.00	20.37	20.45	20.38
			75	0	20.50	20.32	20.42	20.38
		16QAM	1	0	22.00	21.55	20.60	20.83
			1	37	22.00	21.55	20.59	20.86
			1	74	22.00	21.65	20.57	20.85
			36	0	20.00	19.83	19.53	19.71
			36	18	20.00	19.84	19.92	19.41
			36	37	20.00	19.51	19.83	19.44
			75	0	20.00	19.86	19.89	19.52
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18700/1860	18900/1880	19100/1900
LTE Band 2	20MHz	QPSK	1	0	22.00	21.15	21.54	21.29
			1	49	22.00	21.30	21.48	21.34
			1	99	22.00	21.42	21.44	21.29
			50	0	21.00	20.51	20.39	20.42
			50	24	21.00	20.44	20.32	20.29
			50	49	21.00	20.50	20.28	20.36
			100	0	21.00	20.54	20.31	20.37
		16QAM	1	0	21.50	20.59	21.04	20.76
			1	49	21.50	20.73	20.81	20.74
			1	99	21.50	20.79	20.86	20.83
			50	0	20.00	19.90	19.50	19.39

			50	24	20.00	19.90	19.96	19.80
			50	49	20.00	19.61	19.82	19.84
			100	0	20.00	19.85	19.85	19.64

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19957/1710.7	20175/1732.5	20393/1754.3
LTE Band 4	1.4MHz	QPSK	1	0	22.50	21.61	21.97	21.92
			1	2	22.50	21.63	22.01	21.98
			1	5	22.50	21.69	21.95	21.96
			3	0	22.00	21.67	21.86	21.76
			3	1	22.00	21.69	21.90	21.80
			3	2	22.00	21.62	21.82	21.80
			6	0	21.00	20.78	20.87	20.74
		16QAM	1	0	21.50	20.72	21.32	20.91
			1	2	21.50	20.72	21.34	20.87
			1	5	21.50	20.74	21.34	20.91
			3	0	21.00	20.66	20.67	20.34
			3	1	21.00	20.54	20.68	20.37
			3	2	21.00	20.50	20.70	20.38
			6	0	20.50	19.78	19.87	20.43
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19965/1711.5	20175/1732.5	20385/1753.5
LTE Band 4	3MHz	QPSK	1	0	22.00	21.72	21.80	21.72
			1	7	22.00	21.77	21.77	21.72
			1	14	22.00	21.69	21.74	21.77
			8	0	21.00	20.81	20.82	20.79
			8	4	21.00	20.74	20.88	20.73
			8	7	21.00	20.68	20.86	20.85
			15	0	21.00	20.79	20.83	20.83
		16QAM	1	0	22.00	21.21	21.02	21.74
			1	7	22.00	21.21	20.96	21.77
			1	14	22.00	21.22	20.94	21.84
			8	0	20.50	19.90	20.07	19.96
			8	4	20.50	19.96	20.01	19.99
			8	7	20.50	19.88	19.98	20.28
			15	0	20.00	19.75	19.91	19.95
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19975/1712.5	20175/1732.5	20375/1752.5
LTE Band 4	5MHz	QPSK	1	0	22.00	21.63	21.69	21.72
			1	12	22.00	21.60	21.68	21.70
			1	24	22.00	21.68	21.71	21.76
			12	0	21.00	20.68	20.92	20.95
			12	6	21.00	20.70	20.88	20.87
			12	11	21.00	20.81	20.89	20.75
			25	0	21.00	20.70	20.97	20.86
		16QAM	1	0	22.00	20.77	21.43	21.32
			1	12	22.00	20.70	21.49	21.24
			1	24	22.00	20.75	21.52	21.26

			12	0	20.50	19.71	20.06	19.81
			12	6	20.50	19.66	20.01	19.84
			12	11	20.50	19.66	20.03	19.86
			25	0	20.00	19.81	19.98	19.98
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20000/1715	20175/1732.5	20350/1750
LTE Band 4	10MHz	QPSK	1	0	22.00	21.64	21.79	21.98
			1	24	22.00	21.69	21.79	21.91
			1	49	22.00	21.72	21.82	21.92
			25	0	21.50	20.74	20.92	21.11
			25	12	21.50	20.75	21.04	20.86
			25	24	21.50	20.82	20.77	20.95
			50	0	21.50	20.66	21.05	20.92
		16QAM	1	0	22.00	20.98	21.00	21.88
			1	24	22.00	20.98	21.01	21.91
			1	49	22.00	21.01	21.10	21.83
			25	0	20.50	19.76	20.06	20.32
			25	12	20.50	20.16	19.99	20.03
			25	24	20.50	20.10	20.04	20.00
			50	0	20.50	20.16	20.02	19.97
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717.5	20175/1732.5	20325/1747.5
LTE Band 4	15MHz	QPSK	1	0	22.00	21.63	21.77	21.92
			1	37	22.00	21.67	21.76	21.97
			1	74	22.00	21.82	21.84	21.92
			36	0	21.50	20.66	20.95	20.93
			36	18	21.50	20.69	21.04	21.12
			36	37	21.50	20.79	20.94	20.79
			75	0	21.50	20.76	21.02	21.22
		16QAM	1	0	22.50	21.22	21.31	21.89
			1	37	22.50	21.28	21.44	22.13
			1	74	22.50	21.30	21.50	21.83
			36	0	20.50	20.12	20.04	19.98
			36	18	20.50	20.17	20.04	20.32
			36	37	20.50	19.82	20.35	19.97
			75	0	20.50	20.13	19.90	20.26
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20050/1720	20175/1732.5	20300/1745
LTE Band 4	20MHz	QPSK	1	0	22.50	21.64	21.88	22.02
			1	49	22.50	21.67	21.93	21.99
			1	99	22.50	21.83	22.05	21.93
			50	0	21.50	20.61	20.94	21.00
			50	24	21.50	20.66	21.04	21.01
			50	49	21.50	20.83	21.00	20.87
			100	0	21.00	20.57	20.81	20.94
		16QAM	1	0	22.00	20.95	21.43	20.91
			1	49	22.00	21.03	21.46	20.96
			1	99	22.00	21.22	21.57	20.88

			50	0	20.50	20.21	20.31	19.92
			50	24	20.50	19.78	19.95	19.92
			50	49	20.50	19.94	20.32	19.92
			100	0	20.00	19.76	19.97	19.83

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20407/824.7	20525/836.5	20643/848.3
LTE Band 5	1.4MHz	QPSK	1	0	23.00	22.51	22.59	22.44
			1	2	23.00	22.56	22.69	22.52
			1	5	23.00	22.49	22.72	22.47
			3	0	23.00	22.59	22.56	22.46
			3	1	23.00	22.57	22.54	22.27
			3	2	23.00	22.49	22.55	22.36
			6	0	22.50	21.92	22.01	21.31
		16QAM	1	0	23.00	21.97	22.30	21.26
			1	2	23.00	21.89	22.55	21.22
			1	5	23.00	21.85	22.62	21.22
			3	0	22.00	21.58	21.93	20.89
			3	1	22.00	21.58	21.72	20.78
			3	2	22.00	21.55	21.74	20.84
			6	0	21.50	20.93	20.93	21.15
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE Band 5	3MHz	QPSK	1	0	23.00	22.62	22.77	22.66
			1	7	23.00	22.60	22.63	22.42
			1	14	23.00	22.53	22.65	22.39
			8	0	22.00	21.92	21.66	21.67
			8	4	22.00	21.84	22.00	21.49
			8	7	22.00	21.61	21.98	21.48
			15	0	22.00	21.91	21.96	21.46
		16QAM	1	0	23.00	22.30	21.70	22.74
			1	7	23.00	22.30	21.96	22.64
			1	14	23.00	21.96	22.00	22.53
			8	0	21.50	21.01	21.16	20.69
			8	4	21.50	21.01	21.12	20.53
			8	7	21.50	21.12	21.10	21.07
			15	0	21.00	20.83	20.92	20.54
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20425/826.5	20525/836.5	20625/846.5
LTE Band 5	5MHz	QPSK	1	0	23.00	22.58	22.49	22.55
			1	12	23.00	22.46	22.41	22.60
			1	24	23.00	22.56	22.23	22.43
			12	0	22.50	21.84	21.64	22.13
			12	6	22.50	21.58	21.95	21.64
			12	11	22.50	21.56	22.01	21.64
			25	0	22.00	21.58	21.98	21.66
		16QAM	1	0	23.00	21.77	22.22	22.55
			1	12	23.00	21.40	22.53	22.10
			1	24	23.00	21.50	22.27	21.97

			12	0	21.50	20.85	21.04	20.93
			12	6	21.50	20.88	21.05	20.71
			12	11	21.50	20.89	21.07	20.67
			25	0	21.50	21.06	21.07	20.61
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20450/829	20525/836.5	20600/844
LTE Band 5	10MHz	QPSK	1	0	23.50	22.45	22.58	22.92
			1	24	23.50	22.50	22.61	23.12
			1	49	23.50	22.50	22.61	22.60
			25	0	22.00	21.41	21.69	21.52
			25	12	22.00	21.58	21.91	21.99
			25	24	22.00	21.49	21.66	21.61
			50	0	22.50	21.41	22.04	21.97
		16QAM	1	0	23.00	22.13	21.34	22.07
			1	24	23.00	21.65	21.84	22.55
			1	49	23.00	21.75	21.51	22.04
			25	0	21.50	20.96	21.04	20.60
			25	12	21.50	20.93	21.03	21.11
			25	24	21.50	20.52	21.06	20.83
			50	0	21.50	20.96	21.00	21.01

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23017/699.7	23095/707.5	23173/715.3
LTE Band 12	1.4MHz	QPSK	1	0	23.00	22.66	22.75	22.71
			1	2	23.00	22.70	22.70	22.69
			1	5	23.00	22.71	22.70	22.71
			3	0	23.00	22.61	22.70	22.63
			3	1	23.00	22.64	22.71	22.49
			3	2	23.00	22.61	22.70	22.46
			6	0	22.50	21.63	22.16	22.13
		16QAM	1	0	23.00	21.68	22.46	21.56
			1	2	23.00	21.75	22.79	22.03
			1	5	23.00	21.72	22.73	22.07
			3	0	22.50	21.44	22.04	21.30
			3	1	22.50	21.33	22.04	21.69
			3	2	22.50	21.37	22.12	21.72
			6	0	21.50	20.71	21.02	21.17
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23025/700.5	23095/707.5	23165/714.5
LTE Band 12	3MHz	QPSK	1	0	23.00	22.52	22.68	22.74
			1	7	23.00	22.62	22.67	22.66
			1	14	23.00	22.55	22.73	22.54
			8	0	22.50	21.46	21.72	21.74
			8	4	22.50	21.52	22.01	21.72
			8	7	22.50	21.56	22.10	22.12
			15	0	22.50	21.59	22.15	21.68
		16QAM	1	0	23.00	21.95	21.77	22.87
			1	7	23.00	22.00	22.09	22.72

			1	14	23.00	21.96	22.06	22.65
			8	0	21.50	20.69	20.83	21.22
			8	4	21.50	20.75	21.10	21.19
			8	7	21.50	20.63	21.40	21.23
			15	0	21.50	20.43	20.93	21.21
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5
LTE Band 12	5MHz	QPSK	1	0	23.00	22.60	22.58	22.68
			1	12	23.00	22.56	22.44	22.71
			1	24	23.00	22.68	22.52	22.67
			12	0	22.50	21.66	21.75	21.74
			12	6	22.50	21.65	22.03	21.93
			12	11	22.50	21.69	22.00	21.90
			25	0	22.50	21.72	22.11	21.99
		16QAM	1	0	23.00	21.64	22.33	22.17
			1	12	23.00	21.58	22.67	22.28
			1	24	23.00	21.76	22.27	22.61
			12	0	21.50	20.67	20.85	21.01
			12	6	21.50	20.60	21.13	21.06
			12	11	21.50	20.57	21.09	21.07
			25	0	21.50	20.77	21.16	21.14
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23060/704	23095/707.5	23130/711
LTE Band 12	10MHz	QPSK	1	0	23.00	22.63	22.69	22.90
			1	24	23.00	22.77	22.81	22.75
			1	49	23.00	22.81	22.94	22.81
			25	0	22.50	21.72	21.73	22.10
			25	12	22.50	21.91	22.12	21.58
			25	24	22.50	21.73	21.68	22.00
			50	0	22.50	21.68	22.02	21.59
		16QAM	1	0	23.00	21.78	21.52	22.30
			1	24	23.00	21.97	21.91	22.20
			1	49	23.00	22.24	21.77	22.64
			25	0	21.50	20.58	20.88	21.16
			25	12	21.50	20.56	21.04	20.75
			25	24	21.50	20.82	20.74	21.20
			50	0	21.50	20.55	21.01	20.64

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23755/706.5	23790/710	23825/713.5
LTE Band 17	5MHz	QPSK	1	0	23.00	22.50	22.55	22.57
			1	12	23.00	22.60	22.60	22.63
			1	24	23.00	22.61	22.74	22.52
			12	0	22.50	21.75	22.03	21.75
			12	6	22.50	21.69	21.60	22.00
			12	11	22.50	22.12	21.74	21.95
			25	0	22.00	21.68	21.59	21.96
		16QAM	1	0	23.00	22.20	22.05	22.34

			1	12	23.00	22.16	21.74	22.42
			1	24	23.00	22.55	21.82	22.68
			12	0	21.50	20.78	20.97	21.17
			12	6	21.50	20.79	20.56	21.16
			12	11	21.50	21.01	20.99	21.17
			25	0	21.50	20.81	20.69	21.17
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23780/709	23790/710	23800/711
LTE Band 17	10MHz	QPSK	1	0	23.00	22.75	22.92	22.93
			1	24	23.00	22.67	22.81	22.74
			1	49	23.00	22.70	22.91	22.77
			25	0	22.50	21.66	22.15	22.09
			25	12	22.50	22.05	21.59	21.56
			25	24	22.50	21.83	21.77	21.97
			50	0	22.50	22.08	21.60	21.60
		16QAM	1	0	23.00	21.93	21.72	22.31
			1	24	23.00	22.14	21.57	22.17
			1	49	23.00	22.07	21.79	22.62
			25	0	21.50	20.72	21.07	21.19
			25	12	21.50	21.03	20.61	20.76
			25	24	21.50	21.21	21.15	21.19
			50	0	21.50	21.12	20.61	20.66

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40265/2557.5	40740/2605	41215/2652.5
LTE Band 41	5MHz	QPSK	1	0	20.50	19.44	19.40	19.84
			1	12	20.50	19.33	19.20	20.19
			1	24	20.50	19.48	19.41	20.15
			12	0	19.50	18.42	18.27	18.92
			12	6	19.50	18.53	18.22	19.01
			12	11	19.50	18.46	18.26	18.95
			25	0	19.50	18.47	18.28	19.09
		16QAM	1	0	20.00	19.94	18.58	19.34
			1	12	20.00	19.97	18.58	19.48
			1	24	20.00	19.76	19.50	19.35
			12	0	18.00	17.39	17.22	17.79
			12	6	18.00	17.33	17.36	17.87
			12	11	18.00	17.45	17.29	17.93
			25	0	18.00	17.37	17.38	17.96
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40290/2560	40740/2605	41190/2650
LTE Band 41	10MHz	QPSK	1	0	20.50	19.59	19.22	19.99
			1	24	20.50	19.67	19.18	19.88
			1	49	20.50	19.61	19.23	20.16
			25	0	19.00	18.51	18.24	18.99
			25	12	19.00	18.61	18.32	18.85
			25	24	19.00	18.69	18.42	18.96
			50	0	19.00	18.70	18.31	18.80
		16QAM	1	0	20.50	19.12	19.04	20.26

			1	24	20.50	18.91	18.52	20.26
			1	49	20.50	19.24	18.51	20.24
			25	0	18.00	17.50	17.48	17.88
			25	12	18.00	17.55	17.58	17.81
			25	24	18.00	17.48	17.51	17.91
			50	0	18.00	17.64	17.24	17.88
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40315/2562.5	40740/2605	41165/2647.5
LTE Band 41	15MHz	QPSK	1	0	20.50	19.65	19.41	19.84
			1	37	20.50	19.72	19.18	20.03
			1	74	20.50	19.48	19.25	20.19
			36	0	19.50	18.61	18.36	18.85
			36	18	19.50	18.68	18.35	18.90
			36	37	19.50	18.44	18.45	19.02
			75	0	19.00	18.61	18.39	18.92
		16QAM	1	0	20.00	19.18	18.82	19.93
			1	37	20.50	19.19	18.38	20.28
			1	74	20.50	18.76	18.86	20.21
			36	0	18.00	17.54	17.33	17.91
			36	18	18.00	17.53	17.47	17.89
			36	37	18.00	17.44	17.33	17.87
			75	0	18.00	17.54	17.29	17.94
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40340/2565	40740/2605	41140/2645
LTE Band 41	20MHz	QPSK	1	0	20.50	19.48	19.42	19.57
			1	49	20.50	19.37	19.47	19.76
			1	99	20.50	19.55	19.40	20.09
			50	0	19.00	18.63	18.34	18.76
			50	24	19.00	18.55	18.34	18.88
			50	49	19.00	18.53	18.33	18.87
			100	0	19.00	18.53	18.38	18.82
		16QAM	1	0	20.50	19.66	19.60	18.71
			1	49	20.50	19.69	19.63	19.37
			1	99	20.50	20.07	19.75	18.98
			50	0	18.00	17.54	17.44	17.68
			50	24	18.00	17.63	17.41	17.92
			50	49	18.00	17.68	17.28	17.90
			100	0	18.00	17.64	17.30	17.86

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		131979/1710.7	132322/1745	132665/1779.3
LTE Band 66	1.4MHz	QPSK	1	0	22.50	21.74	22.05	21.76
			1	2	22.50	21.75	21.97	21.70
			1	5	22.50	21.77	21.95	21.72
			3	0	22.00	21.72	21.83	21.84
			3	1	22.00	21.75	21.90	21.73
			3	2	22.00	21.66	21.83	21.74
			6	0	21.00	20.65	20.93	20.68
		16QAM	1	0	22.00	21.20	20.99	20.85
			1	2	22.00	21.17	20.94	20.87

			1	5	22.00	21.18	21.50	20.88
			3	0	21.00	20.48	20.73	20.49
			3	1	21.00	20.52	20.69	20.52
			3	2	21.00	20.46	20.70	20.56
			6	0	20.50	19.76	20.08	19.88
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		131987/1711.5	132322/1745	132657/1778.5
LTE Band 66	3MHz	QPSK	1	0	22.00	21.69	21.99	21.78
			1	7	22.00	21.69	21.98	21.81
			1	14	22.00	21.71	21.95	21.82
			8	0	21.00	20.69	20.87	20.80
			8	4	21.00	20.72	20.90	20.75
			8	7	21.00	20.66	20.97	20.85
			15	0	21.00	20.76	20.98	20.84
		16QAM	1	0	22.00	21.16	21.51	21.95
			1	7	22.00	21.09	21.56	22.00
			1	14	22.00	21.13	21.43	21.97
			8	0	20.50	20.05	20.10	20.20
			8	4	20.50	20.09	20.06	20.13
			8	7	20.50	20.43	20.03	20.16
			15	0	20.00	19.77	19.91	19.95
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		131997/1712.5	132322/1745	132647/1777.5
LTE Band 66	5MHz	QPSK	1	0	22.00	21.67	21.81	21.84
			1	12	22.00	21.68	21.87	21.76
			1	24	22.00	21.71	21.85	21.84
			12	0	21.00	20.69	20.94	20.81
			12	6	21.00	20.72	21.00	20.80
			12	11	21.00	20.67	20.83	20.90
			25	0	21.00	20.67	20.97	20.76
		16QAM	1	0	22.00	20.57	21.56	21.41
			1	12	22.00	20.59	21.73	21.33
			1	24	22.00	20.61	21.72	21.36
			12	0	20.50	19.79	20.30	19.83
			12	6	20.50	20.14	19.98	19.87
			12	11	20.50	20.10	20.27	19.87
			25	0	20.50	20.13	20.04	19.91
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		132022/1715	132322/1745	132622/1775
LTE Band 66	10MHz	QPSK	1	0	22.50	21.68	22.07	21.94
			1	24	22.50	21.79	22.06	22.01
			1	49	22.50	21.84	22.07	21.93
			25	0	21.00	20.65	20.84	20.83
			25	12	21.00	20.75	21.00	20.88
			25	24	21.00	20.69	20.96	20.88
			50	0	21.50	20.77	21.02	20.78
		16QAM	1	0	22.00	20.95	21.45	21.45
			1	24	22.00	20.99	21.55	21.46

			1	49	22.00	21.00	21.44	21.48
			25	0	20.50	20.06	20.38	20.00
			25	12	20.50	19.79	20.12	20.33
			25	24	20.50	19.85	20.36	20.07
			50	0	20.50	19.79	20.02	20.18
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		132047/1717.5	132322/1745	132597/1772.5
LTE Band 66	15MHz	QPSK	1	0	22.50	21.61	22.05	21.97
			1	37	22.50	21.64	22.04	21.81
			1	74	22.50	21.72	21.96	21.85
			36	0	21.50	20.77	21.01	20.91
			36	18	21.50	20.69	21.03	20.86
			36	37	21.50	20.80	20.95	20.79
			75	0	21.00	20.76	20.99	20.78
		16QAM	1	0	22.50	20.93	21.81	22.33
			1	37	22.50	20.92	21.88	22.03
			1	74	22.50	21.02	21.81	21.99
			36	0	20.50	19.89	20.03	20.16
			36	18	20.50	19.95	20.02	19.89
			36	37	20.50	19.94	20.35	19.84
			75	0	20.50	19.89	20.02	19.82
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		132072/1720	132322/1745	132572/1770
LTE Band 66	20MHz	QPSK	1	0	22.50	21.71	22.05	21.64
			1	49	22.50	21.77	22.03	21.81
			1	99	22.50	21.92	21.95	21.72
			50	0	21.50	20.78	20.90	21.26
			50	24	21.50	20.85	20.92	20.97
			50	49	21.50	20.85	20.89	20.92
			100	0	21.00	20.82	20.97	20.88
		16QAM	1	0	22.00	21.26	21.69	21.84
			1	49	22.00	21.32	21.72	21.90
			1	99	22.00	21.43	21.56	21.86
			50	0	20.50	19.93	19.97	20.28
			50	24	20.50	19.81	19.97	20.26
			50	49	20.50	19.99	20.35	20.22
			100	0	20.50	19.71	20.08	20.27

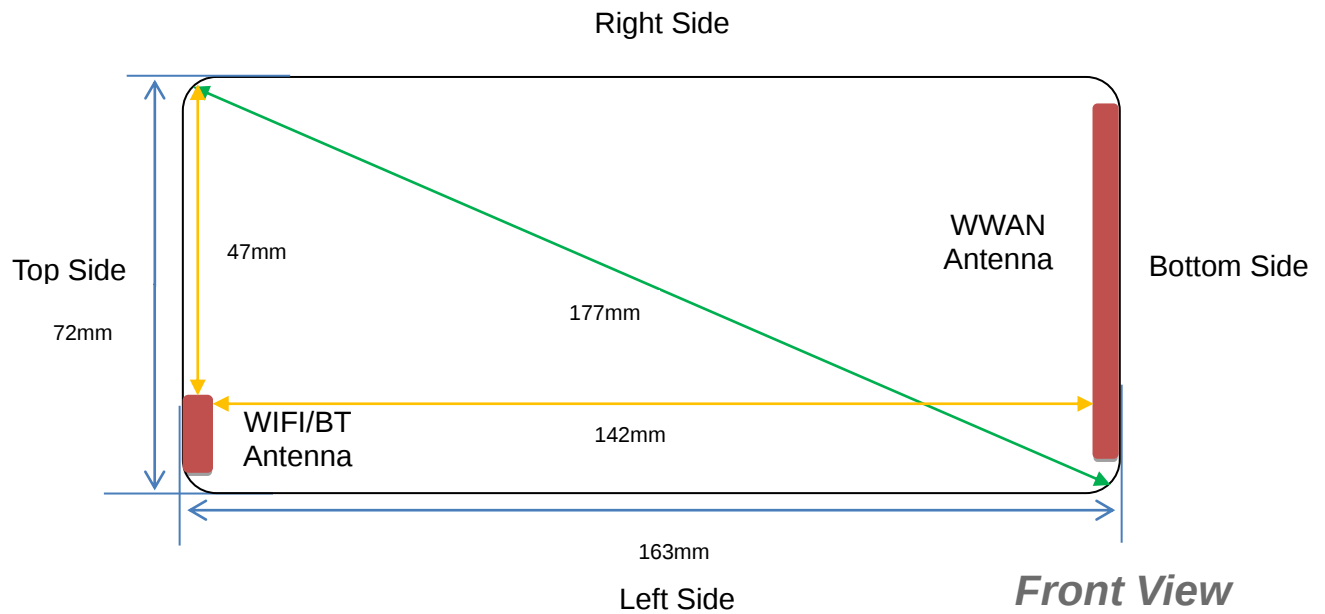
8.4. Wi-Fi & BT Output Power

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11b	1	2412	13.00	12.65
	6	2437	9.00	8.77
	11	2462	13.00	12.46
802.11g	1	2412	17.00	16.70
	6	2437	15.00	14.31
	11	2462	18.00	17.64
802.11n HT20	1	2412	16.00	15.78
	6	2437	14.00	13.77
	11	2462	17.00	16.93

BR+EDR	Output Power (dBm)				
	Channel	Tune-up (dBm)	Data Rates		
			1M	2M	3M
	0CH	1.00	0.72	-0.23	0.08
	39CH	1.00	-0.52	-0.34	0.06
	78CH	-1.00	-1.85	-1.45	-1.06

Mode	Channel	Tune-up (dBm)	Output Power (dBm)
BLE1M	CH00	-7.00	-7.40
	CH19	-5.00	-5.38
	CH39	-5.00	-5.67

9. Antenna Location



Antenna information:

Distance of The Antenna to the EUT surface and edge (mm)						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
BT/WLAN	≤25mm	≤25mm	≤25mm	>25mm	≤25mm	>25mm
WWAN	≤25mm	≤25mm	≤25mm	≤25mm	>25mm	≤25mm

Positions for SAR tests						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
BT/WLAN	Yes	Yes	Yes	NO	Yes	NO
WWAN	Yes	Yes	Yes	Yes	NO	Yes

10. Stand-alone SAR test exclusion

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

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

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

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

Mode	Pmax (dBm)	Pmax (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
Bluetooth	1.00	1.26	5	2.480	0.4	3	Yes

NOTE: Standalone SAR test exclusion for Bluetooth.

