

FCC SAR EVALUATION REPORT

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

Product Name : Tablet

Trademark : DOOGEE

Model Name : T20Ultra

Family Model : T20Ultra Pro, T20Ultra Plus, T20Ultra Max

FCC ID : 2AX4Y-T20ULTRA

Report No. : S23082802306001

Prepared for

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TEST RESULT CERTIFICATION

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Product description

Product name..... Tablet
Trademark DOOGEE
Model Name T20Ultra
Family Model..... T20Ultra Pro, T20Ultra Plus, T20Ultra Max
FCC 47 CFR Part 2(2.1093);
ANSI/IEEE C95.1-1992

Standards IEEE Std 1528-2013;
Published RF exposure KDB procedures

This device described above has been tested by Shenzhen NTEK. In accordance with the measurement methods and procedures specified in IEEE Std 1528-2013 and KDB 865664 D01. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in FCC 47 CFR Part 2(2.1093) and ANSI/IEEE C95.1-1992. The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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Test Sample Number S230828023006

Date of Test

Date (s) of performance of tests Aug. 31, 2023 ~ Sept. 20, 2023

Date of Issue Oct. 26, 2023

Test Result **Pass**

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※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Oct. 26, 2023	Jack Li

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1. General Information

1.1. RF exposure limits

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

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

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

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

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

Occupational/Controlled Environments:

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

General Population/Uncontrolled Environments:

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

NOTE
TRUNK LIMIT
1.6 W/kg
APPLIED TO THIS EUT

1.2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for T20Ultra are as follows.

RF Exposure Conditions		Max Reported SAR Value(W/kg)
1-g Body-Worn (Separation distance of 0mm)		0.640
1-g Hotspot (Separation distance of 0mm)		0.640
Max Simultaneous Tx	Body-Worn	1.194
	Hotspot	1.194

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

1.3. EUT Description

Device Information			
Product Name	Tablet		
Trade Name	DOOGEE		
Model Name	T20Ultra		
Family Model	T20Ultra Pro, T20Ultra Plus, T20Ultra Max		
Model Difference	All the model are the same circuit and RF module,except the model names.		
FCC ID	2AX4Y-T20ULTRA		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna	PIFA Antenna		
Battery	DC 3.85V, 10800mAh, 41.58Wh		
Hardware version	N/A		
Software version	N/A		
Device Operating Configurations			
Supporting Mode(s)	GSM 850/1900, WCDMA Band 2/5, LTE Band 2/4/5/7/12/17/66, WLAN 2.4G/5G, Bluetooth		
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, $\pi/4$ -DQPSK, 8DPSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990

	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	LTE Band 66	1710-1780	2110-2200
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	Bluetooth	2402-2480	
	GPRS Multislot Class(12)	Max Number of Timeslots in Uplink	
Max Number of Timeslots in Downlink		4	
Max Total Timeslot		5	
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink		4
	Max Number of Timeslots in Downlink		4
	Max Total Timeslot		5
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control “all 1”(WCDMA Band 2)		
	3, tested with power control “all 1”(WCDMA Band 5)		
	3, tested with power control all Max.(LTE Band 2)		
	3, tested with power control all Max.(LTE Band 4)		
	3, tested with power control all Max.(LTE Band 5)		
	3, tested with power control all Max.(LTE Band 7)		
	3, tested with power control all Max.(LTE Band 12)		
	3, tested with power control all Max.(LTE Band 17)		
	3, tested with power control all Max.(LTE Band 66)		

1.4. Test specification(s)

FCC 47 CFR Part 2(2.1093)
ANSI/IEEE C95.1-1992
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR

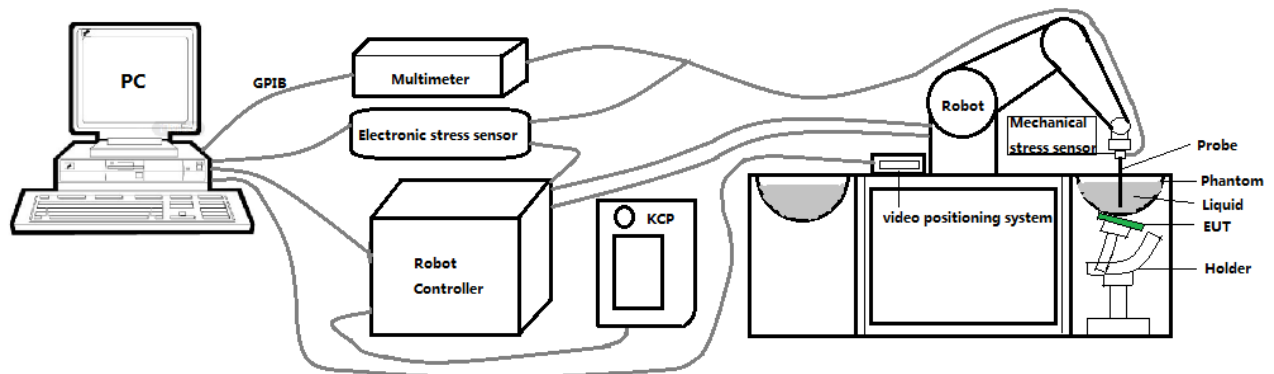
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 616217 D04 SAR for laptop and tablets

1.5. Ambient Condition

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

2. SAR Measurement System

2.1. SATIMO SAR Measurement Set-up Diagram



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

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

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

2.2. Robot

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



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

2.3. E-Field Probe

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

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



- Dynamic range: 0.01-100 W/kg
 - Tip Diameter : 2.5 mm
 - Distance between probe tip and sensor center: 1 mm
 - Distance between sensor center and the inner phantom surface: 2 mm (repeatability better than ± 1 mm).
 - Probe linearity: ± 0.08 dB
 - Axial isotropy: ± 0.01 dB
 - Hemispherical Isotropy: ± 0.01 dB
 - Calibration range: 650MHz to 5900MHz for head & body simulating liquid.
 - Lower detection limit: 8mW/kg
- Angle between probe axis (evaluation axis) and surface normal line: less than 30° .

2.3.1. E-Field Probe Calibration

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

2.4. SAM phantoms

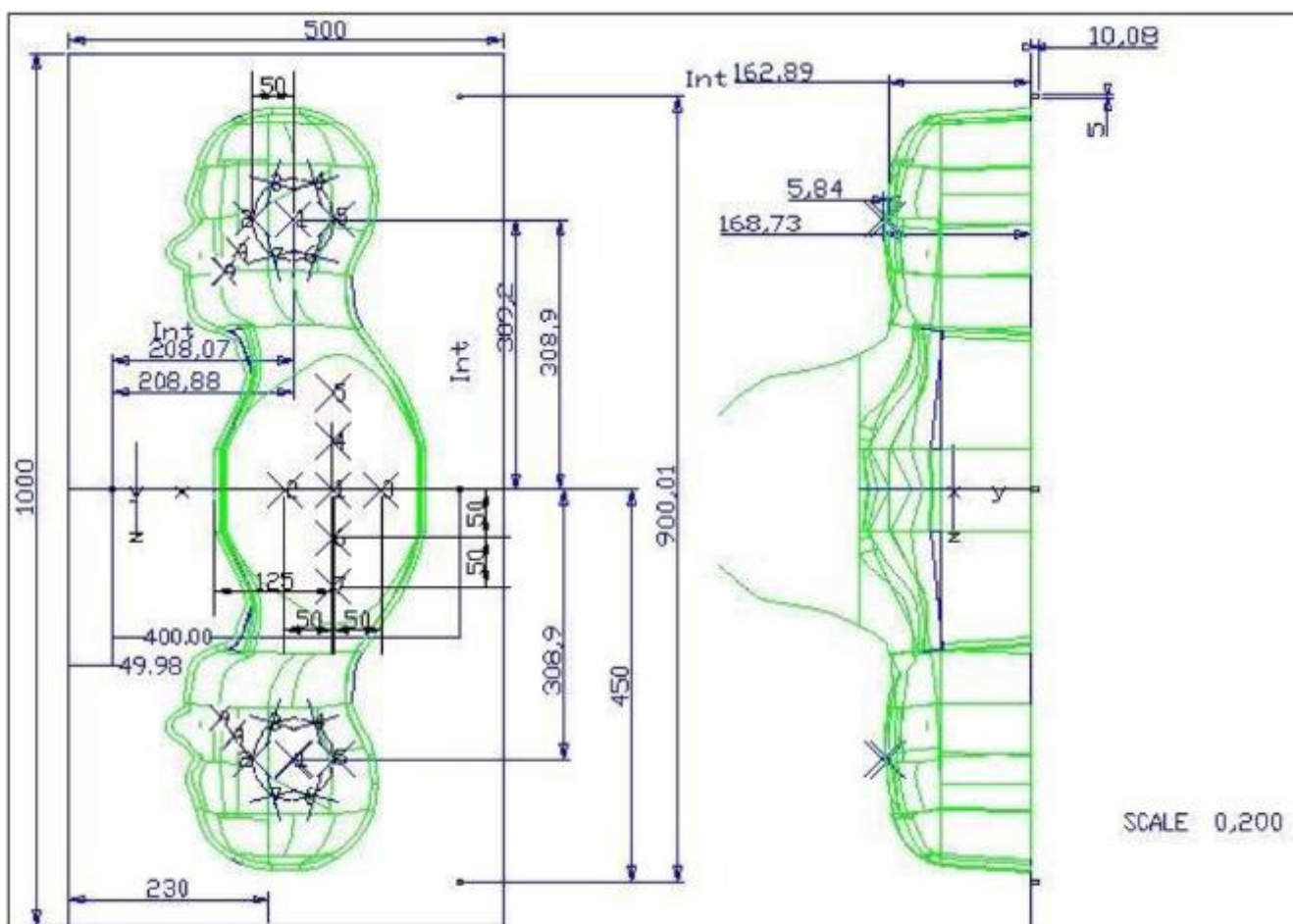
Photo of SAM phantom SN 16/15 SAM119



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

2.4.1. Technical Data

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

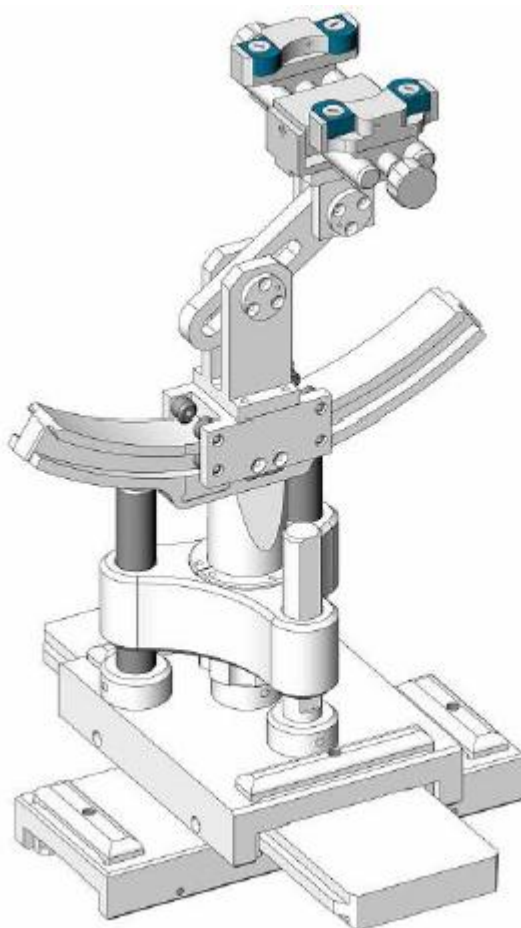


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

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

2.5. Device Holder

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



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

2.6. Test Equipment List

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

Devices used during the test described are marked ☒

	Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
					Last Cal.	Due Date
☒	MVG	E FIELD PROBE	SSE2	SN 08/16 EPGO287	Jan. 10, 2023	Jan. 09, 2024
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Mar. 01, 2021	Feb. 28, 2024
☐	MVG	3500 MHz Dipole	SID3500	SN 09/12 DIP 3G500-360	Oct. 15, 2022	Oct. 14, 2025
☒	MVG	5000 MHz Dipole	SWG5500	SN 13/14 WGA 33	Mar. 01, 2021	Feb. 28, 2024
☒	MVG	Liquid measurement Kit	SCLMP	SN 21/15 OCPG 72	NCR	NCR
☒	MVG	Power Amplifier	N.A	AMPLISAR_28/14_003	NCR	NCR
☒	KEITHLEY	Millivoltmeter	2000	4072790	NCR	NCR
☒	R&S	Universal radio communication tester	CMU200	117858	May 29, 2023	May 28, 2024
☒	R&S	Wideband radio communication tester	CMW500	103917	May 29, 2023	May 28, 2024

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

☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 2600	Head 2600	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 5000	Head 5000	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 WLAN/Bluetooth power measurement, use engineering software to configure EUT WLAN/Bluetooth continuously transmission, at maximum RF power in each supported wireless interface and frequency band.
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/Bluetooth output power.

<SAR measurement>

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

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

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

3.1. Power Reference

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

3.2. Area scan & Zoom scan

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

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

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

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

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

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

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

3.3. Description of interpolation/extrapolation scheme

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

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

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

3.4. Volumetric Scan

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

3.5. Power Drift

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

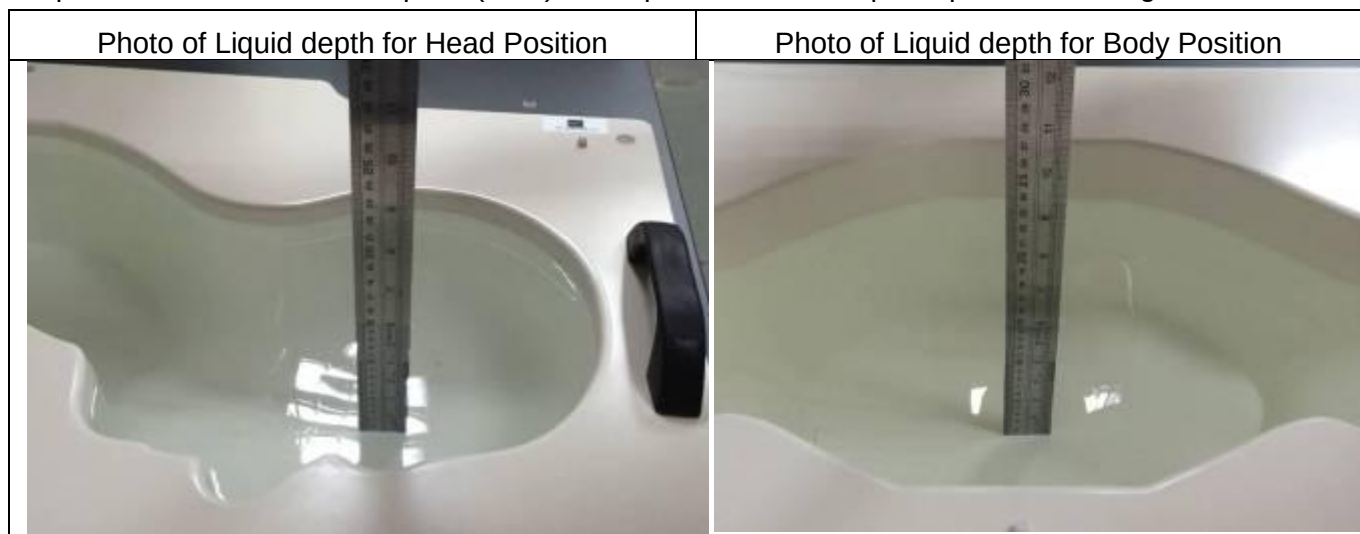
4. System Verification Procedure

4.1. Tissue Verification

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

Ingredients (% of weight)	Head Tissue								
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5000
Water	34.40	34.40	34.40	55.36	55.36	71.88	71.88	71.88	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	17.24
DGBE	0.00	0.00	0.00	13.84	13.84	7.99	7.99	7.99	0.00

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



4.1.1. Tissue Dielectric Parameter Check Results

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

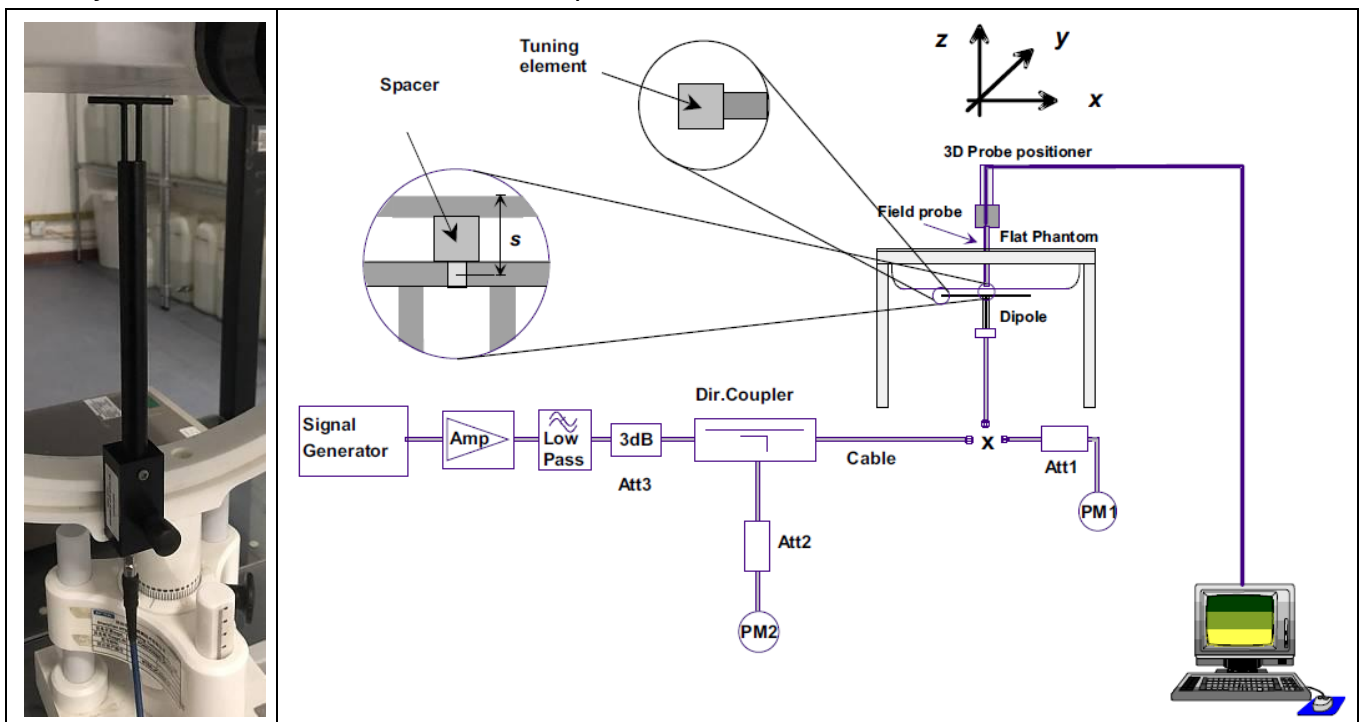
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		$\epsilon_r (\pm 5\%)$	$\sigma \text{ (S/m)} (\pm 5\%)$	ϵ_r	$\sigma \text{ (S/m)}$		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	40.69	0.89	21.5 °C	Sep. 05, 2023
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.82	0.91	21.5 °C	Sep. 04, 2023
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.27	1.38	21.7 °C	Sep. 07, 2023
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.29	1.46	21.5 °C	Sep. 14, 2023
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	39.13	1.85	21.5 °C	Aug. 31, 2023
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	39.00	1.93	21.4 °C	Sep. 01, 2023
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	36.06	4.64	21.5 °C	Sep. 12, 2023
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	35.30	5.17	21.9 °C	Sep. 20, 2023

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

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

System Verification	Target SAR (1W)		Measured SAR		Liquid Temp.	Delta (%)		Test Date
	(±10%)		(Normalized to 1W)			1-g (±10%)	10-g (±10%)	
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)				
750MHz	8.53 (7.68~9.38)	5.56 (5.01~6.11)	7.84	5.59	21.5 °C	-8.09%	0.54%	Sep. 05, 2023
835MHz	9.84 (8.86~10.82)	6.22 (5.60~6.84)	9.73	6.61	21.5 °C	-1.12%	6.27%	Sep. 04, 2023
1800MHz	37.96 (34.17~41.75)	19.81 (17.83~21.79)	39.62	19.18	21.7 °C	4.37%	-3.18%	Sep. 07, 2023
1900MHz	40.37 (36.34~44.40)	20.48 (18.44~22.52)	41.97	22.39	21.5 °C	3.96%	9.33%	Sep. 14, 2023
2450MHz	53.69 (48.33~59.05)	23.94 (21.55~26.33)	48.56	23.38	21.5 °C	-9.55%	-0.72%	Aug. 31, 2023
2600MHz	55.83 (50.25~61.41)	24.19 (21.78~26.60)	59.21	22.44	21.4 °C	6.05%	-7.23%	Sep. 01, 2023
5200MHz	162.34 (146.11~178.57)	55.42 (49.88~60.96)	151.58	58.59	21.5 °C	-6.63%	5.72%	Sep. 12, 2023
5800MHz	178.89 (161.01~196.77)	59.32 (53.39~65.25)	183.47	64.76	21.9 °C	2.56%	9.17%	Sep. 20, 2023

5. SAR Measurement variability and uncertainty

5.1. SAR measurement variability

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

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

5.2. SAR measurement uncertainty

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

6. RF Exposure Positions

6.1. Tablet host platform exposure conditions

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

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

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

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune -	128	189	251	Tune -	128	189	251
Frequency (MHz)	up (dBm)	824.2	836.4	848.8	up (dBm)	824.2	836.4	848.8
GSM (GMSK)	35.00	34.67	34.77	34.70	25.97	25.64	25.74	25.67
GPRS(GMSK, 1 TS)	35.00	34.72	34.82	34.74	25.97	25.69	25.79	25.71
GPRS(GMSK, 2 TS)	34.00	33.72	33.82	33.82	27.98	27.70	27.80	27.80
GPRS(GMSK, 3 TS)	31.50	30.84	30.95	31.02	27.24	26.58	26.69	26.76
GPRS(GMSK, 4 TS)	30.00	29.62	29.68	29.77	26.99	26.61	26.67	26.76
EGPRS(8PSK, 1 TS)	31.50	30.90	31.02	30.94	22.47	21.87	21.99	21.91
EGPRS(8PSK, 2 TS)	31.00	30.83	30.94	30.81	24.98	24.81	24.92	24.79
EGPRS(8PSK, 3 TS)	31.00	30.60	30.60	30.61	26.74	26.34	26.34	26.35
EGPRS(8PSK, 4 TS)	30.50	30.38	30.26	30.32	27.49	27.37	27.25	27.31
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune -	512	661	810	Tune -	512	661	810
Frequency (MHz)	up (dBm)	1850.2	1880	1909.8	up (dBm)	1850.2	1880	1909.8
GSM (GMSK)	33.00	32.70	32.78	32.73	23.97	23.67	23.75	23.70
GPRS(GMSK, 1 TS)	33.00	32.76	32.81	32.76	23.97	23.73	23.78	23.73
GPRS(GMSK, 2 TS)	32.00	31.74	31.87	31.96	25.98	25.72	25.85	25.94
GPRS(GMSK, 3 TS)	29.50	28.97	29.19	29.39	25.24	24.71	24.93	25.13
GPRS(GMSK, 4 TS)	28.50	27.73	27.96	28.17	25.49	24.72	24.95	25.16
EGPRS(8PSK, 1 TS)	29.50	29.38	29.11	29.23	20.47	20.35	20.08	20.20
EGPRS(8PSK, 2 TS)	29.00	28.52	28.66	28.17	22.98	22.50	22.64	22.15
EGPRS(8PSK, 3 TS)	27.00	26.81	26.48	26.05	22.74	22.55	22.22	21.79
EGPRS(8PSK, 4 TS)	26.00	25.83	25.06	24.56	22.99	22.82	22.05	21.55

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

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

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

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

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

7.2. WCDMA Conducted Power

WCDMA Band 2		Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	9262	9400	9538	
Frequency (MHz)		1852.4	1880	1907.6	
RMC12.2K	24.50	24.24	24.27	24.21	
HSDPA Sub 1	23.50	23.42	22.32	22.41	
HSDPA Sub 2	24.00	23.78	23.57	22.33	
HSDPA Sub 3	24.00	22.71	22.53	23.66	
HSDPA Sub 4	23.50	22.58	22.31	23.28	
HSUPA Sub 1	23.00	22.90	22.36	21.95	
HSUPA Sub 2	24.50	24.30	24.07	24.30	
HSUPA Sub 3	23.00	22.56	21.87	22.54	
HSUPA Sub 4	24.50	24.34	23.65	23.96	
HSUPA Sub 5	23.00	22.82	22.81	22.73	
WCDMA Band 5		Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up (dBm)	4132	4182	4233	
Frequency (MHz)		826.4	836.4	846.6	
RMC12.2K	23.50	23.37	23.36	23.37	
HSDPA Sub 1	24.00	23.52	23.66	23.68	
HSDPA Sub 2	23.50	23.14	23.17	23.28	
HSDPA Sub 3	22.50	21.87	22.18	22.16	
HSDPA Sub 4	22.50	22.08	22.33	22.08	
HSUPA Sub 1	24.00	22.92	23.56	23.33	
HSUPA Sub 2	24.00	23.44	23.54	23.55	
HSUPA Sub 3	23.00	21.87	22.43	22.66	
HSUPA Sub 4	24.00	23.51	23.68	23.66	
HSUPA Sub 5	23.00	22.06	22.97	22.78	

7.3. LTE Conducted Power

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	24.50	24.00	24.15	24.32
			1	2	24.50	24.05	24.21	24.36
			1	5	24.50	23.98	24.16	24.31

				3	0	24.50	24.08	24.26	24.43
				3	1	24.50	24.09	24.25	24.42
				3	2	24.50	24.10	24.25	24.44
				6	0	24.00	23.21	23.36	23.54
			16QAM	1	0	24.00	23.20	23.53	23.66
				1	2	24.00	23.40	23.57	23.67
				1	5	24.00	23.30	23.53	23.54
				3	0	23.50	23.13	23.34	23.35
				3	1	23.50	23.11	23.34	23.48
				3	2	23.50	23.02	23.31	23.36
				6	0	23.00	22.31	22.46	22.67
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)			
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5	
LTE Band 2	3MHz	QPSK	1	0	24.50	23.88	24.09	24.22	
			1	7	24.50	23.94	24.13	24.34	
			1	14	24.50	23.86	24.08	24.24	
			8	0	24.00	23.07	23.30	23.49	
			8	4	24.00	23.12	23.36	23.53	
			8	7	24.00	23.07	23.29	23.45	
			15	0	23.50	23.05	23.30	23.48	
		16QAM	1	0	24.00	23.04	23.32	23.52	
			1	7	24.00	23.30	23.52	23.64	
			1	14	24.00	23.23	23.39	23.49	
			8	0	23.00	22.15	22.39	22.54	
			8	4	23.00	22.20	22.46	22.59	
			8	7	23.00	22.17	22.37	22.52	
			15	0	22.50	22.10	22.31	22.49	
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	25.00	24.09	24.30	24.49	
			1	12	25.00	24.23	24.43	24.59	
			1	24	25.00	24.12	24.33	24.47	
			12	0	24.00	23.10	23.37	23.59	
			12	6	24.00	23.21	23.43	23.64	
			12	11	24.00	23.19	23.36	23.44	
			25	0	24.00	23.17	23.37	23.52	

		16QAM	1	0	24.00	23.50	23.63	23.69
			1	12	24.00	23.48	23.81	23.79
			1	24	24.00	23.46	23.69	23.70
			12	0	23.00	22.13	22.36	22.59
			12	6	23.00	22.26	22.44	22.64
			12	11	23.00	22.23	22.37	22.46
			25	0	23.00	22.22	22.43	22.55
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	25.00	24.22	24.42	24.66
			1	24	25.00	24.28	24.45	24.65
			1	49	25.00	24.23	24.44	24.57
			25	0	24.00	23.11	23.40	23.47
			25	12	24.00	23.22	23.45	23.67
			25	24	24.00	23.26	23.30	23.50
			50	0	24.00	23.21	23.40	23.51
		16QAM	1	0	24.00	23.45	23.63	23.88
			1	24	24.00	23.57	23.82	23.90
			1	49	24.00	23.59	23.70	23.91
			25	0	23.00	22.16	22.45	22.48
			25	12	23.00	22.28	22.47	22.68
			25	24	23.00	22.31	22.34	22.51
			50	0	23.00	22.23	22.39	22.51
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	25.00	24.17	24.35	24.66
			1	37	25.00	24.31	24.48	24.71
			1	74	25.00	24.26	24.41	24.56
			36	0	24.00	23.16	23.41	23.61
			36	18	24.00	23.25	23.44	23.69
			36	37	24.00	23.29	23.34	23.63
			75	0	24.00	23.24	23.41	23.62
		16QAM	1	0	24.50	23.39	23.67	24.02
			1	37	24.50	23.61	23.75	23.97
			1	74	24.50	23.51	23.74	23.73
			36	0	23.00	22.19	22.41	22.64

			36	18	23.00	22.29	22.46	22.68
			36	37	23.00	22.32	22.37	22.65
			75	0	23.00	22.26	22.41	22.64
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	25.00	24.08	24.25	24.50
			1	49	25.00	24.31	24.47	24.75
			1	99	25.00	24.25	24.41	24.45
			50	0	24.00	23.09	23.42	23.64
			50	24	24.00	23.30	23.49	23.80
			50	49	24.00	23.47	23.28	23.86
			100	0	24.00	23.29	23.34	23.75
		16QAM	1	0	24.00	23.39	23.62	23.83
			1	49	24.00	23.58	23.79	23.98
			1	99	24.00	23.57	23.77	23.68
			50	0	23.00	22.11	22.40	22.66
			50	24	23.00	22.33	22.51	22.79
			50	49	23.00	22.47	22.33	22.84
			100	0	23.00	22.30	22.32	22.75

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	25.00	23.79	24.41	24.47
			1	2	25.00	23.82	24.45	24.55
			1	5	25.00	23.78	24.38	24.47
			3	0	25.00	23.89	24.47	24.54
			3	1	25.00	23.93	24.49	24.57
			3	2	25.00	23.92	24.48	24.57
			6	0	24.00	23.01	23.59	23.66
		16QAM	1	0	24.00	23.11	23.76	23.85
			1	2	24.00	23.27	23.83	23.79
			1	5	24.00	23.05	23.68	23.85
			3	0	24.00	22.94	23.59	23.59
			3	1	24.00	22.98	23.57	23.60
			3	2	24.00	22.84	23.54	23.66

			6	0	23.00	22.16	22.77	22.83
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	24.50	23.68	24.28	24.36
			1	7	24.50	23.87	24.39	24.46
			1	14	24.50	23.74	24.24	24.39
			8	0	24.00	22.89	23.48	23.60
			8	4	24.00	22.98	23.57	23.68
			8	7	24.00	22.95	23.51	23.60
			15	0	24.00	22.92	23.48	23.61
		16QAM	1	0	24.00	22.99	23.60	23.58
			1	7	24.00	23.18	23.76	23.82
			1	14	24.00	23.12	23.63	23.65
			8	0	23.00	21.99	22.61	22.71
			8	4	23.00	22.08	22.66	22.80
			8	7	23.00	22.01	22.62	22.70
			15	0	23.00	21.95	22.52	22.65
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	25.00	23.91	24.55	24.50
			1	12	25.00	24.12	24.65	24.65
			1	24	25.00	24.06	24.55	24.50
			12	0	24.00	22.99	23.53	23.59
			12	6	24.00	23.06	23.65	23.64
			12	11	24.00	23.04	23.64	23.59
			25	0	24.00	23.00	23.59	23.60
		16QAM	1	0	24.50	23.25	23.84	23.79
			1	12	24.50	23.45	24.06	24.05
			1	24	24.50	23.29	23.91	23.81
			12	0	23.00	22.02	22.58	22.66
			12	6	23.00	22.11	22.68	22.70
			12	11	23.00	22.05	22.69	22.66
			25	0	23.00	22.04	22.65	22.67
Ban	Band	Modulation	RB		Tune-u	Channel/Frequency(MHz)		

d	Width	n	Configuratio n		p (dBm)			
			RB Size	RB Offset		20000/1715	20175/1732. 5	20350/1750
LTE Ban d 4	10MHz	QPSK	1	0	25.00	24.01	24.60	24.55
			1	24	25.00	24.17	24.67	24.67
			1	49	25.00	24.30	24.62	24.60
			25	0	24.00	23.03	23.47	23.55
			25	12	24.00	23.17	23.65	23.63
			25	24	24.00	23.15	23.64	23.56
			50	0	24.00	23.15	23.59	23.59
		16QAM	1	0	24.00	23.33	23.95	23.89
			1	24	24.00	23.56	23.96	23.98
			1	49	24.00	23.53	23.88	23.89
			25	0	23.00	22.07	22.53	22.63
			25	12	23.00	22.22	22.70	22.69
			25	24	23.00	22.22	22.72	22.62
			50	0	23.00	22.17	22.62	22.63
Ban d	Band Width	Modulatio n	RB Configuratio n		Tune-u p (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717. 5	20175/1732. 5	20325/1747. 5
LTE Ban d 4	15MHz	QPSK	1	0	25.00	23.95	24.48	24.43
			1	37	25.00	24.29	24.68	24.65
			1	74	25.00	24.42	24.62	24.58
			36	0	24.00	23.13	23.46	23.52
			36	18	24.00	23.24	23.64	23.58
			36	37	24.00	23.30	23.66	23.57
			75	0	24.00	23.22	23.59	23.54
		16QAM	1	0	24.50	23.19	23.83	23.69
			1	37	24.50	23.61	24.05	23.96
			1	74	24.50	23.67	23.81	23.85
			36	0	23.00	22.15	22.53	22.57
			36	18	23.00	22.29	22.67	22.63
			36	37	23.00	22.35	22.70	22.62
			75	0	23.00	22.26	22.62	22.57
Ban d	Band Width	Modulatio n	RB Configuratio n		Tune-u p (dBm)	Channel/Frequency(MHz)		

			RB Size	RB Offset		20050/1720	20175/1732. 5	20300/1745
LTE Band 4	20MHz	QPSK	1	0	25.00	23.87	24.36	24.30
			1	49	25.00	24.39	24.70	24.60
			1	99	25.00	24.43	24.56	24.49
			50	0	24.00	23.26	23.39	23.49
			50	24	24.00	23.36	23.67	23.60
			50	49	24.00	23.52	23.70	23.52
			100	0	24.00	23.38	23.55	23.51
		16QAM	1	0	24.00	23.16	23.60	23.62
			1	49	24.00	23.65	23.95	23.95
			1	99	24.00	23.68	23.88	23.84
			50	0	23.00	22.29	22.41	22.53
			50	24	23.00	22.40	22.71	22.63
			50	49	23.00	22.55	22.72	22.55
			100	0	23.00	22.42	22.58	22.53

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	22.46	22.59	22.55
			1	2	23.00	22.50	22.72	22.58
			1	5	23.00	22.45	22.65	22.50
			3	0	23.00	22.55	22.70	22.61
			3	1	23.00	22.58	22.72	22.63
			3	2	23.00	22.57	22.73	22.62
			6	0	22.00	21.64	21.79	21.71
		16QAM	1	0	22.50	21.83	21.91	21.77
			1	2	22.50	21.74	22.06	21.81
			1	5	22.50	21.68	21.95	21.70
			3	0	22.00	21.60	21.65	21.65
			3	1	22.00	21.62	21.75	21.68
			3	2	22.00	21.61	21.70	21.55
			6	0	21.00	20.84	20.95	20.83
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE	3MHz	QPSK	1	0	23.00	22.39	22.51	22.47

Band 5			1	7	23.00	22.47	22.60	22.55
			1	14	23.00	22.35	22.55	22.41
			8	0	22.00	21.51	21.71	21.69
			8	4	22.00	21.61	21.77	21.73
			8	7	22.00	21.56	21.74	21.58
			15	0	22.00	21.57	21.72	21.64
		16QAM	1	0	22.00	21.55	21.87	21.71
			1	7	22.00	21.65	21.88	21.79
			1	14	22.00	21.67	21.76	21.59
			8	0	21.00	20.69	20.89	20.75
			8	4	21.00	20.77	20.94	20.77
			8	7	21.00	20.73	20.86	20.64
			15	0	21.00	20.65	20.82	20.68
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	22.61	22.76	22.71
			1	12	23.00	22.70	22.91	22.82
			1	24	23.00	22.58	22.79	22.65
			12	0	22.00	21.54	21.91	21.76
			12	6	22.00	21.68	21.86	21.77
			12	11	22.00	21.75	21.76	21.40
			25	0	22.00	21.66	21.87	21.61
		16QAM	1	0	22.50	21.93	22.12	22.08
			1	12	22.50	22.01	22.18	22.09
			1	24	22.50	21.94	22.11	21.89
			12	0	21.50	20.62	21.03	20.74
			12	6	21.50	20.78	20.94	20.78
			12	11	21.50	20.84	20.85	20.40
			25	0	21.00	20.80	20.97	20.64
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	23.00	22.67	22.79	22.91
			1	24	23.00	22.75	22.91	22.87
			1	49	23.00	22.83	22.87	22.76
			25	0	22.50	21.43	22.04	21.58
			25	12	22.50	21.71	21.88	21.83

			25	24	22.50	21.61	21.78	21.46
			50	0	22.00	21.56	21.96	21.52
		16QAM	1	0	22.50	22.04	22.15	22.11
			1	24	22.50	22.01	22.15	22.19
			1	49	22.50	22.19	22.20	22.01
			25	0	21.50	20.53	21.17	20.67
			25	12	21.50	20.82	21.01	20.95
			25	24	21.50	20.74	20.91	20.50
			50	0	21.50	20.65	21.06	20.60

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20775/2502.5	21100/2535	21425/2567.5
LTE Band 7	5MHz	QPSK	1	0	26.00	25.51	25.16	24.52
			1	12	26.00	25.66	25.23	24.59
			1	24	26.00	25.51	25.05	24.41
			12	0	25.00	24.62	24.22	23.57
			12	6	25.00	24.69	24.24	23.56
			12	11	25.00	24.64	24.14	23.47
			25	0	25.00	24.63	24.20	23.54
		16QAM	1	0	25.00	24.83	24.52	23.85
			1	12	25.00	24.86	24.49	23.88
			1	24	25.00	24.74	24.32	23.72
			12	0	24.00	23.63	23.26	22.59
			12	6	24.00	23.69	23.27	22.59
			12	11	24.00	23.62	23.15	22.50
			25	0	24.00	23.66	23.26	22.58
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20800/2505	21100/2535	21400/2565
LTE Band 7	10MHz	QPSK	1	0	26.00	25.59	25.32	24.76
			1	24	26.00	25.65	25.24	24.64
			1	49	26.00	25.52	25.08	24.50
			25	0	25.00	24.62	24.31	23.71
			25	12	25.00	24.66	24.24	23.61
			25	24	25.00	24.63	24.14	23.51
			50	0	25.00	24.65	24.28	23.65
		16QAM	1	0	25.00	24.88	24.64	24.02

			1	24	25.00	24.92	24.50	23.94
			1	49	25.00	24.65	24.34	23.81
			25	0	24.00	23.63	23.34	22.74
			25	12	24.00	23.69	23.27	22.66
			25	24	24.00	23.65	23.18	22.56
			50	0	24.00	23.64	23.26	22.67
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5
LTE Band 7	15MHz	QPSK	1	0	26.00	25.54	25.25	24.79
			1	37	26.00	25.62	25.27	24.70
			1	74	26.00	25.30	25.02	24.42
			36	0	25.00	24.60	24.26	23.71
			36	18	25.00	24.58	24.22	23.70
			36	37	25.00	24.49	24.09	23.51
			75	0	25.00	24.57	24.18	23.66
		16QAM	1	0	25.00	24.80	24.60	24.02
			1	37	25.00	24.78	24.42	23.91
			1	74	25.00	24.67	24.28	23.74
			36	0	24.00	23.59	23.31	22.74
			36	18	24.00	23.59	23.26	22.74
			36	37	24.00	23.51	23.12	22.52
			75	0	24.00	23.57	23.21	22.65
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20850/2510	21100/2535	21350/2560
LTE Band 7	20MHz	QPSK	1	0	26.00	25.43	25.20	24.82
			1	49	26.00	25.52	25.25	24.79
			1	99	26.00	25.12	24.88	24.33
			50	0	25.00	24.51	24.32	23.82
			50	24	25.00	24.55	24.31	23.83
			50	49	25.00	24.40	24.06	23.57
			100	0	24.50	24.45	24.23	23.67
		16QAM	1	0	25.00	24.73	24.37	24.11
			1	49	25.00	24.80	24.47	24.00
			1	99	25.00	24.40	24.18	23.61
			50	0	24.00	23.51	23.33	22.82
			50	24	24.00	23.55	23.29	22.83

			50	49	24.00	23.41	23.07	22.59
			100	0	23.50	23.44	23.20	22.65

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23017/699.7	23095/707.5	23173/715.3
LTE Band 12	1.4MHz	QPSK	1	0	23.50	23.36	23.23	23.09
			1	2	23.50	23.41	23.27	23.20
			1	5	23.50	23.37	23.19	23.10
			3	0	24.00	23.43	23.36	23.19
			3	1	24.00	23.50	23.33	23.21
			3	2	24.00	23.48	23.32	23.20
			6	0	23.00	22.53	22.43	22.31
		16QAM	1	0	23.00	22.54	22.52	22.36
			1	2	23.00	22.74	22.55	22.48
			1	5	23.00	22.57	22.45	22.32
			3	0	22.50	22.46	22.39	22.15
			3	1	22.50	22.38	22.36	22.18
			3	2	22.50	22.43	22.33	22.24
			6	0	22.00	21.70	21.60	21.45
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23025/700.5	23095/707.5	23165/714.5
LTE Band 12	3MHz	QPSK	1	0	23.50	23.17	23.19	22.98
			1	7	23.50	23.27	23.18	23.06
			1	14	23.50	23.20	23.11	23.00
			8	0	22.50	22.43	22.34	22.23
			8	4	22.50	22.46	22.40	22.27
			8	7	22.50	22.41	22.39	22.20
			15	0	22.50	22.41	22.36	22.23
		16QAM	1	0	23.00	22.49	22.41	22.26
			1	7	23.00	22.46	22.54	22.39
			1	14	23.00	22.42	22.38	22.16
			8	0	22.00	21.59	21.47	21.36
			8	4	22.00	21.61	21.56	21.38
			8	7	22.00	21.55	21.50	21.33
			15	0	21.50	21.48	21.45	21.31
Band	Band	Modulation	RB		Tune-up	Channel/Frequency(MHz)		

	Width		Configuration		(dBm)			
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5
LTE Band 12	5MHz	QPSK	1	0	24.00	23.45	23.41	23.28
			1	12	24.00	23.54	23.47	23.35
			1	24	24.00	23.38	23.32	23.21
			12	0	23.00	22.54	22.37	22.49
			12	6	23.00	22.51	22.46	22.35
			12	11	23.00	22.35	22.54	22.22
			25	0	22.50	22.47	22.47	22.35
		16QAM	1	0	23.00	22.71	22.63	22.48
			1	12	23.00	22.72	22.70	22.58
			1	24	23.00	22.67	22.60	22.47
			12	0	22.00	21.62	21.42	21.53
			12	6	22.00	21.58	21.56	21.43
			12	11	22.00	21.43	21.63	21.28
			25	0	22.00	21.56	21.57	21.45
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23060/704	23095/707.5	23130/711
LTE Band 12	10MHz	QPSK	1	0	24.00	23.56	23.53	23.48
			1	24	24.00	23.51	23.49	23.42
			1	49	24.00	23.40	23.34	23.29
			25	0	23.00	22.72	22.42	22.19
			25	12	23.00	22.54	22.49	22.36
			25	24	23.00	22.49	22.45	22.02
			50	0	23.00	22.65	22.50	22.14
		16QAM	1	0	23.00	22.82	22.67	22.77
			1	24	23.00	22.82	22.72	22.71
			1	49	23.00	22.60	22.68	22.54
			25	0	22.00	21.81	21.53	21.31
			25	12	22.00	21.64	21.61	21.47
			25	24	22.00	21.60	21.58	21.10
			50	0	22.00	21.75	21.54	21.21
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	24.00	23.50	23.46	23.36
			1	12	24.00	23.60	23.54	23.47
			1	24	24.00	23.43	23.33	23.33
			12	0	23.00	22.48	22.32	22.58
			12	6	23.00	22.58	22.48	22.45
			12	11	23.00	22.56	22.33	22.32
			25	0	23.00	22.54	22.33	22.46
		16QAM	1	0	23.00	22.72	22.73	22.56
			1	12	23.00	22.93	22.75	22.74
			1	24	23.00	22.68	22.66	22.67
			12	0	22.00	21.56	21.35	21.65
			12	6	22.00	21.65	21.59	21.52
			12	11	22.00	21.63	21.41	21.35
			25	0	22.00	21.62	21.45	21.54
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	24.00	23.62	23.57	23.55
			1	24	24.00	23.57	23.54	23.50
			1	49	24.00	23.40	23.40	23.40
			25	0	23.00	22.38	22.28	22.27
			25	12	23.00	22.50	22.46	22.42
			25	24	23.00	22.25	22.17	22.11
			50	0	22.50	22.34	22.25	22.21
		16QAM	1	0	23.00	22.83	22.75	22.87
			1	24	23.00	22.90	22.87	22.78
			1	49	23.00	22.67	22.64	22.70
			25	0	22.00	21.48	21.39	21.39
			25	12	22.00	21.60	21.57	21.53
			25	24	22.00	21.36	21.26	21.25
			50	0	21.50	21.42	21.32	21.29

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	1.4MHz	QPSK	1	0	25.00	23.87	24.38	24.40
			1	2	25.00	23.96	24.45	24.50

d 66				1	5	25.00	23.85	24.36	24.41
				3	0	25.00	23.97	24.46	24.49
				3	1	25.00	24.00	24.48	24.51
				3	2	25.00	23.98	24.45	24.51
				6	0	24.00	23.06	23.55	23.61
			16QAM	1	0	24.00	23.20	23.62	23.62
				1	2	24.00	23.34	23.70	23.72
				1	5	24.00	23.09	23.58	23.66
				3	0	24.00	23.03	23.51	23.55
				3	1	24.00	23.05	23.56	23.50
				3	2	24.00	23.02	23.46	23.50
				6	0	23.00	22.20	22.65	22.74
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	24.50	23.75	24.24	24.25	
			1	7	24.50	23.85	24.30	24.33	
			1	14	24.50	23.77	24.26	24.18	
			8	0	24.00	22.96	23.46	23.43	
			8	4	24.00	23.03	23.54	23.47	
			8	7	24.00	22.98	23.48	23.43	
			15	0	23.50	22.97	23.46	23.43	
		16QAM	1	0	24.00	23.01	23.55	23.54	
			1	7	24.00	23.06	23.71	23.61	
			1	14	24.00	23.14	23.56	23.47	
			8	0	23.00	22.06	22.55	22.51	
			8	4	23.00	22.10	22.61	22.56	
			8	7	23.00	22.07	22.52	22.50	
			15	0	22.50	21.99	22.48	22.44	
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	25.00	23.97	24.49	24.49	
			1	12	25.00	24.12	24.63	24.58	
			1	24	25.00	24.04	24.52	24.43	
			12	0	24.00	23.04	23.52	23.58	

				12	6	24.00	23.12	23.61	23.59
				12	11	24.00	23.05	23.51	23.51
				25	0	24.00	23.06	23.52	23.55
			16QAM	1	0	24.00	23.32	23.82	23.80
				1	12	24.00	23.47	23.99	23.93
				1	24	24.00	23.31	23.81	23.71
				12	0	23.00	22.07	22.55	22.58
				12	6	23.00	22.11	22.60	22.62
				12	11	23.00	22.06	22.55	22.51
				25	0	23.00	22.09	22.57	22.60
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	25.00	24.05	24.50	24.68	
			1	24	25.00	24.18	24.64	24.64	
			1	49	25.00	24.30	24.61	24.52	
			25	0	24.00	23.09	23.48	23.72	
			25	12	24.00	23.18	23.61	23.63	
			25	24	24.00	23.15	23.51	23.51	
			50	0	24.00	23.17	23.50	23.64	
		16QAM	1	0	24.50	23.30	23.72	24.01	
			1	24	24.50	23.53	23.95	23.96	
			1	49	24.50	23.66	23.98	23.88	
			25	0	23.00	22.14	22.51	22.76	
			25	12	23.00	22.20	22.65	22.65	
			25	24	23.00	22.21	22.56	22.56	
			50	0	23.00	22.19	22.51	22.66	
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	25.00	24.01	24.46	24.62	
			1	37	25.00	24.28	24.64	24.67	
			1	74	25.00	24.42	24.57	24.51	
			36	0	24.00	23.16	23.49	23.73	
			36	18	24.00	23.23	23.57	23.68	
			36	37	24.00	23.33	23.54	23.53	

			75	0	24.00	23.25	23.55	23.67
		16QAM	1	0	24.50	23.36	23.70	23.91
			1	37	24.50	23.62	23.92	24.04
			1	74	24.50	23.68	23.89	23.78
			36	0	23.00	22.17	22.52	22.74
			36	18	23.00	22.26	22.61	22.70
			36	37	23.00	22.33	22.59	22.54
			75	0	23.00	22.28	22.56	22.68
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	25.00	23.92	24.36	24.59
			1	49	25.00	24.35	24.64	24.72
			1	99	25.00	24.44	24.52	24.42
			50	0	24.00	23.27	23.50	23.62
			50	24	24.00	23.36	23.60	23.75
			50	49	24.00	23.56	23.53	23.48
			100	0	24.00	23.39	23.50	23.56
		16QAM	1	0	24.50	23.20	23.74	23.83
			1	49	24.50	23.66	23.98	24.01
			1	99	24.50	23.80	23.82	23.76
			50	0	23.00	22.29	22.53	22.62
			50	24	23.00	22.37	22.60	22.76
			50	49	23.00	22.55	22.56	22.50
			100	0	23.00	22.40	22.50	22.56

7.4. WLAN & Bluetooth Output Power

7.4.1. Output Power Results Of WLAN

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11b	1	2412	16.50	15.33
	6	2437	16.50	16.14
	11	2462	16.50	15.88
802.11g	1	2412	15.00	13.71
	6	2437	15.00	14.61
	11	2462	15.00	14.41

802.11n HT20	1	2412	14.50	13.62
	6	2437	14.50	14.48
	11	2462	14.50	14.33
802.11n HT40	3	2422	15.00	14.19
	6	2437	15.00	14.74
	9	2452	15.00	14.50

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	36	5180	15.00	14.40
	40	5200	15.00	14.52
	48	5240	15.00	14.93
802.11n HT20	36	5180	15.00	14.35
	40	5200	15.00	14.39
	48	5240	15.00	14.88
802.11n HT40	38	5190	14.50	14.35
	46	5230	14.50	14.08
802.11ac VHT20	36	5180	14.50	14.43
	40	5200	14.50	14.12
	48	5240	14.50	14.42
802.11ac VHT40	38	5190	15.00	14.36
	46	5230	15.00	14.83
802.11ac VHT80	42	5210	12.00	11.59

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	149	5745	15.50	14.72
	157	5785	15.50	15.35
	165	5825	15.50	15.48
802.11n HT20	149	5745	15.50	14.55
	157	5785	15.50	15.22
	165	5825	15.50	15.29
802.11n HT40	151	5755	15.50	15.32
	159	5795	15.50	15.32
802.11ac VHT20	149	5745	15.50	14.59
	157	5785	15.50	15.23
	165	5825	15.50	15.44
802.11ac VHT40	151	5755	15.50	14.90

	159	5795	15.50	15.35
802.11ac VHT80	155	5775	15.00	14.80

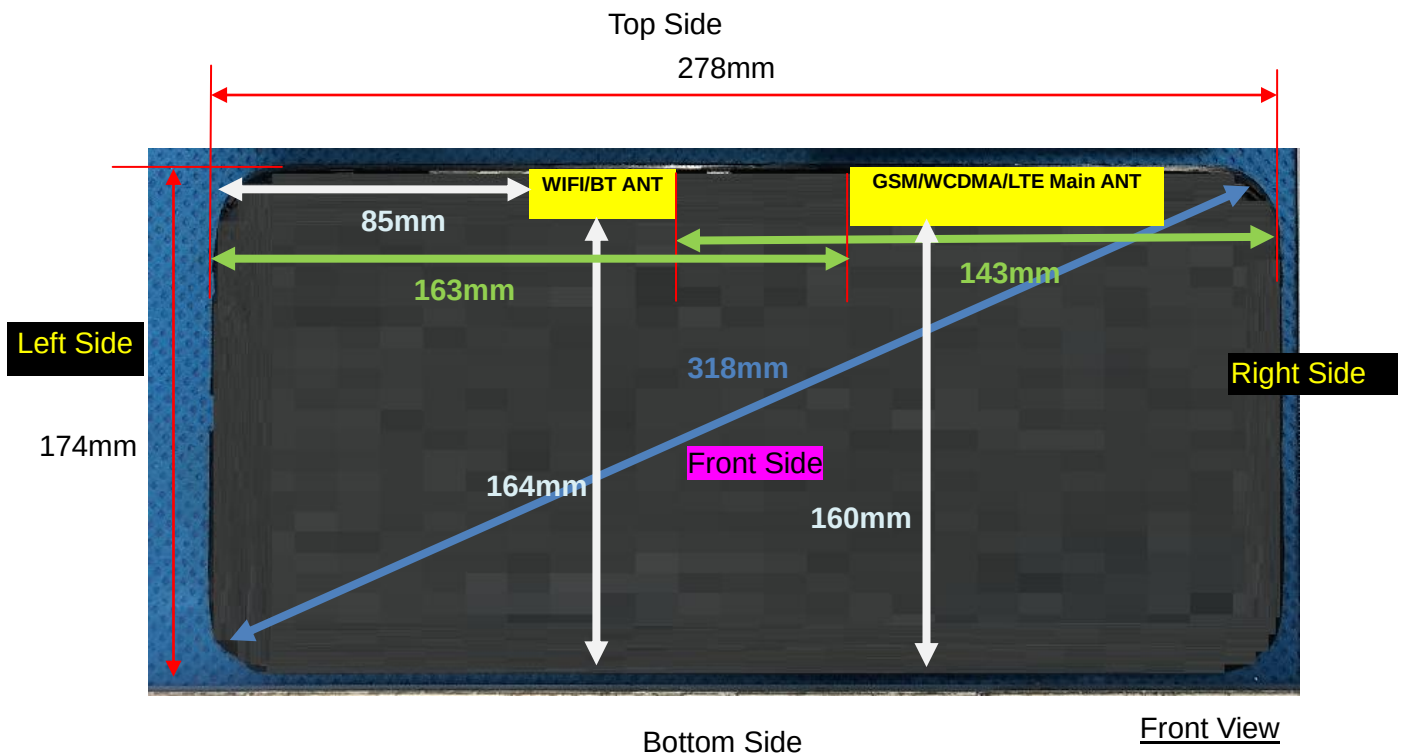
NOTE: Power measurement results of WLAN 5.8G.