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

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

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

Mode	Position	Pmax (dBm)	Pmax (mW)	Distance (mm)	f (GHz)	x	Estimated SAR (W/kg)
Bluetooth	Head	1.00	1.26	5	2.48	7.5	0.053
Bluetooth	Body	1.00	1.26	10	2.48	7.5	0.026
Bluetooth	Hotspot	1.00	1.26	10	2.48	7.5	0.026

NOTE: Estimated SAR calculation for Bluetooth

11. SAR Measurement Results

< GSM 850>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Left Cheek	189/836.4	GPRS(GMSK 2TS)	0.280	0.178	-3.42	30.16	30.50	0.303	2025/2/10	1#
Left Tilt 15 Degree	189/836.4	GPRS(GMSK 2TS)	0.164	0.103	0.31	30.16	30.50	0.177	2025/2/10	
Right Cheek	189/836.4	GPRS(GMSK 2TS)	0.255	0.159	-2.44	30.16	30.50	0.276	2025/2/10	
Right Tilt 15 Degree	189/836.4	GPRS(GMSK 2TS)	0.132	0.081	-0.73	30.16	30.50	0.143	2025/2/10	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	189/836.4	GPRS(GMSK 2TS)	0.348	0.189	1.69	30.16	30.50	0.376	2025/2/10	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.578	0.324	-4.11	30.16	30.50	0.625	2025/2/10	2#
Left Side	189/836.4	GPRS(GMSK 2TS)	0.183	0.098	1.03	30.16	30.50	0.198	2025/2/10	
Right Side	189/836.4	GPRS(GMSK 2TS)	0.177	0.094	-3.01	30.16	30.50	0.191	2025/2/10	
Bottom Side	189/836.4	GPRS(GMSK 2TS)	0.295	0.157	-2.27	30.16	30.50	0.319	2025/2/10	

< GSM 1900>

[illegible]

								(W/Kg)		
Left Cheek	661/1880	GPRS(GMSK 3TS)	0.421	0.266	0.79	24.02	24.50	0.470	2025/2/14	3#
Left Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.242	0.151	1.57	24.02	24.50	0.270	2025/2/14	
Right Cheek	661/1880	GPRS(GMSK 3TS)	0.371	0.223	-1.89	24.02	24.50	0.414	2025/2/14	
Right Tilt 15 Degree	661/1880	GPRS(GMSK 3TS)	0.194	0.119	-0.28	24.02	24.50	0.217	2025/2/14	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	661/1880	GPRS(GMSK 3TS)	0.180	0.114	-1.81	24.02	24.50	0.201	2025/2/14	
Back Side	661/1880	GPRS(GMSK 3TS)	0.298	0.193	-4.84	24.02	24.50	0.333	2025/2/14	4#
Left Side	661/1880	GPRS(GMSK 3TS)	0.099	0.062	-3.84	24.02	24.50	0.111	2025/2/14	
Right Side	661/1880	GPRS(GMSK 3TS)	0.093	0.058	2.73	24.02	24.50	0.104	2025/2/14	
Bottom Side	661/1880	GPRS(GMSK 3TS)	0.155	0.100	-3.27	24.02	24.50	0.173	2025/2/14	

< WCDMA Band 2>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Left Cheek	9400/1880	RMC12.2K	0.431	0.284	-4.74	21.44	21.50	0.437	2025/2/14	5#
Left Tilt 15 Degree	9400/1880	RMC12.2K	0.223	0.141	0.49	21.44	21.50	0.226	2025/2/14	
Right	9400/1880	RMC12.2K	0.381	0.239	-3.32	21.44	21.50	0.386	2025/2/14	

Cheek										
Right Tilt 15 Degree	9400/1880	RMC12.2K	0.182	0.119	-0.11	21.44	21.50	0.185	2025/2/14	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	9400/1880	RMC12.2K	0.216	0.128	2.01	21.44	21.50	0.219	2025/2/14	
Back Side	9400/1880	RMC12.2K	0.360	0.220	-2.67	21.44	21.50	0.365	2025/2/14	6#
Left Side	9400/1880	RMC12.2K	0.120	0.073	3.15	21.44	21.50	0.122	2025/2/14	
Right Side	9400/1880	RMC12.2K	0.111	0.065	1.98	21.44	21.50	0.113	2025/2/14	
Bottom Side	9400/1880	RMC12.2K	0.195	0.116	-0.45	21.44	21.50	0.198	2025/2/14	

< WCDMA Band 5 >

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Left Cheek	4182/836.4	RMC12.2K	0.293	0.181	1.86	22.64	23.00	0.318	2025/2/10	7#
Left Tilt 15 Degree	4182/836.4	RMC12.2K	0.170	0.104	3.56	22.64	23.00	0.185	2025/2/10	
Right Cheek	4182/836.4	RMC12.2K	0.252	0.151	-1.92	22.64	23.00	0.274	2025/2/10	
Right Tilt 15 Degree	4182/836.4	RMC12.2K	0.127	0.075	1.53	22.64	23.00	0.138	2025/2/10	

Test Position	Test channel	Test Mode	SAR Value (W/kg)		Power Drift	Conducted power	Tune-up power	Scaled SAR	Date	Plot
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of Hotspot with 10mm	/Freq.		1g	10g	(±5%)	(dBm)	(dBm)	1g (W/Kg)		
Front Side	4182/836.4	RMC12.2K	0.168	0.097	-2.46	22.64	23.00	0.183	2025/2/10	
Back Side	4182/836.4	RMC12.2K	0.248	0.145	-2.94	22.64	23.00	0.269	2025/2/10	8#
Left Side	4182/836.4	RMC12.2K	0.078	0.044	2.26	22.64	23.00	0.085	2025/2/10	
Right Side	4182/836.4	RMC12.2K	0.081	0.045	3.53	22.64	23.00	0.088	2025/2/10	
Bottom Side	4182/836.4	RMC12.2K	0.135	0.075	-0.97	22.64	23.00	0.147	2025/2/10	

< LTE Band 2>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	18900/1880	20M QPSK(1,0)	0.422	0.275	-4.71	21.54	22.00	0.469	2025/2/14	11#
Left Tilt 15 Degree	18900/1880	20M QPSK(1,0)	0.233	0.147	-1.39	21.54	22.00	0.259	2025/2/14	
Right Cheek	18900/1880	20M QPSK(1,0)	0.381	0.246	0.57	21.54	22.00	0.424	2025/2/14	
Right Tilt 15 Degree	18900/1880	20M QPSK(1,0)	0.187	0.116	-0.50	21.54	22.00	0.208	2025/2/14	
50%RB										
Left Cheek	18900/1880	20M QPSK(50,0)	0.219	0.151	4.96	20.39	21.00	0.252	2025/2/14	
Left Tilt 15 Degree	18900/1880	20M QPSK(50,0)	0.129	0.087	-4.15	20.39	21.00	0.148	2025/2/14	
Right Cheek	18900/1880	20M QPSK(50,0)	0.203	0.147	3.09	20.39	21.00	0.234	2025/2/14	
Right	18900/1880	20M QPSK(50,0)	0.101	0.065	-3.67	20.39	21.00	0.116	2025/2/14	

Tilt 15 Degree										
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Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	18900/1880	20M QPSK(1,0)	0.240	0.131	-2.98	21.54	22.00	0.267	2025/2/14	
Back Side	18900/1880	20M QPSK(1,0)	0.371	0.213	-1.49	21.54	22.00	0.412	2025/2/14	12#
Left Side	18900/1880	20M QPSK(1,0)	0.126	0.072	3.68	21.54	22.00	0.140	2025/2/14	
Right Side	18900/1880	20M QPSK(1,0)	0.117	0.067	-2.18	21.54	22.00	0.130	2025/2/14	
Bottom Side	18900/1880	20M QPSK(1,0)	0.195	0.107	-3.48	21.54	22.00	0.217	2025/2/14	
50%RB										
Front Side	18900/1880	20M QPSK(50,0)	0.136	0.070	3.11	20.39	21.00	0.157	2025/2/14	
Back Side	18900/1880	20M QPSK(50,0)	0.204	0.110	-0.45	20.39	21.00	0.235	2025/2/14	
Left Side	18900/1880	20M QPSK(50,0)	0.071	0.036	-3.42	20.39	21.00	0.082	2025/2/14	
Right Side	18900/1880	20M QPSK(50,0)	0.066	0.034	0.01	20.39	21.00	0.076	2025/2/14	
Bottom Side	18900/1880	20M QPSK(50,0)	0.099	0.056	-4.92	20.39	21.00	0.114	2025/2/14	

< LTE Band 4>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	20175/1732.5	20M QPSK(1,99)	0.447	0.278	-0.96	22.05	22.50	0.496	2025/2/12	13#
Left Tilt	20175/1732.5	20M QPSK(1,99)	0.255	0.155	-3.87	22.05	22.50	0.283	2025/2/12	

15 Degree										
Right Cheek	20175/1732.5	20M QPSK(1,99)	0.383	0.226	1.87	22.05	22.50	0.425	2025/2/12	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(1,99)	0.195	0.116	3.27	22.05	22.50	0.216	2025/2/12	
50%RB										
Left Cheek	20175/1732.5	20M QPSK(50,24)	0.256	0.166	-3.52	21.04	21.50	0.285	2025/2/12	
Left Tilt 15 Degree	20175/1732.5	20M QPSK(50,24)	0.144	0.087	1.26	21.04	21.50	0.160	2025/2/12	
Right Cheek	20175/1732.5	20M QPSK(50,24)	0.220	0.118	-0.09	21.04	21.50	0.245	2025/2/12	
Right Tilt 15 Degree	20175/1732.5	20M QPSK(50,24)	0.103	0.064	1.56	21.04	21.50	0.115	2025/2/12	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,99)	0.234	0.136	-3.64	22.05	22.50	0.260	2025/2/12	
Back Side	20175/1732.5	20M QPSK(1,99)	0.361	0.217	-0.63	22.05	22.50	0.400	2025/2/12	14#
Left Side	20175/1732.5	20M QPSK(1,99)	0.117	0.068	-3.88	22.05	22.50	0.130	2025/2/12	
Right Side	20175/1732.5	20M QPSK(1,99)	0.117	0.070	2.50	22.05	22.50	0.130	2025/2/12	
Bottom Side	20175/1732.5	20M QPSK(1,99)	0.200	0.117	3.92	22.05	22.50	0.222	2025/2/12	
50%RB										
Front Side	20175/1732.5	20M QPSK(50,24)	0.135	0.079	4.74	21.04	21.50	0.150	2025/2/12	
Back Side	20175/1732.5	20M QPSK(50,24)	0.204	0.130	0.95	21.04	21.50	0.227	2025/2/12	

Left Side	20175/1732.5	20M QPSK(50,24)	0.065	0.040	2.66	21.04	21.50	0.072	2025/2/12	
Right Side	20175/1732.5	20M QPSK(50,24)	0.069	0.042	-3.66	21.04	21.50	0.077	2025/2/12	
Bottom Side	20175/1732.5	20M QPSK(50,24)	0.118	0.065	0.17	21.04	21.50	0.131	2025/2/12	

< LTE Band 5>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	20525/836.5	10M QPSK(1,24)	0.267	0.180	2.23	22.61	23.50	0.328	2025/2/10	15#
Left Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.158	0.105	3.48	22.61	23.50	0.194	2025/2/10	
Right Cheek	20525/836.5	10M QPSK(1,24)	0.239	0.153	-1.80	22.61	23.50	0.293	2025/2/10	
Right Tilt 15 Degree	20525/836.5	10M QPSK(1,24)	0.109	0.073	-1.00	22.61	23.50	0.134	2025/2/10	
50%RB										
Left Cheek	20525/836.5	10M QPSK(25,12)	0.155	0.102	-2.79	21.91	22.00	0.158	2025/2/10	
Left Tilt 15 Degree	20525/836.5	10M QPSK(25,12)	0.089	0.062	-4.32	21.91	22.00	0.091	2025/2/10	
Right Cheek	20525/836.5	10M QPSK(25,12)	0.124	0.084	4.55	21.91	22.00	0.127	2025/2/10	
Right Tilt 15 Degree	20525/836.5	10M QPSK(25,12)	0.060	0.040	-3.78	21.91	22.00	0.061	2025/2/10	

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

1RB										
Front Side	20525/836.5	10M QPSK(1,24)	0.180	0.103	-1.67	22.61	23.50	0.221	2025/2/10	
Back Side	20525/836.5	10M QPSK(1,24)	0.256	0.152	0.35	22.61	23.50	0.314	2025/2/10	16#
Left Side	20525/836.5	10M QPSK(1,24)	0.081	0.047	-3.81	22.61	23.50	0.099	2025/2/10	
Right Side	20525/836.5	10M QPSK(1,24)	0.090	0.051	-2.36	22.61	23.50	0.110	2025/2/10	
Bottom Side	20525/836.5	10M QPSK(1,24)	0.145	0.085	1.28	22.61	23.50	0.178	2025/2/10	
50%RB										
Front Side	20525/836.5	10M QPSK(25,12)	0.103	0.053	-1.60	21.91	22.00	0.105	2025/2/10	
Back Side	20525/836.5	10M QPSK(25,12)	0.147	0.084	4.32	21.91	22.00	0.150	2025/2/10	
Left Side	20525/836.5	10M QPSK(25,12)	0.043	0.025	2.41	21.91	22.00	0.044	2025/2/10	
Right Side	20525/836.5	10M QPSK(25,12)	0.046	0.026	-1.04	21.91	22.00	0.047	2025/2/10	
Bottom Side	20525/836.5	10M QPSK(25,12)	0.083	0.045	-0.42	21.91	22.00	0.085	2025/2/10	

< LTE Band 12>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	23095/707.5	10M QPSK(1,49)	0.308	0.194	-0.04	22.94	23.00	0.312	2025/2/11	17#
Left Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.184	0.114	-3.00	22.94	23.00	0.187	2025/2/11	
Right Cheek	23095/707.5	10M QPSK(1,49)	0.281	0.168	-2.64	22.94	23.00	0.285	2025/2/11	
Right Tilt 15 Degree	23095/707.5	10M QPSK(1,49)	0.146	0.090	-0.71	22.94	23.00	0.148	2025/2/11	
50%RB										

Left Cheek	23095/707.5	10M QPSK(25,12)	0.183	0.105	2.12	22.12	22.50	0.200	2025/2/11	
Left Tilt 15 Degree	23095/707.5	10M QPSK(25,12)	0.094	0.064	-4.33	22.12	22.50	0.103	2025/2/11	
Right Cheek	23095/707.5	10M QPSK(25,12)	0.143	0.094	-4.75	22.12	22.50	0.156	2025/2/11	
Right Tilt 15 Degree	23095/707.5	10M QPSK(25,12)	0.074	0.053	-4.60	22.12	22.50	0.081	2025/2/11	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	23095/707.5	10M QPSK(1,49)	0.162	0.097	-1.90	22.94	23.00	0.164	2025/2/11	
Back Side	23095/707.5	10M QPSK(1,49)	0.252	0.155	-3.34	22.94	23.00	0.256	2025/2/11	18#
Left Side	23095/707.5	10M QPSK(1,49)	0.084	0.051	1.96	22.94	23.00	0.085	2025/2/11	
Right Side	23095/707.5	10M QPSK(1,49)	0.081	0.048	1.78	22.94	23.00	0.082	2025/2/11	
Bottom Side	23095/707.5	10M QPSK(1,49)	0.140	0.082	3.56	22.94	23.00	0.142	2025/2/11	
50%RB										
Front Side	23095/707.5	10M QPSK(25,12)	0.096	0.058	-0.84	22.12	22.50	0.105	2025/2/11	
Back Side	23095/707.5	10M QPSK(25,12)	0.129	0.078	1.85	22.12	22.50	0.141	2025/2/11	
Left Side	23095/707.5	10M QPSK(25,12)	0.042	0.030	-2.53	22.12	22.50	0.046	2025/2/11	
Right Side	23095/707.5	10M QPSK(25,12)	0.048	0.029	-0.16	22.12	22.50	0.052	2025/2/11	
Bottom Side	23095/707.5	10M QPSK(25,12)	0.078	0.042	-3.27	22.12	22.50	0.085	2025/2/11	

< LTE Band 17>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	23790/710	10M QPSK(1,0)	0.309	0.187	-0.79	22.92	23.00	0.315	2025/2/11	19#
Left Tilt 15 Degree	23790/710	10M QPSK(1,0)	0.163	0.095	1.46	22.92	23.00	0.166	2025/2/11	
Right Cheek	23790/710	10M QPSK(1,0)	0.263	0.154	-2.19	22.92	23.00	0.268	2025/2/11	
Right Tilt 15 Degree	23790/710	10M QPSK(1,0)	0.122	0.073	0.92	22.92	23.00	0.124	2025/2/11	
50%RB										
Left Cheek	23790/710	10M QPSK(25,0)	0.167	0.111	-2.62	22.15	22.50	0.181	2025/2/11	
Left Tilt 15 Degree	23790/710	10M QPSK(25,0)	0.083	0.052	3.17	22.15	22.50	0.090	2025/2/11	
Right Cheek	23790/710	10M QPSK(25,0)	0.148	0.087	-2.90	22.15	22.50	0.160	2025/2/11	
Right Tilt 15 Degree	23790/710	10M QPSK(25,0)	0.063	0.038	1.85	22.15	22.50	0.068	2025/2/11	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	23790/710	10M QPSK(1,0)	0.192	0.109	2.65	22.92	23.00	0.196	2025/2/11	
Back Side	23790/710	10M QPSK(1,0)	0.274	0.158	-3.40	22.92	23.00	0.279	2025/2/11	20#
Left	23790/710	10M QPSK(1,0)	0.096	0.054	-3.41	22.92	23.00	0.098	2025/2/11	

Side										
Right Side	23790/710	10M QPSK(1,0)	0.087	0.049	-1.25	22.92	23.00	0.089	2025/2/11	
Bottom Side	23790/710	10M QPSK(1,0)	0.155	0.089	-3.57	22.92	23.00	0.158	2025/2/11	
50%RB										
Front Side	23790/710	10M QPSK(25,0)	0.099	0.059	2.60	22.15	22.50	0.107	2025/2/11	
Back Side	23790/710	10M QPSK(25,0)	0.155	0.079	-2.83	22.15	22.50	0.168	2025/2/11	
Left Side	23790/710	10M QPSK(25,0)	0.051	0.031	3.51	22.15	22.50	0.055	2025/2/11	
Right Side	23790/710	10M QPSK(25,0)	0.048	0.026	-0.19	22.15	22.50	0.052	2025/2/11	
Bottom Side	23790/710	10M QPSK(25,0)	0.083	0.045	1.76	22.15	22.50	0.090	2025/2/11	

< LTE Band 41>

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Left Cheek	40740/2605	20M QPSK(1,99)	0.519	0.335	-2.82	19.40	20.50	0.669	2025/2/17	21#
Left Tilt 15 Degree	40740/2605	20M QPSK(1,99)	0.264	0.165	-2.41	19.40	20.50	0.340	2025/2/17	
Right Cheek	40740/2605	20M QPSK(1,99)	0.477	0.292	2.41	19.40	20.50	0.614	2025/2/17	
Right Tilt 15 Degree	40740/2605	20M QPSK(1,99)	0.228	0.146	-1.57	19.40	20.50	0.294	2025/2/17	
50%RB										
Left Cheek	40740/2605	20M QPSK(50,24)	0.281	0.198	-1.64	18.34	19.00	0.327	2025/2/17	
Left Tilt 15 Degree	40740/2605	20M QPSK(50,24)	0.156	0.086	-2.33	18.34	19.00	0.182	2025/2/17	
Right	40740/2605	20M QPSK(50,24)	0.279	0.156	-3.30	18.34	19.00	0.325	2025/2/17	

Cheek										
Right Tilt 15 Degree	40740/2605	20M QPSK(50,24)	0.120	0.083	-4.23	18.34	19.00	0.140	2025/2/17	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	40740/2605	20M QPSK(1,99)	0.306	0.169	-1.02	19.40	20.50	0.394	2025/2/17	
Back Side	40740/2605	20M QPSK(1,99)	0.478	0.269	-3.25	19.40	20.50	0.616	2025/2/17	22#
Left Side	40740/2605	20M QPSK(1,99)	0.147	0.079	2.92	19.40	20.50	0.189	2025/2/17	
Right Side	40740/2605	20M QPSK(1,99)	0.144	0.077	3.30	19.40	20.50	0.186	2025/2/17	
Bottom Side	40740/2605	20M QPSK(1,99)	0.240	0.132	0.18	19.40	20.50	0.309	2025/2/17	
50%RB										
Front Side	40740/2605	20M QPSK(50,24)	0.159	0.100	-2.27	18.34	19.00	0.185	2025/2/17	
Back Side	40740/2605	20M QPSK(50,24)	0.268	0.150	0.70	18.34	19.00	0.312	2025/2/17	
Left Side	40740/2605	20M QPSK(50,24)	0.084	0.045	1.10	18.34	19.00	0.098	2025/2/17	
Right Side	40740/2605	20M QPSK(50,24)	0.079	0.039	-0.76	18.34	19.00	0.092	2025/2/17	
Bottom Side	40740/2605	20M QPSK(50,24)	0.123	0.073	-0.99	18.34	19.00	0.143	2025/2/17	

< LTE Band 66>

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

Left Cheek	132322/1745	20M QPSK(1,0)	0.449	0.286	-2.77	22.05	22.50	0.498	2025/2/12	23#
Left Tilt 15 Degree	132322/1745	20M QPSK(1,0)	0.253	0.156	0.54	22.05	22.50	0.281	2025/2/12	
Right Cheek	132322/1745	20M QPSK(1,0)	0.387	0.242	-1.14	22.05	22.50	0.429	2025/2/12	
Right Tilt 15 Degree	132322/1745	20M QPSK(1,0)	0.201	0.123	-3.42	22.05	22.50	0.223	2025/2/12	
50%RB										
Left Cheek	132322/1745	20M QPSK(50,0)	0.256	0.152	-3.98	20.90	21.50	0.294	2025/2/12	
Left Tilt 15 Degree	132322/1745	20M QPSK(50,0)	0.148	0.079	2.29	20.90	21.50	0.170	2025/2/12	
Right Cheek	132322/1745	20M QPSK(50,0)	0.195	0.131	0.32	20.90	21.50	0.224	2025/2/12	
Right Tilt 15 Degree	132322/1745	20M QPSK(50,0)	0.101	0.072	-3.20	20.90	21.50	0.116	2025/2/12	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
1RB										
Front Side	132322/1745	20M QPSK(1,0)	0.228	0.136	0.45	22.05	22.50	0.253	2025/2/12	
Back Side	132322/1745	20M QPSK(1,0)	0.370	0.230	-2.79	22.05	22.50	0.410	2025/2/12	24#
Left Side	132322/1745	20M QPSK(1,0)	0.111	0.069	3.00	22.05	22.50	0.123	2025/2/12	
Right Side	132322/1745	20M QPSK(1,0)	0.123	0.075	3.28	22.05	22.50	0.136	2025/2/12	
Bottom Side	132322/1745	20M QPSK(1,0)	0.200	0.121	2.47	22.05	22.50	0.222	2025/2/12	
50%RB										
Front	132322/1745	20M	0.114	0.077	2.64	20.90	21.50	0.131	2025/2/12	

Side		QPSK(50,0)								
Back Side	132322/1745	20M QPSK(50,0)	0.211	0.135	-0.11	20.90	21.50	0.242	2025/2/12	
Left Side	132322/1745	20M QPSK(50,0)	0.063	0.041	0.94	20.90	21.50	0.072	2025/2/12	
Right Side	132322/1745	20M QPSK(50,0)	0.072	0.040	2.79	20.90	21.50	0.083	2025/2/12	
Bottom Side	132322/1745	20M QPSK(50,0)	0.119	0.071	-0.61	20.90	21.50	0.137	2025/2/12	

< WiFi 2.4G >

Test Position	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Left Cheek	1/2412	802.11b	0.397	0.280	-4.07	12.65	13.00	0.430	2025/2/16	9#
Left Cheek	11/2462	802.11g	0.365	0.261	0.12	17.64	18.00	0.397	2025/2/16	
Left Tilt 15 Degree	1/2412	802.11b	0.205	0.139	3.30	12.65	13.00	0.222	2025/2/16	
Right Cheek	1/2412	802.11b	0.366	0.245	0.86	12.65	13.00	0.397	2025/2/16	
Right Tilt 15 Degree	1/2412	802.11b	0.183	0.125	1.45	12.65	13.00	0.198	2025/2/16	

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	1/2412	802.11b	0.252	0.158	-1.05	12.65	13.00	0.273	2025/2/16	
Back Side	1/2412	802.11b	0.374	0.241	-3.62	12.65	13.00	0.405	2025/2/16	10#
Back Side	11/2462	802.11g	0.356	0.220	1.14	17.64	18.00	0.387	2025/2/16	



Left Side	1/2412	802.11b	0.120	0.073	-1.79	12.65	13.00	0.130	2025/2/16	
Top Side	1/2412	802.11b	0.126	0.077	1.89	12.65	13.00	0.137	2025/2/16	

12. Simultaneous Transmission Analysis

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

1) Scalar SAR summation $< 1.6\text{W/kg}$.

2) $\text{SPLSR} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{\text{min. separation distance, mm}}$, and the peak separation distance is

determined from the square root of $[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$, where

(x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.

If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

No.	Simultaneous Tx	Head	Body-worn	Hotspot
1	WWAN+WLAN	Yes	Yes	Yes
2	WWAN+Bluetooth	Yes	Yes	Yes

Note : WiFi and Bluetooth use the same antenna and cannot be transmitted at the same time.

Exposure Position		WWAN Band	DTS/DSS Band	Simultaneous Tx SAR(W/Kg)
		SAR(W/Kg)	SAR(W/Kg)	
Head	Left Cheek	0.669	0.430	1.099
	Left Tilt 15 Degree	0.340	0.222	0.562
	Right Cheek	0.614	0.397	1.011
	Right Tilt 15 Degree	0.294	0.198	0.492
Body&Hotspot	Front Side	0.394	0.273	0.667
	Back Side	0.625	0.405	1.030
	Left Side	0.198	0.130	0.328
	Right Side	0.191	/	0.191
	Top Side	/	0.137	0.137
	Bottom Side	0.319	/	0.319

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

Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

Appendix B. System Check Plots

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MEASUREMENT 6 System Performance Check - 2600MHz

MEASUREMENT 1

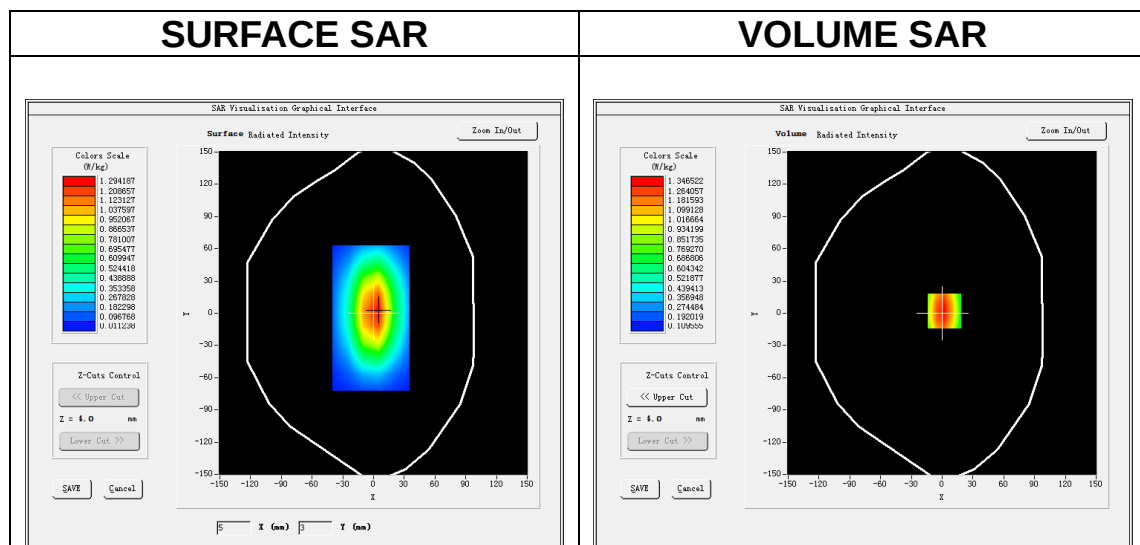
Date of measurement: 11/2/2025

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW750</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>1.65</u>

B. SAR Measurement Results

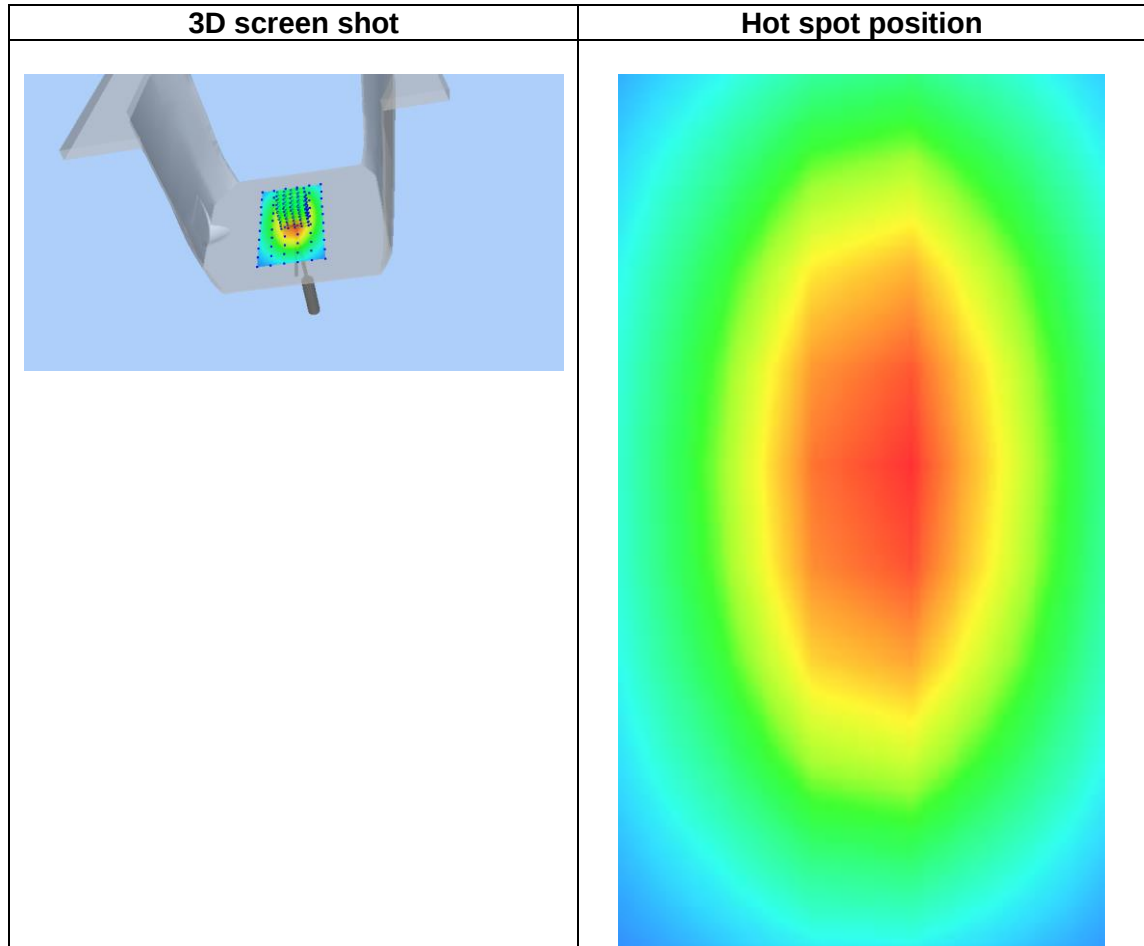
Frequency (MHz)	750.000000
Relative permittivity (real part)	42.562010
Relative permittivity (imaginary part)	19.132740
Conductivity (S/m)	0.912054
Variation (%)	0.210000



Maximum location: X=2.00, Y=2.00

SAR Peak: 1.87 W/kg

SAR 10g (W/Kg)	0.621031
SAR 1g (W/Kg)	0.930125



MEASUREMENT 2

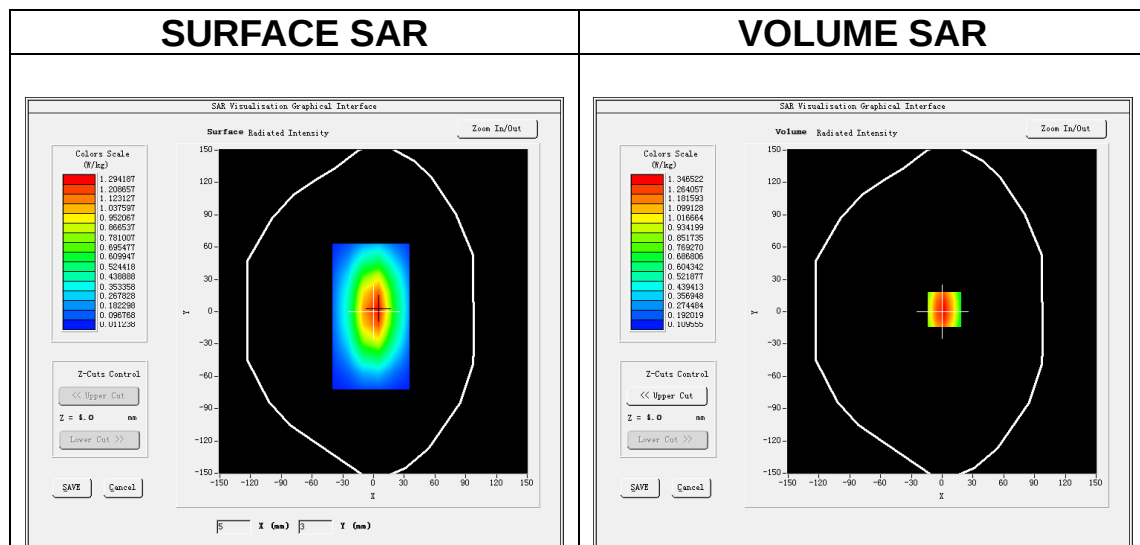
Date of measurement: 10/2/2025

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW835</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>1.66</u>

B. SAR Measurement Results

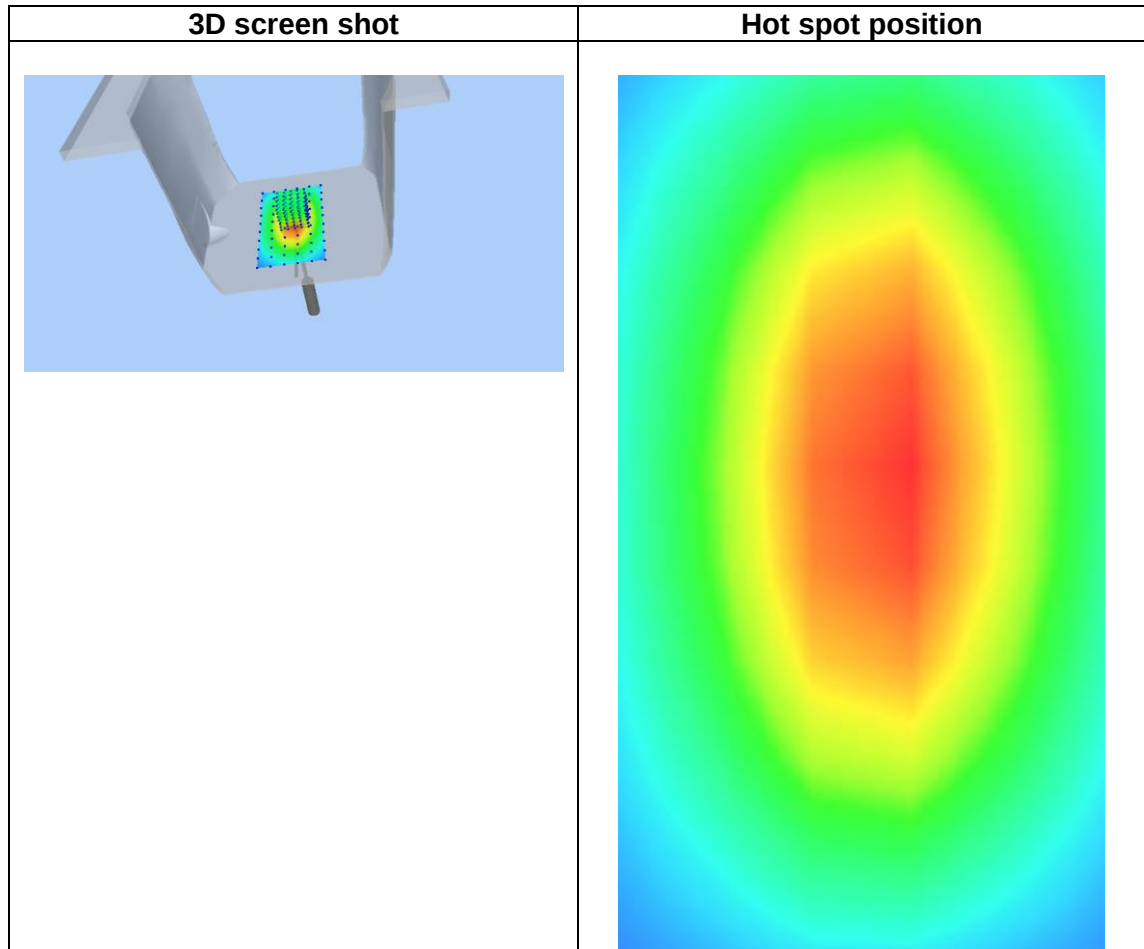
Frequency (MHz)	835.000000
Relative permittivity (real part)	42.012031
Relative permittivity (imaginary part)	19.131021
Conductivity (S/m)	0.941030
Variation (%)	0.310000



Maximum location: X=2.00, Y=2.00

SAR Peak: 1.87 W/kg

SAR 10g (W/Kg)	0.612031
SAR 1g (W/Kg)	1.011231



MEASUREMENT 3

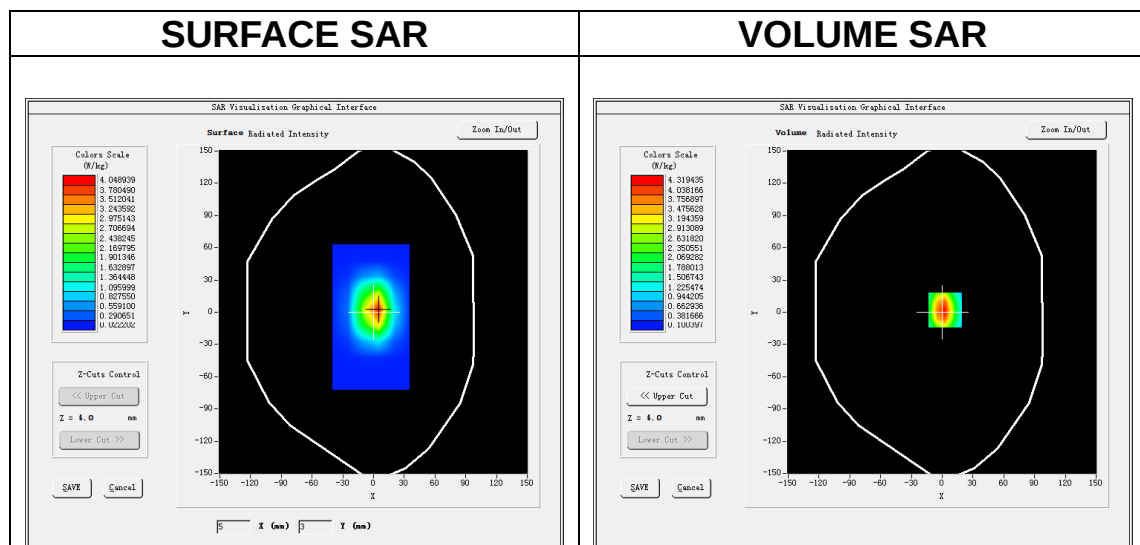
Date of measurement: 12/2/2025

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>2.05</u>

B. SAR Measurement Results

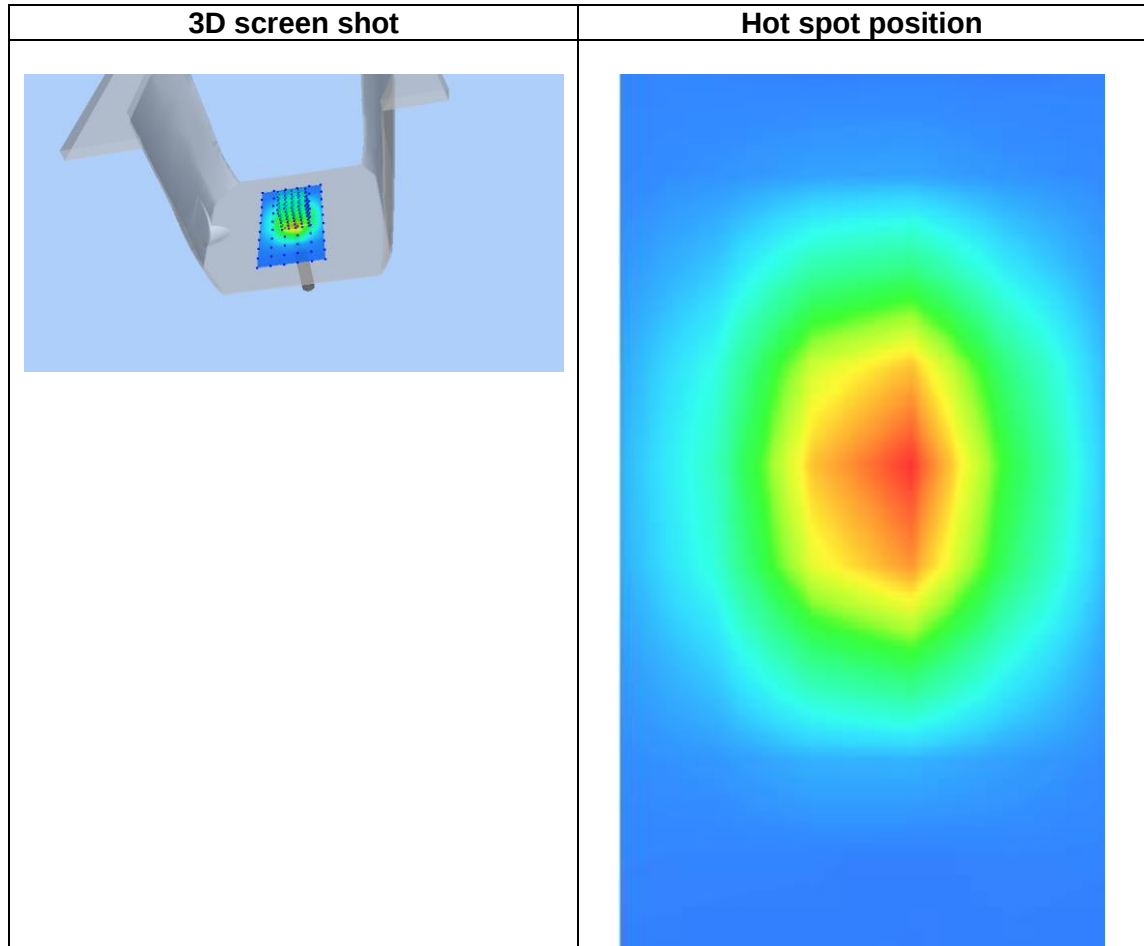
Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.606403
Relative permittivity (imaginary part)	14.067180
Conductivity (S/m)	1.406718
Variation (%)	-0.140000



Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	2.024557
SAR 1g (W/Kg)	3.832112



MEASUREMENT 4

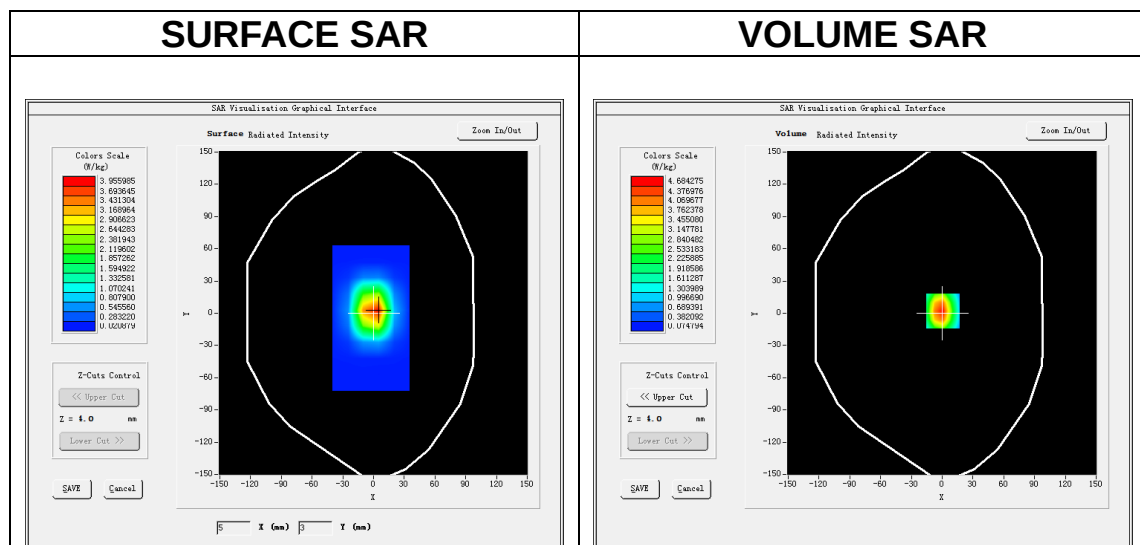
Date of measurement: 14/2/2025

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW1900</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>2.05</u>