7.4.2. Output Power Results Of Bluetooth

BR+EDR	Output Power (dBm)				
	Data Rates	Tune-up (dBm)	Channel		
			0CH	39CH	78CH
	1M	6.00	5.17	4.73	4.59
	2M	7.00	6.19	5.94	6.05
	3M	7.00	6.42	6.22	6.31

BLE	Channel	Tune-up (dBm)	Output Power (dBm)
			1M
	0CH	4.00	3.28
	19CH	6.00	5.11
	39CH	4.00	3.83

8. Antenna Location



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

Distance of the Antenna to the EUT surface/edge						
Antennas	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
WLAN/BT	5	5	85	143	5	164
WWAN	5	5	163	5	5	160

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

Positions for SAR tests		
Test separation distances $\leq$ 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	16.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.02
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.02
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.02
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	

	15.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.48
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.48
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	14.48
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	15.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	17.13
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	17.13
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	17.13
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 850	
	34.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	462.90
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	462.90
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	462.90
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	462.90
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 1900	
	32.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	438.07
	SAR testing required?	YES

Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	438.07
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	438.07
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	438.07
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 2	
	24.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	77.86
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	77.86
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	77.86
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	77.86
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 5	
	23.50dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.21
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.21
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.21
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	41.21
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 2	
	25.00dBm	
Front Side	Antenna to user(mm)	5

	SAR exclusion threshold	87.18
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	87.18
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	87.18
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	87.18
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 4	
	25.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	83.55
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	83.55
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	83.55
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	83.55
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 5	
	23.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.66
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.66
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.66
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	36.66
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 7	

	26.00 dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	127.39
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	127.39
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	127.39
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	127.39
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 12	
	24.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 17	
	24.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	42.36

	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of LTE Band 66	
	25.00dBm	
Front Side	Antenna to user(mm)	5
	SAR exclusion threshold	84.14
	SAR testing required?	YES
Back Side	Antenna to user(mm)	5
	SAR exclusion threshold	84.14
	SAR testing required?	YES
Right Side	Antenna to user(mm)	5
	SAR exclusion threshold	84.14
	SAR testing required?	YES
Top Side	Antenna to user(mm)	5
	SAR exclusion threshold	84.14
	SAR testing required?	YES

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

Positions for SAR tests		
Test separation distances > 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	16.50 dBm	44.67 mW
Left Side	Antenna to user(mm)	85
	SAR exclusion threshold(mW)	446
	SAR testing required?	NO
Right Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	1026
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	164
	SAR exclusion threshold(mW)	1236
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	
	15.00 dBm	31.62 mW
Left Side	Antenna to user(mm)	85
	SAR exclusion threshold(mW)	416
	SAR testing required?	NO
Right Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	996
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	164
	SAR exclusion threshold(mW)	1206

	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	15.50 dBm	35.48 mW
Left Side	Antenna to user(mm)	85
	SAR exclusion threshold(mW)	412
	SAR testing required?	NO
Right Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	992
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	164
	SAR exclusion threshold(mW)	1202
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of GSM 850	
	34.00 dBm	2511.89 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	793
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	776
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 1900	
	32.00 dBm	1584.89 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1239
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1209
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of WCDMA Band 2	
	24.50 dBm	281.84 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1239
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1209
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 5	
	23.50 dBm	223.87 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	793
	SAR testing required?	NO

Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	776
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 2	
	25.00 dBm	316.23 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1239
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1209
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 4	
	25.00 dBm	316.23 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1239
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1209
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 5	
	23.00 dBm	199.53 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	793
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	776
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 7	
	26.00 dBm	398.11 mV
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1226
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1196
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 12	
	24.00 dBm	251.19 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	700
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160

	SAR exclusion threshold(mW)	685
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 17	
	24.00 dBm	251.19 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	700
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	685
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 66	
	25.00 dBm	316.23 mW
Left Side	Antenna to user(mm)	163
	SAR exclusion threshold(mW)	1239
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	160
	SAR exclusion threshold(mW)	1209
	SAR testing required?	NO

NOTE: Refer to section 4.3.1 of KDB 447498 D01.

9. Stand-alone SAR test exclusion

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

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}] \leq 3.0$ 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	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
Bluetooth	7.00	5.01	5	2.480	1.6	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:

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

SAR.

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

Mode	Position	P _{max} (dBm)	P _{max} (mW)	Distance (mm)	f (GHz)	x	Estimated SAR (W/Kg)
Bluetooth	Body	7.00	5.01	5	2.48	7.5	0.210
Bluetooth	Hotspot	7.00	5.01	5	2.48	7.5	0.210

NOTE: Estimated SAR calculation for Bluetooth

10. SAR Results

10.1. SAR measurement results

10.1.1. SAR measurement Result of GSM850

Test Position of Body-Worn with 0mm	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)	0.150	0.077	2.84	33.82	34.00	0.156	2023/9/04	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.246	0.131	0.78	33.82	34.00	0.256	2023/9/04	1#

NOTE: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	189/836.4	GPRS(GMSK 2TS)	0.150	0.077	2.84	33.82	34.00	0.156	2023/9/04	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.246	0.131	0.78	33.82	34.00	0.256	2023/9/04	1#
Left Side	189/836.4	GPRS(GMSK 2TS)	0.084	0.043	-3.26	33.82	34.00	0.088	2023/9/04	
Right Side	189/836.4	GPRS(GMSK 2TS)	0.078	0.040	0.10	33.82	34.00	0.081	2023/9/04	
Top Side	189/836.4	GPRS(GMSK 2TS)	0.120	0.067	1.07	33.82	34.00	0.125	2023/9/04	
Bottom	189/836.4	GPRS(GMSK 2TS)	0.140	0.071	-3.10	33.82	34.00	0.146	2023/9/04	

Side		2TS)								
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NOTE: Hotspot SAR test results of GSM850

10.1.2. SAR measurement Result of GSM1900

Test Position of Body-Worn with 0mm	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 2TS)	0.258	0.116	-0.12	31.87	32.00	0.266	2023/9/14	
Back Side	661/1880	GPRS(GMSK 2TS)	0.392	0.183	-3.39	31.87	32.00	0.404	2023/9/14	2#

NOTE: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	661/1880	GPRS(GMSK 2TS)	0.258	0.116	-0.12	31.87	32.00	0.266	2023/9/14	
Back Side	661/1880	GPRS(GMSK 2TS)	0.392	0.183	-3.39	31.87	32.00	0.404	2023/9/14	2#
Left Side	661/1880	GPRS(GMSK 2TS)	0.123	0.057	-0.16	31.87	32.00	0.127	2023/9/14	
Right Side	661/1880	GPRS(GMSK 2TS)	0.120	0.056	0.49	31.87	32.00	0.124	2023/9/14	
Top Side	661/1880	GPRS(GMSK 2TS)	0.230	0.107	1.28	31.87	32.00	0.237	2023/9/14	
Bottom Side	661/1880	GPRS(GMSK 2TS)	0.205	0.091	-1.66	31.87	32.00	0.211	2023/9/14	

NOTE: Hotspot SAR test results of GSM1900

10.1.3. SAR measurement Result of WCDMA Band 2

Test Position of Body-Worn with 0mm	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	0.234	0.105	2.68	24.27	24.50	0.247	2023/9/14	
Back Side	9400/1880	RMC12.2K	0.383	0.177	-2.60	24.27	24.50	0.404	2023/9/14	3#

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	9400/1880	RMC12.2K	0.234	0.105	2.68	24.27	24.50	0.247	2023/9/14	
Back Side	9400/1880	RMC12.2K	0.383	0.177	-2.60	24.27	24.50	0.404	2023/9/14	3#
Right Side	9400/1880	RMC12.2K	0.126	0.057	1.20	24.27	24.50	0.133	2023/9/14	
Top Side	9400/1880	RMC12.2K	0.215	0.098	1.37	24.27	24.50	0.227	2023/9/14	

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA Band 5

Test Position of Body-Worn with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (±5%)	Conducted power (dBm)	Tune-up power (dBm)	Scaled SAR 1g (W/Kg)	Date	Plot
			1g	10g						
Front Side	4182/836.4	RMC12.2K	0.168	0.090	-3.18	23.36	23.50	0.174	2023/9/04	
Back Side	4182/836.4	RMC12.2K	0.238	0.130	-2.94	23.36	23.50	0.246	2023/9/04	5#

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	4182/836.4	RMC12.2K	0.168	0.090	-3.18	23.36	23.50	0.174	2023/9/04	
Back Side	4182/836.4	RMC12.2K	0.238	0.130	-2.94	23.36	23.50	0.246	2023/9/04	5#
Right Side	4182/836.4	RMC12.2K	0.075	0.041	-3.73	23.36	23.50	0.077	2023/9/04	

Top Side	4182/836.4	RMC12.2K	0.140	0.073	1.77	23.36	23.50	0.145	2023/9/04	
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NOTE: Hotspot SAR test results of WCDMA Band 5

10.1.5. SAR measurement Result of LTE Band 2

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
1RB										
Front Side	18900/1880	20M QPSK(1,49)	0.312	0.143	3.00	24.47	25.00	0.352	2023/9/14	
Back Side	18900/1880	20M QPSK(1,49)	0.490	0.225	-0.86	24.47	25.00	0.554	2023/9/14	8#
50%RB										
Front Side	18900/1880	20M QPSK(50,49)	0.160	0.085	3.54	23.28	24.00	0.189	2023/9/14	
Back Side	18900/1880	20M QPSK(50,49)	0.266	0.130	2.34	23.28	24.00	0.314	2023/9/14	

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	18900/1880	20M QPSK(1,49)	0.312	0.143	3.00	24.47	25.00	0.352	2023/9/14	
Back Side	18900/1880	20M QPSK(1,49)	0.490	0.225	-0.86	24.47	25.00	0.554	2023/9/14	8#
Right Side	18900/1880	20M QPSK(1,49)	0.156	0.068	0.21	24.47	25.00	0.176	2023/9/14	
Top Side	18900/1880	20M QPSK(1,49)	0.270	0.118	0.95	24.47	25.00	0.305	2023/9/14	
50%RB										
Front Side	18900/1880	20M QPSK(50,49)	0.160	0.085	3.54	23.28	24.00	0.189	2023/9/14	
Back Side	18900/1880	20M QPSK(50,49)	0.266	0.130	2.34	23.28	24.00	0.314	2023/9/14	

Right Side	18900/1880	20M QPSK(50,49)	0.083	0.035	2.62	23.28	24.00	0.098	2023/9/14	
Top Side	18900/1880	20M QPSK(50,49)	0.158	0.063	1.11	23.28	24.00	0.186	2023/9/14	

NOTE: Hotspot SAR test results of LTE Band 2

10.1.6. SAR measurement Result of LTE Band 4

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,49)	0.240	0.112	2.18	24.70	25.00	0.257	2023/9/07	
Back Side	20175/1732.5	20M QPSK(1,49)	0.377	0.181	-2.90	24.70	25.00	0.404	2023/9/07	9#
50%RB										
Front Side	20175/1732.5	20M QPSK(50,49)	0.135	0.064	-3.74	23.70	24.00	0.145	2023/9/07	
Back Side	20175/1732.5	20M QPSK(50,49)	0.221	0.099	0.31	23.70	24.00	0.237	2023/9/07	

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,49)	0.240	0.112	2.18	24.70	25.00	0.257	2023/9/07	
Back Side	20175/1732.5	20M QPSK(1,49)	0.377	0.181	-2.90	24.70	25.00	0.404	2023/9/07	9#
Right Side	20175/1732.5	20M QPSK(1,49)	0.120	0.057	1.20	24.70	25.00	0.129	2023/9/07	
Top Side	20175/1732.5	20M QPSK(1,49)	0.195	0.089	-1.20	24.70	25.00	0.209	2023/9/07	
50%RB										
Front Side	20175/1732.5	20M QPSK(50,49)	0.135	0.064	-3.74	23.70	24.00	0.145	2023/9/07	

Back Side	20175/1732.5	20M QPSK(50,49)	0.221	0.099	0.31	23.70	24.00	0.237	2023/9/07	
Right Side	20175/1732.5	20M QPSK(50,49)	0.064	0.029	0.33	23.70	24.00	0.069	2023/9/07	
Top Side	20175/1732.5	20M QPSK(50,49)	0.116	0.053	-2.94	23.70	24.00	0.124	2023/9/07	

NOTE: Hotspot SAR test results of LTE Band 4

10.1.7. SAR measurement Result of LTE Band 5

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
1RB										
Front Side	20525/836.5	10M QPSK(1,24)	0.138	0.074	3.24	22.91	23.00	0.141	2023/9/04	
Back Side	20525/836.5	10M QPSK(1,24)	0.224	0.121	-0.89	22.91	23.00	0.229	2023/9/04	10#
50%RB										
Front Side	20525/836.5	10M QPSK(25,0)	0.075	0.041	3.96	22.04	22.50	0.083	2023/9/04	
Back Side	20525/836.5	10M QPSK(25,0)	0.112	0.067	0.14	22.04	22.50	0.125	2023/9/04	

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	20525/836.5	10M QPSK(1,24)	0.138	0.074	3.24	22.91	23.00	0.141	2023/9/04	
Back Side	20525/836.5	10M QPSK(1,24)	0.224	0.121	-0.89	22.91	23.00	0.229	2023/9/04	10#
Right Side	20525/836.5	10M QPSK(1,24)	0.075	0.040	-0.33	22.91	23.00	0.077	2023/9/04	
Top Side	20525/836.5	10M QPSK(1,24)	0.120	0.063	-3.20	22.91	23.00	0.123	2023/9/04	
50%RB										

Front Side	20525/836.5	10M QPSK(25,0)	0.075	0.041	3.96	22.04	22.50	0.083	2023/9/04	
Back Side	20525/836.5	10M QPSK(25,0)	0.112	0.067	0.14	22.04	22.50	0.125	2023/9/04	
Right Side	20525/836.5	10M QPSK(25,0)	0.040	0.022	-3.85	22.04	22.50	0.044	2023/9/04	
Top Side	20525/836.5	10M QPSK(25,0)	0.063	0.037	0.13	22.04	22.50	0.070	2023/9/04	

NOTE: Hotspot SAR test results of LTE Band 5

10.1.8. SAR measurement Result of LTE Band 7

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
1RB										
Front Side	21100/2535	20M QPSK(1,49)	0.276	0.121	-1.26	25.25	26.00	0.328	2023/9/01	
Back Side	21100/2535	20M QPSK(1,49)	0.426	0.196	-0.95	25.25	26.00	0.506	2023/9/01	11#
50%RB										
Front Side	21100/2535	20M QPSK(50,24)	0.165	0.065	4.27	24.31	25.00	0.193	2023/9/01	
Back Side	21100/2535	20M QPSK(50,24)	0.247	0.106	2.09	24.31	25.00	0.290	2023/9/01	

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	21100/2535	20M QPSK(1,49)	0.276	0.121	-1.26	25.25	26.00	0.328	2023/9/01	
Back Side	21100/2535	20M QPSK(1,49)	0.426	0.196	-0.95	25.25	26.00	0.506	2023/9/01	11#
Right Side	21100/2535	20M QPSK(1,49)	0.145	0.064	-2.26	25.25	26.00	0.172	2023/9/01	

Top Side	21100/2535	20M QPSK(1,49)	0.235	0.105	-2.46	25.25	26.00	0.279	2023/9/01	
50%RB										
Front Side	21100/2535	20M QPSK(50,24)	0.165	0.065	4.27	24.31	25.00	0.193	2023/9/01	
Back Side	21100/2535	20M QPSK(50,24)	0.247	0.106	2.09	24.31	25.00	0.290	2023/9/01	
Right Side	21100/2535	20M QPSK(50,24)	0.084	0.033	-0.37	24.31	25.00	0.098	2023/9/01	
Top Side	21100/2535	20M QPSK(50,24)	0.131	0.055	-1.47	24.31	25.00	0.154	2023/9/01	

NOTE: Hotspot SAR test results of LTE Band 7

10.1.9. SAR measurement Result of LTE Band 12

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
1RB										
Front Side	23095/707.5	10M QPSK(1,0)	0.132	0.068	3.59	23.53	24.00	0.147	2023/9/05	
Back Side	23095/707.5	10M QPSK(1,0)	0.182	0.096	1.39	23.53	24.00	0.203	2023/9/05	12#
50%RB										
Front Side	23095/707.5	10M QPSK(25,0)	0.074	0.036	-4.95	22.42	23.00	0.085	2023/9/05	
Back Side	23095/707.5	10M QPSK(25,0)	0.092	0.053	-0.85	22.42	23.00	0.105	2023/9/05	

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

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										
Front Side	23095/707.5	10M QPSK(1,0)	0.132	0.068	3.59	23.53	24.00	0.147	2023/9/05	
Back	23095/707.5	10M	0.182	0.096	1.39	23.53	24.00	0.203	2023/9/05	12#

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
1RB										

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

with 0mm										
1RB										
Front Side	132322/1745	20M QPSK(1,49)	0.300	0.136	3.68	24.64	25.00	0.326	2023/9/07	
Back Side	132322/1745	20M QPSK(1,49)	0.500	0.238	-3.40	24.64	25.00	0.543	2023/9/07	14#
Right Side	132322/1745	20M QPSK(1,49)	0.162	0.076	3.91	24.64	25.00	0.176	2023/9/07	
Top Side	132322/1745	20M QPSK(1,49)	0.270	0.129	-0.99	24.64	25.00	0.293	2023/9/07	
50%RB										
Front Side	132322/1745	20M QPSK(50,24)	0.153	0.078	1.18	23.60	24.00	0.168	2023/9/07	
Back Side	132322/1745	20M QPSK(50,24)	0.251	0.143	1.13	23.60	24.00	0.275	2023/9/07	
Right Side	132322/1745	20M QPSK(50,24)	0.097	0.042	-2.47	23.60	24.00	0.106	2023/9/07	
Top Side	132322/1745	20M QPSK(50,24)	0.140	0.076	4.86	23.60	24.00	0.154	2023/9/07	

NOTE: Hotspot SAR test results of LTE Band 66

10.1.12. SAR measurement Result of WLAN 2.4G

Test Position of Body-Worn with 0mm	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
			1-g	10-g						
Front Side	6/2437	802.11b	0.378	0.146	-2.68	16.14	16.50	0.411	2023/8/31	
Back Side	6/2437	802.11b	0.589	0.234	3.05	16.14	16.50	0.640	2023/8/31	5#

NOTE: Body-Worn SAR test results of WLAN 2.4G

Test Position of Hotspot with 0mm	Test channel /Freq.	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	6/2437	802.11b	0.378	0.146	-2.68	16.14	16.50	0.411	2023/8/31	
Back Side	6/2437	802.11b	0.589	0.234	3.05	16.14	16.50	0.640	2023/8/31	5#
Top Side	6/2437	802.11b	0.186	0.074	-2.61	16.14	16.50	0.202	2023/8/31	

NOTE: Hotspot SAR test results of WLAN 2.4G

10.1.13. SAR measurement Result of WLAN 5.2G

Test Position of Body-Worn with 0mm	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	48/5240	802.11a	0.228	0.065	-3.12	14.93	15.00	0.232	2023/9/12	
Back Side	48/5240	802.11a	0.334	0.096	-4.26	14.93	15.00	0.339	2023/9/12	6#

NOTE: Body-Worn SAR test results of WLAN 5.2G

Test Position of Hotspot with 0mm	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	48/5240	802.11a	0.228	0.065	-3.12	14.93	15.00	0.232	2023/9/12	
Back Side	48/5240	802.11a	0.334	0.096	-4.26	14.93	15.00	0.339	2023/9/12	6#
Top Side	48/5240	802.11a	0.108	0.030	3.06	14.93	15.00	0.110	2023/9/12	

NOTE: Hotspot SAR test results of WLAN 5.2G

10.1.14. SAR measurement Result of WLAN 5.8G

Test Position of Body-Worn with 0mm	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	165/5825	802.11a	0.102	0.030	-0.67	15.48	15.50	0.102	2023/9/20	
Back Side	165/5825	802.11a	0.169	0.050	0.08	15.48	15.50	0.170	2023/9/20	7#

NOTE: Body-Worn SAR test results of WLAN 5.8G

Test Position of Hotspot with 0mm	Test channel /Freq	Mode	SAR Value (W/kg)		Power Drift(%)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR 1-g (W/Kg)	Date	Plot
			1-g	10-g						
Front Side	165/5825	802.11a	0.102	0.030	-0.67	15.48	15.50	0.102	2023/9/20	
Back Side	165/5825	802.11a	0.169	0.050	0.08	15.48	15.50	0.170	2023/9/20	7#

Top Side	165/5825	802.11a	0.051	0.015	0.96	15.48	15.50	0.051	2023/9/20	
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NOTE: Hotspot SAR test results of WLAN 5.8G

10.2. SAR Summation Scenario

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

- 1) Scalar SAR summation $< 1.6\text{W/kg}$.
- 2) $\text{SPLSR} = (\text{SAR}_1 + \text{SAR}_2)^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan. If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.

Test Position		Scaled SARMAX		$\Sigma 1\text{-g SAR}$ (W/Kg)	SPLSR	Remark
		WWAN	DTS			
Body-Worn	Front Side	0.352	0.411	0.763	N/A	N/A
	Back Side	0.554	0.640	1.194	N/A	N/A
Hotspot	Front Side	0.352	0.411	0.763	N/A	N/A
	Back Side	0.554	0.640	1.194	N/A	N/A
	Left Side	0.127	N/A	0.127	N/A	N/A
	Right Side	0.176	N/A	0.176	N/A	N/A
	Top Side	0.305	0.202	0.507	N/A	N/A
	Bottom Side	0.211	N/A	0.211	N/A	N/A

Test Position		Scaled SARMAX		$\Sigma 1\text{-g SAR}$ (W/Kg)	SPLSR	Remark
		WWAN	NII			
Body-Worn	Front Side	0.352	0.232	0.584	N/A	N/A
	Back Side	0.554	0.339	0.893	N/A	N/A
Hotspot	Front Side	0.352	0.232	0.584	N/A	N/A
	Back Side	0.554	0.339	0.893	N/A	N/A
	Left Side	0.127	N/A	0.127	N/A	N/A
	Right Side	0.176	N/A	0.176	N/A	N/A
	Top Side	0.305	0.110	0.415	N/A	N/A
	Bottom Side	0.211	N/A	0.211	N/A	N/A

Test Position		Scaled SARMAX		$\Sigma 1\text{-g SAR}$ (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Body-Worn	Front Side	0.352	0.210	0.562	N/A	N/A
	Back Side	0.554	0.210	0.764	N/A	N/A

Hotspot	Front Side	0.352	0.210	0.562	N/A	N/A
	Back Side	0.554	0.210	0.764	N/A	N/A
	Left Side	0.127	N/A	0.127	N/A	N/A
	Right Side	0.176	N/A	0.176	N/A	N/A
	Top Side	0.305	0.210	0.515	N/A	N/A
	Bottom Side	0.211	N/A	0.211	N/A	N/A

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

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

MEASUREMENT 1

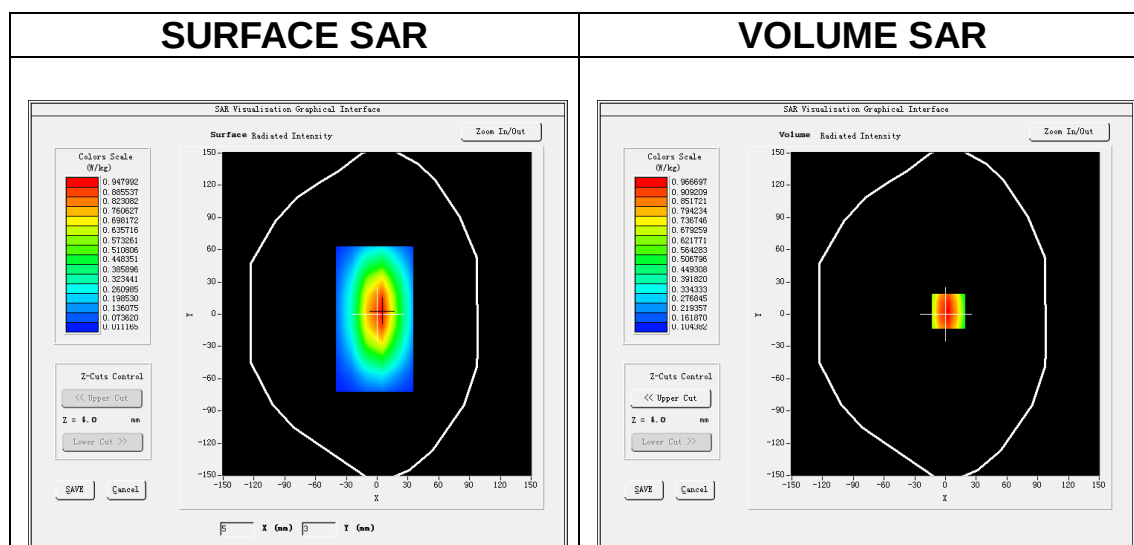
Date of measurement: 5/9/2023

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW750</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

B. SAR Measurement Results

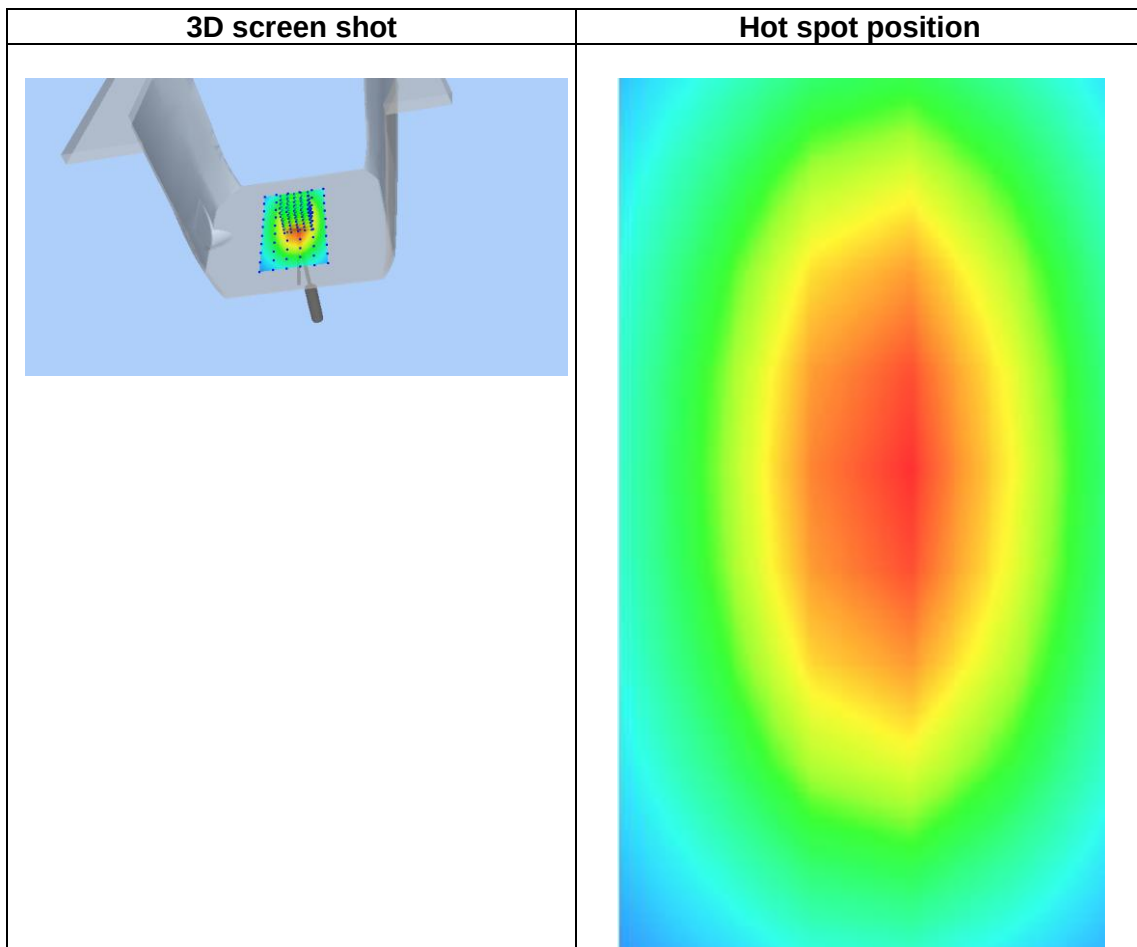
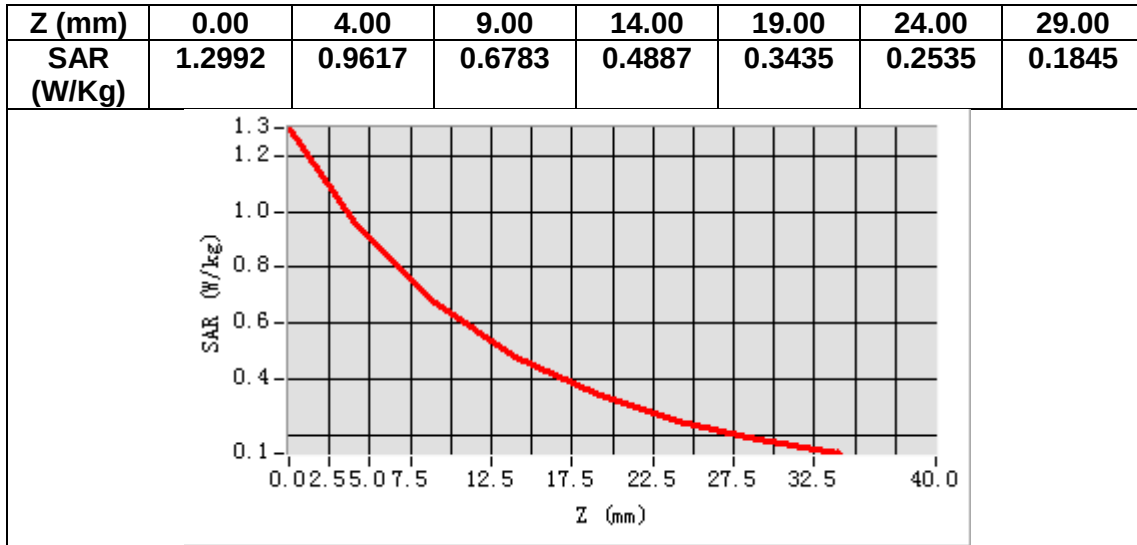
Frequency (MHz)	750.000000
Relative permittivity (real part)	40.685061
Relative permittivity (imaginary part)	21.314079
Conductivity (S/m)	0.888087
Variation (%)	2.730000



Maximum location: X=3.00, Y=3.00

SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.559332
SAR 1g (W/Kg)	0.784321



MEASUREMENT 2

Date of measurement: 4/9/2023

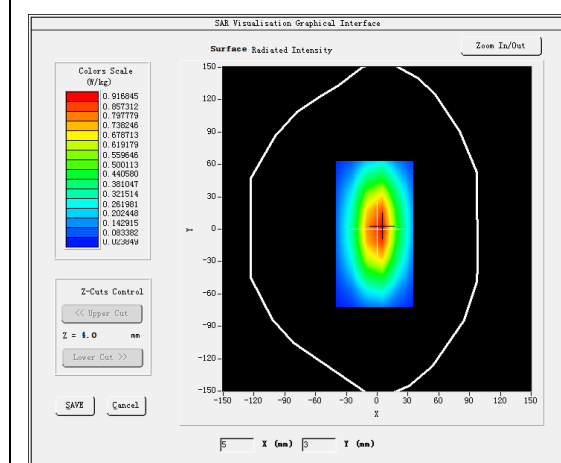
A. Experimental conditions.