B. SAR Measurement Results

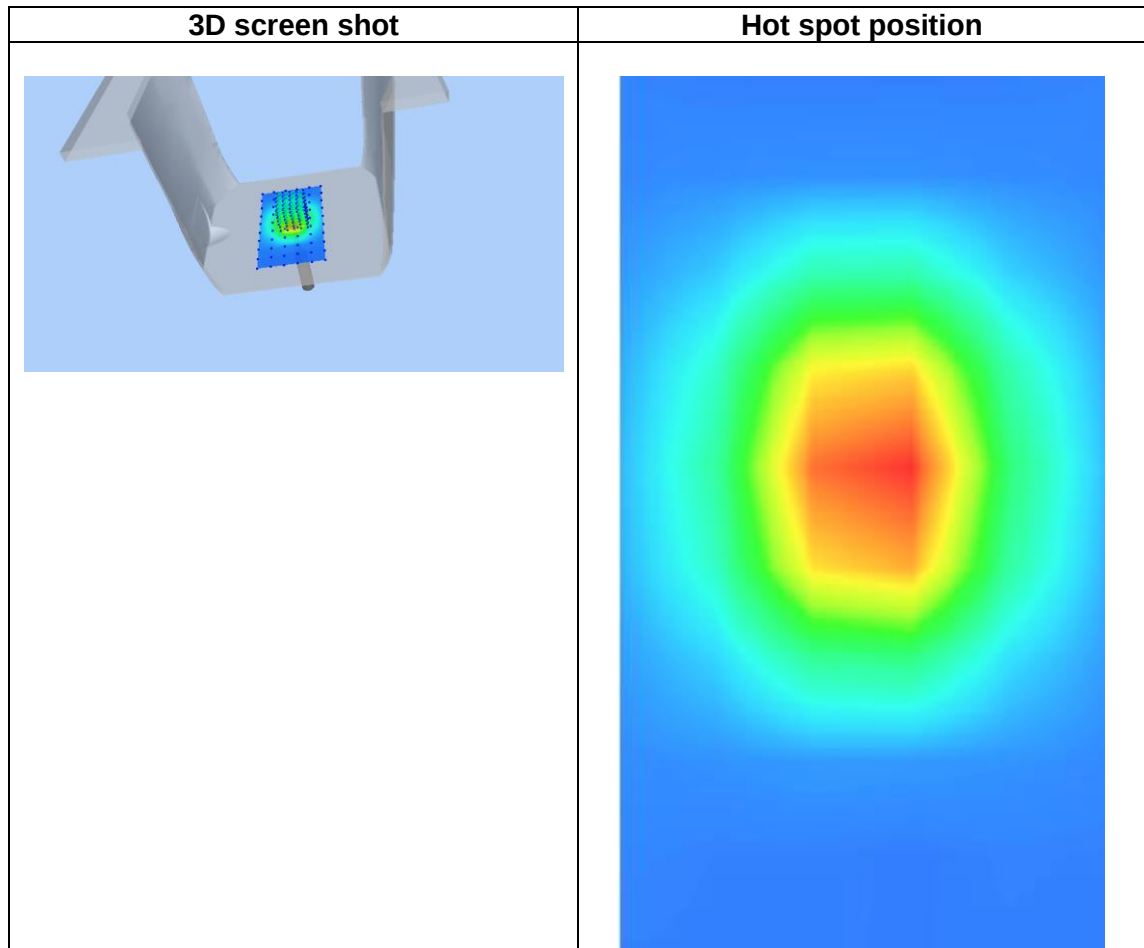
Frequency (MHz)	1900.000000
Relative permittivity (real part)	41.420140
Relative permittivity (imaginary part)	12.570123
Conductivity (S/m)	1.390503
Variation (%)	-0.440000



Maximum location: X=1.00, Y=2.00

SAR Peak: 7.65 W/kg

SAR 10g (W/Kg)	2.153165
SAR 1g (W/Kg)	4.153568



MEASUREMENT 5

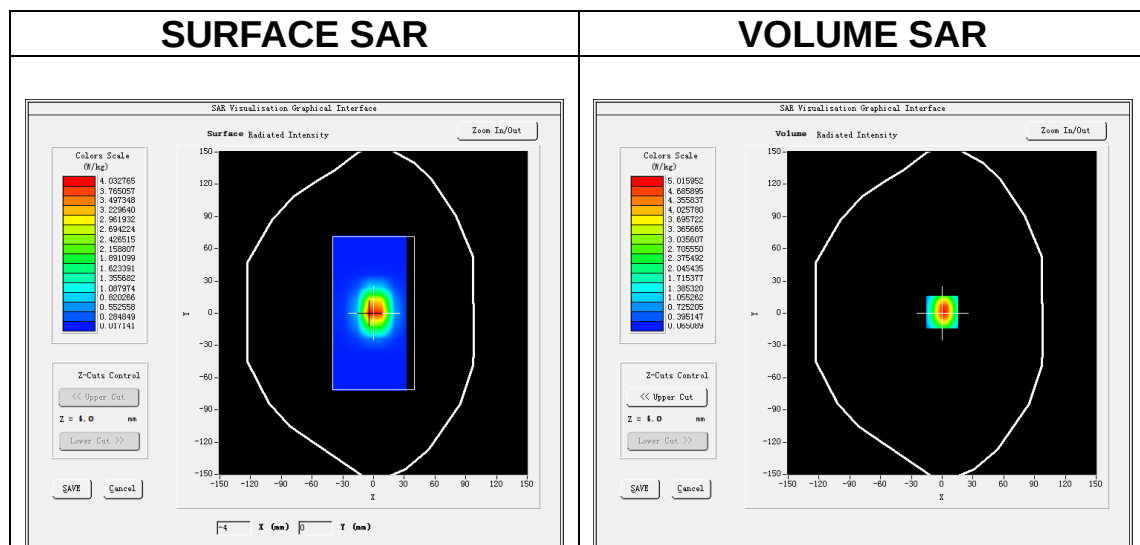
Date of measurement: 16/2/2025

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW2450</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>2.38</u>

B. SAR Measurement Results

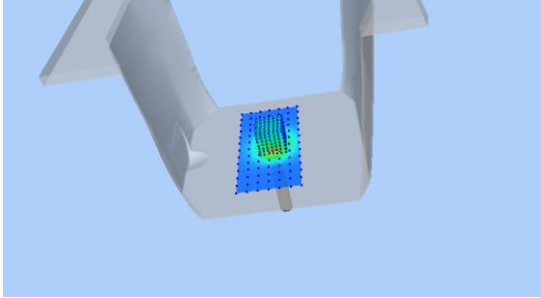
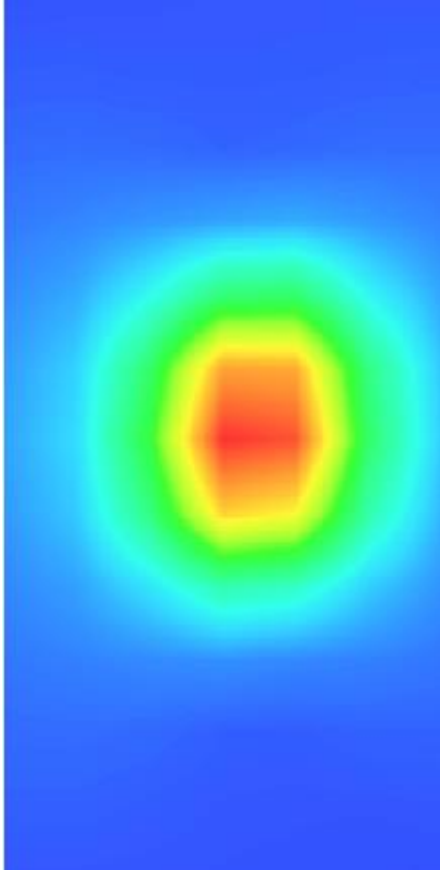
Frequency (MHz)	2450.000000
Relative permittivity (real part)	40.408511
Relative permittivity (imaginary part)	13.399264
Conductivity (S/m)	1.823789
Variation (%)	-1.250000



Maximum location: X=0.00, Y=1.00

SAR Peak: 8.14 W/kg

SAR 10g (W/Kg)	2.359425
SAR 1g (W/Kg)	5.183642

3D screen shot	Hot spot position
	

MEASUREMENT 6

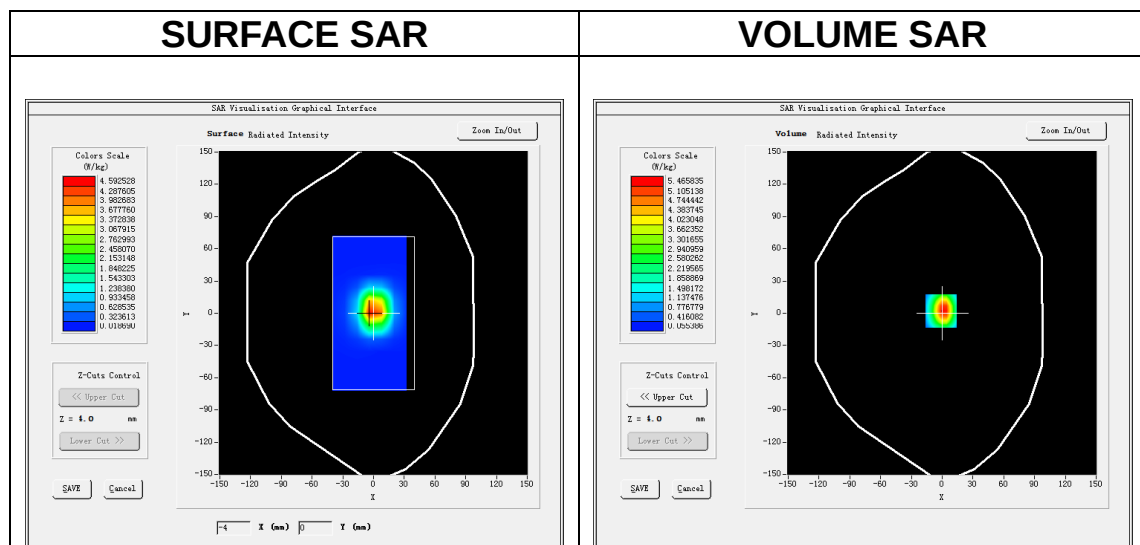
Date of measurement: 17/2/2025

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Validation plane</u>
Device Position	<u>Dipole</u>
Band	<u>CW2600</u>
Channels	<u>Middle</u>
Signal	<u>CW (Crest factor: 1.0)</u>
ConvF	<u>2.35</u>

B. SAR Measurement Results

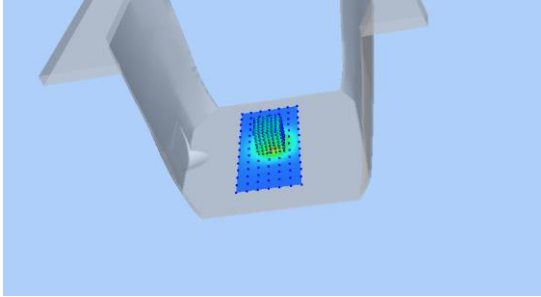
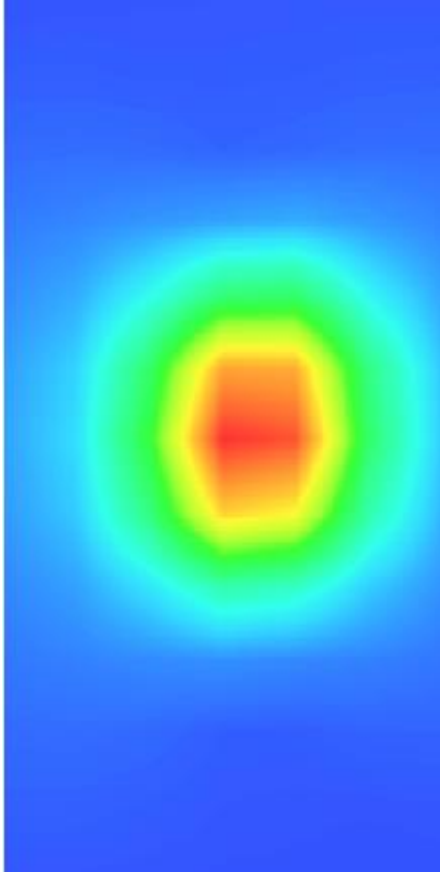
Frequency (MHz)	2600.000000
Relative permittivity (real part)	39.432362
Relative permittivity (imaginary part)	13.768602
Conductivity (S/m)	1.988798
Variation (%)	-3.980000



Maximum location: X=-1.00, Y=2.00

SAR Peak: 9.07 W/kg

SAR 10g (W/Kg)	2.523157
SAR 1g (W/Kg)	5.432595

3D screen shot	Hot spot position
	

Appendix C. SAR Test Plots

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MEASUREMENT 8 WCDMA Band 5 Body
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MEASUREMENT 21 LTE Band 41 Head
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MEASUREMENT 24 LTE Band 66 Body

MEASUREMENT 1

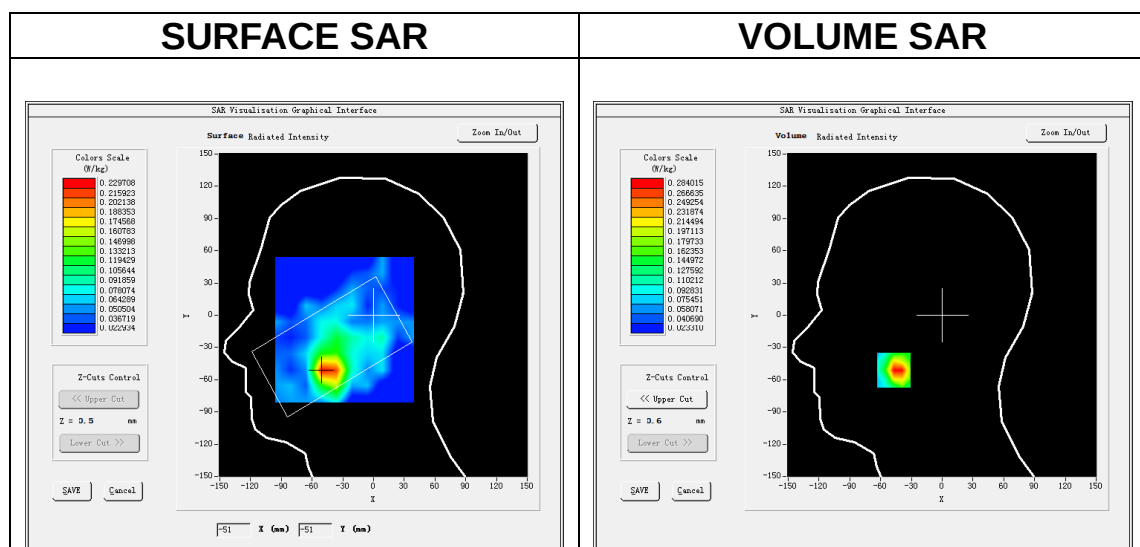
Date of measurement: 10/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>1.66</u>

B. SAR Measurement Results

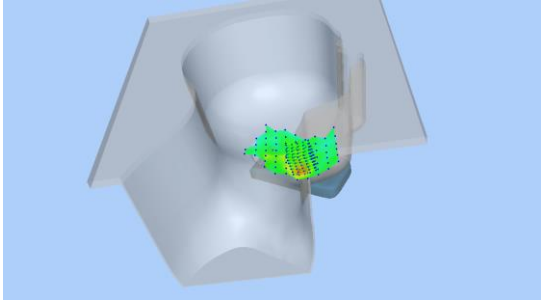
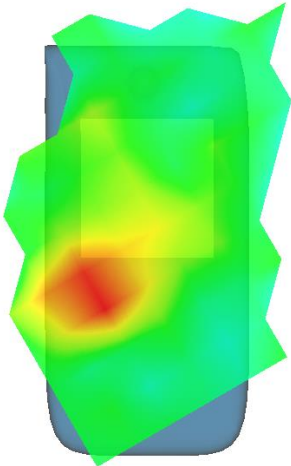
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901453
Variation (%)	-3.420000



Maximum location: X=-47.00, Y=-51.00

SAR Peak: 0.42 W/kg

SAR 10g (W/Kg)	0.177724
SAR 1g (W/Kg)	0.279768

3D screen shot	Hot spot position
	

MEASUREMENT 2

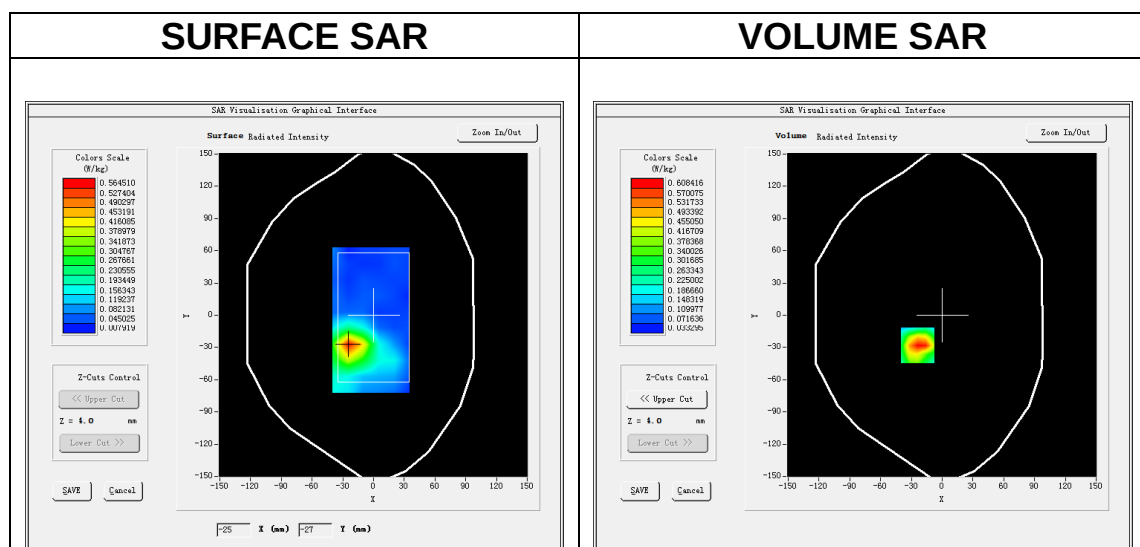
Date of measurement: 10/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>1.66</u>

B. SAR Measurement Results

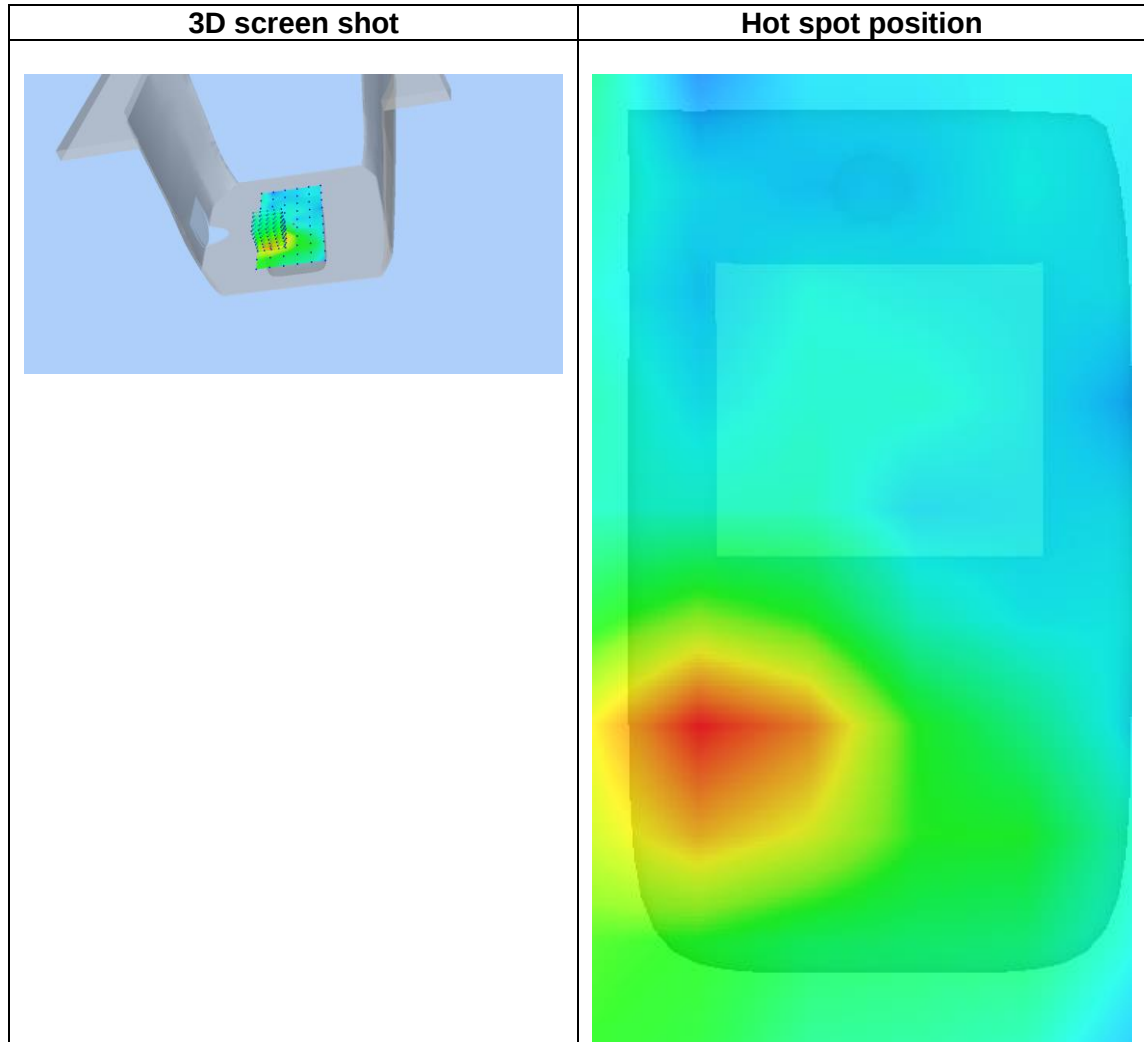
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901453
Variation (%)	-4.110001



Maximum location: X=-24.00, Y=-28.00

SAR Peak: 0.97 W/kg

SAR 10g (W/Kg)	0.323722
SAR 1g (W/Kg)	0.577671



MEASUREMENT 3

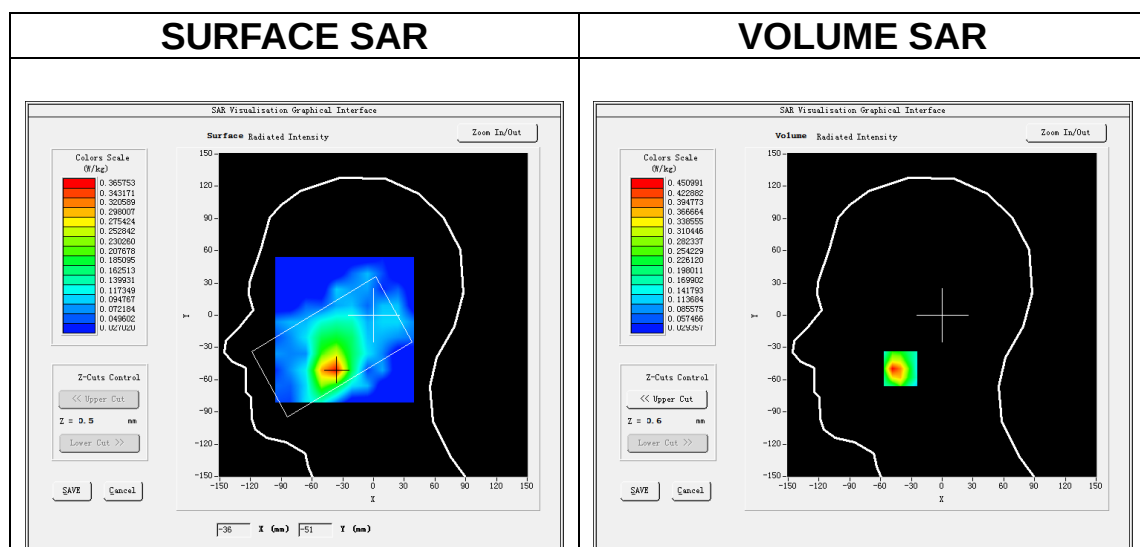
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