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

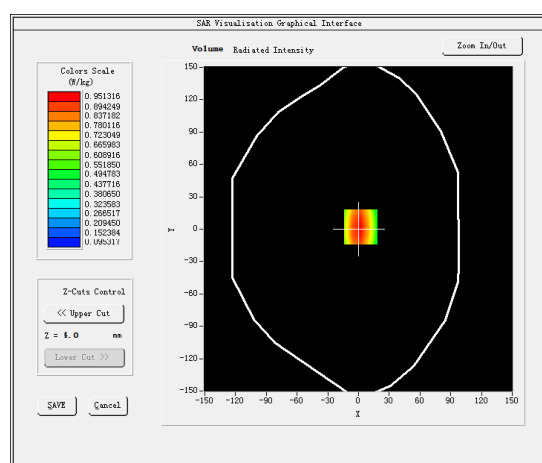
B. SAR Measurement Results

Frequency (MHz)	835.000000
Relative permittivity (real part)	41.818079
Relative permittivity (imaginary part)	19.656212
Conductivity (S/m)	0.911830
Variation (%)	-2.720000

SURFACE SAR



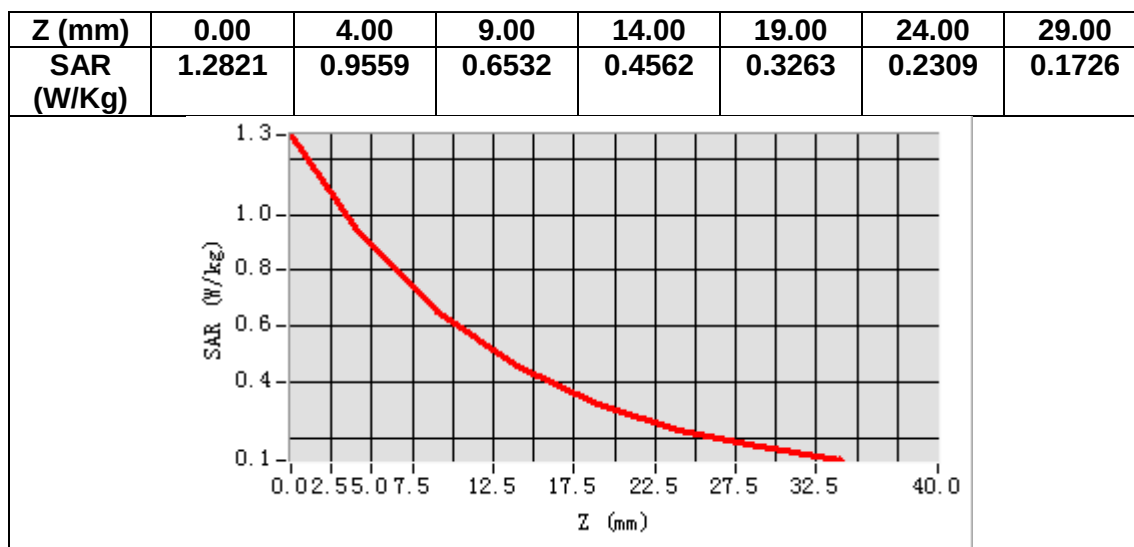
VOLUME SAR



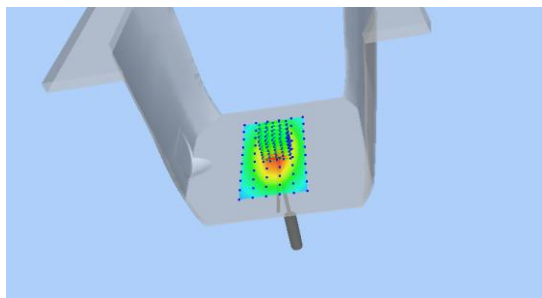
Maximum location: X=2.00, Y=2.00

SAR Peak: 1.29 W/kg

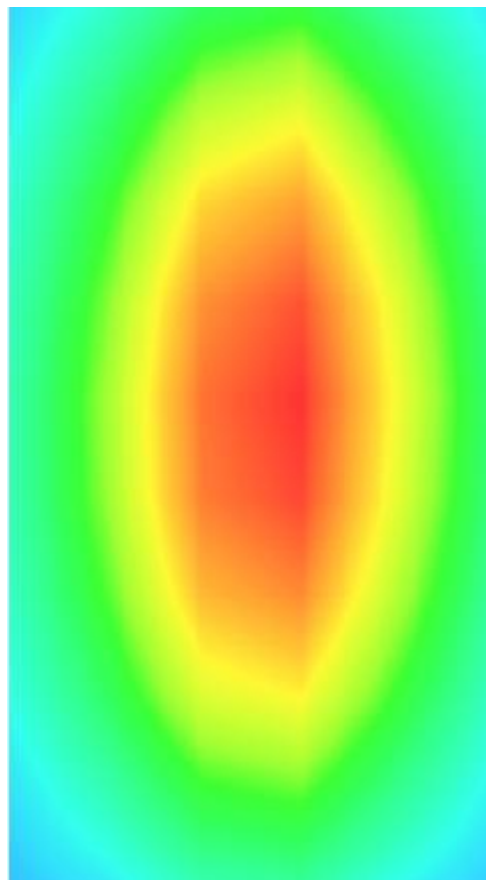
SAR 10g (W/Kg)	0.661333
SAR 1g (W/Kg)	0.973172



3D screen shot



Hot spot position



MEASUREMENT 3

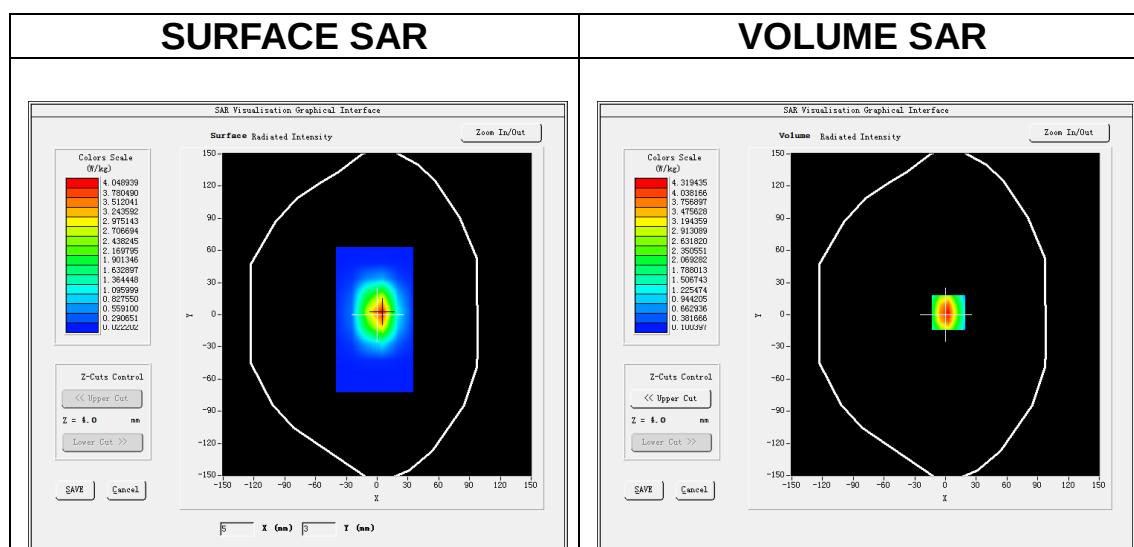
Date of measurement: 7/9/2023

A. Experimental conditions.

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

B. SAR Measurement Results

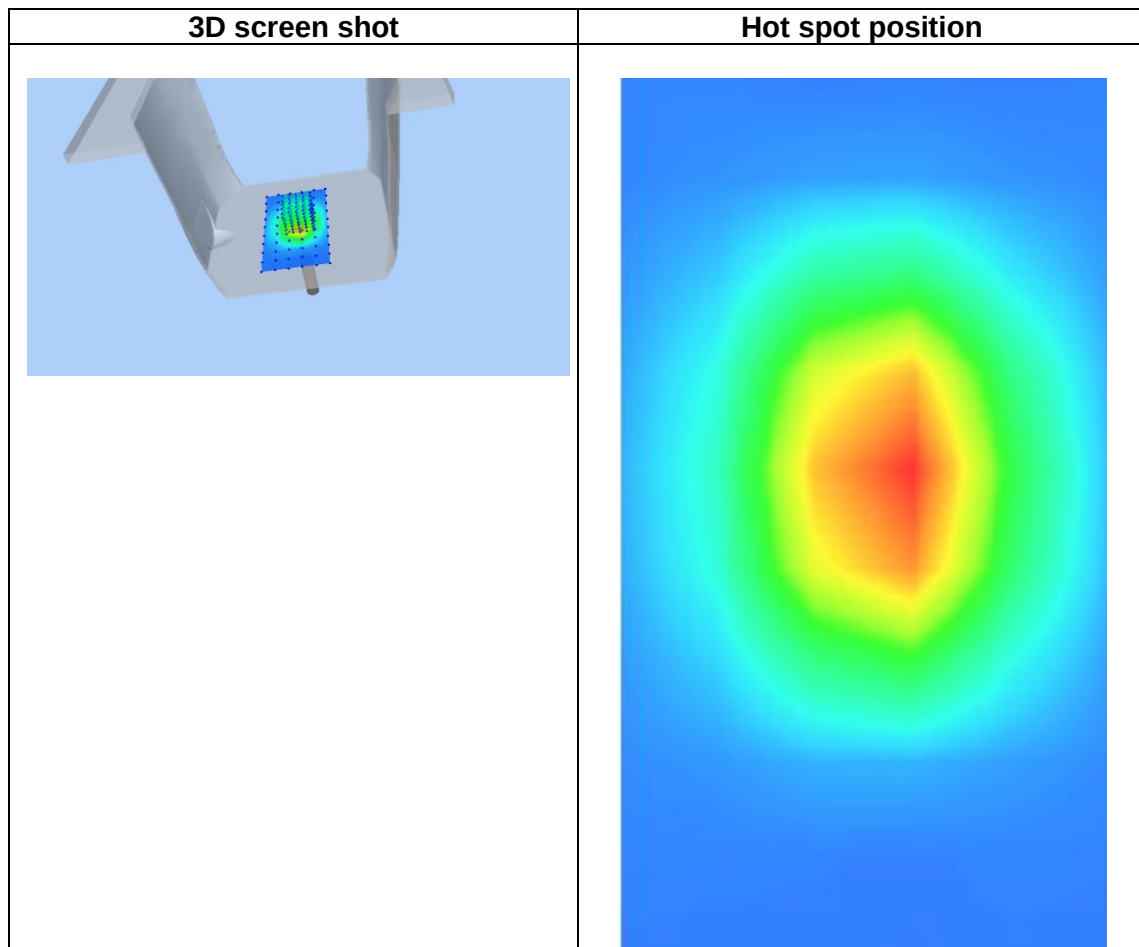
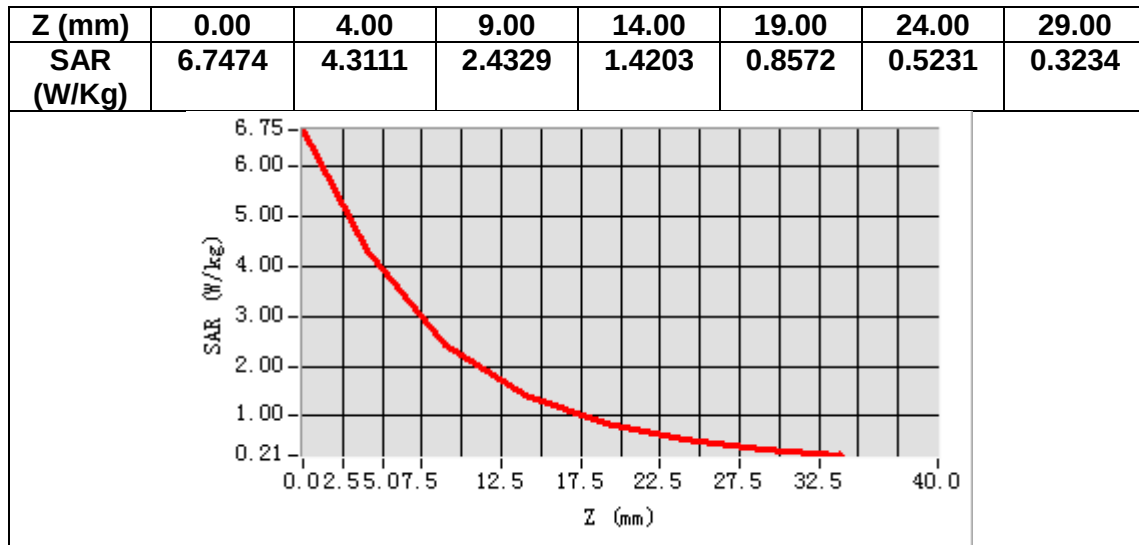
Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.267451
Relative permittivity (imaginary part)	13.815104
Conductivity (S/m)	1.381510
Variation (%)	2.980000



Maximum location: X=3.00, Y=2.00

SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	1.918307
SAR 1g (W/Kg)	3.962066



MEASUREMENT 4

Date of measurement: 14/9/2023

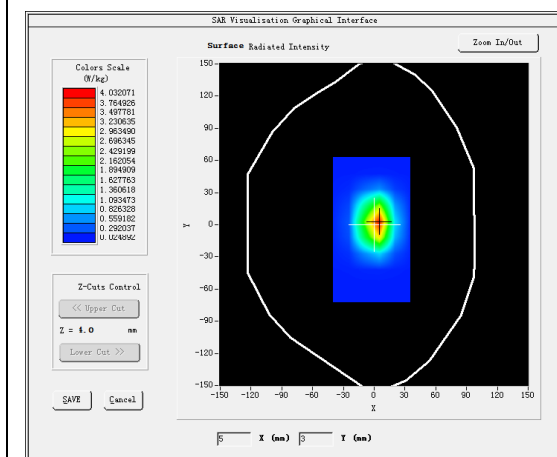
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.91</u>

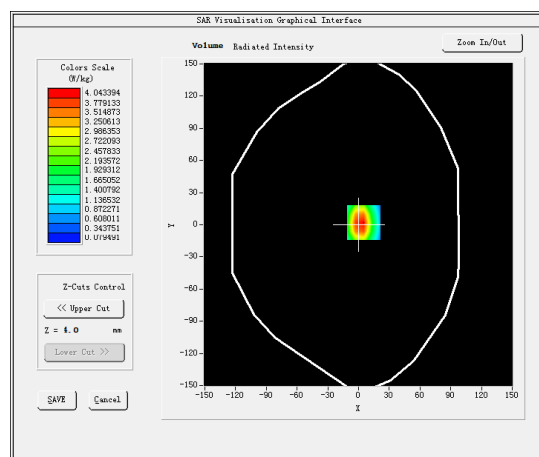
B. SAR Measurement Results

Frequency (MHz)	1900.000000
Relative permittivity (real part)	39.287921
Relative permittivity (imaginary part)	13.863358
Conductivity (S/m)	1.463354
Variation (%)	2.220000

SURFACE SAR



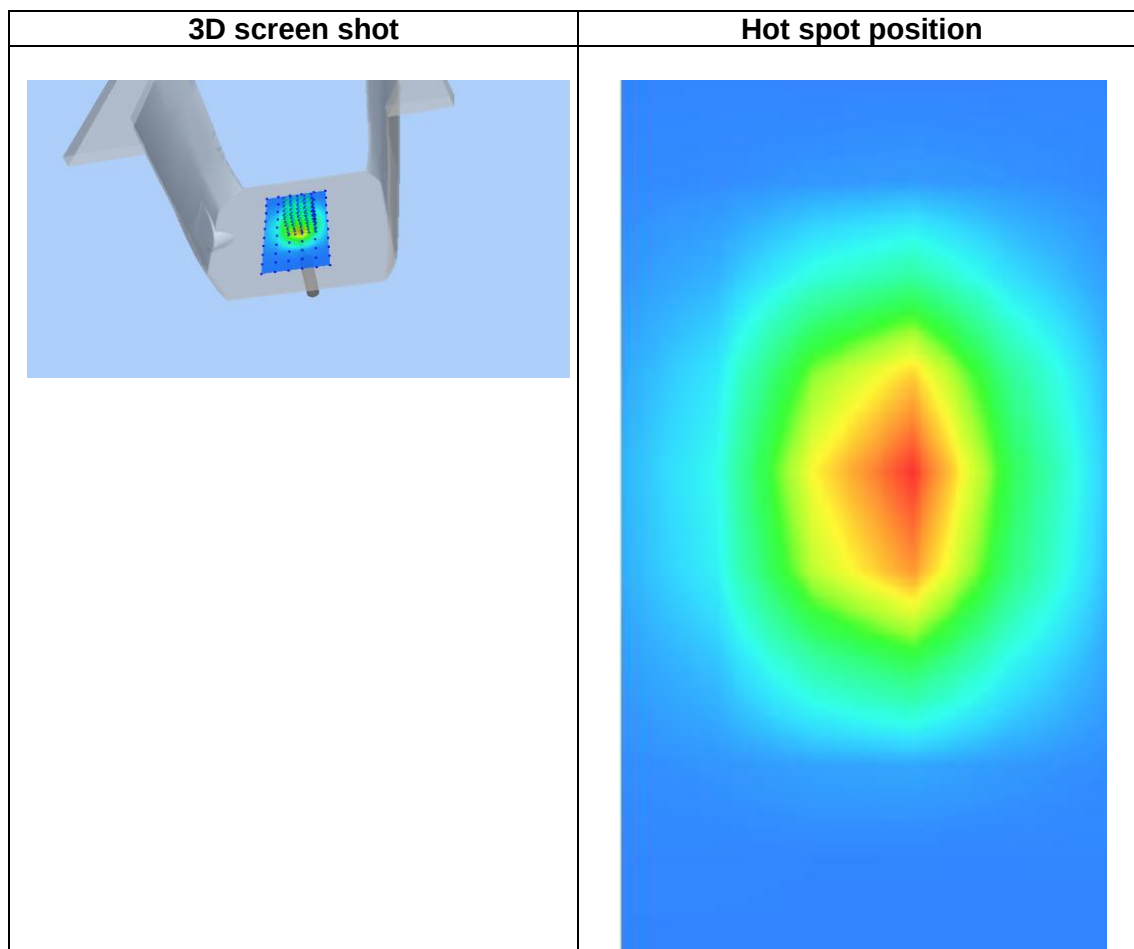
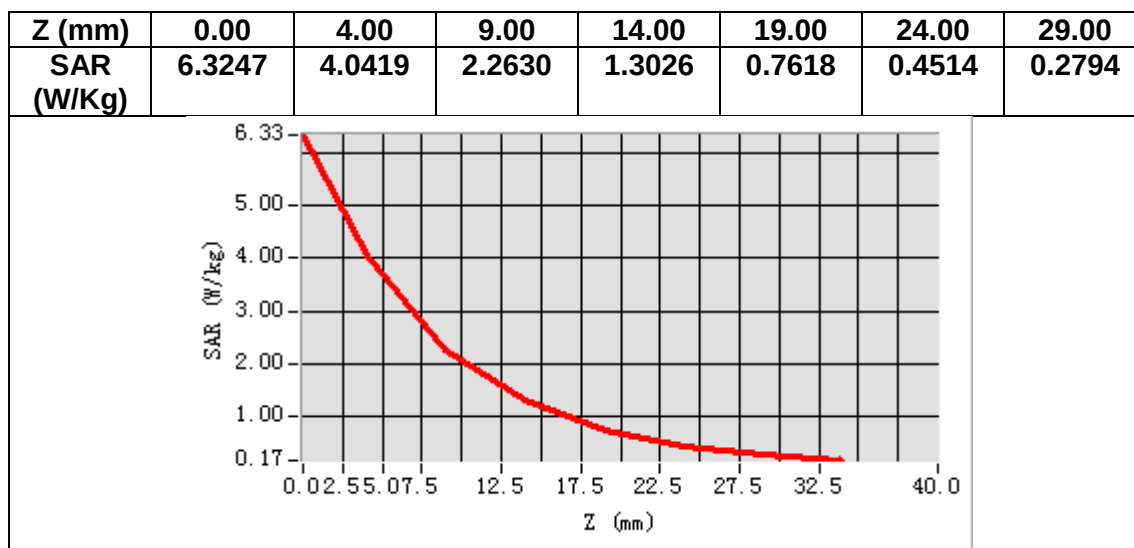
VOLUME SAR



Maximum location: X=5.00, Y=2.00

SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	2.239347
SAR 1g (W/Kg)	4.197221



MEASUREMENT 5

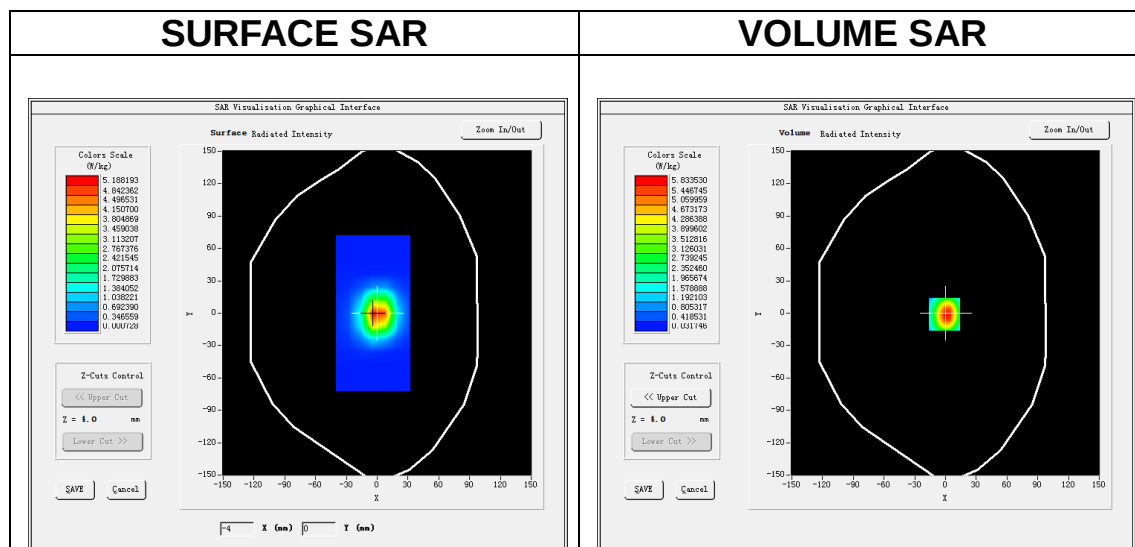
Date of measurement: 31/8/2023

A. Experimental conditions.

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

B. SAR Measurement Results

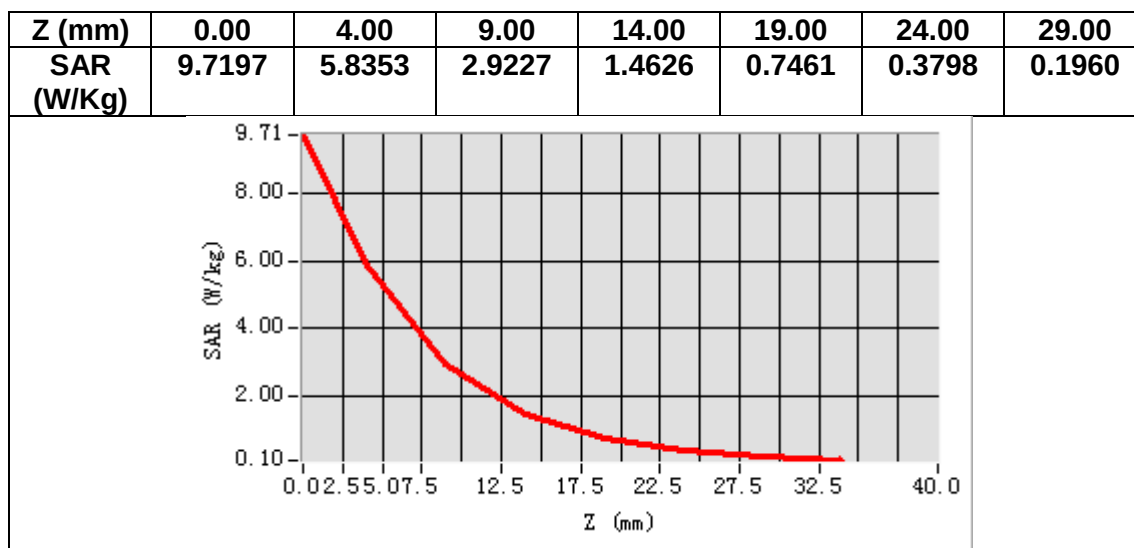
Frequency (MHz)	2450.000000
Relative permittivity (real part)	39.131196
Relative permittivity (imaginary part)	13.595063
Conductivity (S/m)	1.850439
Variation (%)	1.290000



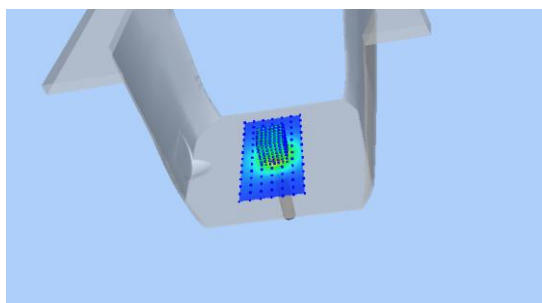
Maximum location: X=-1.00, Y=-1.00

SAR Peak: 9.83 W/kg

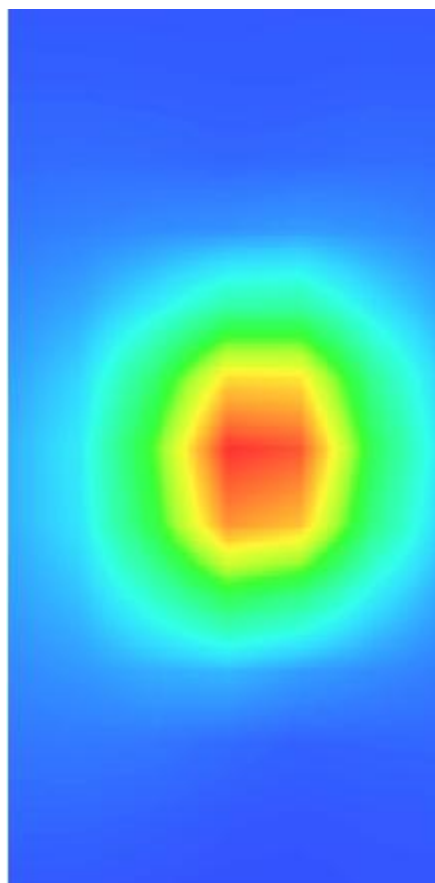
SAR 10g (W/Kg)	2.338106
SAR 1g (W/Kg)	4.856340



3D screen shot



Hot spot position



MEASUREMENT 6

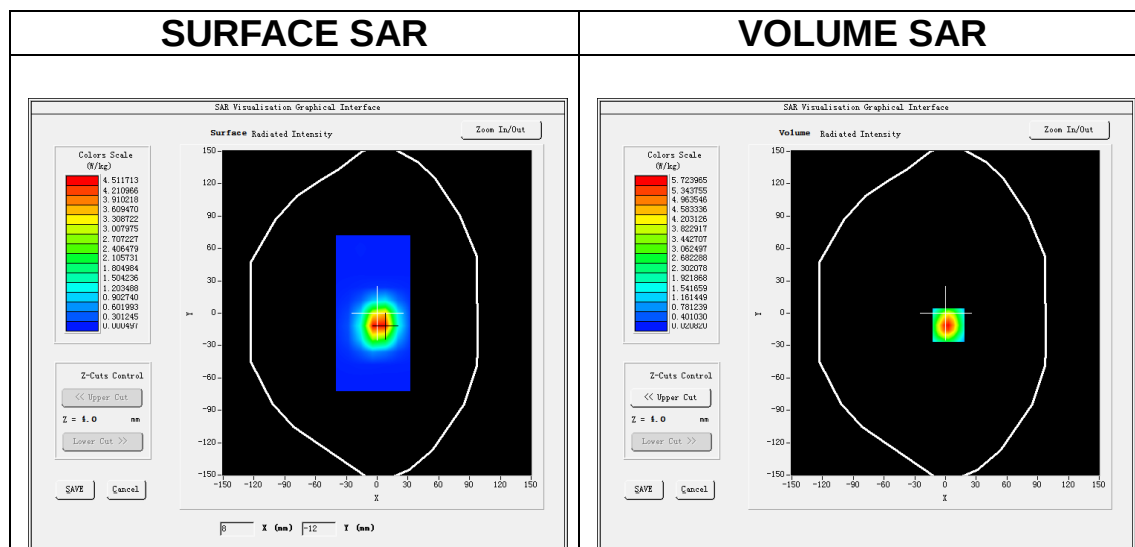
Date of measurement: 1/9/2023

A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Dipole</u>
<u>Band</u>	<u>CW2600</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>CW (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.87</u>

B. SAR Measurement Results

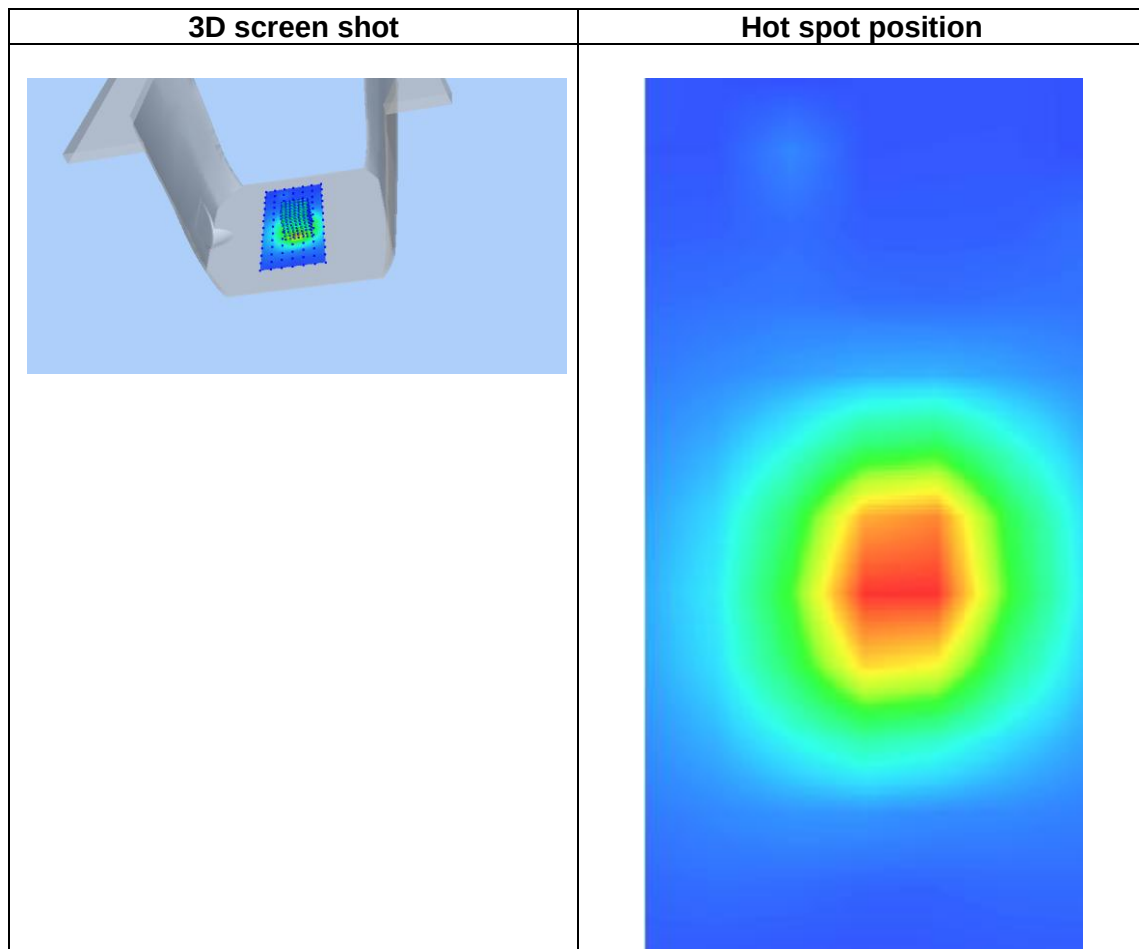
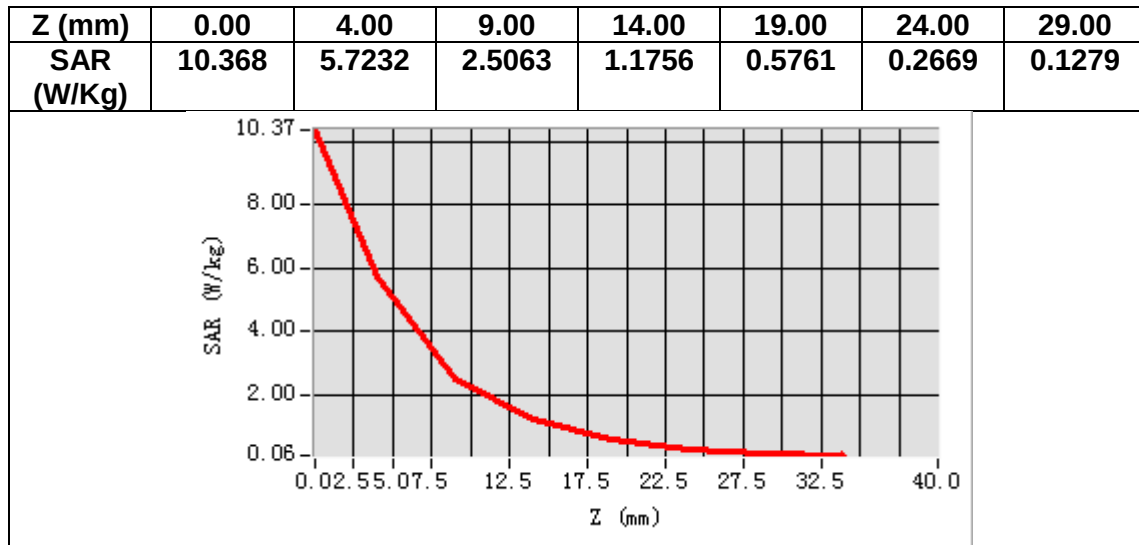
Frequency (MHz)	2600.000000
Relative permittivity (real part)	38.996635
Relative permittivity (imaginary part)	13.383702
Conductivity (S/m)	1.933201
Variation (%)	0.250000



Maximum location: X=3.00, Y=-11.00

SAR Peak: 10.29 W/kg

SAR 10g (W/Kg)	2.244037
SAR 1g (W/Kg)	5.921199



MEASUREMENT 7

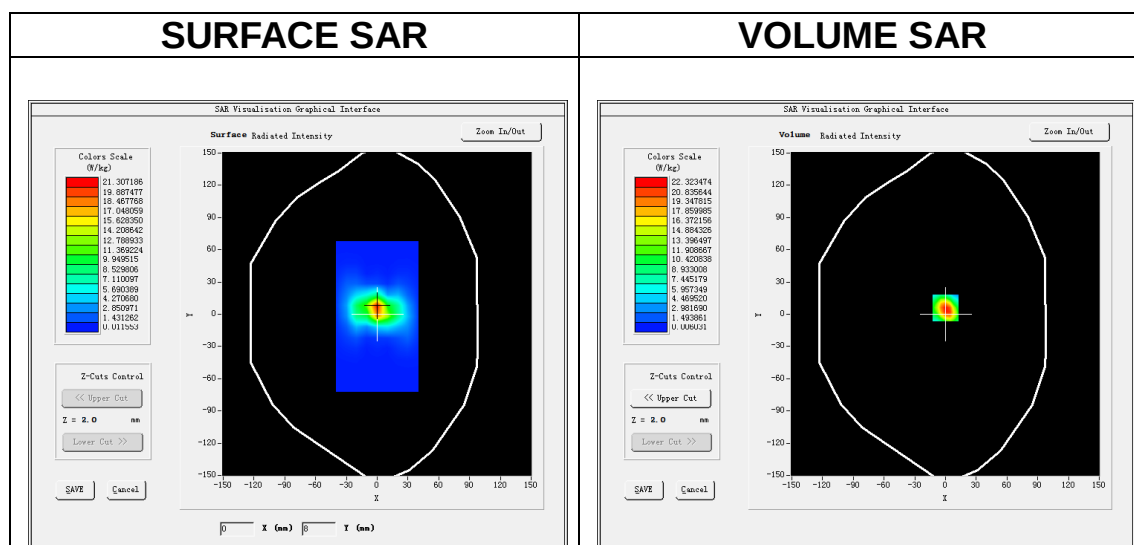
Date of measurement: 12/9/2023

A. Experimental conditions.

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

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	36.057116
Relative permittivity (imaginary part)	16.044251
Conductivity (S/m)	4.635006
Variation (%)	2.800000

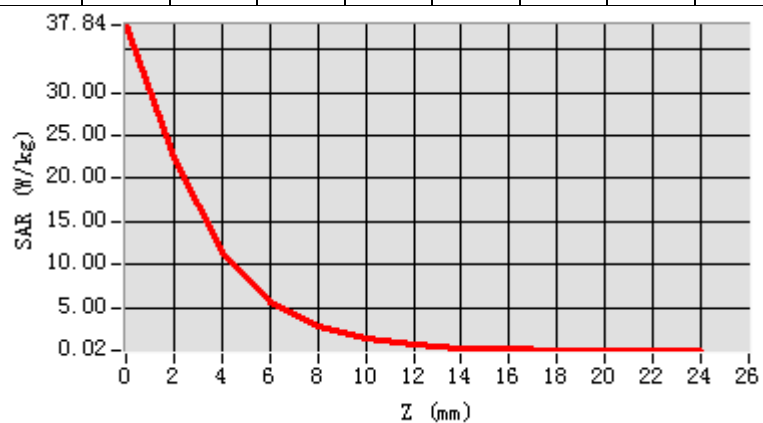


Maximum location: X=0.00, Y=6.00

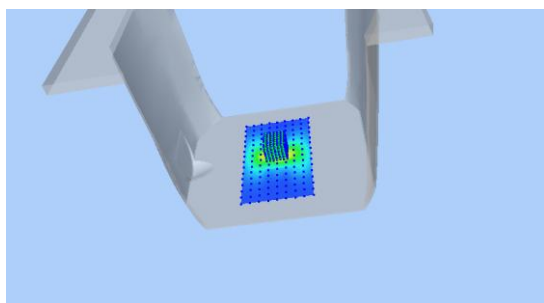
SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.859162
SAR 1g (W/Kg)	15.158032

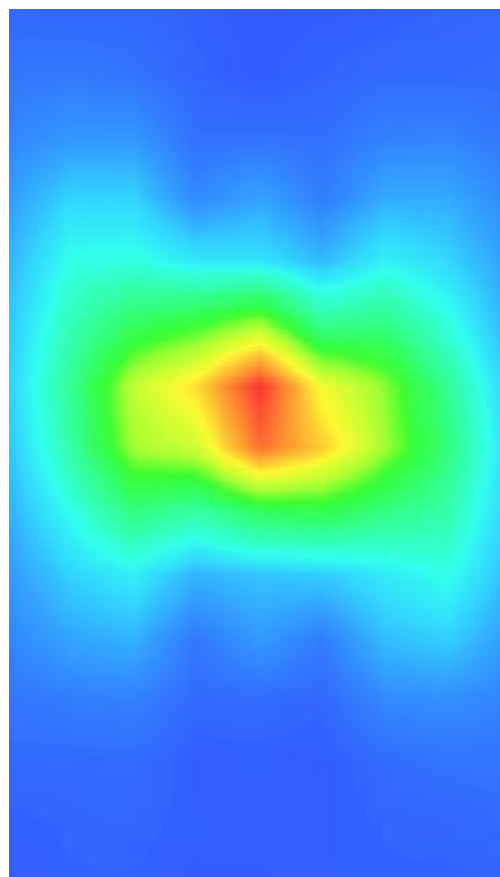
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0 0	12.0 0	14.0 0	16.0 0	18.0 0	20.0 0	22.0 0
SAR (W/ Kg)	37.8 91	22.3 91	11.3 77	5.66 94	2.82 91	1.40 43	0.71 50	0.36 37	0.18 02	0.10 08	0.05 27	0.03 97



3D screen shot



Hot spot position



MEASUREMENT 8

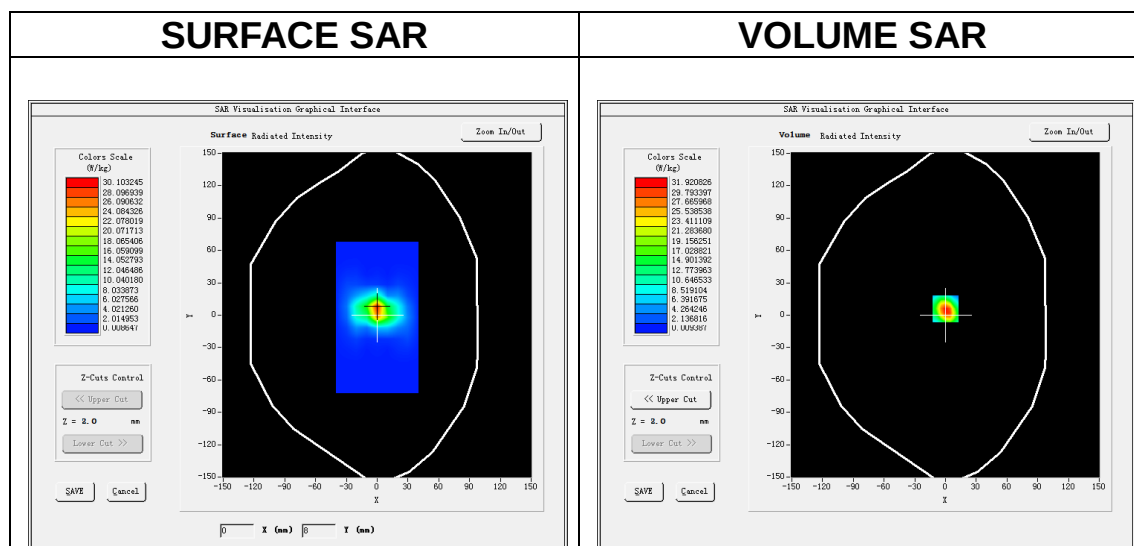
Date of measurement: 20/9/2023

A. Experimental conditions.

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

B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	35.304895
Relative permittivity (imaginary part)	16.058771
Conductivity (S/m)	5.174493
Variation (%)	-0.500000

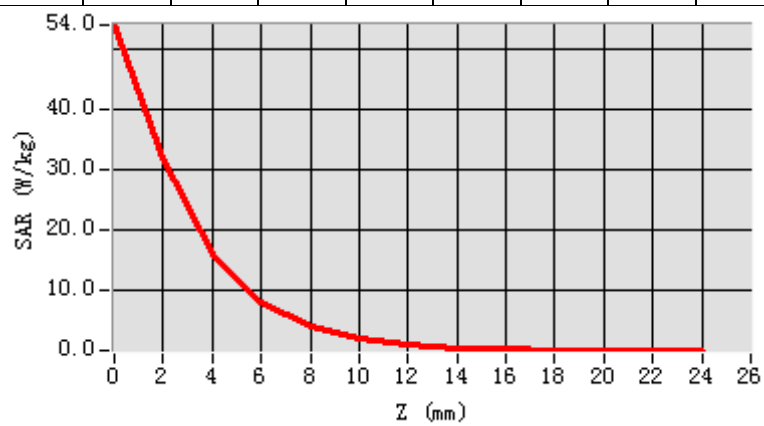


Maximum location: X=0.00, Y=6.00

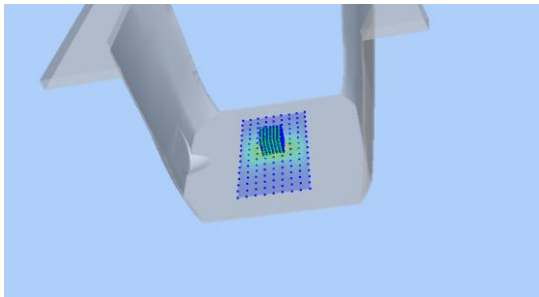
SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.476228
SAR 1g (W/Kg)	18.347190

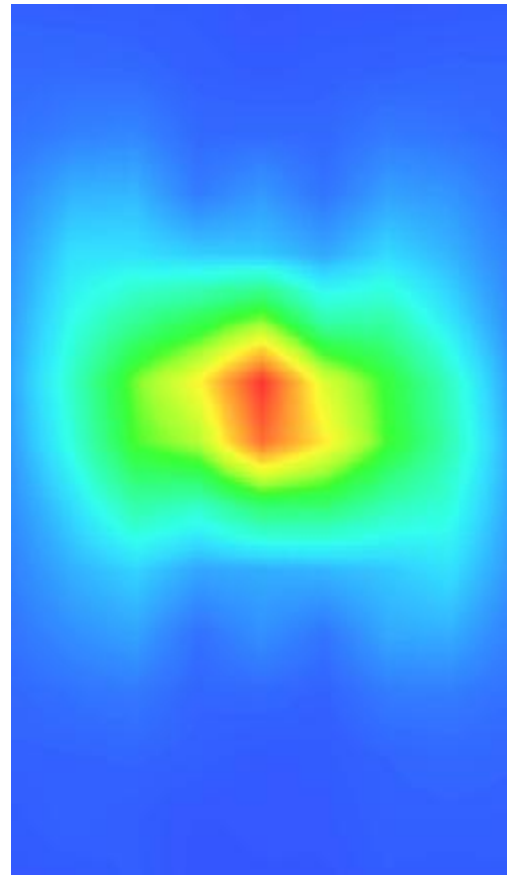
Z (m m)	0.00	2.00	4.00	6.00	8.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0
SAR (W/ Kg)	54.0 36	31.9 48	16.1 44	8.17 66	4.08 90	2.05 50	1.03 61	0.51 44	0.27 95	0.15 72	0.07 88	0.04 38



3D screen shot



Hot spot position



13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 7 WLAN 5.8G Body
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MEASUREMENT 10 LTE Band 5 Body
MEASUREMENT 11 LTE Band 7 Body
MEASUREMENT 12 LTE Band 12 Body
MEASUREMENT 13 LTE Band 17 Body
MEASUREMENT 14 LTE Band 66 Body

MEASUREMENT 1

Date of measurement: 4/9/2023

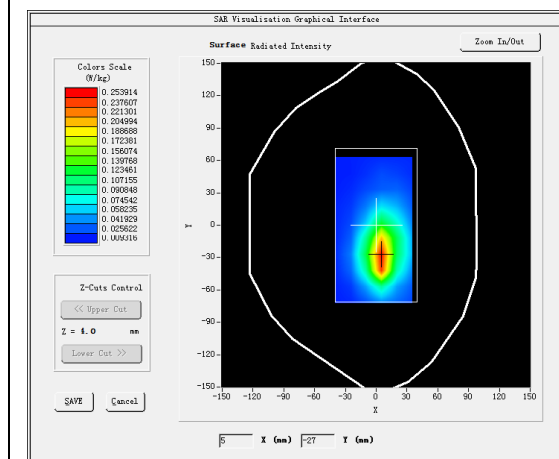
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>1.50</u>

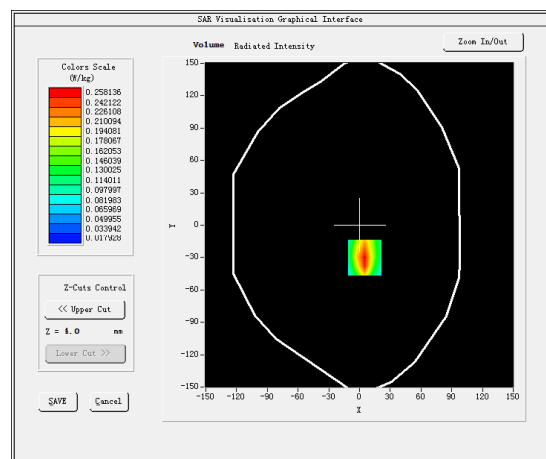
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.827160
Relative permittivity (imaginary part)	19.663412
Conductivity (S/m)	0.913693
Variation (%)	0.780000

SURFACE SAR



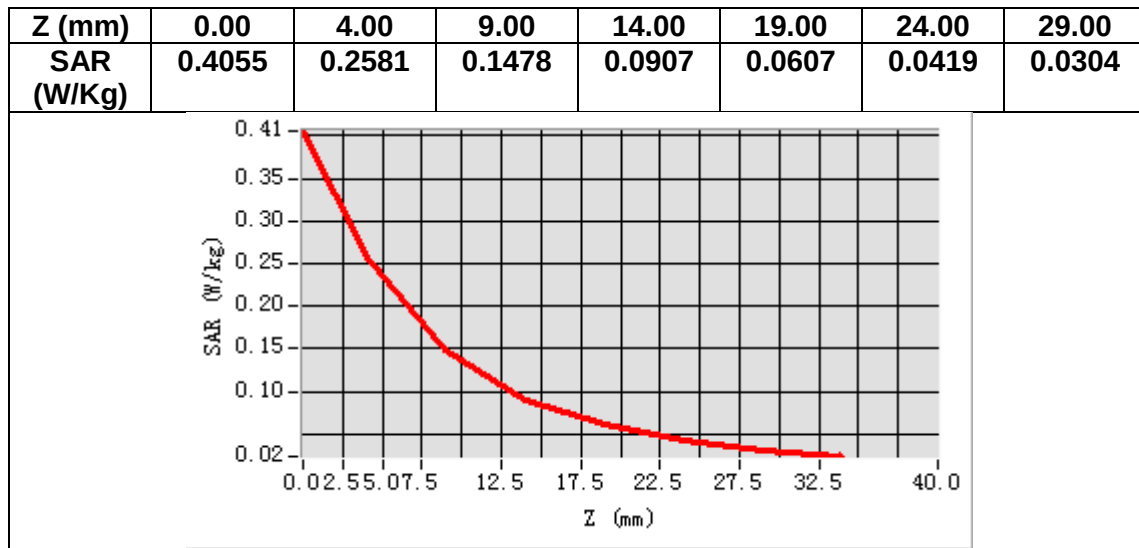
VOLUME SAR



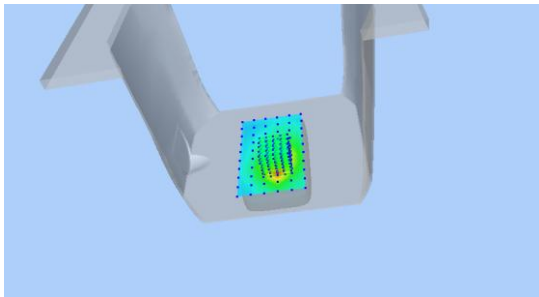
Maximum location: X=5.00, Y=-30.00

SAR Peak: 0.42 W/kg

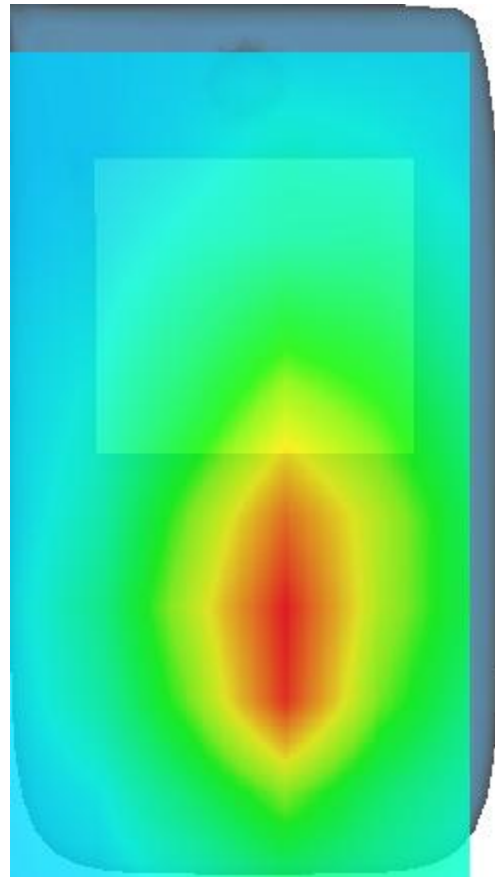
SAR 10g (W/Kg)	0.131087
SAR 1g (W/Kg)	0.246379



3D screen shot



Hot spot position



MEASUREMENT 2

Date of measurement: 14/9/2023

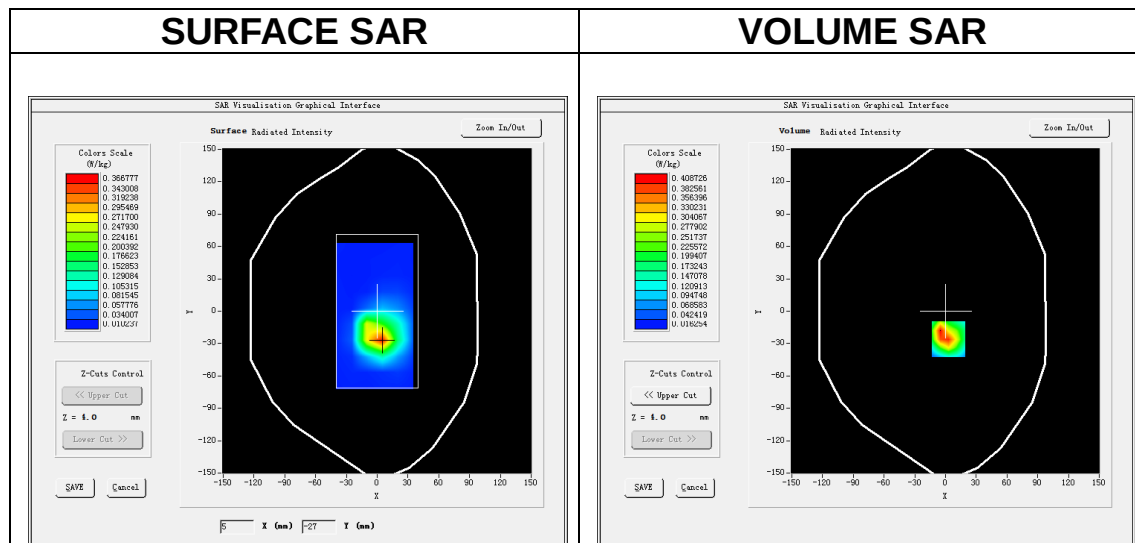
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>GSM1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>TDMA (Crest factor: 4.0)</u>
<u>ConvF</u>	<u>1.91</u>

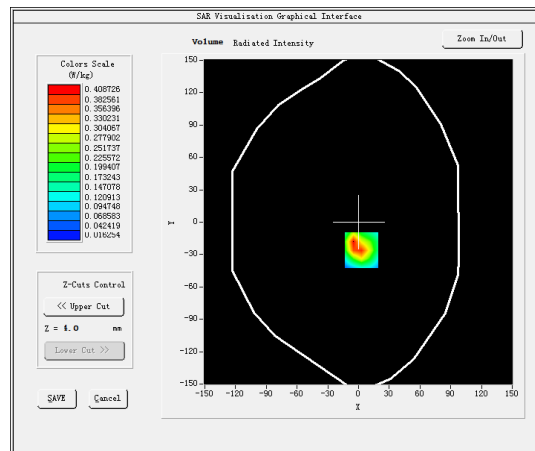
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.363220
Relative permittivity (imaginary part)	13.911258
Conductivity (S/m)	1.452954
Variation (%)	-3.390000