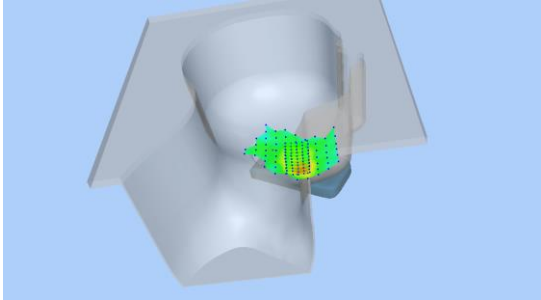
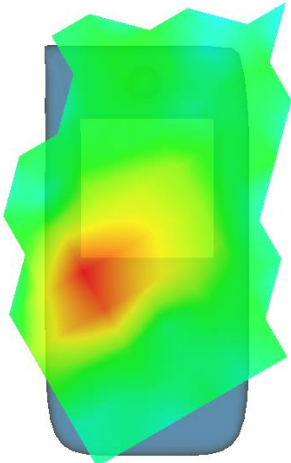
Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.408000
Conductivity (S/m)	1.400391
Variation (%)	0.790000



Maximum location: X=-38.00, Y=-50.00

SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.266415
SAR 1g (W/Kg)	0.421400

3D screen shot	Hot spot position
	

MEASUREMENT 4

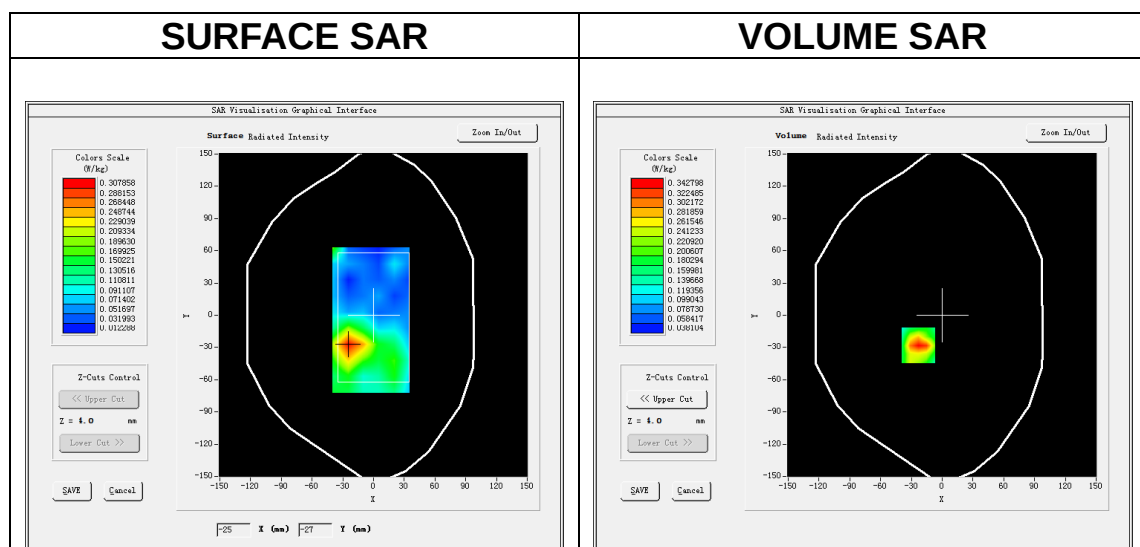
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 2.7)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

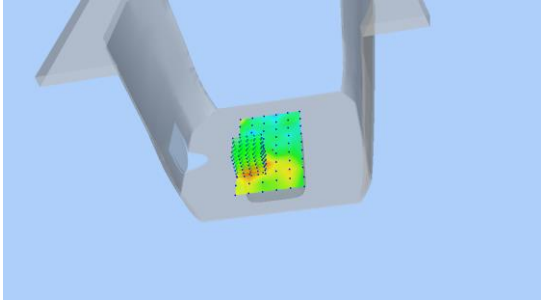
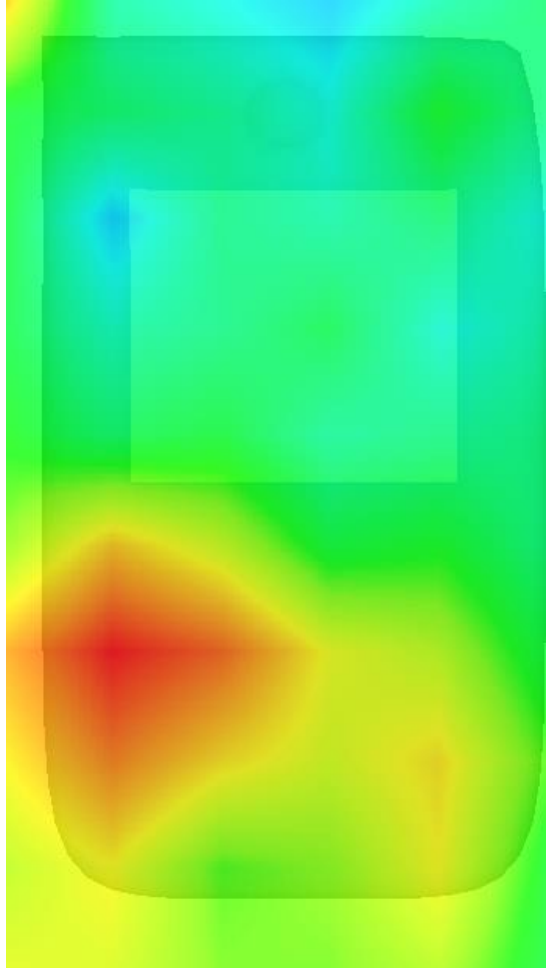
Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.408000
Conductivity (S/m)	1.400391
Variation (%)	-4.840000



Maximum location: X=-23.00, Y=-28.00

SAR Peak: 0.44 W/kg

SAR 10g (W/Kg)	0.192576
SAR 1g (W/Kg)	0.298010

3D screen shot	Hot spot position
	

MEASUREMENT 5

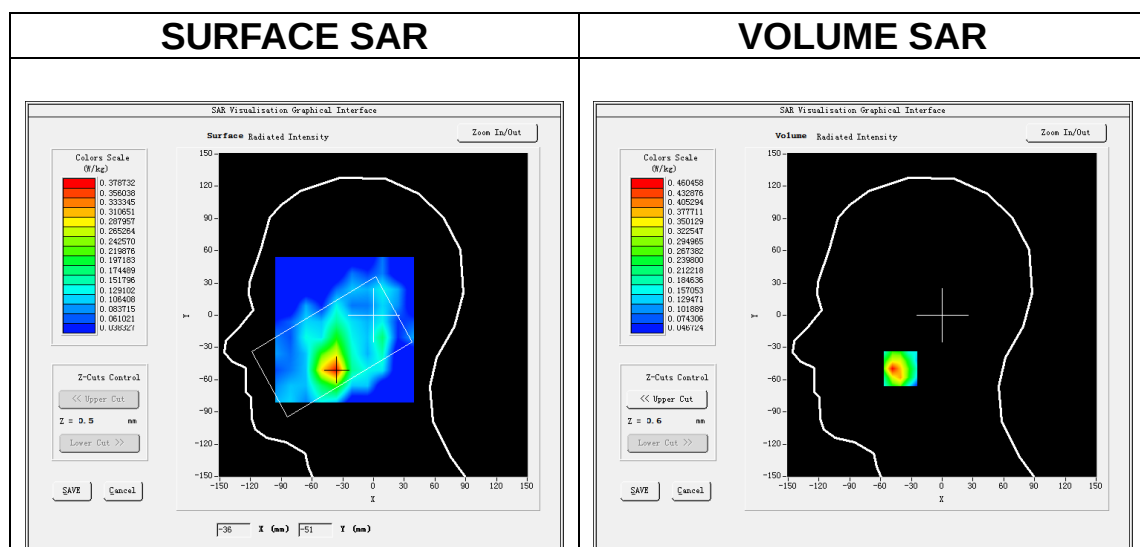
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

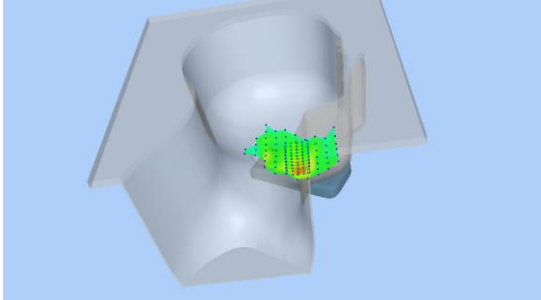
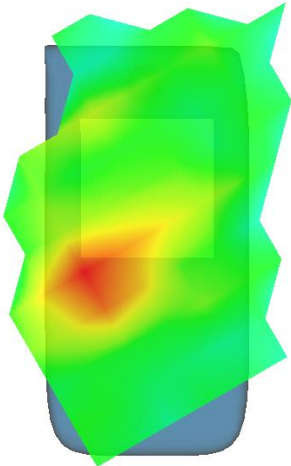
Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.408000
Conductivity (S/m)	1.400391
Variation (%)	-4.740000



Maximum location: X=-38.00, Y=-50.00

SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.284499
SAR 1g (W/Kg)	0.430966

3D screen shot	Hot spot position
	

MEASUREMENT 6

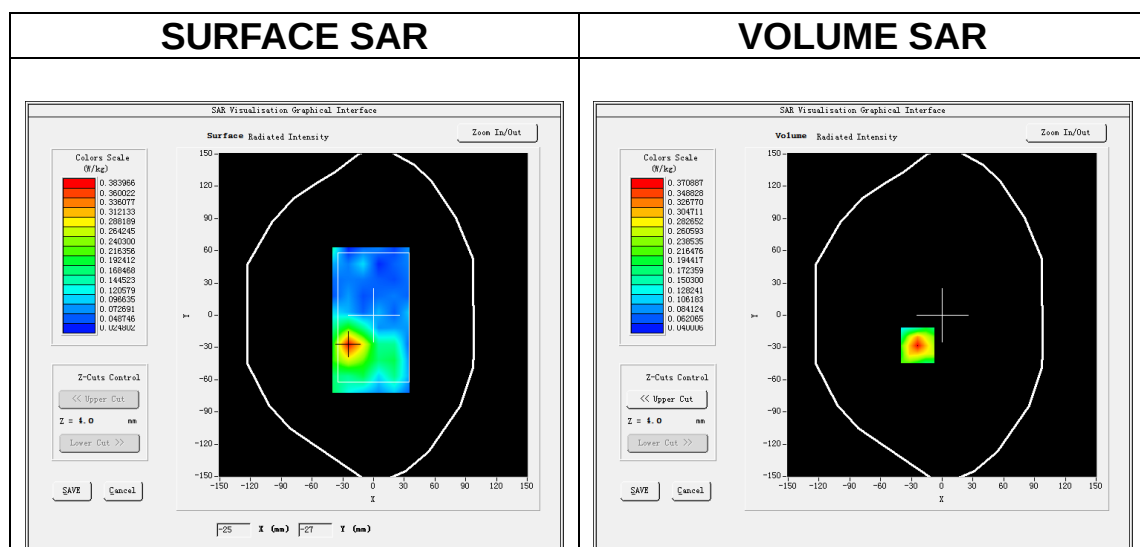
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

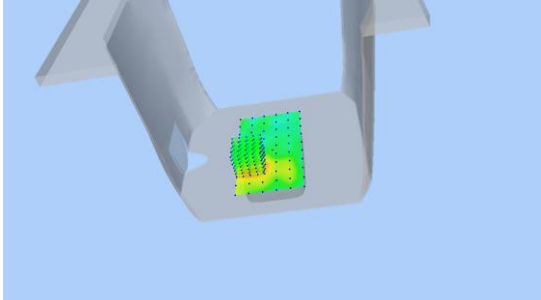
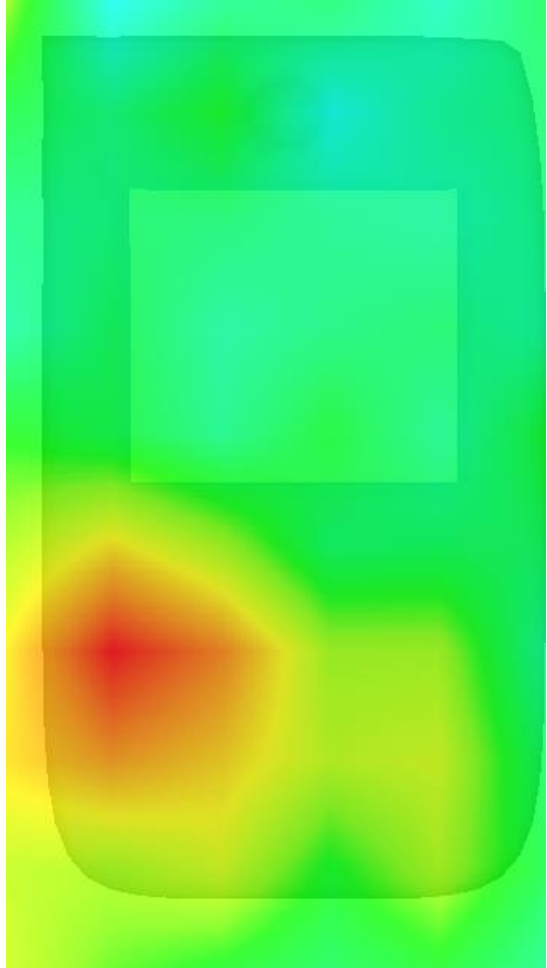
Frequency (MHz)	1880.000000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.408000
Conductivity (S/m)	1.400391
Variation (%)	-2.670000



Maximum location: X=-24.00, Y=-28.00

SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.219893
SAR 1g (W/Kg)	0.360409

3D screen shot	Hot spot position
	

MEASUREMENT 7

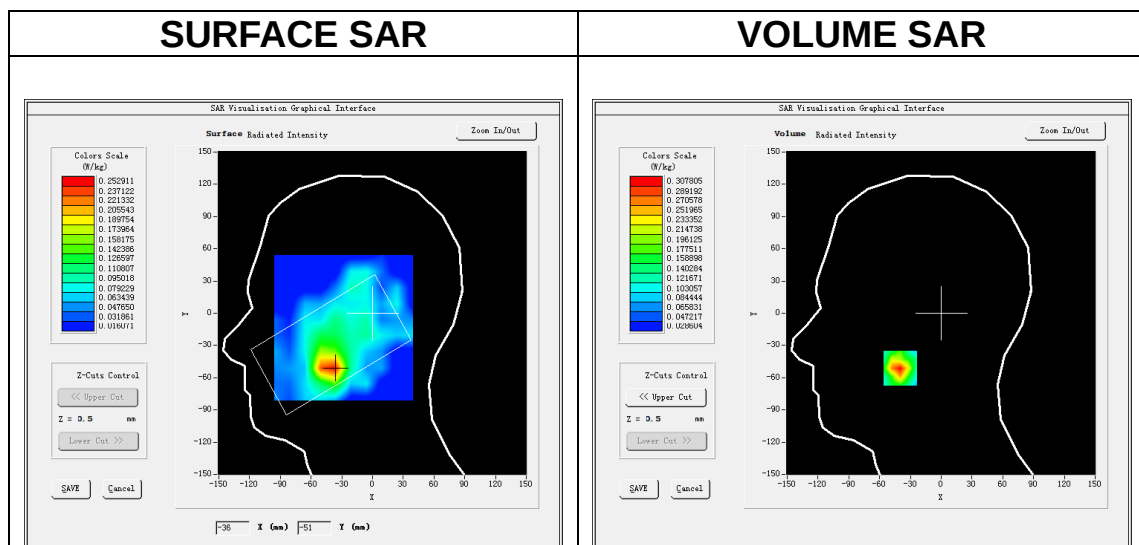
Date of measurement: 10/2/2025

A. Experimental conditions.

Area Scan	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
ZoomScan	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>Band5 WCDMA850</u>
Channels	<u>Middle</u>
Signal	<u>WCDMA (Crest factor: 1.0)</u>
ConvF	<u>1.66</u>

B. SAR Measurement Results

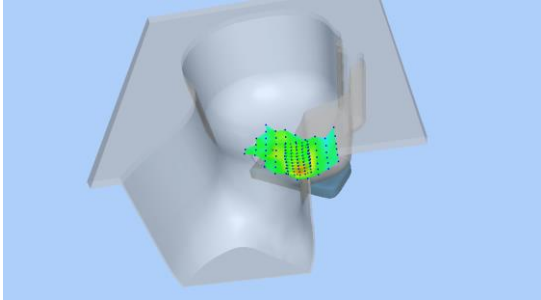
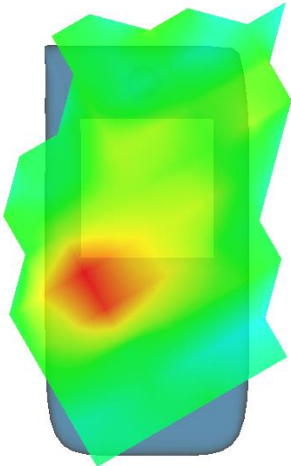
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901453
Variation (%)	1.860000



Maximum location: X=-40.00, Y=-51.00

SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.181495
SAR 1g (W/Kg)	0.292726

3D screen shot	Hot spot position
	

MEASUREMENT 8

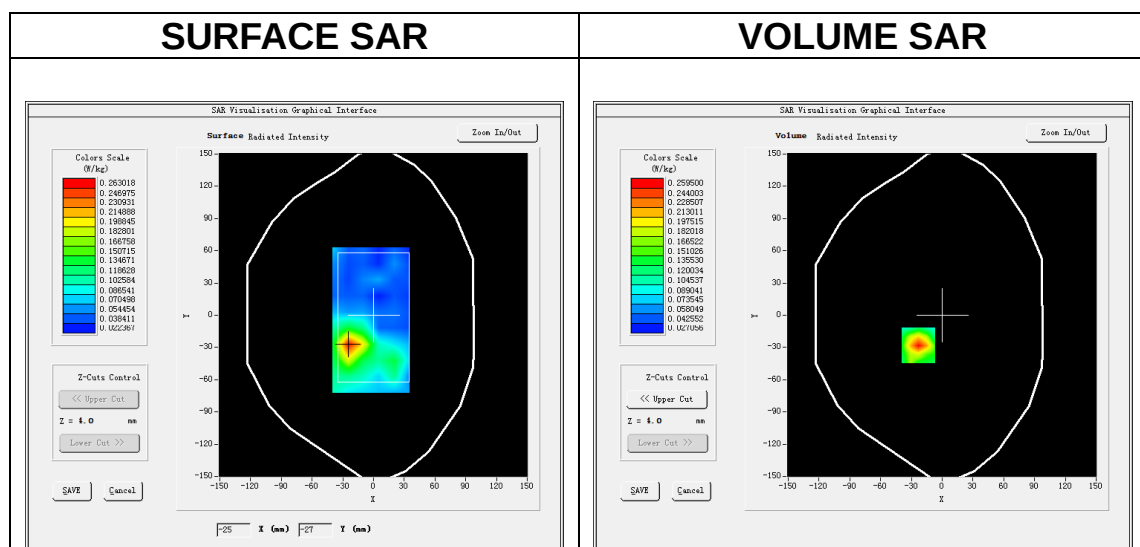
Date of measurement: 10/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.66</u>

B. SAR Measurement Results

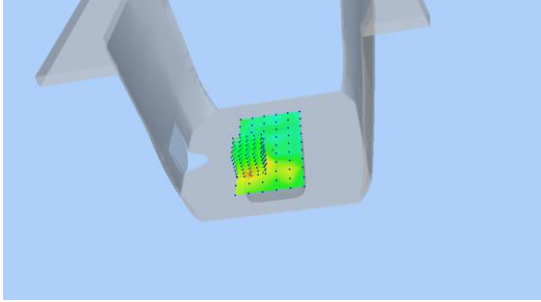
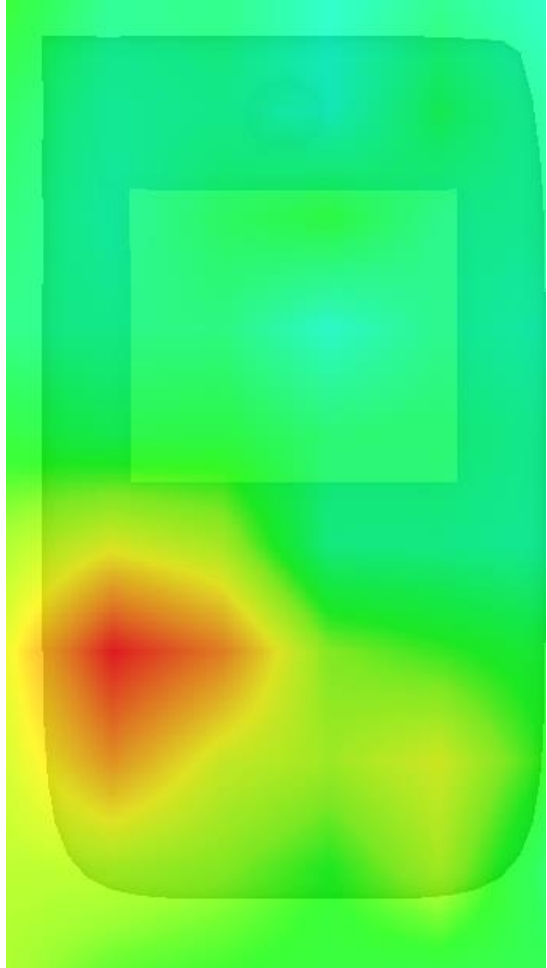
Frequency (MHz)	836.400024
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901453
Variation (%)	-2.940001



Maximum location: X=-23.00, Y=-28.00

SAR Peak: 0.43 W/kg

SAR 10g (W/Kg)	0.145010
SAR 1g (W/Kg)	0.247683

3D screen shot	Hot spot position
	

MEASUREMENT 9

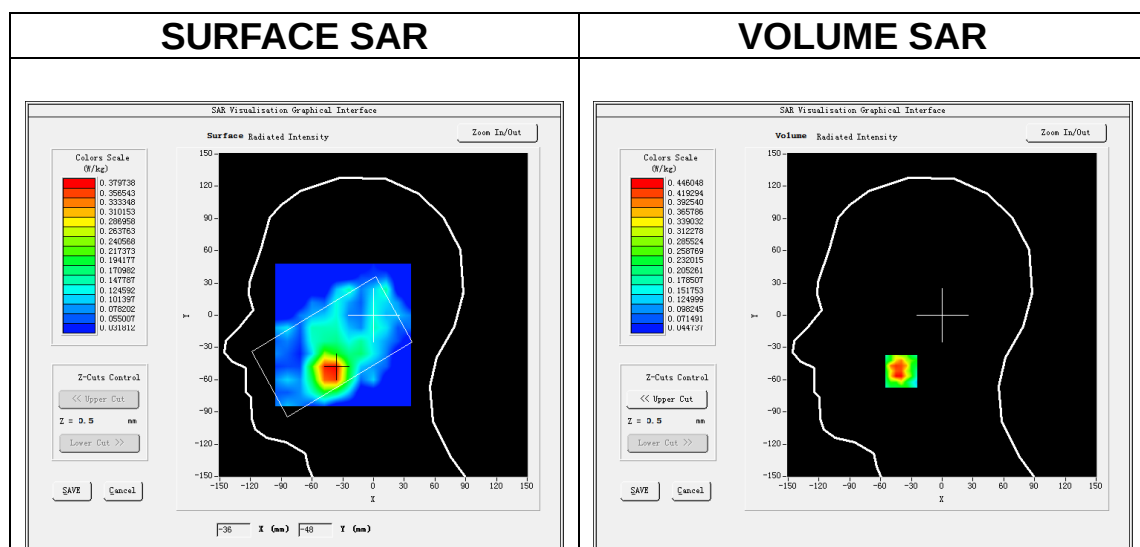
Date of measurement: 16/2/2025

A. Experimental conditions.

Area Scan	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
ZoomScan	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
Phantom	<u>Left head</u>
Device Position	<u>Cheek</u>
Band	<u>IEEE 802.11b ISM</u>
Channels	<u>Low</u>
Signal	<u>IEEE802.b (Crest factor: 1.0)</u>
ConvF	<u>2.38</u>