SURFACE SAR



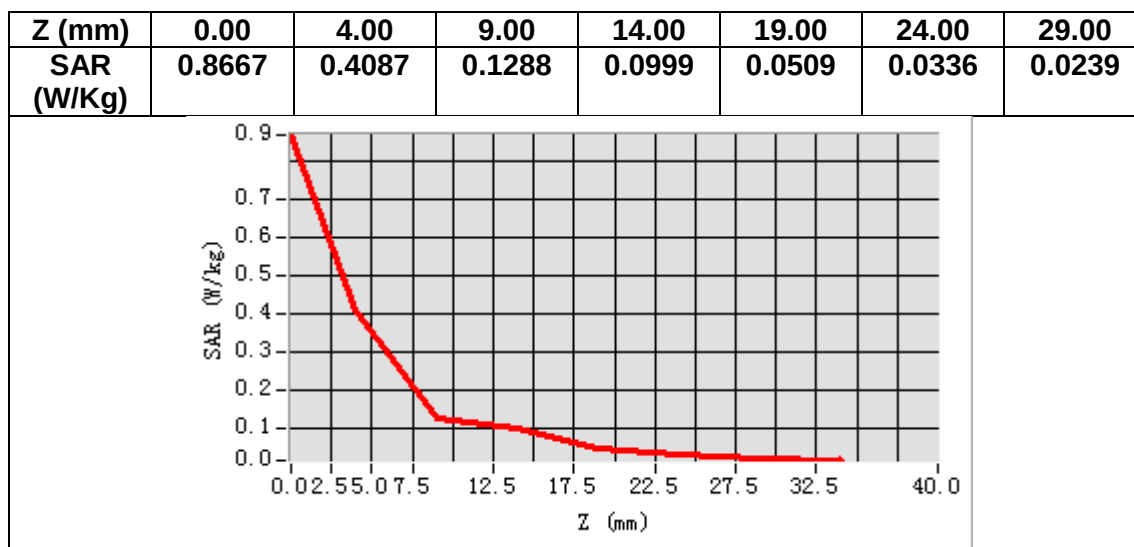
VOLUME SAR



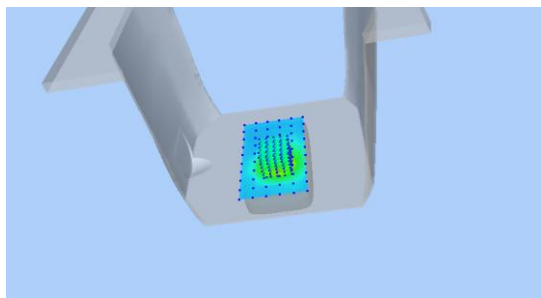
Maximum location: X=3.00, Y=-26.00

SAR Peak: 0.73 W/kg

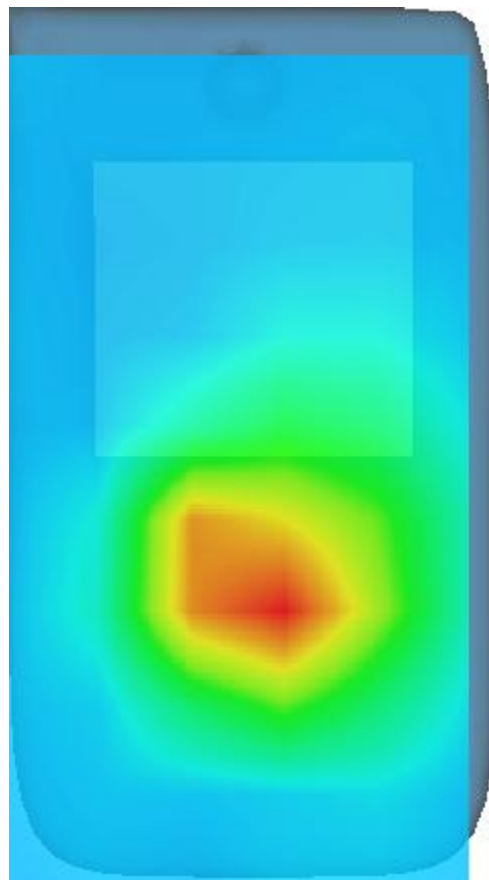
SAR 10g (W/Kg)	0.182733
SAR 1g (W/Kg)	0.391842



3D screen shot



Hot spot position



MEASUREMENT 3

Date of measurement: 14/9/2023

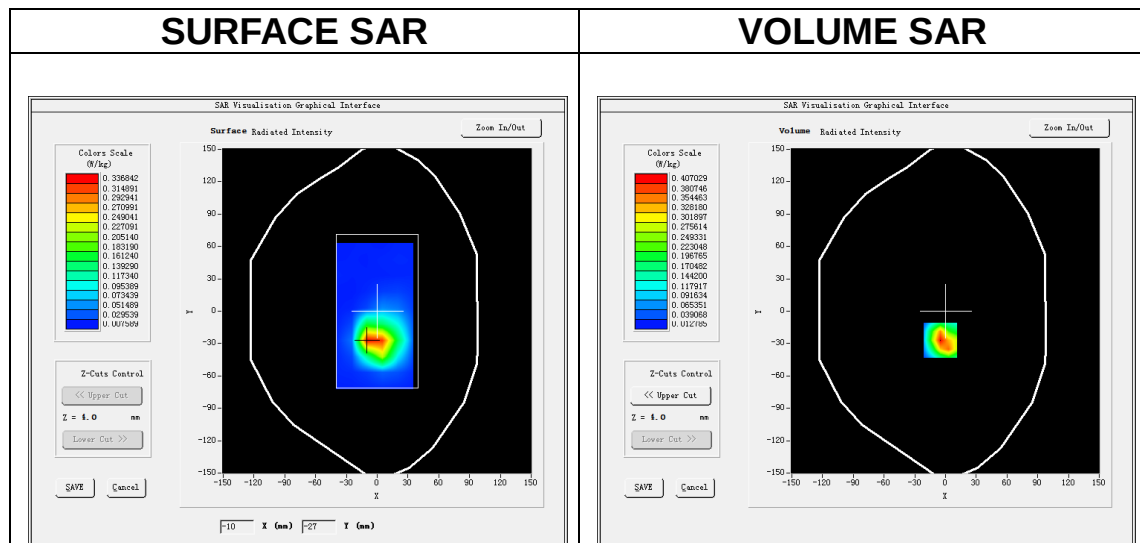
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band2 WCDMA1900</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.91</u>

B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.363220
Relative permittivity (imaginary part)	13.911258
Conductivity (S/m)	1.452954
Variation (%)	-2.600000

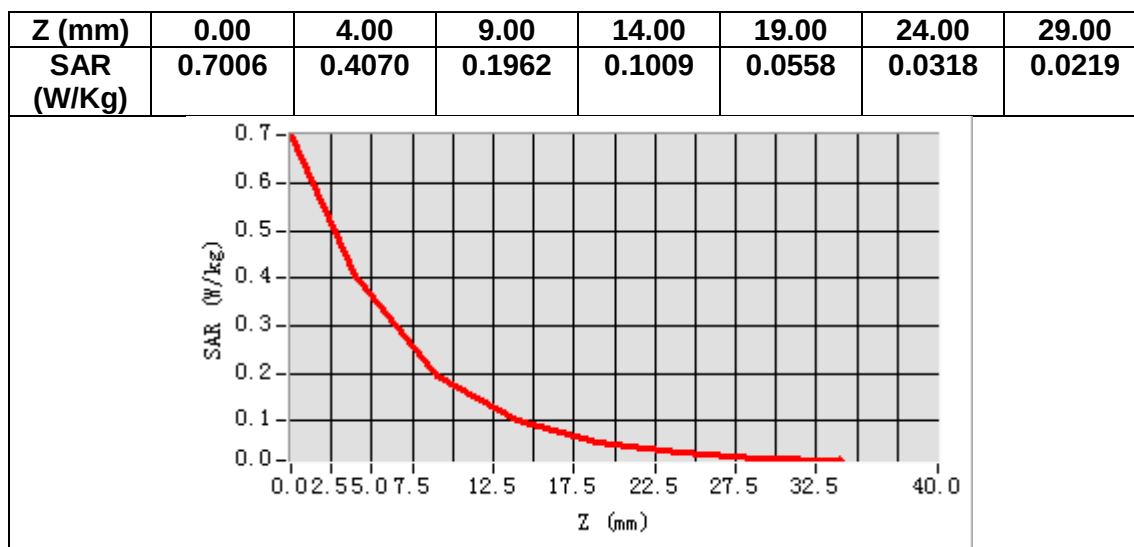
SURFACE SAR



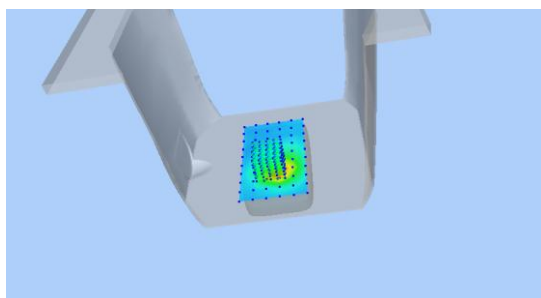
Maximum location: X=-5.00, Y=-27.00

SAR Peak: 0.70 W/kg

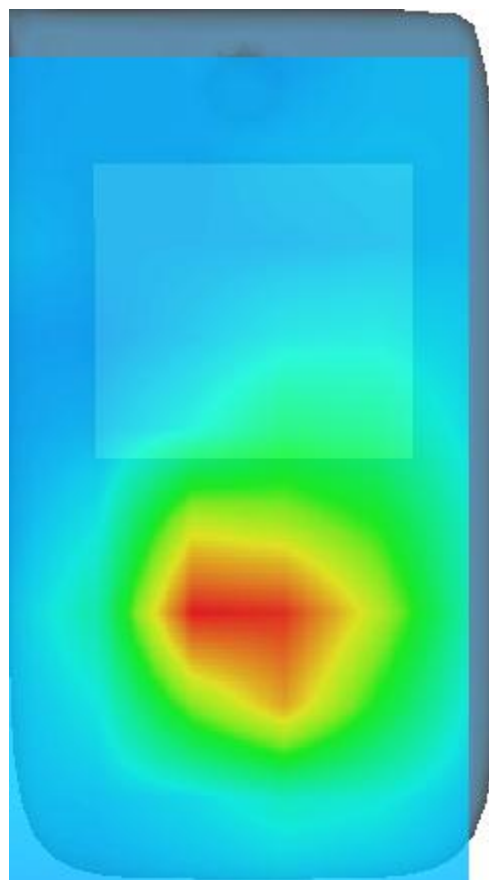
SAR 10g (W/Kg)	0.176846
SAR 1g (W/Kg)	0.382945



3D screen shot



Hot spot position



MEASUREMENT 4

Date of measurement: 4/9/2023

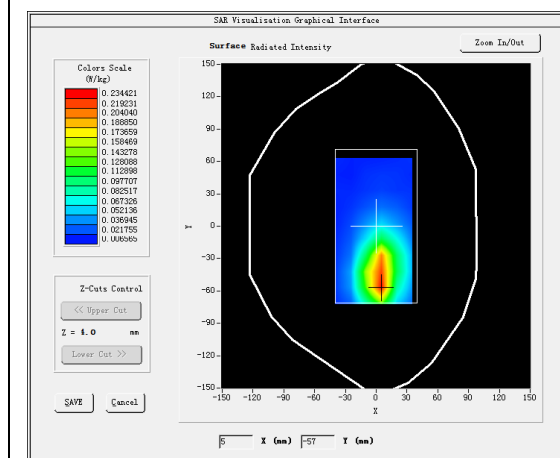
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>Band5 WCDMA850</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>WCDMA (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.50</u>

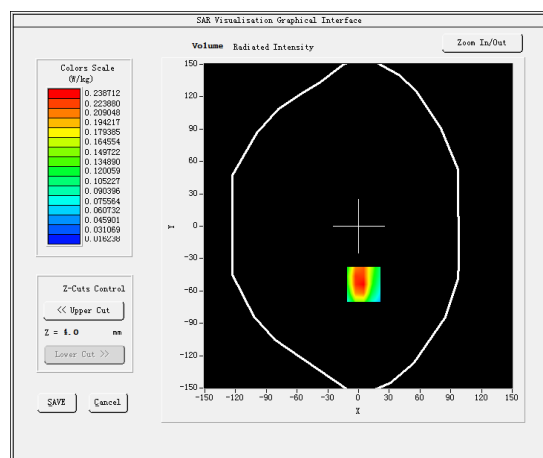
B. SAR Measurement Results

Frequency (MHz)	836.400000
Relative permittivity (real part)	41.827160
Relative permittivity (imaginary part)	19.663412
Conductivity (S/m)	0.913693
Variation (%)	-2.940000

SURFACE SAR



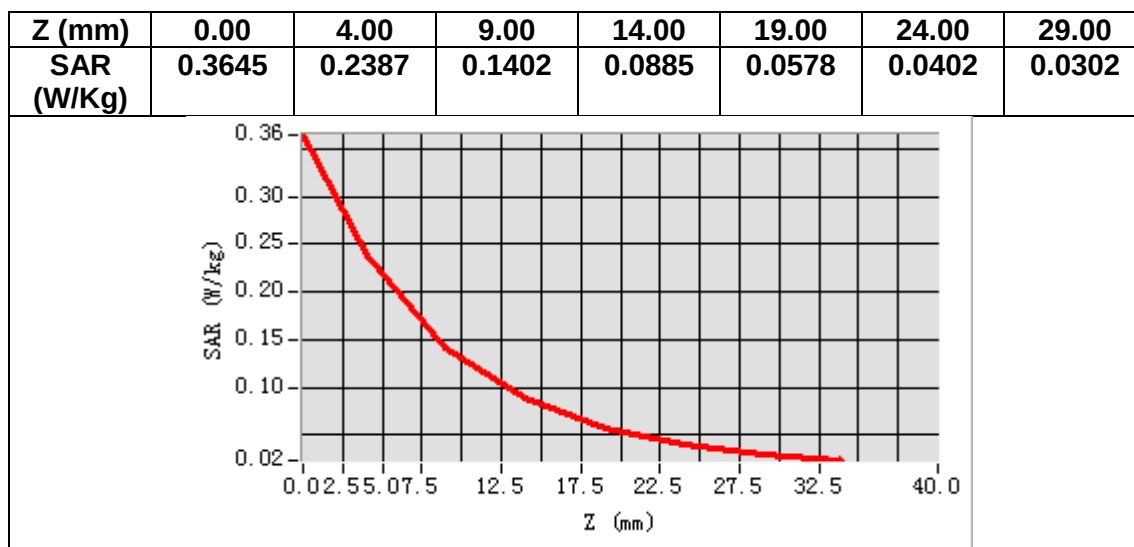
VOLUME SAR



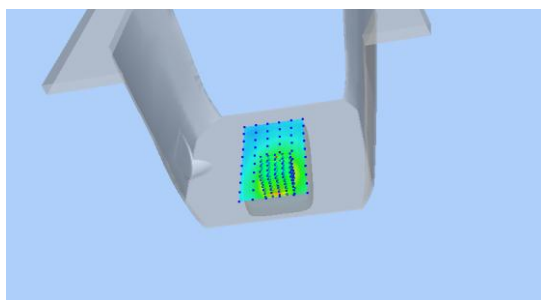
Maximum location: X=5.00, Y=-54.00

SAR Peak: 0.39 W/kg

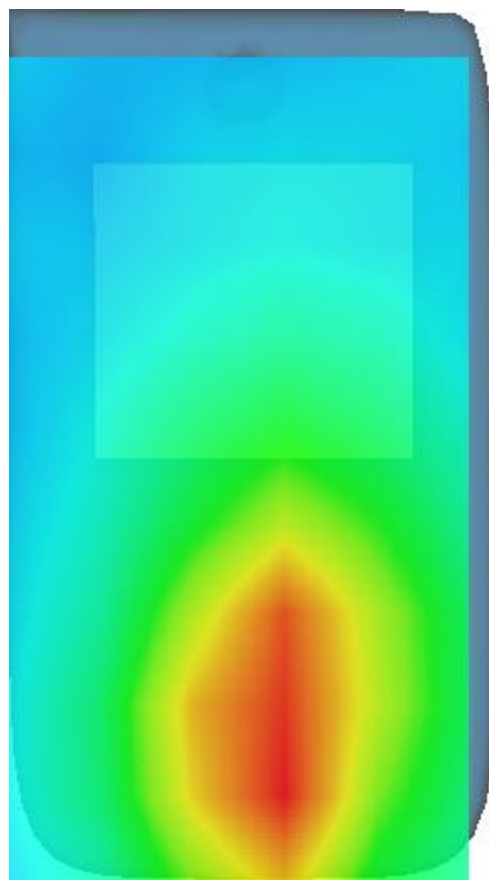
SAR 10g (W/Kg)	0.130481
SAR 1g (W/Kg)	0.237977



3D screen shot



Hot spot position



MEASUREMENT 5

Date of measurement: 31/8/2023

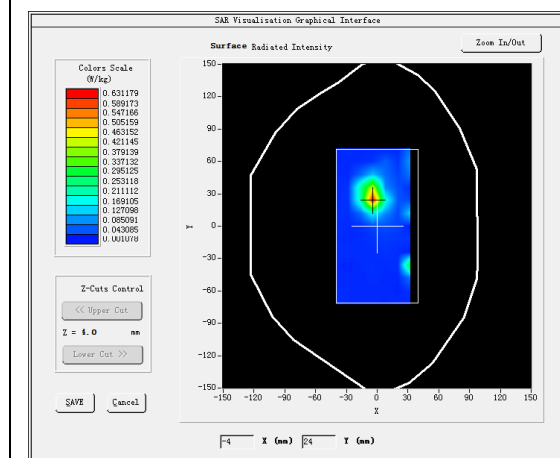
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7, dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>IEEE 802.11b ISM</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>IEEE802.11b (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.98</u>

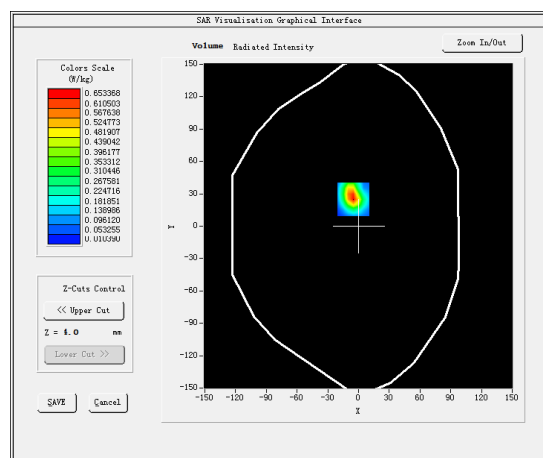
B. SAR Measurement Results

Frequency (MHz)	2437.000000
Relative permittivity (real part)	39.183296
Relative permittivity (imaginary part)	13.513563
Conductivity (S/m)	1.829586
Variation (%)	3.050000

SURFACE SAR



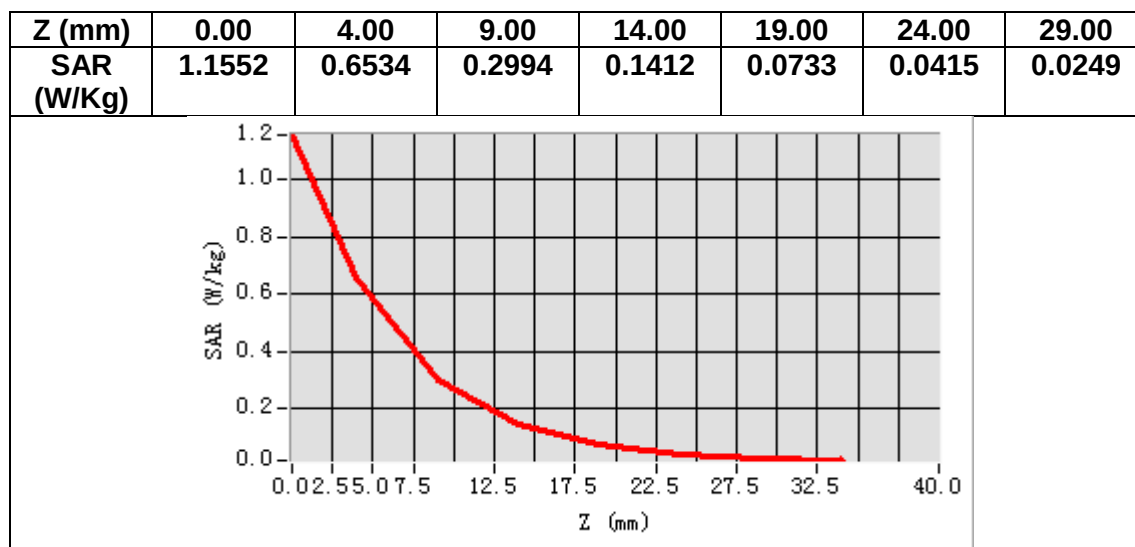
VOLUME SAR



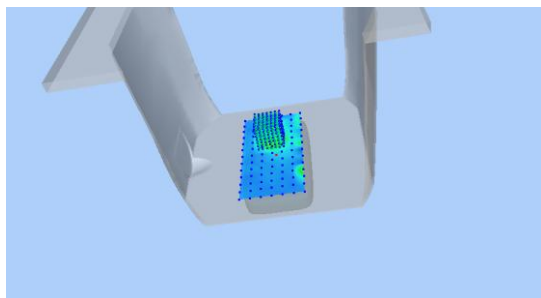
Maximum location: X=-5.00, Y=25.00

SAR Peak: 1.17 W/kg

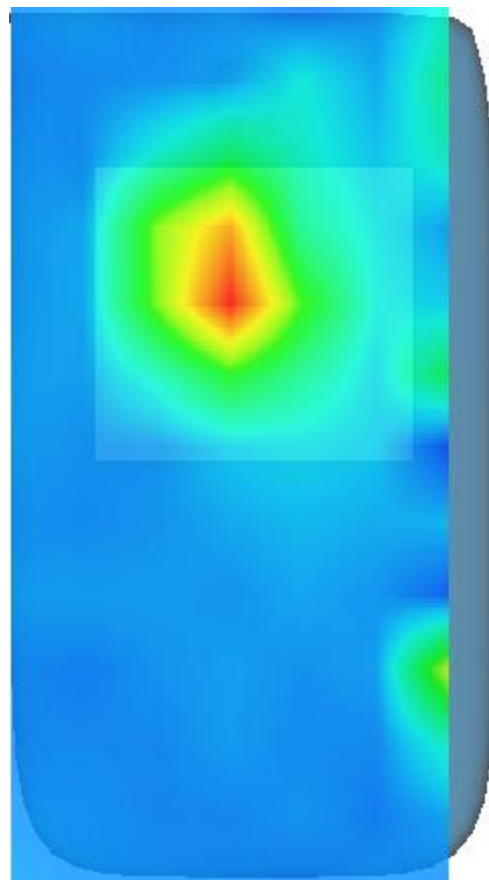
SAR 10g (W/Kg)	0.234387
SAR 1g (W/Kg)	0.588926



3D screen shot



Hot spot position



MEASUREMENT 6

Date of measurement: 12/9/2023

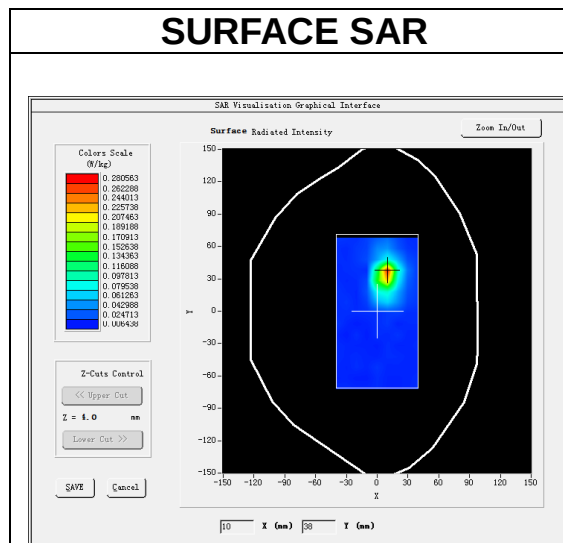
A. Experimental conditions.

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

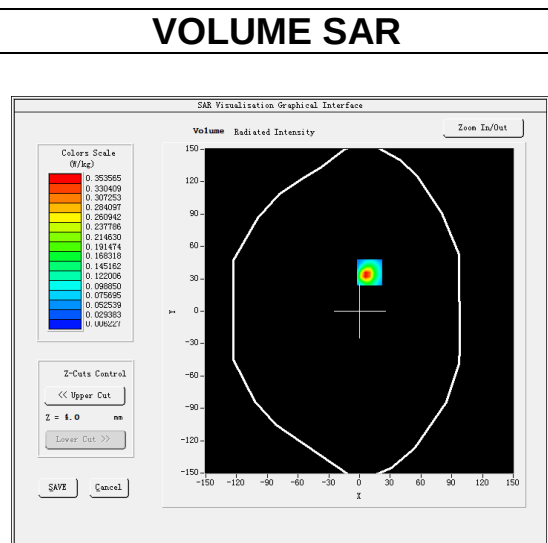
B. SAR Measurement Results

Frequency (MHz)	5240.000000
Relative permittivity (real part)	35.902592
Relative permittivity (imaginary part)	16.055636
Conductivity (S/m)	4.673974
Variation (%)	-4.260000

SURFACE SAR



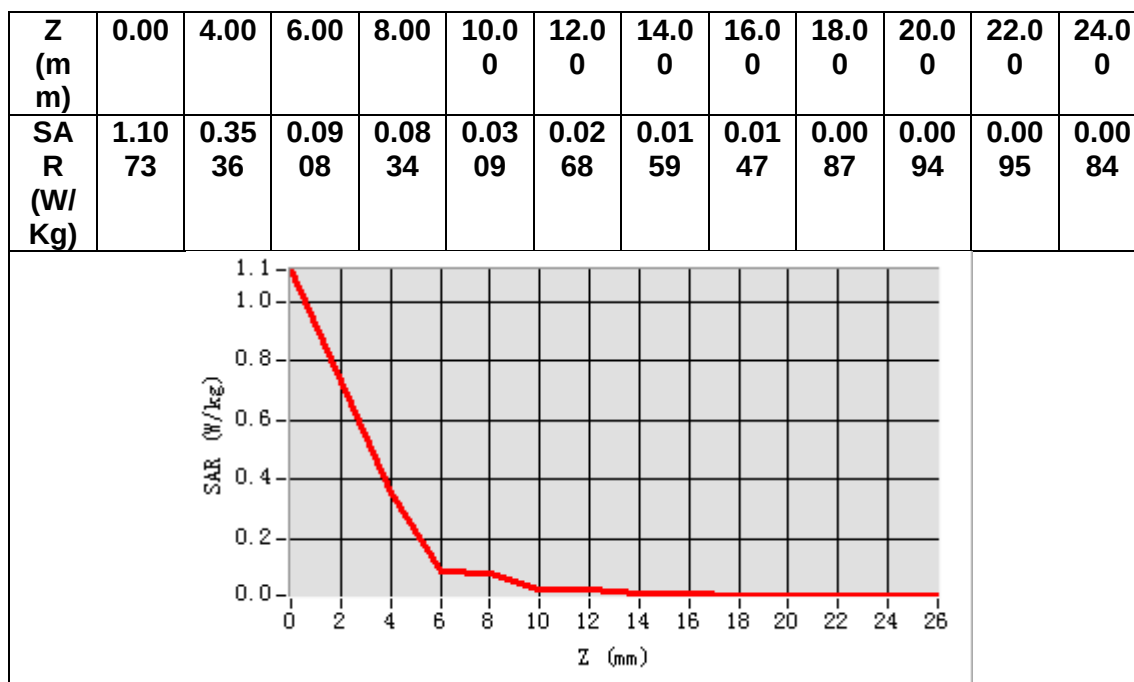
VOLUME SAR



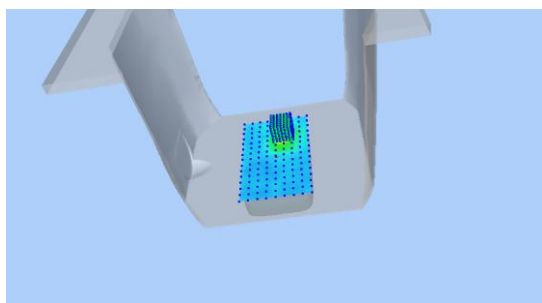
Maximum location: X=10.00, Y=36.00

SAR Peak: 1.03 W/kg

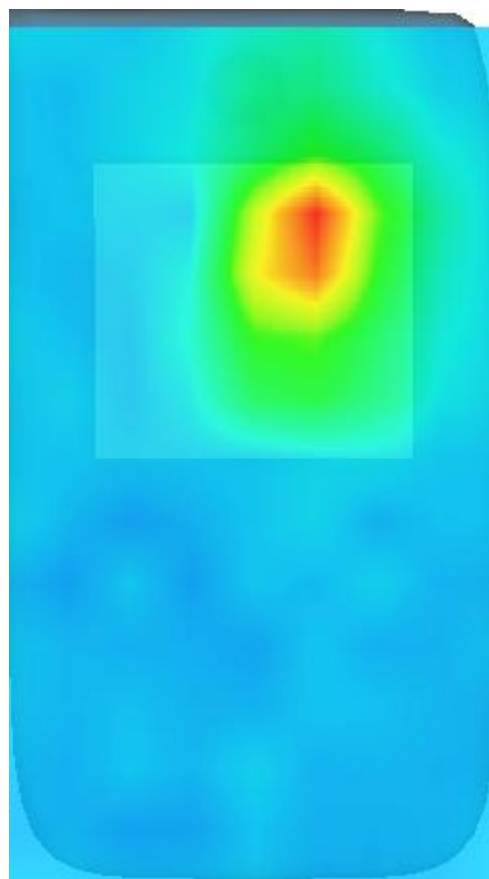
SAR 10g (W/Kg)	0.096226
SAR 1g (W/Kg)	0.334401



3D screen shot



Hot spot position



MEASUREMENT 7

Date of measurement: 20/9/2023

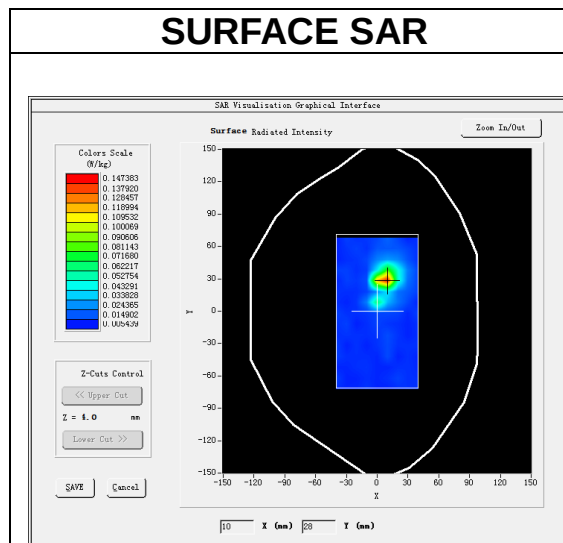
A. Experimental conditions.

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

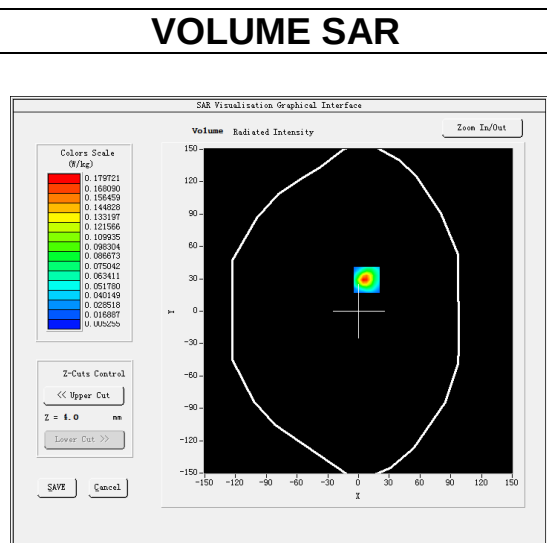
B. SAR Measurement Results

Frequency (MHz)	5825.000000
Relative permittivity (real part)	35.238806
Relative permittivity (imaginary part)	16.039702
Conductivity (S/m)	5.190626
Variation (%)	0.080000

SURFACE SAR



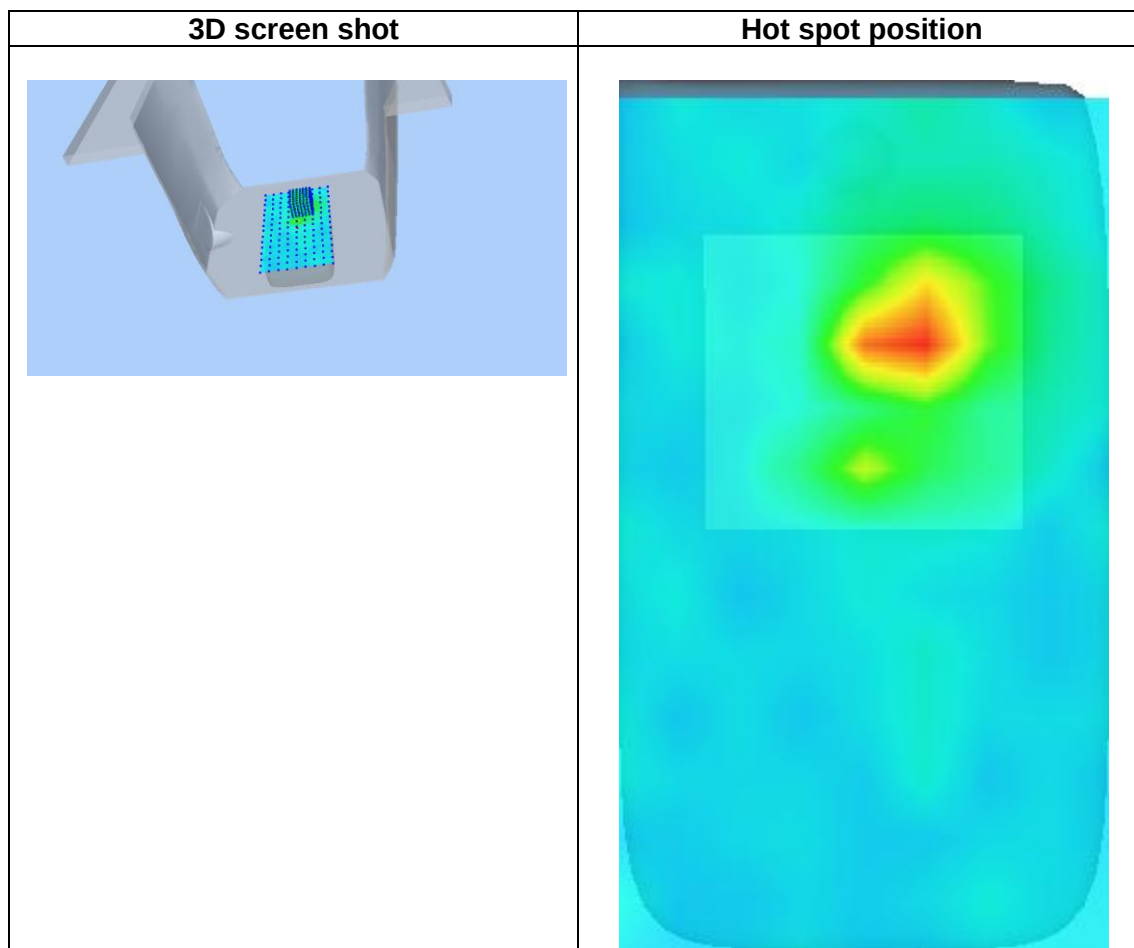
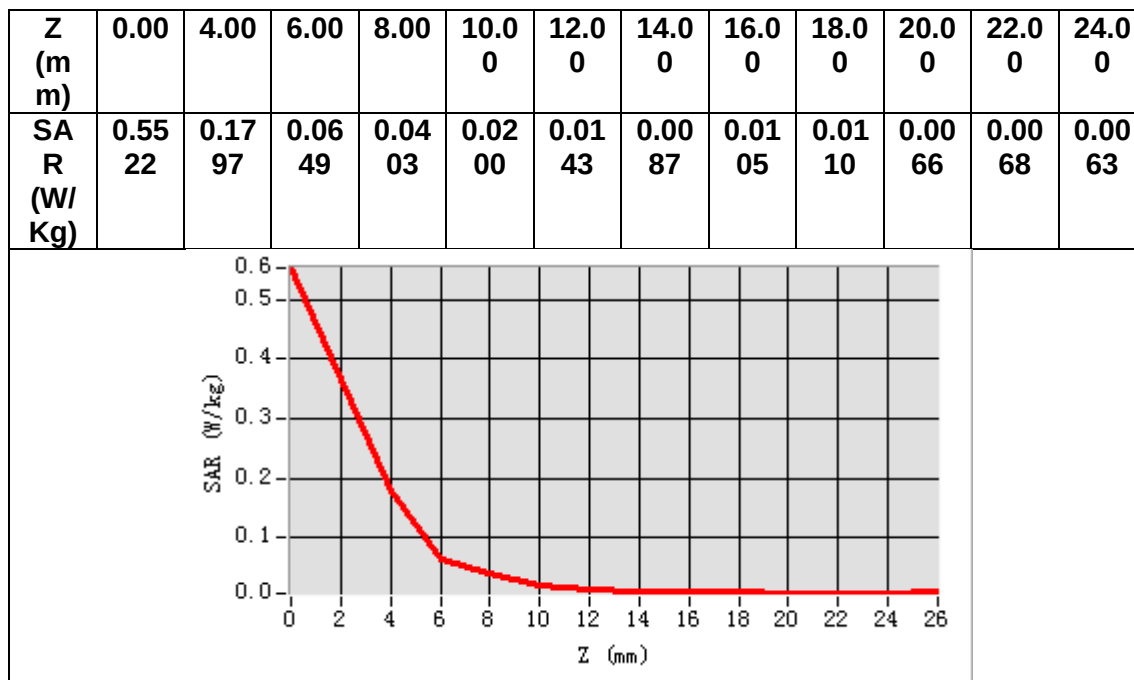
VOLUME SAR



Maximum location: X=8.00, Y=29.00

SAR Peak: 0.53 W/kg

SAR 10g (W/Kg)	0.050135
SAR 1g (W/Kg)	0.169054



MEASUREMENT 8

Date of measurement: 14/9/2023

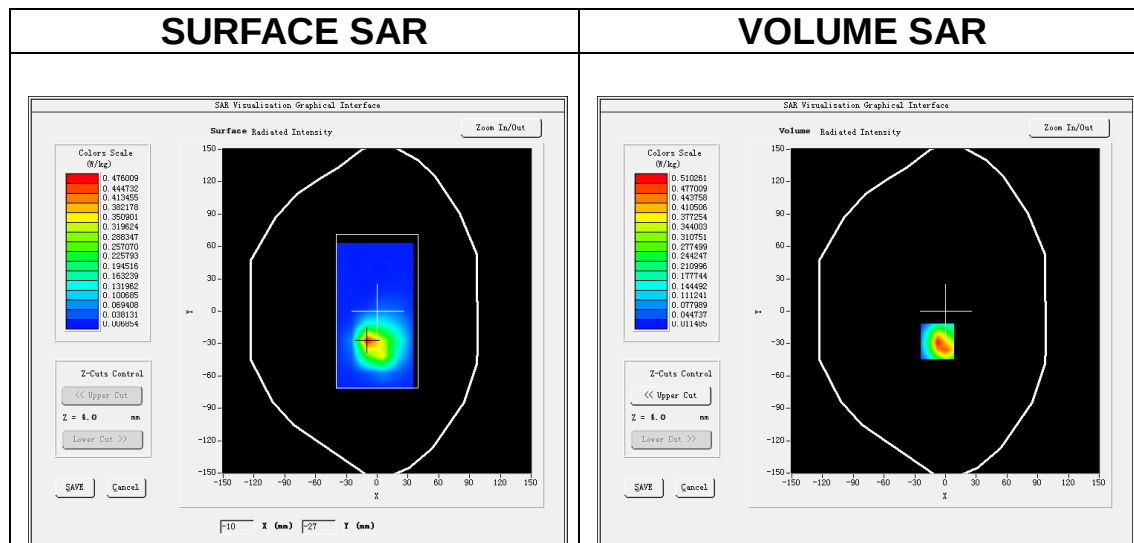
A. Experimental conditions.

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

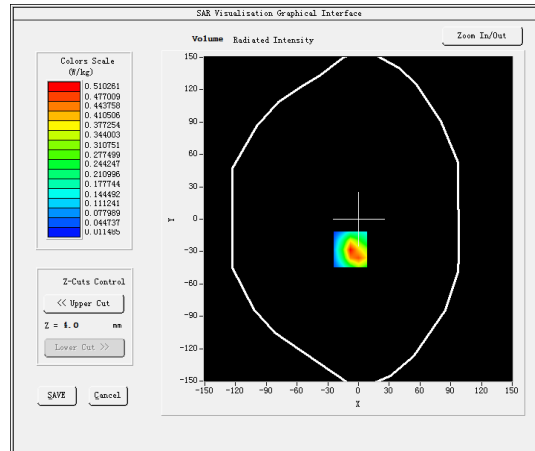
B. SAR Measurement Results

Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.363220
Relative permittivity (imaginary part)	13.911258
Conductivity (S/m)	1.452954
Variation (%)	-0.860000

SURFACE SAR



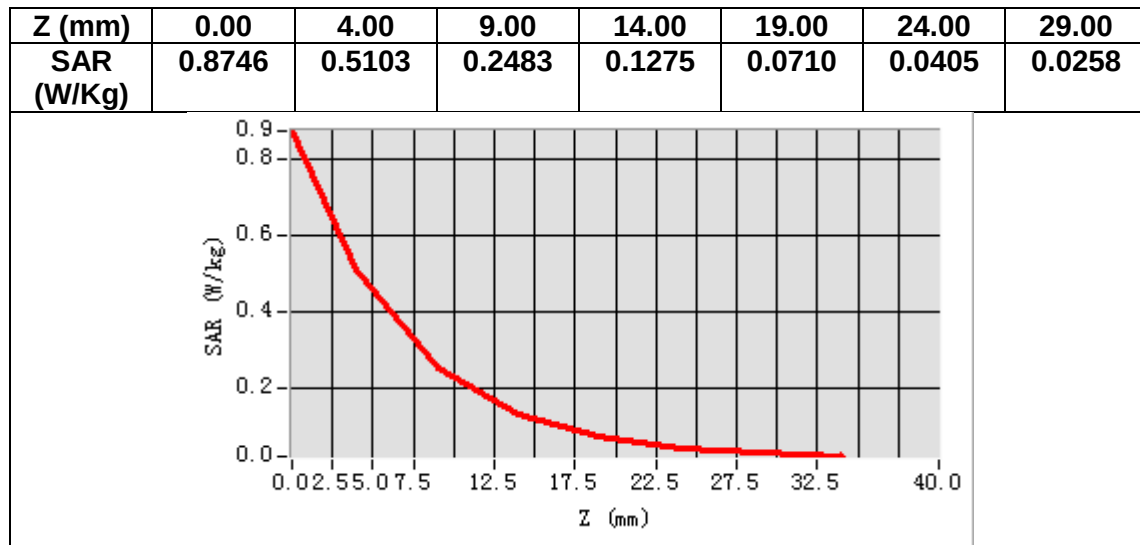
VOLUME SAR



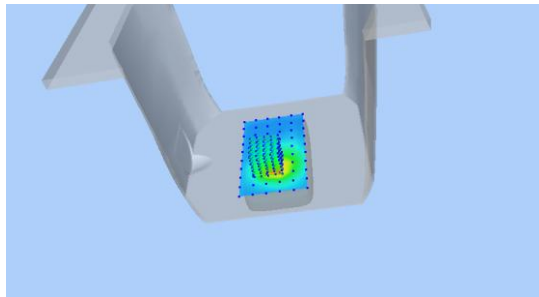
Maximum location: X=-8.00, Y=-28.00

SAR Peak: 0.88 W/kg

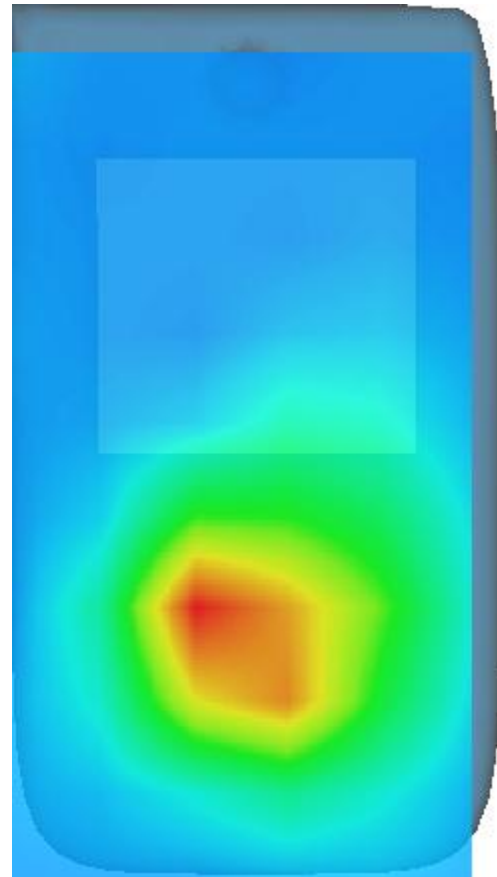
SAR 10g (W/Kg)	0.224974
SAR 1g (W/Kg)	0.489931



3D screen shot



Hot spot position



MEASUREMENT 9

Date of measurement: 7/9/2023

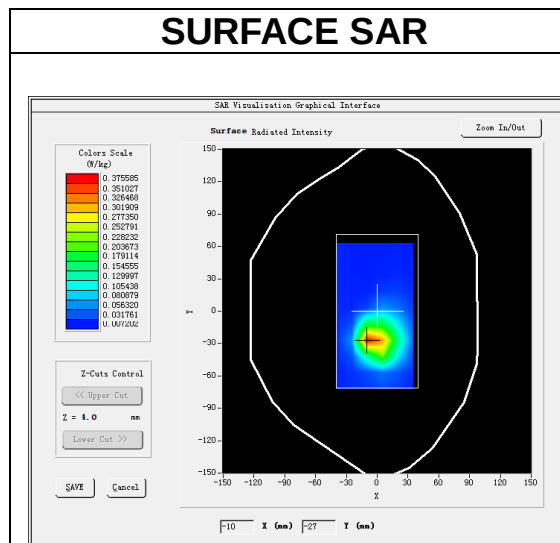
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 4</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.73</u>

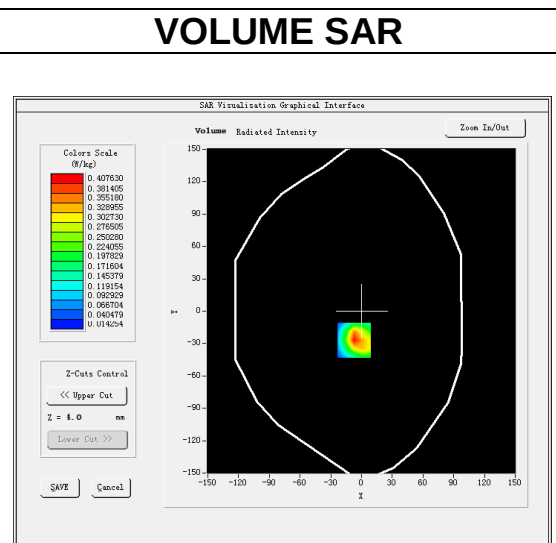
B. SAR Measurement Results

Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.798302
Relative permittivity (imaginary part)	13.663504
Conductivity (S/m)	1.315112
Variation (%)	-2.900000

SURFACE SAR



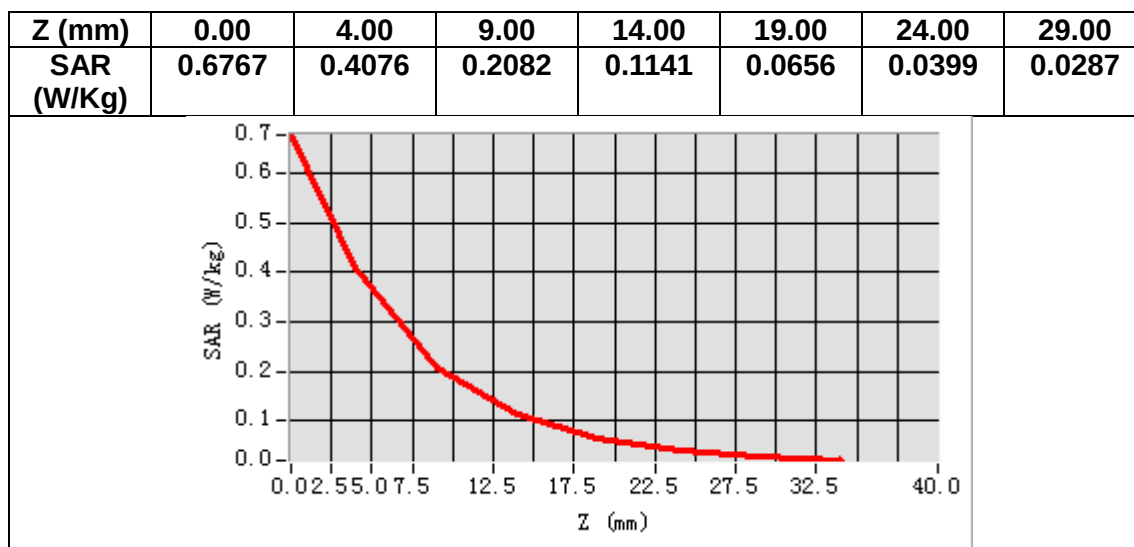
VOLUME SAR



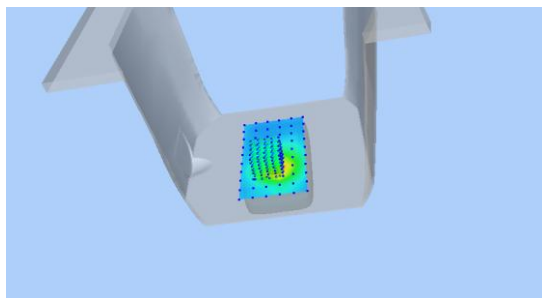
Maximum location: X=-7.00, Y=-27.00

SAR Peak: 0.68 W/kg

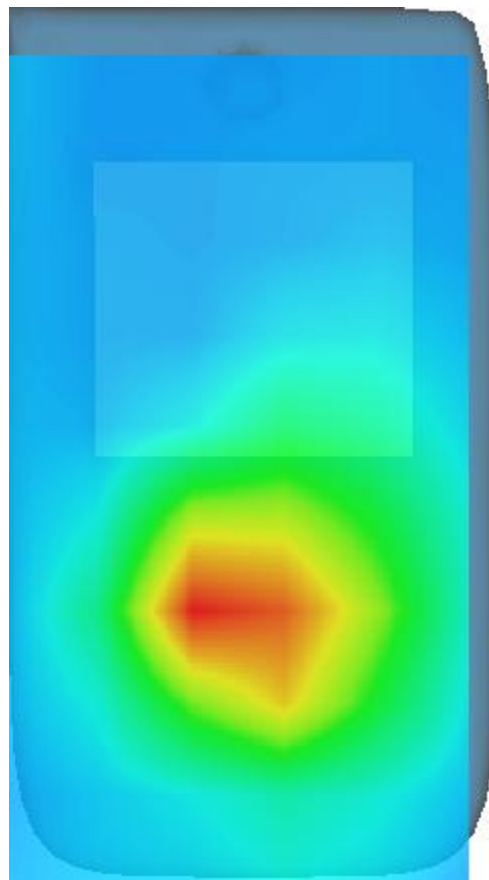
SAR 10g (W/Kg)	0.180554
SAR 1g (W/Kg)	0.376732



3D screen shot



Hot spot position



MEASUREMENT 10

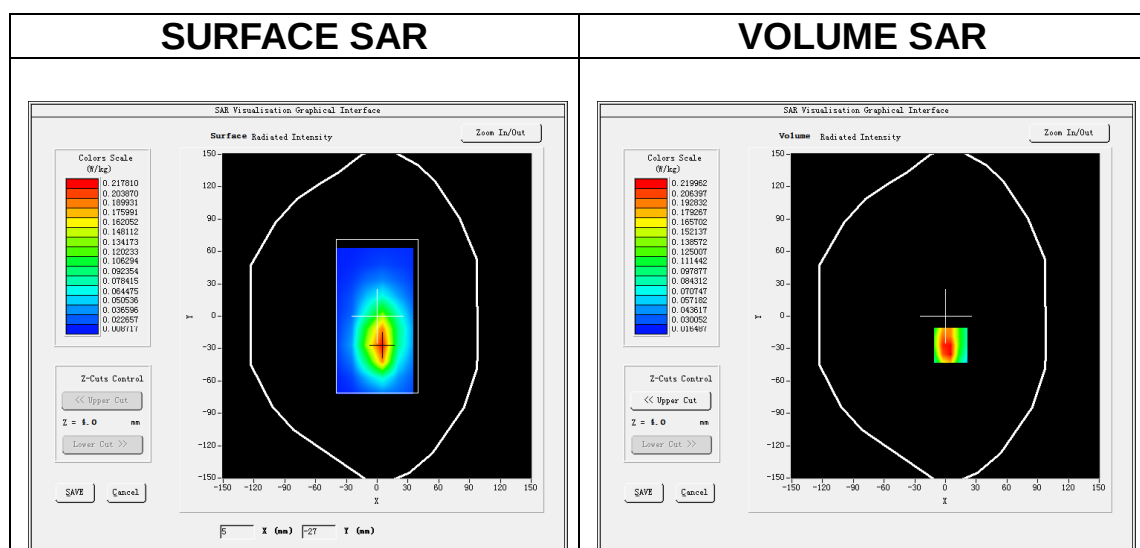
Date of measurement: 4/9/2023

A. Experimental conditions.

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

B. SAR Measurement Results

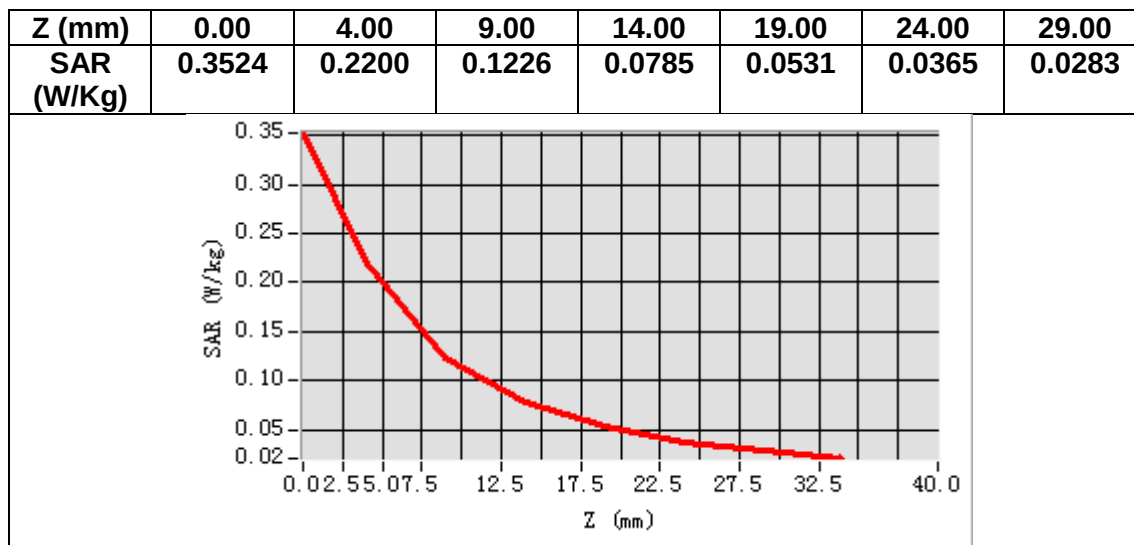
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.829430
Relative permittivity (imaginary part)	19.665213
Conductivity (S/m)	0.913886
Variation (%)	-0.890000



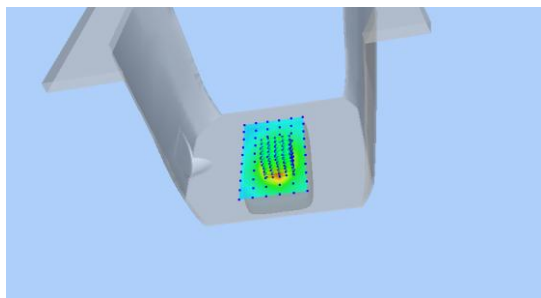
Maximum location: X=5.00, Y=-27.00

SAR Peak: 0.37 W/kg

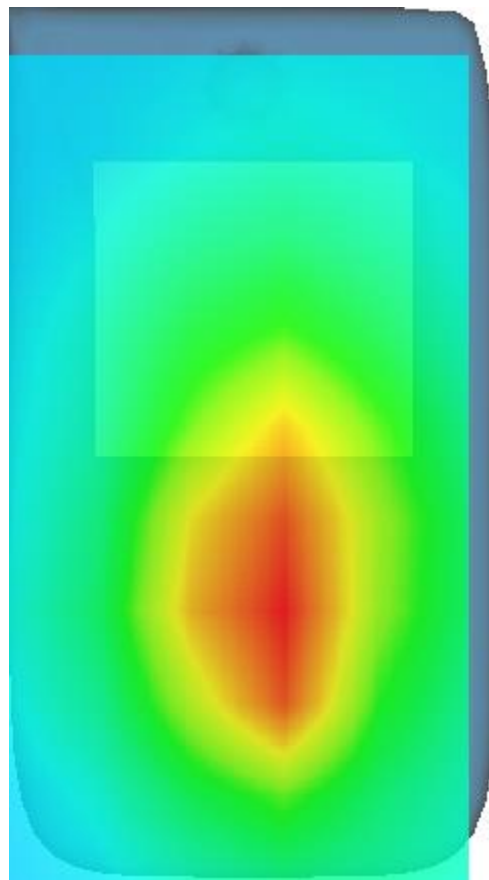
SAR 10g (W/Kg)	0.121261
SAR 1g (W/Kg)	0.223700