B. SAR Measurement Results

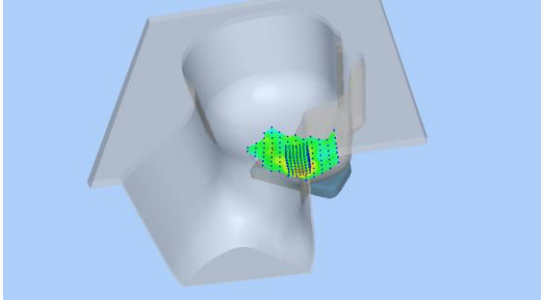
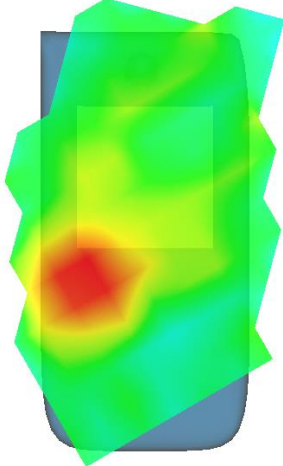
Frequency (MHz)	2412.000000
Relative permittivity (real part)	39.226002
Relative permittivity (imaginary part)	13.207000
Conductivity (S/m)	1.769738
Variation (%)	-4.070000



Maximum location: X=-40.00, Y=-52.00

SAR Peak: 0.70 W/kg

SAR 10g (W/Kg)	0.279643
SAR 1g (W/Kg)	0.396633

3D screen shot	Hot spot position
	

MEASUREMENT 10

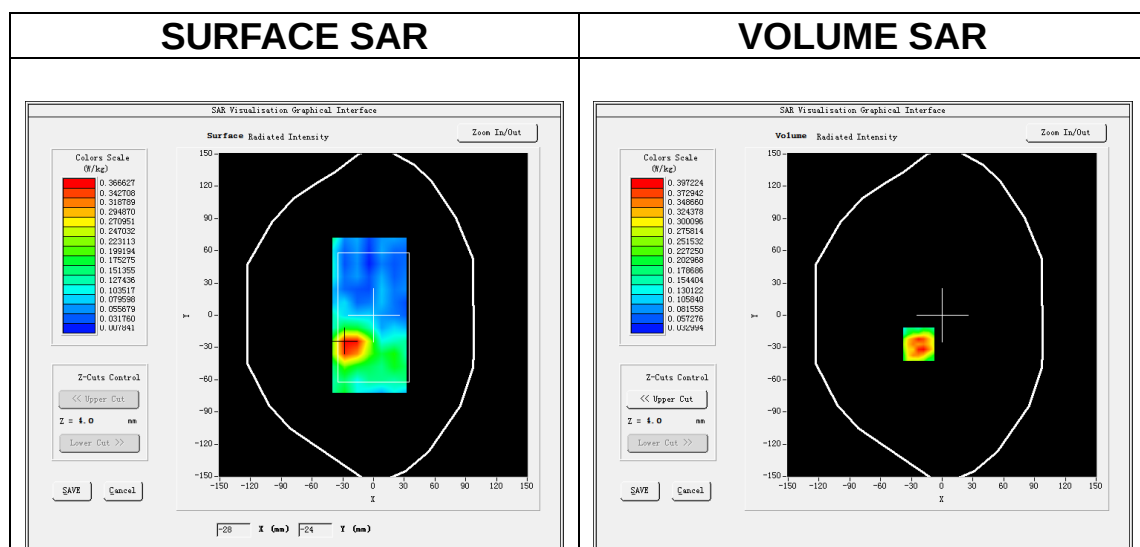
Date of measurement: 16/2/2025

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>Low</u>
<u>Signal</u>	<u>IEEE802.b (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.38</u>

B. SAR Measurement Results

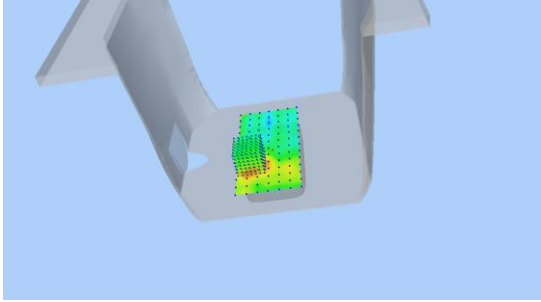
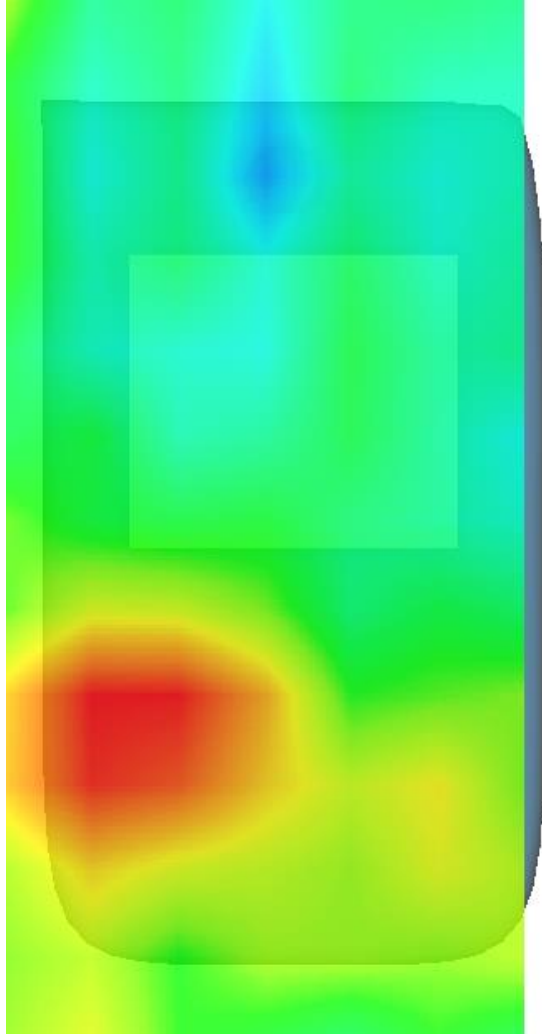
Frequency (MHz)	2412.000000
Relative permittivity (real part)	39.226002
Relative permittivity (imaginary part)	13.207000
Conductivity (S/m)	1.769738
Variation (%)	-3.620000



Maximum location: X=-23.00, Y=-27.00

SAR Peak: 0.64 W/kg

SAR 10g (W/Kg)	0.240525
SAR 1g (W/Kg)	0.373652

3D screen shot	Hot spot position
	

MEASUREMENT 11

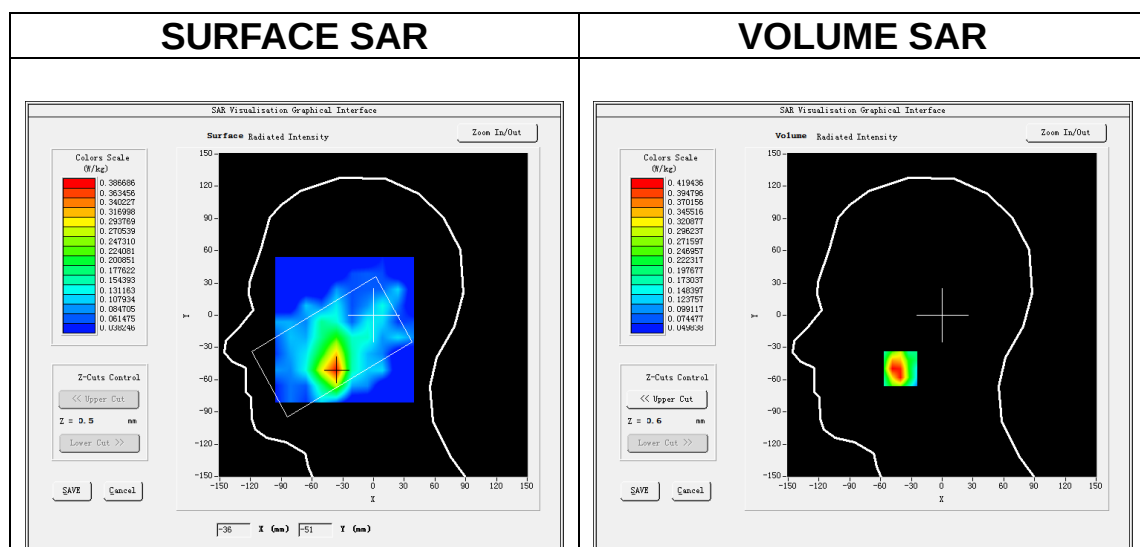
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

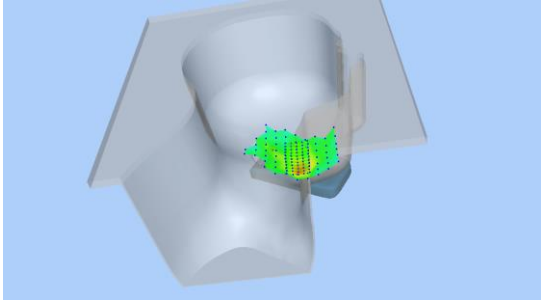
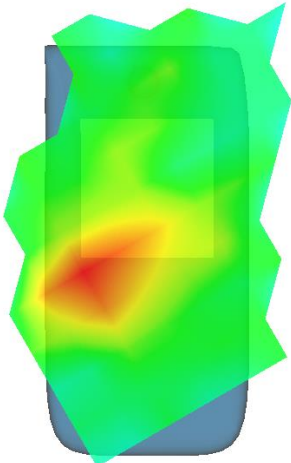
Frequency (MHz)	1879.500000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.411700
Conductivity (S/m)	1.400405
Variation (%)	-4.710000



Maximum location: X=-38.00, Y=-50.00

SAR Peak: 0.62 W/kg

SAR 10g (W/Kg)	0.275491
SAR 1g (W/Kg)	0.421885

3D screen shot	Hot spot position
	

MEASUREMENT 12

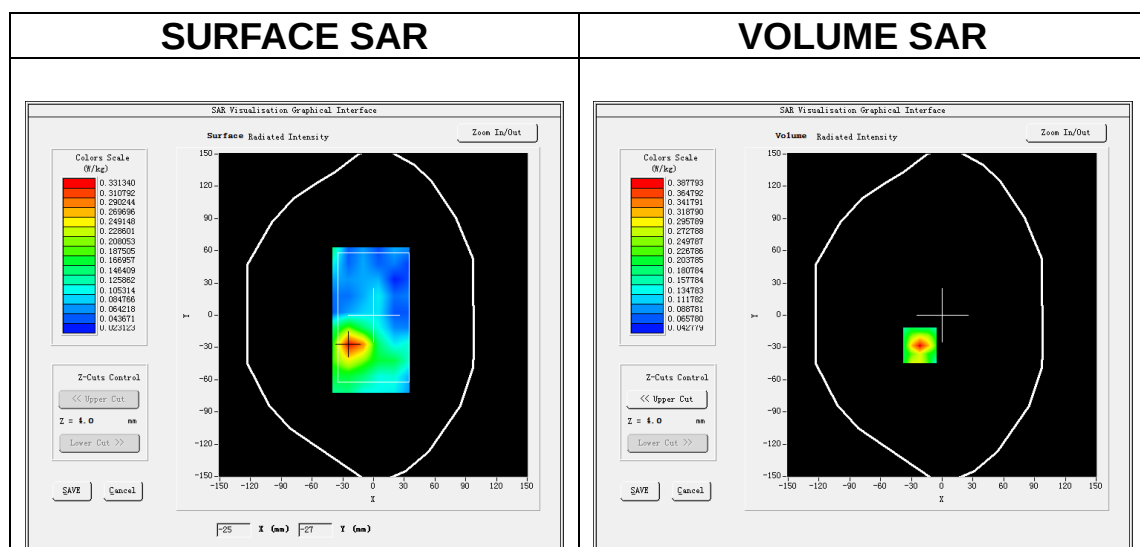
Date of measurement: 14/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 2</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.05</u>

B. SAR Measurement Results

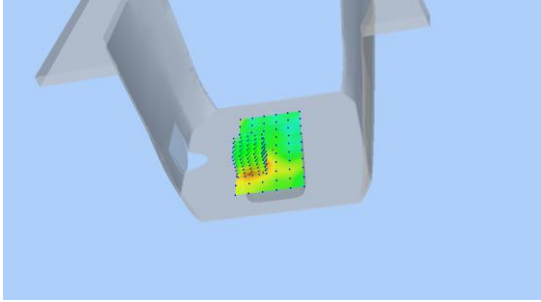
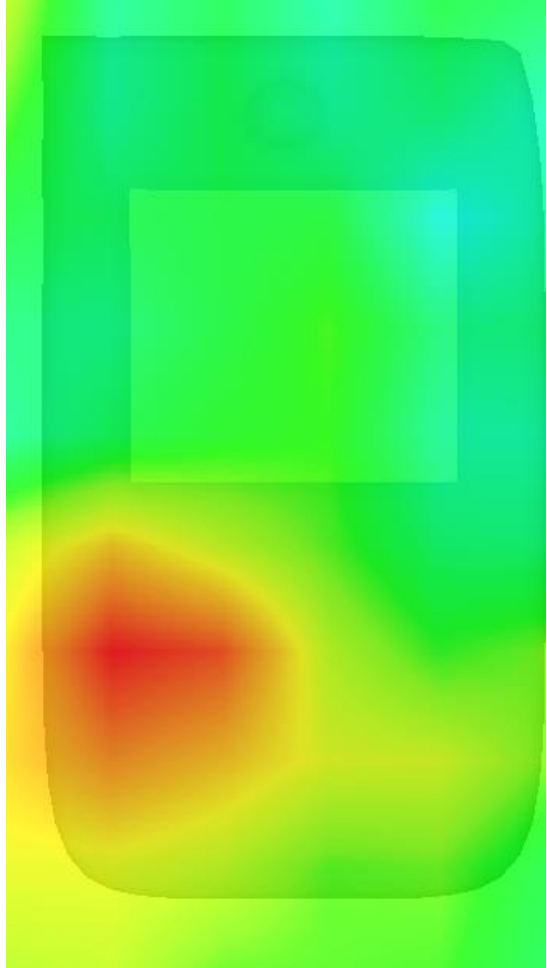
Frequency (MHz)	1879.500000
Relative permittivity (real part)	40.000000
Relative permittivity (imaginary part)	13.411700
Conductivity (S/m)	1.400405
Variation (%)	-1.490000



Maximum location: X=-22.00, Y=-28.00

SAR Peak: 0.63 W/kg

SAR 10g (W/Kg)	0.213208
SAR 1g (W/Kg)	0.370842

3D screen shot	Hot spot position
	

MEASUREMENT 13

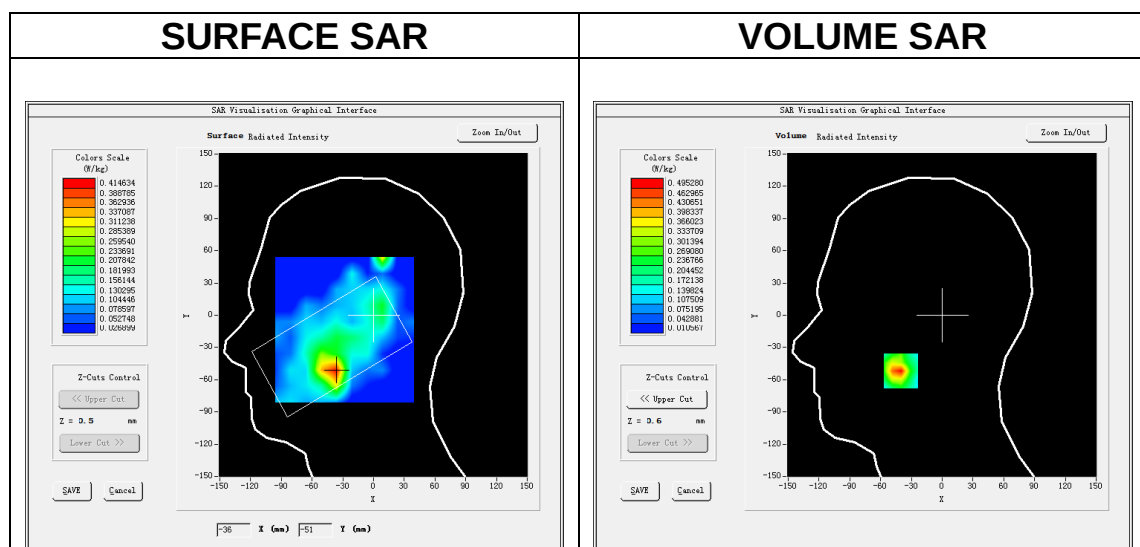
Date of measurement: 12/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.09</u>

B. SAR Measurement Results

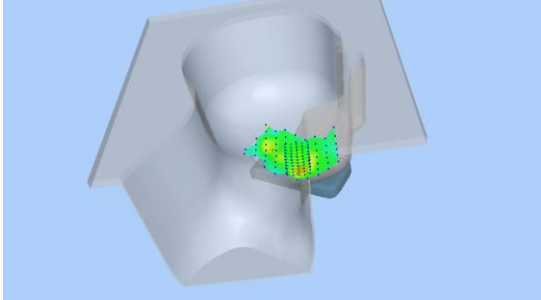
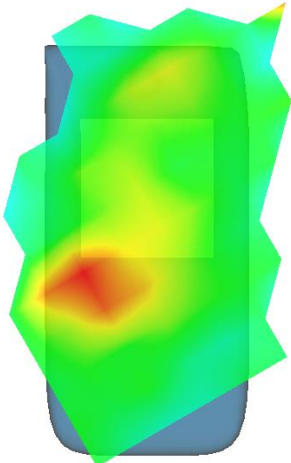
Frequency (MHz)	1732.500000
Relative permittivity (real part)	40.115910
Relative permittivity (imaginary part)	14.136136
Conductivity (S/m)	1.360603
Variation (%)	-0.959999



Maximum location: X=-39.00, Y=-52.00

SAR Peak: 0.73 W/kg

SAR 10g (W/Kg)	0.278087
SAR 1g (W/Kg)	0.446685

3D screen shot	Hot spot position
 A 3D perspective view of a grey, bowl-shaped structure. A cluster of green and yellow dots is visible on the right side of the bowl, indicating the hot spot position.	 A 3D visualization of the hot spot position. It shows a green, irregularly shaped volume with a yellow and red core, indicating the intensity of the hot spot. The volume is positioned within the bowl structure.

MEASUREMENT 14

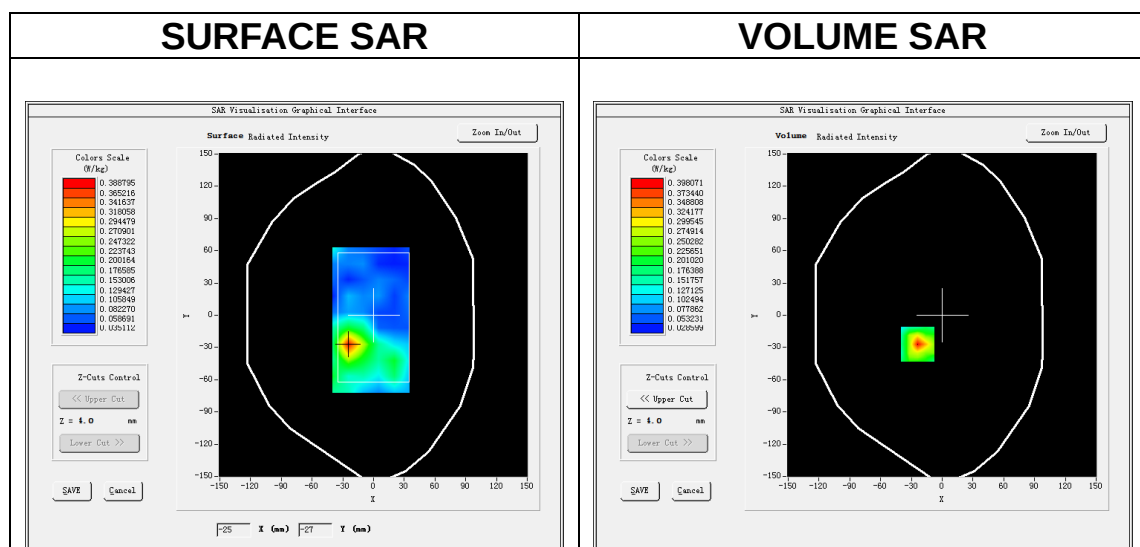
Date of measurement: 12/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.09</u>

B. SAR Measurement Results

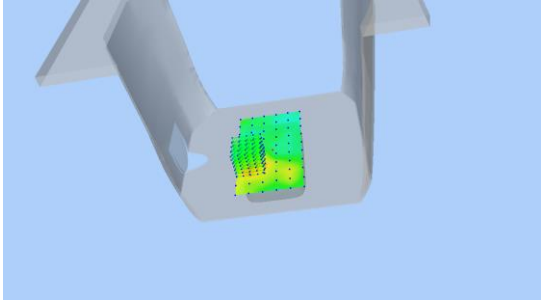
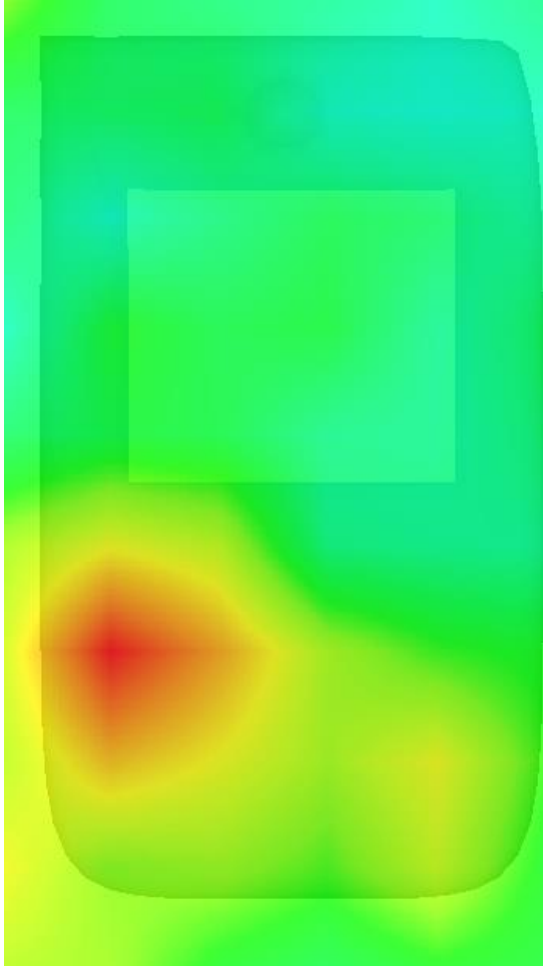
Frequency (MHz)	1732.500000
Relative permittivity (real part)	40.115910
Relative permittivity (imaginary part)	14.136136
Conductivity (S/m)	1.360603
Variation (%)	-0.630000