3D screen shot



Hot spot position



MEASUREMENT 11

Date of measurement: 1/9/2023

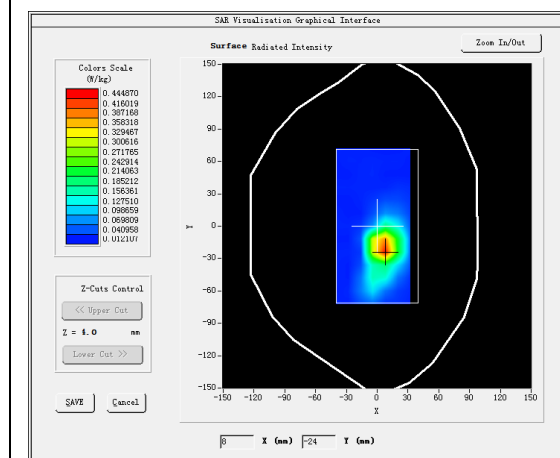
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=12mm dy=12mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>7x7x7,dx=5mm dy=5mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Cheek</u>
<u>Band</u>	<u>LTE band 7</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.87</u>

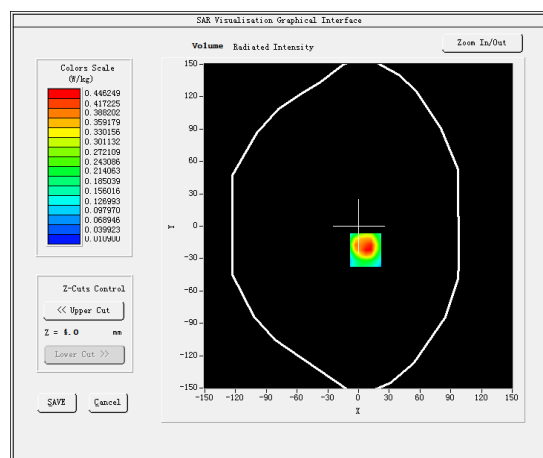
B. SAR Measurement Results

Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.331936
Relative permittivity (imaginary part)	13.251602
Conductivity (S/m)	1.866267
Variation (%)	-0.950000

SURFACE SAR



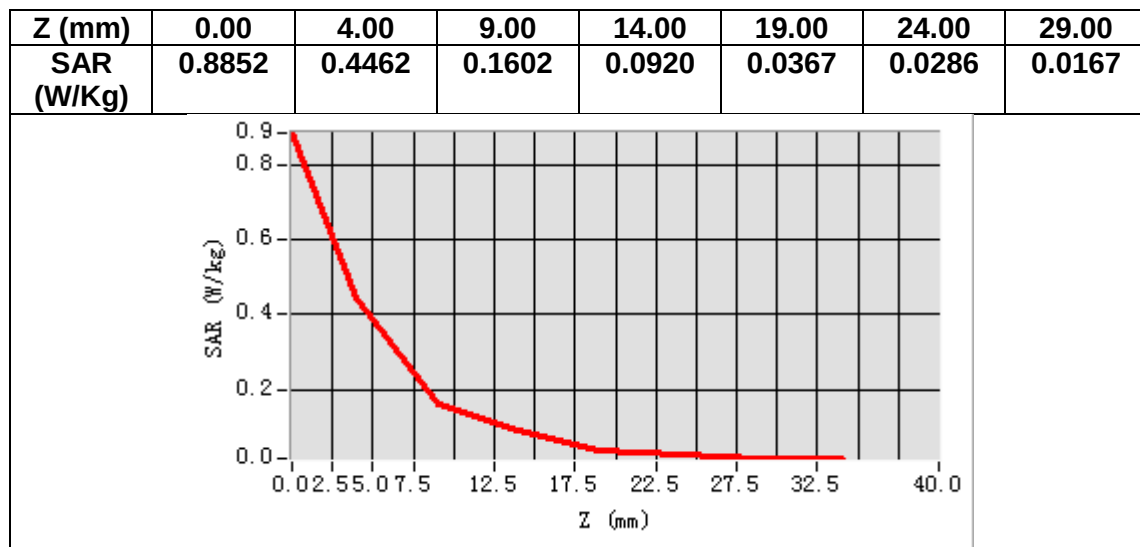
VOLUME SAR



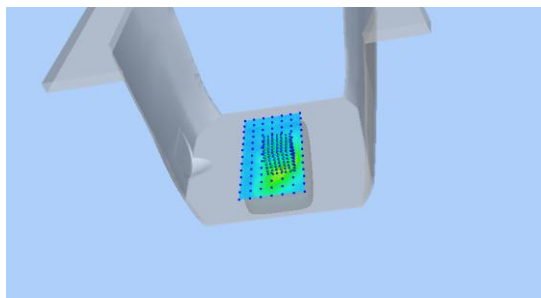
Maximum location: X=7.00, Y=-22.00

SAR Peak: 0.85 W/kg

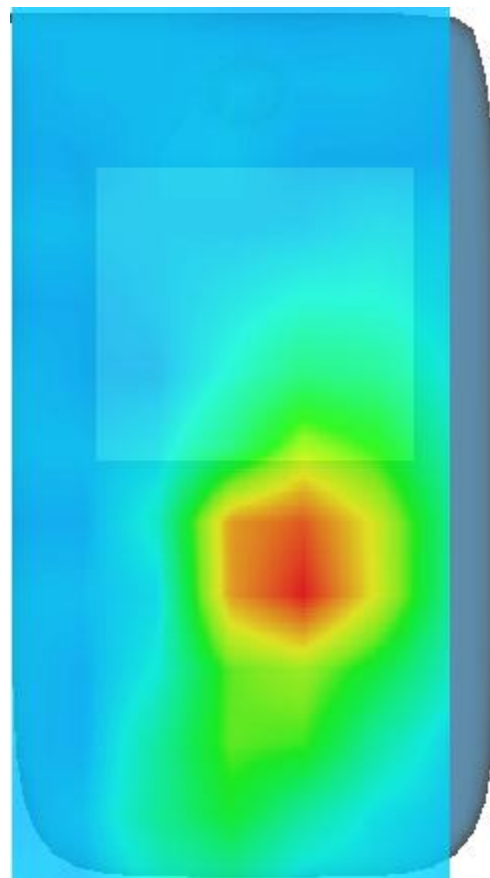
SAR 10g (W/Kg)	0.196096
SAR 1g (W/Kg)	0.426307



3D screen shot



Hot spot position



MEASUREMENT 12

Date of measurement: 5/9/2023

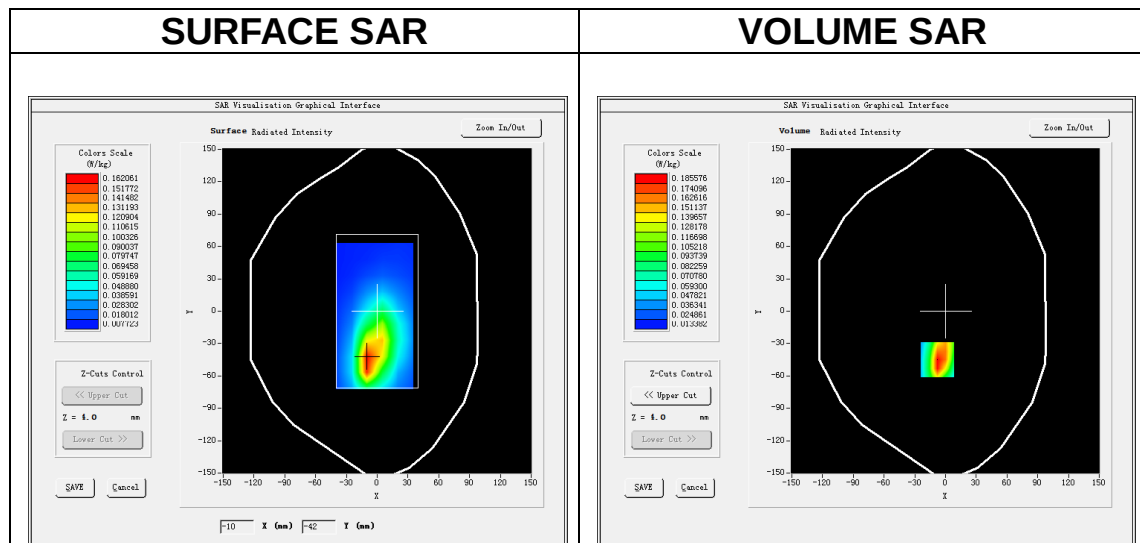
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7, dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 12</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

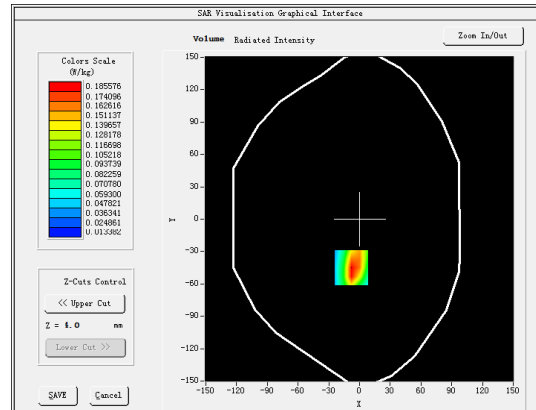
B. SAR Measurement Results

Frequency (MHz)	707.500000
Relative permittivity (real part)	41.227711
Relative permittivity (imaginary part)	21.625830
Conductivity (S/m)	0.850015
Variation (%)	1.390000

SURFACE SAR



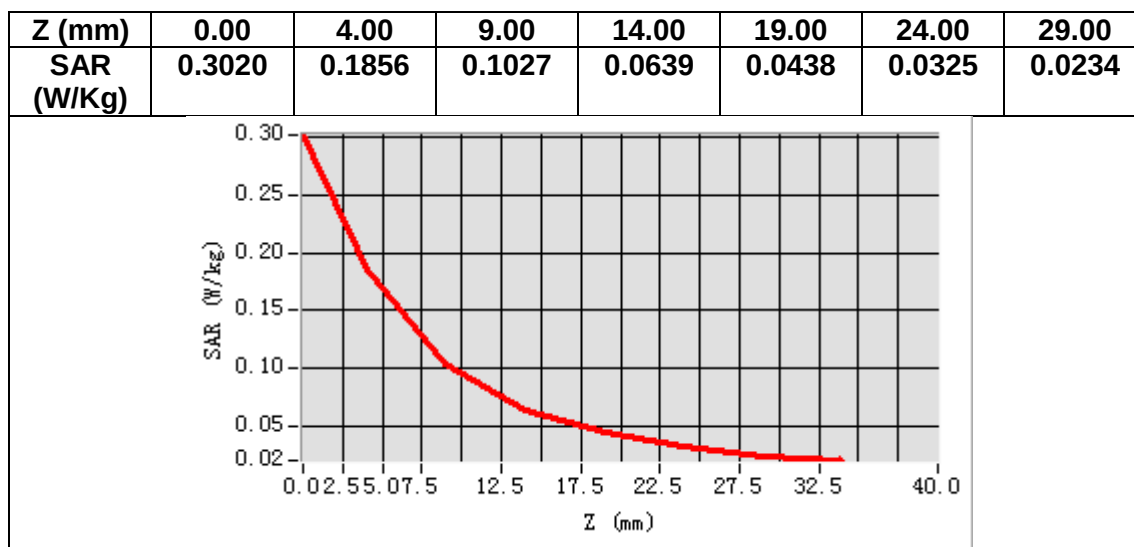
VOLUME SAR



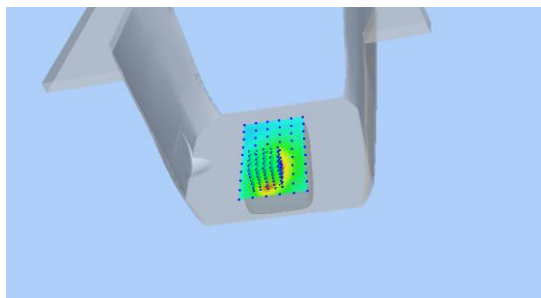
Maximum location: X=-8.00, Y=-45.00

SAR Peak: 0.32 W/kg

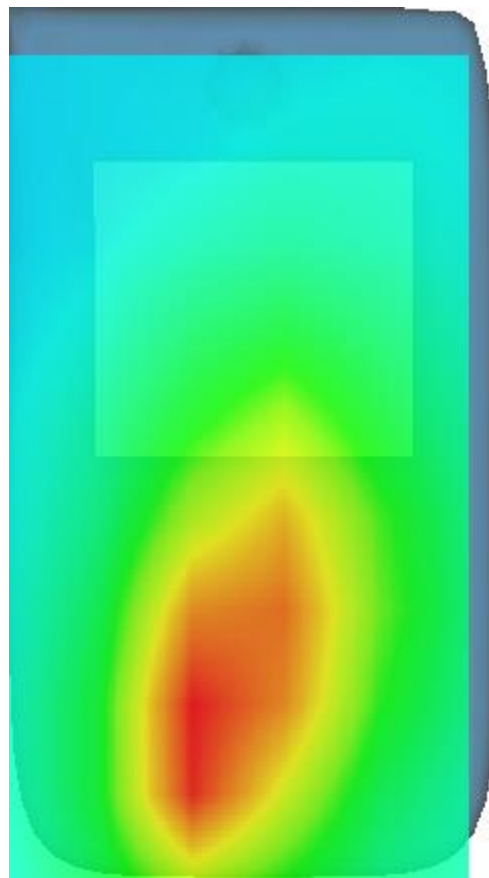
SAR 10g (W/Kg)	0.095992
SAR 1g (W/Kg)	0.181671



3D screen shot



Hot spot position



MEASUREMENT 13

Date of measurement: 5/9/2023

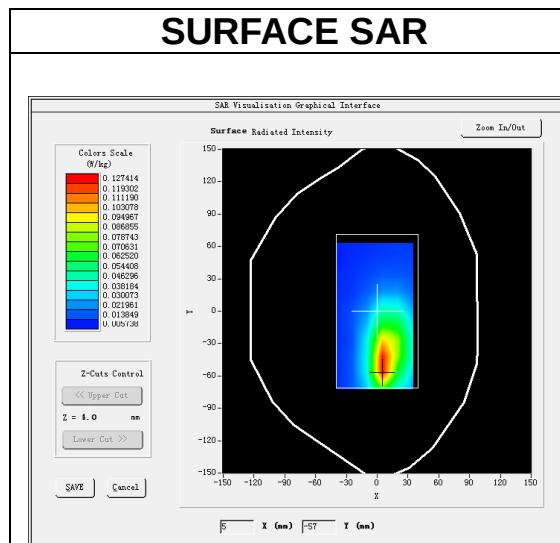
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>LTE band 17</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>LTE (Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.49</u>

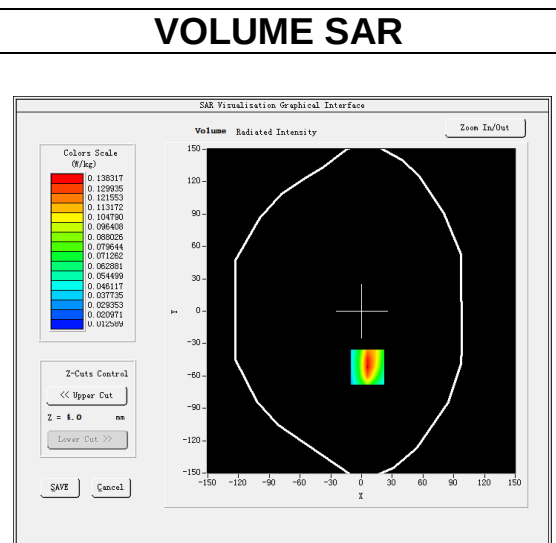
B. SAR Measurement Results

Frequency (MHz)	710.000000
Relative permittivity (real part)	41.212360
Relative permittivity (imaginary part)	21.566278
Conductivity (S/m)	0.850670
Variation (%)	1.840000

SURFACE SAR



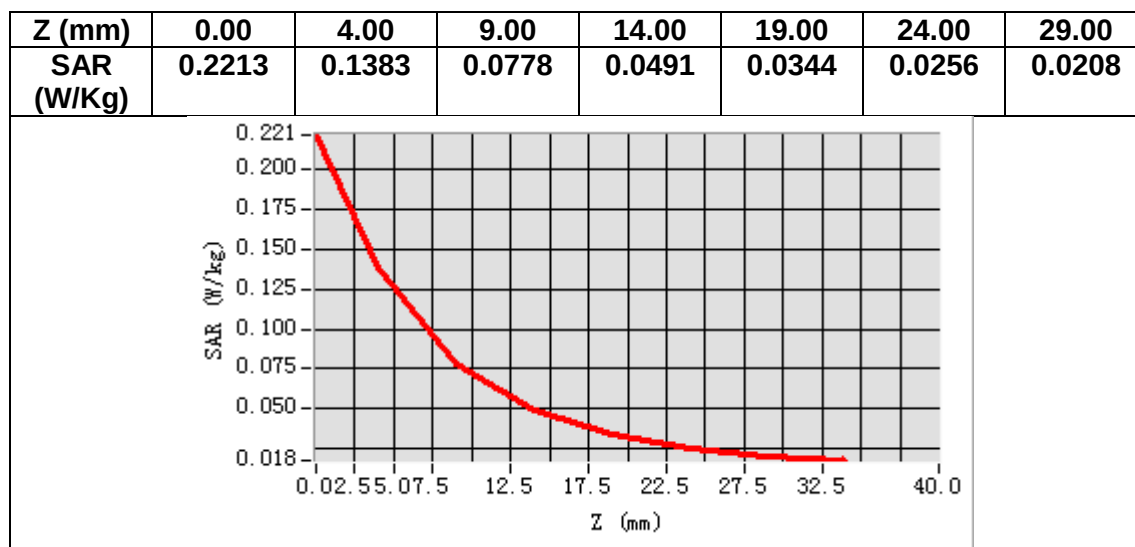
VOLUME SAR



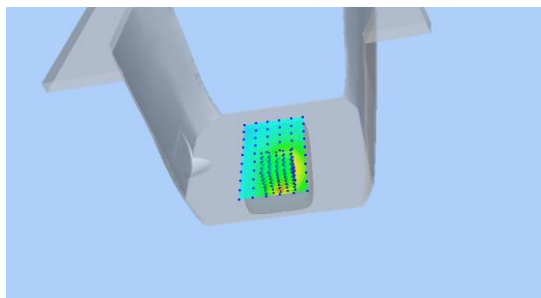
Maximum location: X=6.00, Y=-52.00

SAR Peak: 0.22 W/kg

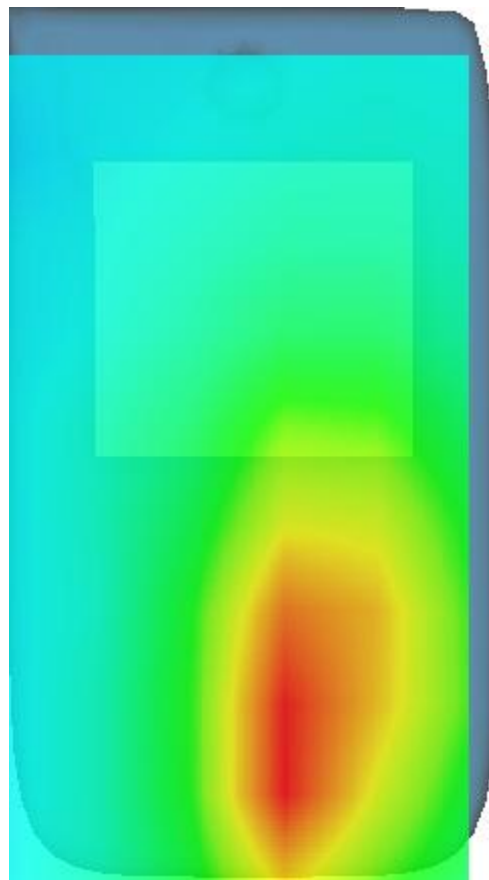
SAR 10g (W/Kg)	0.073526
SAR 1g (W/Kg)	0.130421



3D screen shot



Hot spot position



MEASUREMENT 14

Date of measurement: 7/9/2023

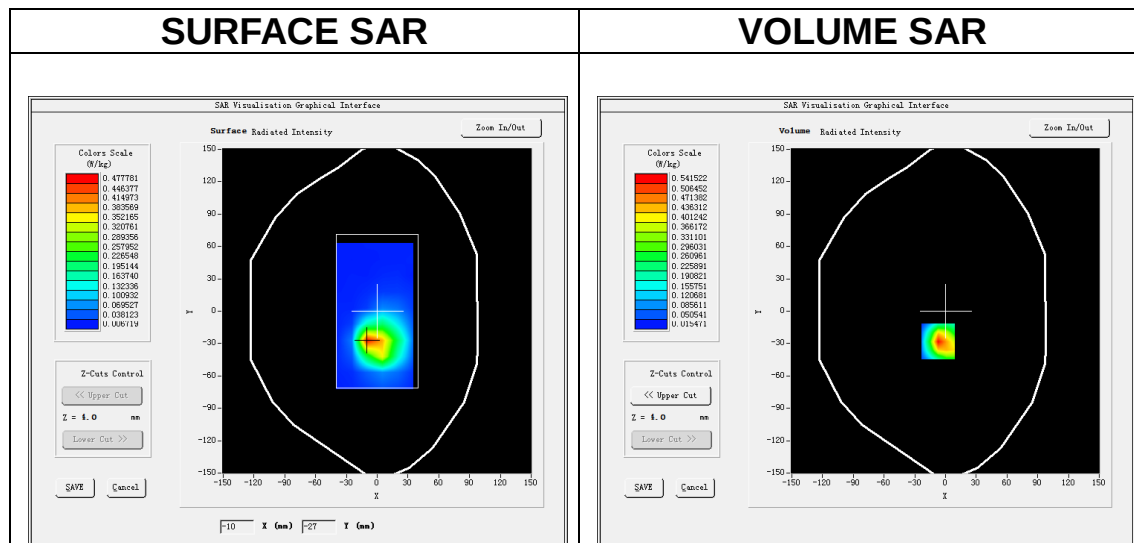
A. Experimental conditions.

<u>Area Scan</u>	<u>dx=15mm dy=15mm, h= 5.00 mm</u>
<u>ZoomScan</u>	<u>5x5x7,dx=8mm dy=8mm dz=5mm</u>
<u>Phantom</u>	<u>Validation plane</u>
<u>Device Position</u>	<u>Body</u>
<u>Band</u>	<u>FDDBand66</u>
<u>Channels</u>	<u>Middle</u>
<u>Signal</u>	<u>(Crest factor: 1.0)</u>
<u>ConvF</u>	<u>1.73</u>

B. SAR Measurement Results

Frequency (MHz)	1745.000000
Relative permittivity (real part)	39.731052
Relative permittivity (imaginary part)	13.654504
Conductivity (S/m)	1.323728
Variation (%)	-3.400000

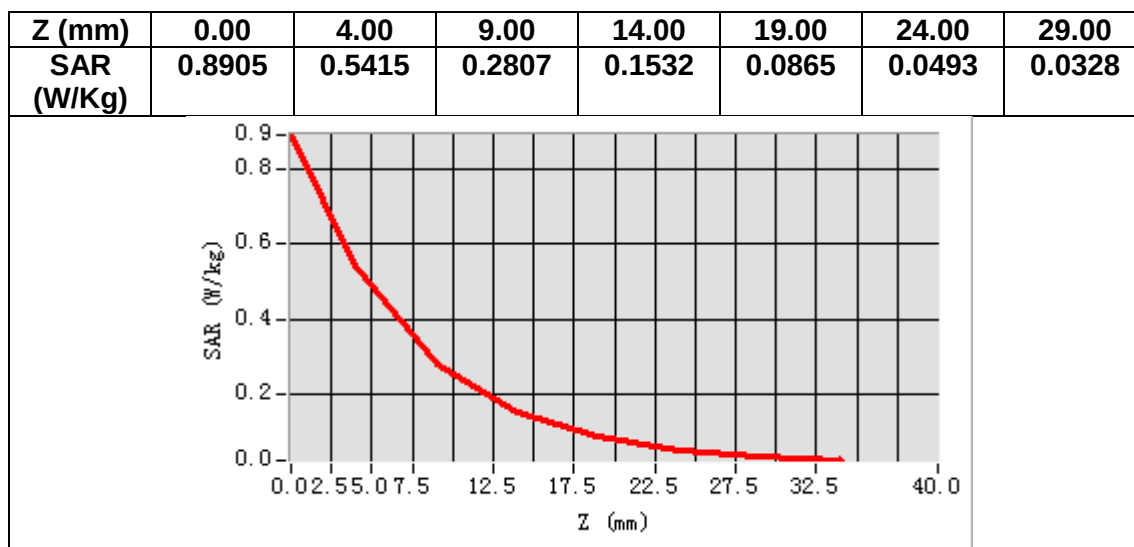
SURFACE SAR



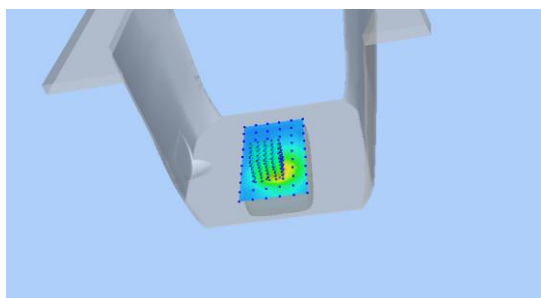
Maximum location: X=-7.00, Y=-28.00

SAR Peak: 0.90 W/kg

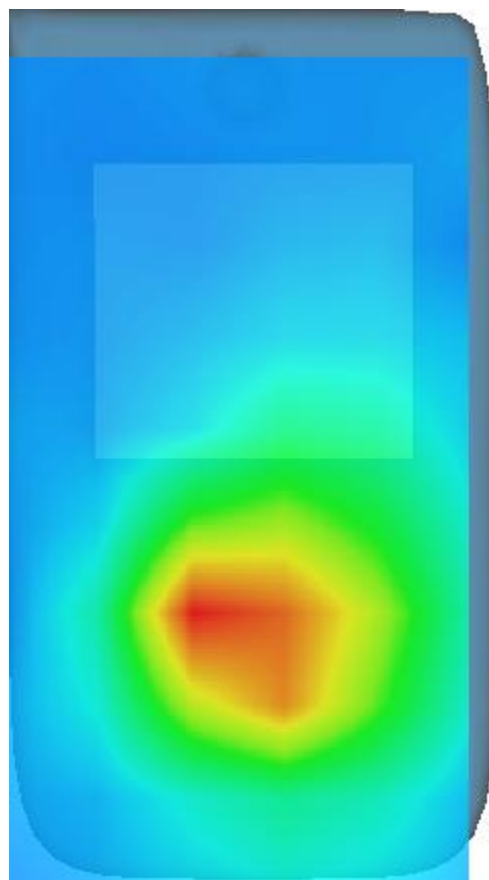
SAR 10g (W/Kg)	0.238239
SAR 1g (W/Kg)	0.500226



3D screen shot



Hot spot position



14. Appendix D. Calibration Certificate

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



COMOSAR E-Field Probe Calibration Report

Ref : ACR.60.1.21.MVGB.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

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

Calibrated at MVG

Z.I. de la pointe du diable

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

Calibration date: 01/10/2023



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

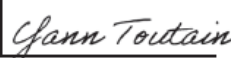
Summary:

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



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

	Name	Function	Date	Signature
Prepared by :	Jérôme Luc	Technical Manager	1/10/2023	
Checked by :	Jérôme Luc	Technical Manager	1/10/2023	
Approved by :	Yann Toutain	Laboratory Director	1/10/2023	

Modèle d'emploi

2023.01.10

11:27:33

+01'00'

PHILIPS

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

Issue	Name	Date	Modifications
A	Jérôme Luc	1/10/2023	Initial release



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.60.1.21.MVGB.A

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