Maximum location: X=-24.00, Y=-27.00

SAR Peak: 0.64 W/kg

SAR 10g (W/Kg)	0.217082
SAR 1g (W/Kg)	0.361218

3D screen shot	Hot spot position
	

MEASUREMENT 15

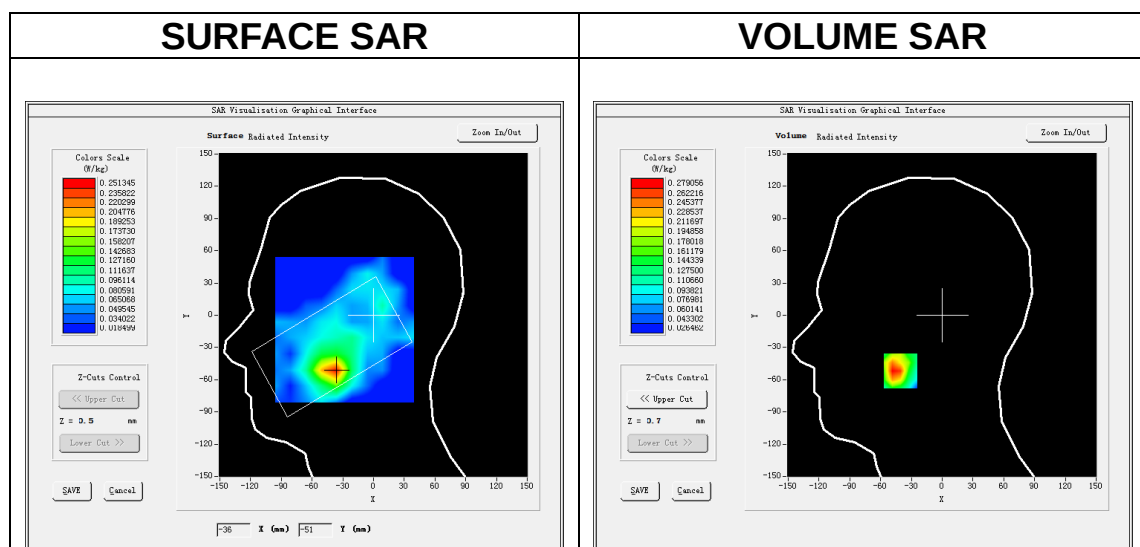
Date of measurement: 10/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.66</u>

B. SAR Measurement Results

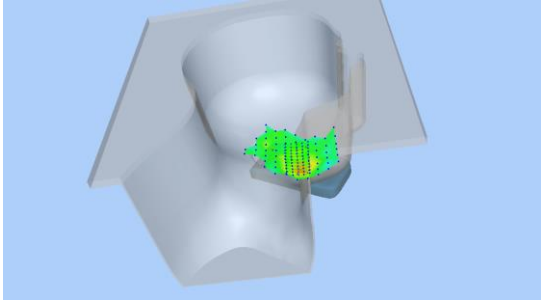
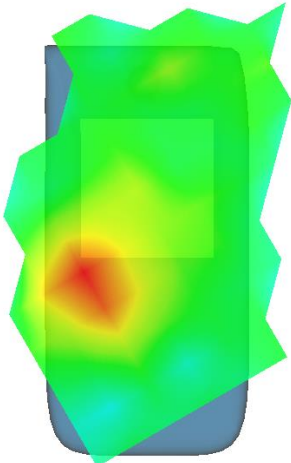
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901561
Variation (%)	2.230000



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

SAR Peak: 0.37 W/kg

SAR 10g (W/Kg)	0.180229
SAR 1g (W/Kg)	0.267397

3D screen shot	Hot spot position
	

MEASUREMENT 16

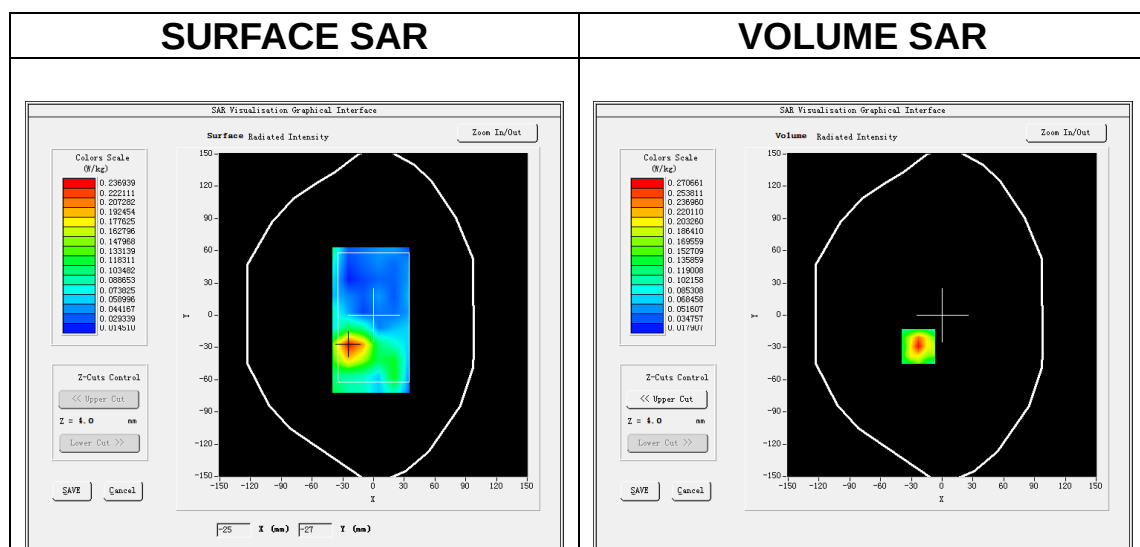
Date of measurement: 10/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 5</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.66</u>

B. SAR Measurement Results

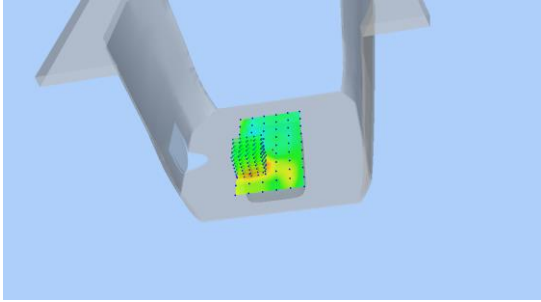
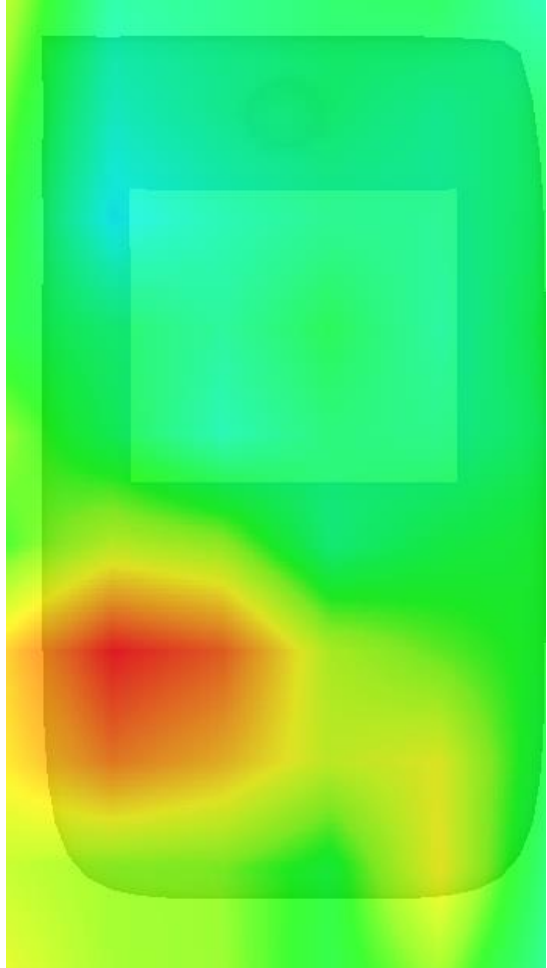
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.500000
Relative permittivity (imaginary part)	19.400000
Conductivity (S/m)	0.901561
Variation (%)	0.350000



Maximum location: X=-23.00, Y=-29.00

SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.151990
SAR 1g (W/Kg)	0.256000

3D screen shot	Hot spot position
	

MEASUREMENT 17

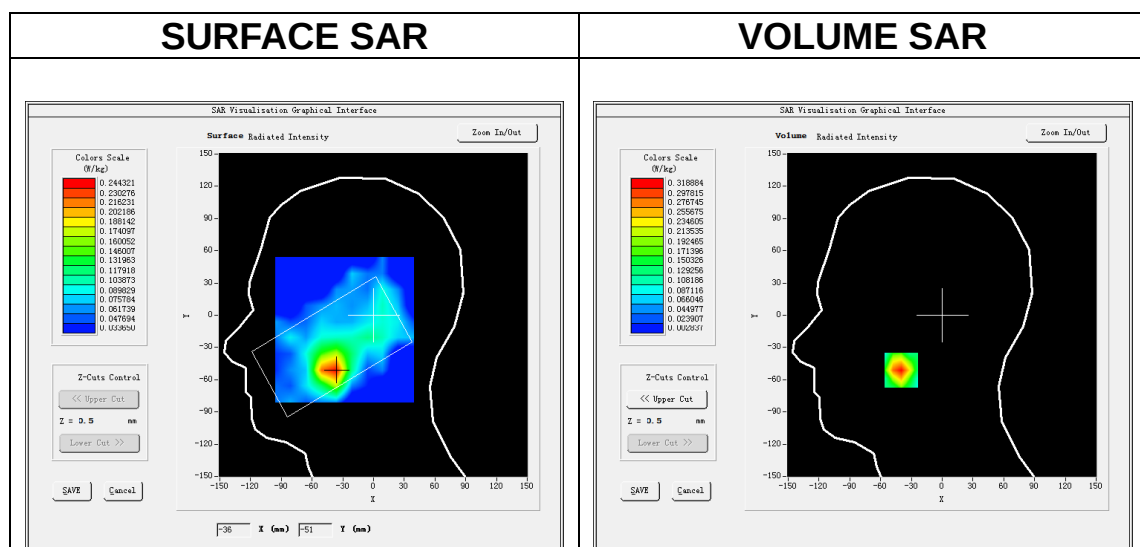
Date of measurement: 11/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.65</u>

B. SAR Measurement Results

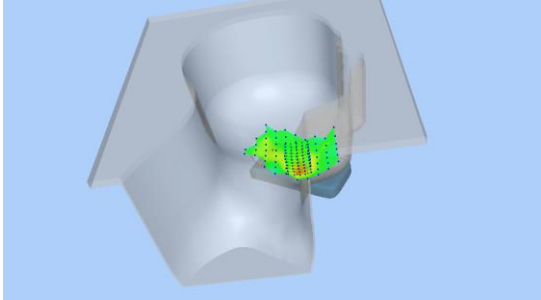
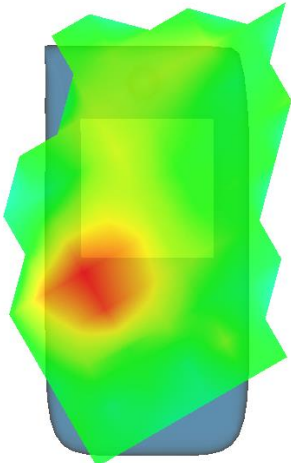
Frequency (MHz)	707.500000
Relative permittivity (real part)	42.126667
Relative permittivity (imaginary part)	23.264000
Conductivity (S/m)	0.914404
Variation (%)	-0.040001



Maximum location: X=-40.00, Y=-51.00

SAR Peak: 0.44 W/kg

SAR 10g (W/Kg)	0.193677
SAR 1g (W/Kg)	0.307736

3D screen shot	Hot spot position
 A 3D perspective view of a grey, bowl-shaped structure on a light blue background. A small, rectangular, green and yellow mesh-like object is positioned inside the bowl, representing the hot spot position.	 A 3D visualization of a hot spot position. It shows a green, irregularly shaped volume with a red and yellow core, indicating the highest intensity of the hot spot. The volume is positioned within a grey, bowl-shaped structure.

MEASUREMENT 18

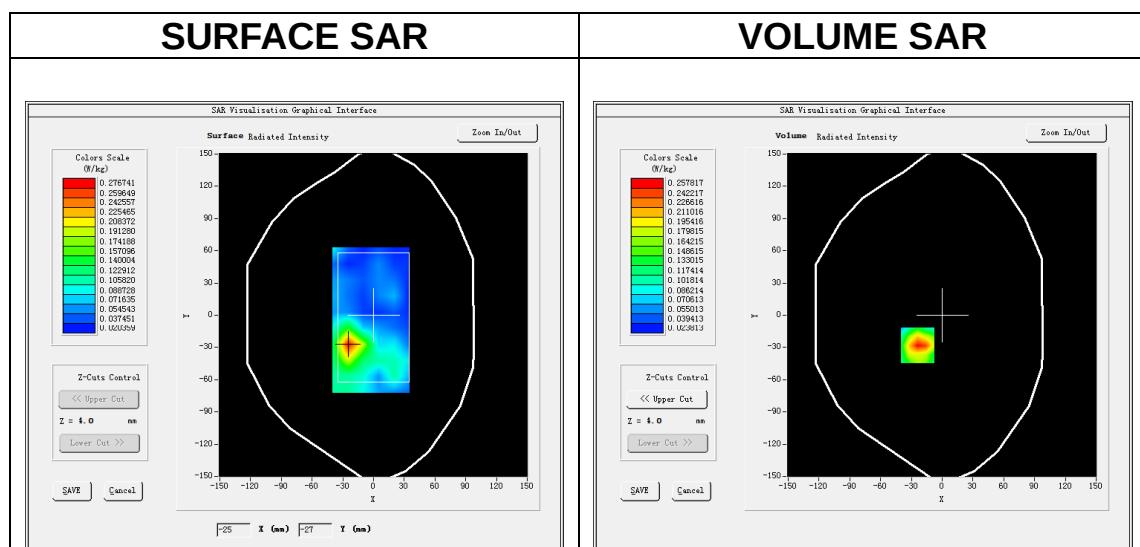
Date of measurement: 11/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.65</u>

B. SAR Measurement Results

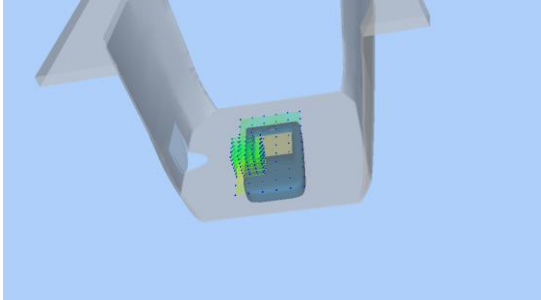
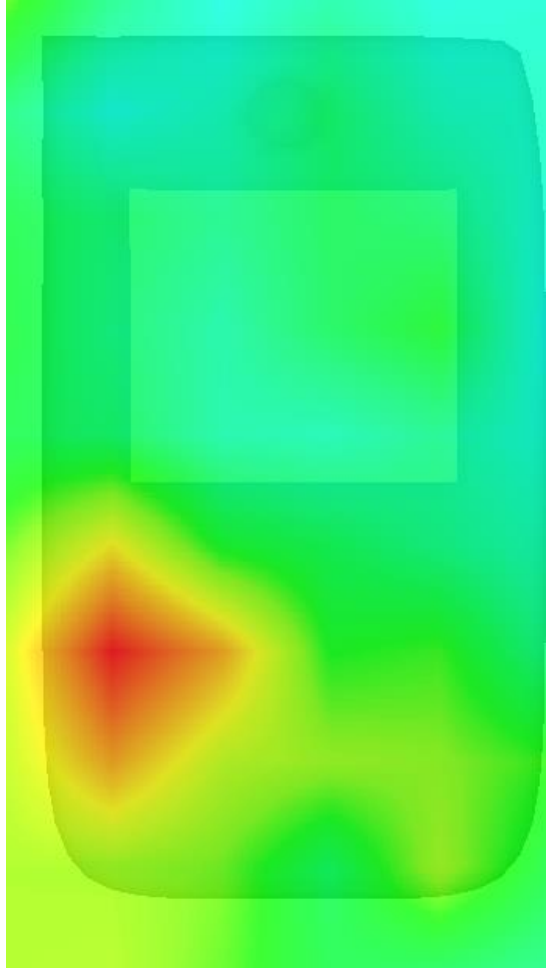
Frequency (MHz)	707.500000
Relative permittivity (real part)	42.126667
Relative permittivity (imaginary part)	23.264000
Conductivity (S/m)	0.914404
Variation (%)	-3.340000



Maximum location: X=-24.00, Y=-28.00

SAR Peak: 0.42 W/kg

SAR 10g (W/Kg)	0.154777
SAR 1g (W/Kg)	0.252199

3D screen shot	Hot spot position
	

MEASUREMENT 19

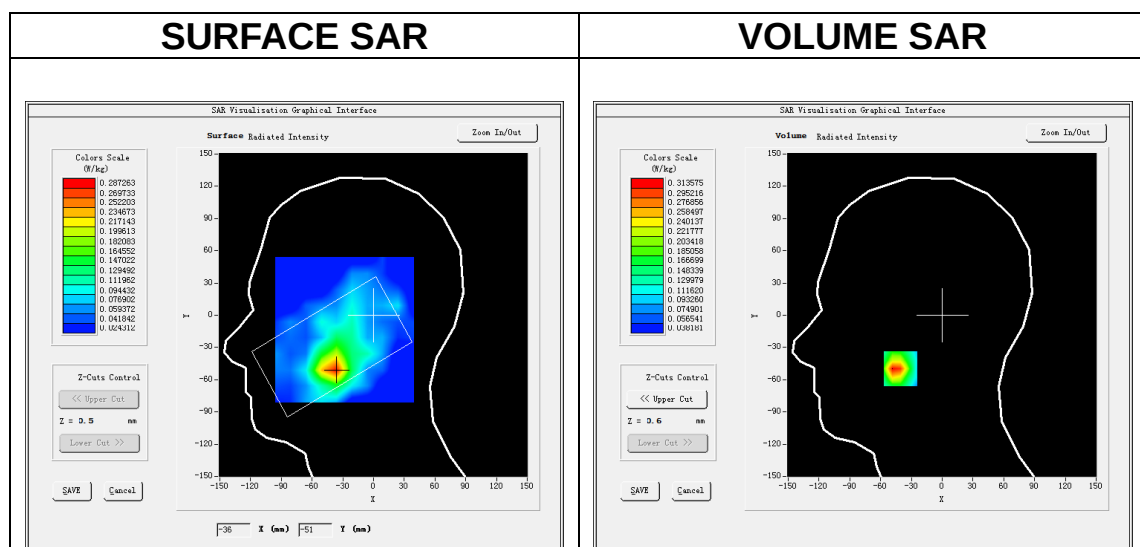
Date of measurement: 11/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.65</u>

B. SAR Measurement Results

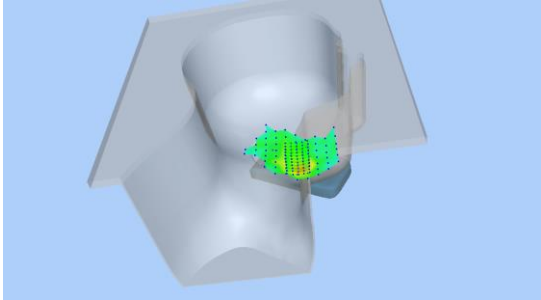
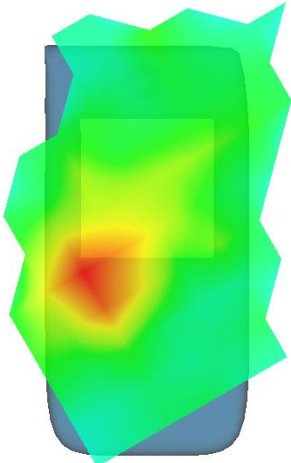
Frequency (MHz)	710.000000
Relative permittivity (real part)	42.113335
Relative permittivity (imaginary part)	23.152000
Conductivity (S/m)	0.913218
Variation (%)	-0.790000



Maximum location: X=-38.00, Y=-50.00

SAR Peak: 0.51 W/kg

SAR 10g (W/Kg)	0.186823
SAR 1g (W/Kg)	0.309054

3D screen shot	Hot spot position
	

MEASUREMENT 20

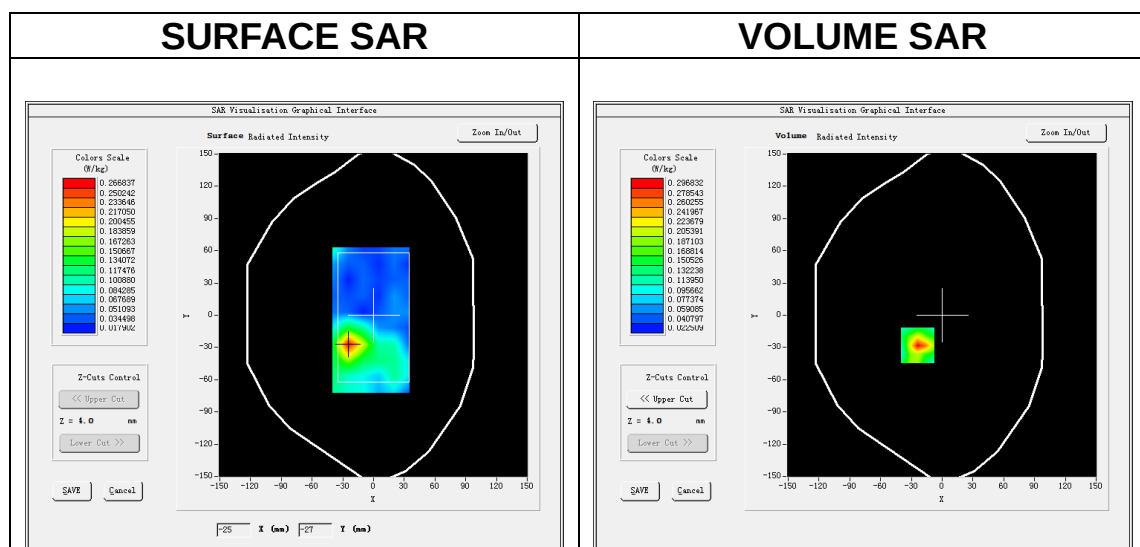
Date of measurement: 11/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.65</u>

B. SAR Measurement Results

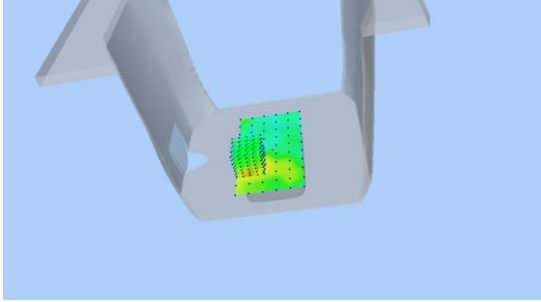
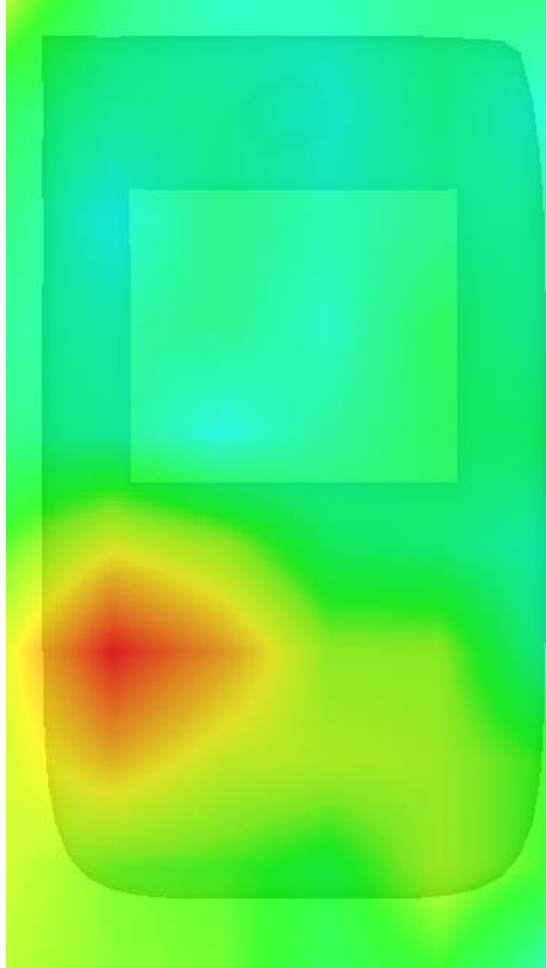
Frequency (MHz)	710.000000
Relative permittivity (real part)	42.113335
Relative permittivity (imaginary part)	23.152000
Conductivity (S/m)	0.913218
Variation (%)	-3.400000



Maximum location: X=-24.00, Y=-28.00

SAR Peak: 0.45 W/kg

SAR 10g (W/Kg)	0.158353
SAR 1g (W/Kg)	0.274411

3D screen shot	Hot spot position
	

MEASUREMENT 21

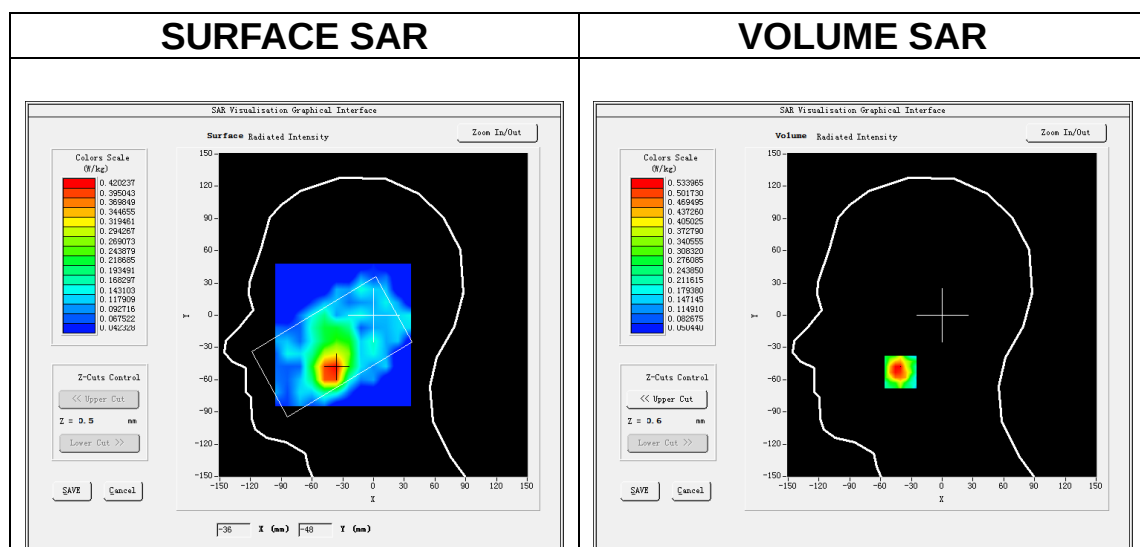
Date of measurement: 17/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Left head</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.35</u>

B. SAR Measurement Results

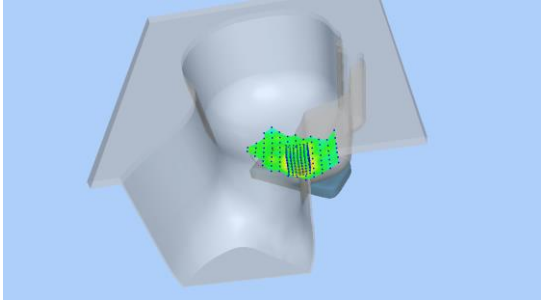
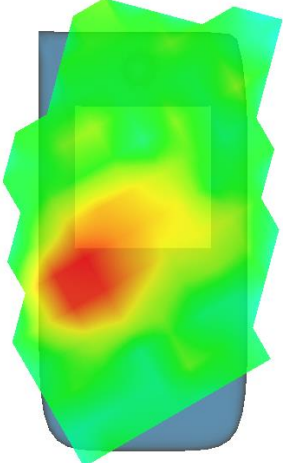
Frequency (MHz)	2605.000000
Relative permittivity (real part)	39.009335
Relative permittivity (imaginary part)	13.553667
Conductivity (S/m)	1.952481
Variation (%)	-2.820000



Maximum location: X=-40.00, Y=-53.00

SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.334634
SAR 1g (W/Kg)	0.519178

3D screen shot	Hot spot position
	

MEASUREMENT 22

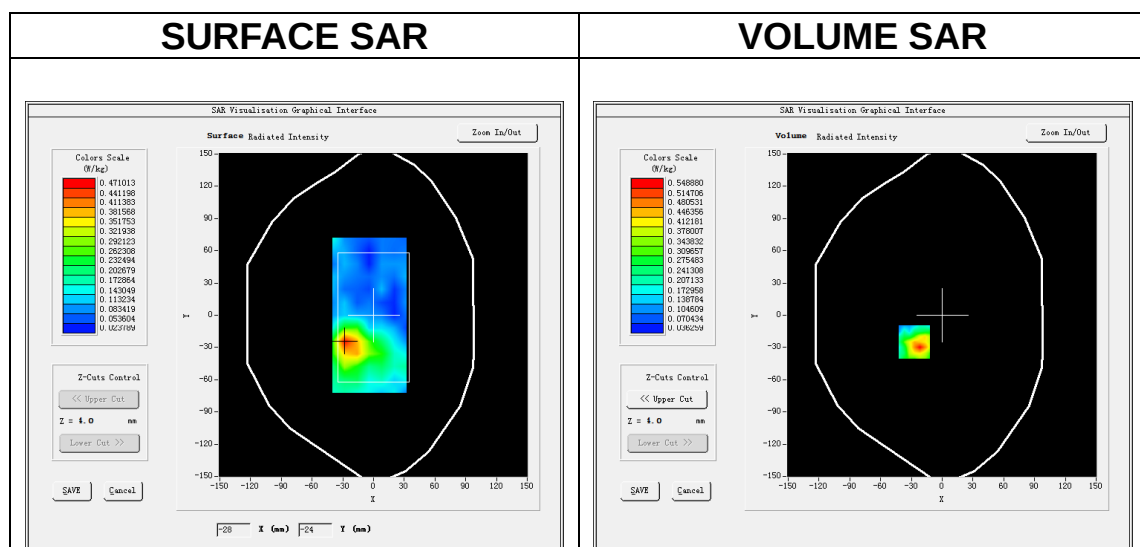
Date of measurement: 17/2/2025

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 41</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.35</u>

B. SAR Measurement Results

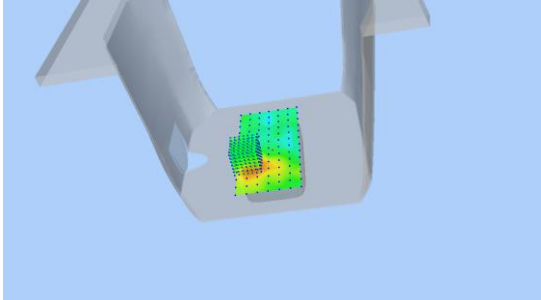
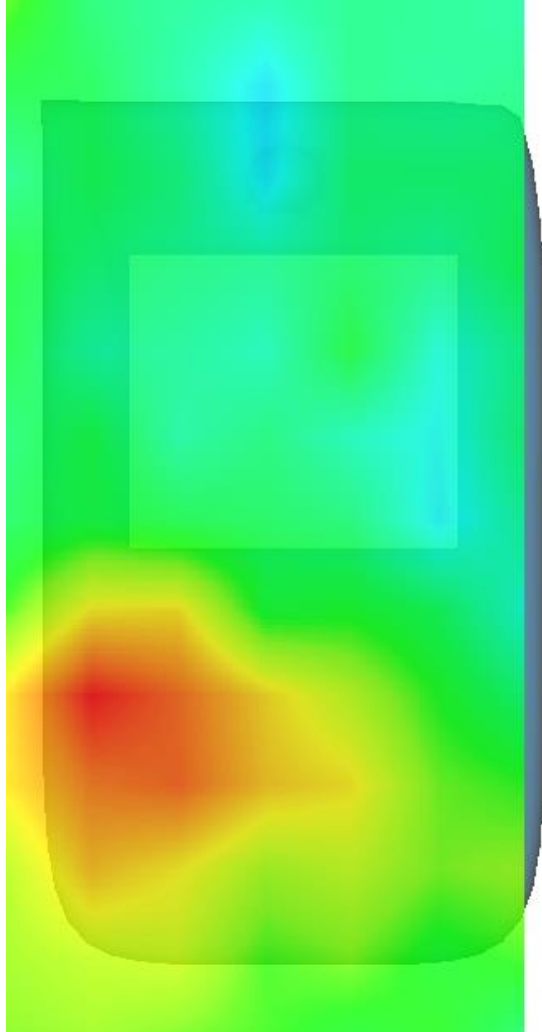
Frequency (MHz)	2605.000000
Relative permittivity (real part)	39.009335
Relative permittivity (imaginary part)	13.553667
Conductivity (S/m)	1.952481
Variation (%)	-3.250000



Maximum location: X=-27.00, Y=-25.00

SAR Peak: 1.00 W/kg

SAR 10g (W/Kg)	0.269111
SAR 1g (W/Kg)	0.477772

3D screen shot	Hot spot position
	

MEASUREMENT 23

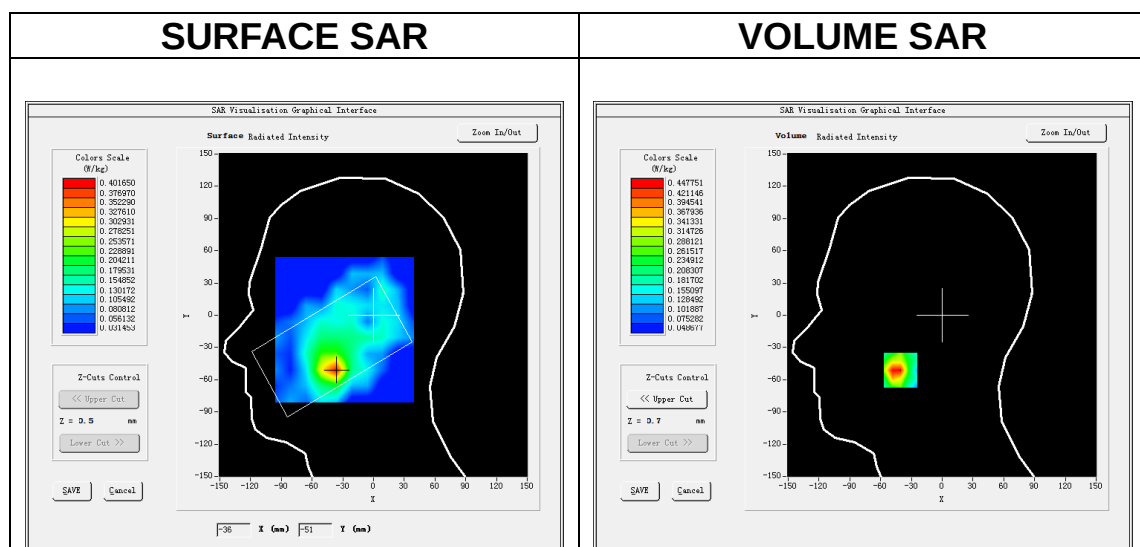
Date of measurement: 12/2/2025

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>CUSTOM (LTEBand66)</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.09</u>

B. SAR Measurement Results

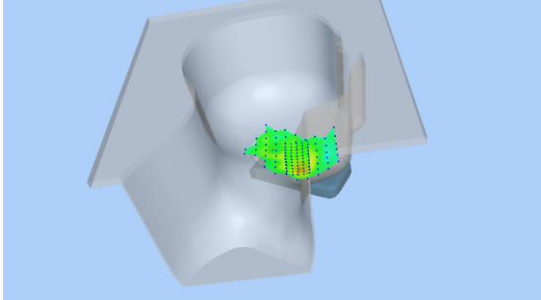
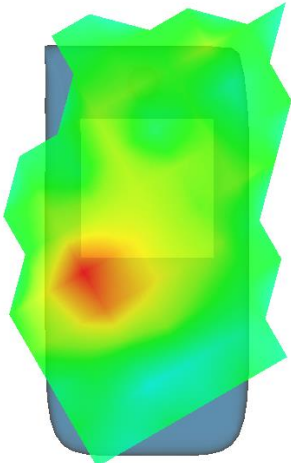
Frequency (MHz)	1745.000000
Relative permittivity (real part)	40.104546
Relative permittivity (imaginary part)	14.103182
Conductivity (S/m)	1.367225
Variation (%)	-2.770000



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

SAR Peak: 0.69 W/kg

SAR 10g (W/Kg)	0.285864
SAR 1g (W/Kg)	0.448855

3D screen shot	Hot spot position
	

MEASUREMENT 24

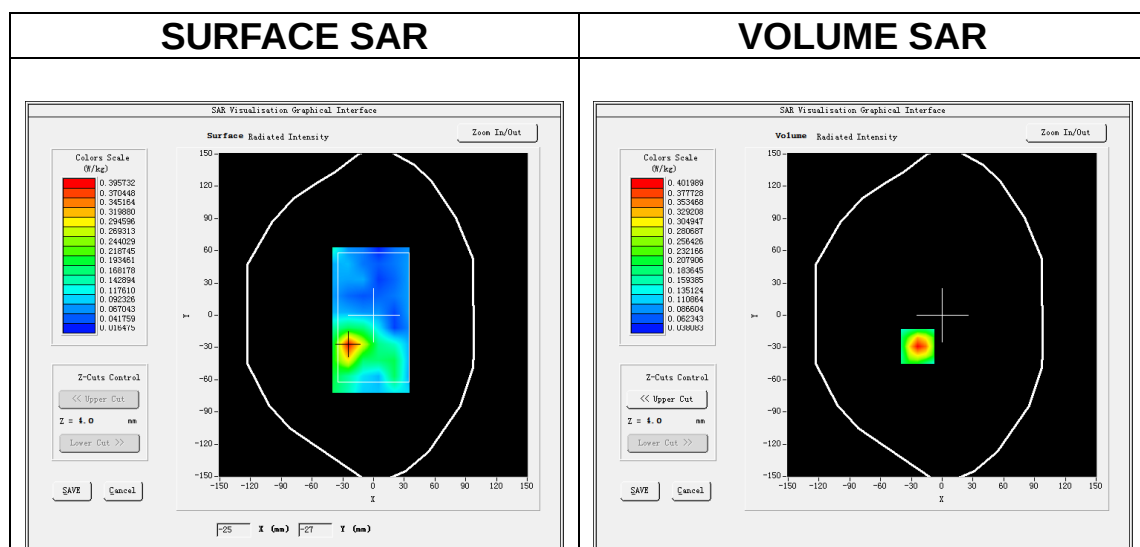
Date of measurement: 12/2/2025

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>CUSTOM (LTEBand66)</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>2.09</u>

B. SAR Measurement Results

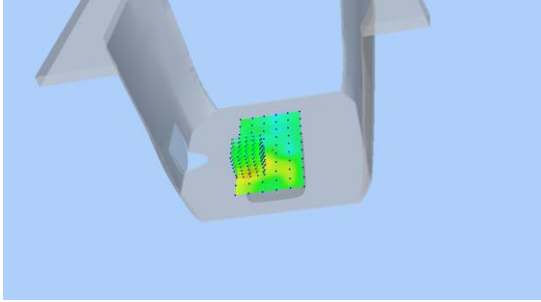
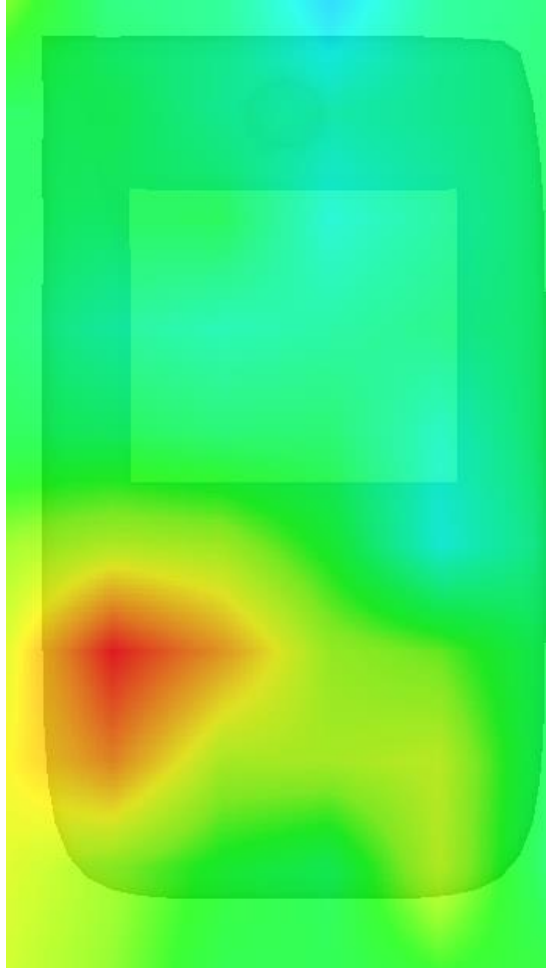
Frequency (MHz)	1745.000000
Relative permittivity (real part)	40.104546
Relative permittivity (imaginary part)	14.103182
Conductivity (S/m)	1.367225
Variation (%)	-2.790001



Maximum location: X=-24.00, Y=-29.00

SAR Peak: 0.55 W/kg

SAR 10g (W/Kg)	0.230495
SAR 1g (W/Kg)	0.369973

3D screen shot	Hot spot position
	

Appendix D. Calibration Certificate

Table of contents
E Field Probe - EPGO0523-403
750 MHz Dipole - SN 03/15 DIP 0G750-355
835 MHz Dipole - SN 03/15 DIP 0G835-347
1800 MHz Dipole - SN 03/15 DIP 1G800-349
1900 MHz Dipole - SN 03/15 DIP 1G900-350
2450 MHz Dipole - SN 03/15 DIP 2G450-352
2600 MHz Dipole - SN 03/15 DIP 2G600-356



COMOSAR E-Field Probe Calibration Report

Ref : ACR.307.3.24.BES.A

**GUANGDONG ASIA HONGKE TEST
TECHNOLOGY CO., LTD**
NO.1/F,BUILDING B1, JUNFENG INDUSTRIAL PARK,
CHONGQING ROAD, HEPING COMMUNITY,
FUHAIHAI STREET, BAO'AN DISTRICT,SHENZHEN,
GUANGDONG 518055, P.R.CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 39/21 EPGO0523-403

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 09/11/2024



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Summary:

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

	<i>Name</i>	<i>Function</i>	<i>Date</i>	<i>Signature</i>
<i>Prepared by :</i>	Jérôme Le Gall	Measurement Responsible	09/10/2024	
<i>Checked by :</i>	Jérôme Luc	Technical Manager	09/10/2024	
<i>Approved by :</i>	Yann Toutain	Laboratory Director	09/11/2024	

	<i>Customer Name</i>
<i>Distribution :</i>	Shenzhen Asia Hongke

<i>Issue</i>	<i>Name</i>	<i>Date</i>	<i>Modifications</i>
A	Jérôme Luc	9/11/2024	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 39/21 EPG00523-403
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.199 M Ω Dipole 2: R2=0.218 M Ω Dipole 3: R3=0.210 M Ω

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 affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

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

3.2 SENSITIVITY

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

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

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3.3 LOWER DETECTION LIMIT

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

3.4 ISOTROPY

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

3.1 BOUNDARY EFFECT

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

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

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

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.307.3.24.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 an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

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

5 CALIBRATION MEASUREMENT RESULTS

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

5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normy dipole 2 ($\mu\text{V}/(\text{V}/\text{m})^2$)	Normz dipole 3 ($\mu\text{V}/(\text{V}/\text{m})^2$)
1.26	0.87	0.77

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
113	108	113

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

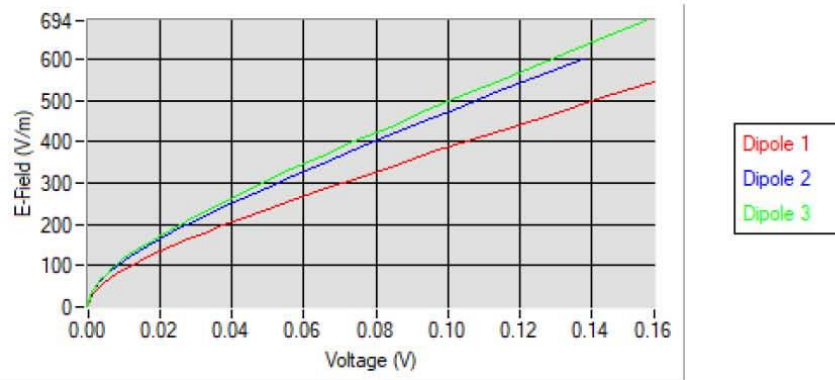
$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

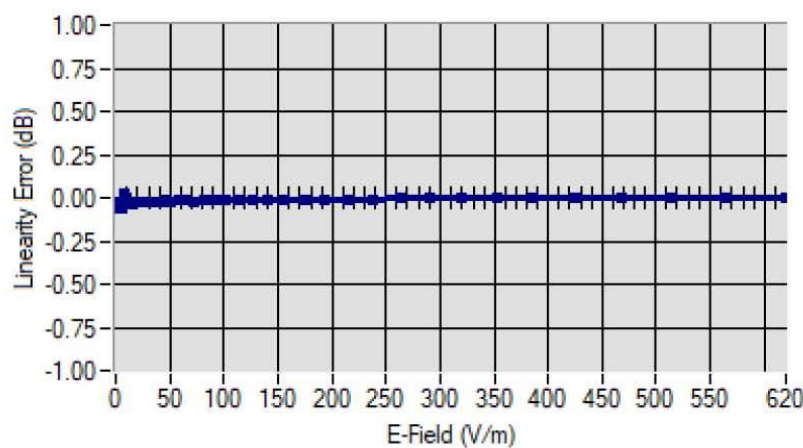
Ref: ACR.307.3.24.BES.A

Calibration curves



5.2 LINEARITY

Linearity



Linearity: $\pm 1.42\%$ ($\pm 0.06\text{dB}$)



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL600	600	1.62
HL750	750	1.65
HL850	835	1.66
HL900	900	1.77
HL1500	1500	2.09
HL1750	1750	2.09
HL1800	1800	2.05
HL1900	1900	2.05
HL2000	2000	2.41
HL2100	2100	2.36
HL2300	2300	2.55
HL2450	2450	2.38
HL2600	2600	2.35
HL3300	3300	2.04
HL3500	3500	1.98
HL3700	3700	2.11
HL3900	3900	2.54
HL4200	4200	2.22
HL4600	4600	2.40
HL4900	4900	2.33
HL5200	5200	2.30
HL5400	5400	2.30
HL5600	5600	2.29
HL5800	5800	2.27

LOWER DETECTION LIMIT: 8mW/kg

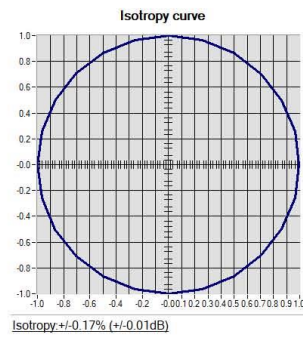


COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref. ACR.307.3.24.BES.A

5.4 ISOTROPY

HL1800 MHz





COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

6 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	08/2024	08/2027
Network Analyzer	Agilent 8753ES	MY40003210	10/2021	10/2024
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	05/2024	05/2027
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Multimeter	Keithley 2000	1160271	02/2024	02/2027
Signal Generator	Rohde & Schwarz SMB	106589	04/2024	04/2027
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	06/2024	06/2027
Power Meter	Rohde & Schwarz NRVD	832839-056	11/2021	11/2024
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
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.

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.307.3.24.BES.A

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.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2024	06/2027



SAR Reference Dipole Calibration Report

Ref : ACR.53.23.24.BES.A

**GUANGDONG ASIA HONGKE TEST
TECHNOLOGY CO., LTD**
NO.1/F,BUILDING B1, JUNFENG INDUSTRIAL PARK,
CHONGQING ROAD, HEPING COMMUNITY ,
FUHAIHAI STREET, BAO'AN DISTRICT, SHENZHEN,
GUANGDONG 518055, P.R.CHINA
MVG COMOSAR REFERENCE DIPOLE
FREQUENCY: 750MHZ
SERIAL NO.: SN 03/15 DIP0G750-355

Calibrated at MVG
Z.I. de la pointe du diable
Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 02/21/2024



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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.