FCC SAR EVALUATION REPORT

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

Product Name： Tablet PC

Trademark： Blackview

Model Name： Active 8 Pro

Family Model： N/A

FCC ID： 2A7DX-ACTIVE8PRO

Report No.： S24050904102001

Prepared for

DOKE COMMUNICATION (HK) LIMITED

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

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name..... DOKE COMMUNICATION (HK) LIMITED

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

Manufacturer's Name..... Shenzhen DOKE Electronic Co., Ltd

Address ..... 801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road, Guangming District, Shenzhen, China.

Product description

Product name..... Tablet PC

Trademark ..... Blackview

Model Name ..... Active 8 Pro

Family Model..... N/A

Standards..... FCC 47 CFR Part 2(2.1093);
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). 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 S240509041002

Date of Test

Date (s) of performance of tests..... May. 11, 2024 ~ May. 30, 2024

Date of Issue ..... Jul. 17, 2024

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

Prepared By	Reviewed By	Approved By
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(Project Engineer)	(Supervisor)	(Manager)

※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	Jul. 17, 2024	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 Active 8 Pro are as follows.

RF Exposure Conditions		Equipment Class -Highest Reported SAR (W/kg)				Max. Reported SAR (W/kg)
		PCB	DTS	NII	DSS	
1-g Body-Worn (Separation distance of 0mm)		0.785	0.553	0.666	0.066	0.785
1-g Hotspot (Separation distance of 0mm)		0.785	0.553	0.666	0.066	
Max Simultaneous Tx	Body-Worn	N/A	1.338	1.451	0.851	1.451
	Hotspot	N/A	1.338	1.451	0.851	

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 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 PC		
Trade Name	Blackview		
Model Name	Active 8 Pro		
Family Model	N/A		
Model Difference	N/A		
FCC ID	2A7DX-ACTIVE8PRO		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Antenna	PIFA Antenna		
Battery	DC 3.87V, 22000mAh, 85.14Wh		
Hardware version	TP769_A1_V1.0		
Software version	Active8Pro_NEU_TP769_V1.0_01		
Device Operating Configurations			
Supporting Mode(s)	GSM 850/1900, WCDMA Band 2/4/5, LTE Band 2/4/5/7/12/17/41, WLAN 2.4G/5G, Bluetooth		
Test Modulation	GSM(GMSK/8PSK), WCDMA(QPSK), LTE(QPSK/16QAM), WLAN(DSSS/OFDM), Bluetooth(GFSK, π/4-DQPSK, 8DPSK)		
Device Class	B		
Operating Frequency	Band	Tx (MHz)	Rx (MHz)

Range(s)	GSM 850	824-849	869-894
	GSM 1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 4	1710-1755	2110-2155
	WCDMA Band 5	824-849	869-894
	LTE Band 2	1850-1910	1930-1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	LTE Band 12	699-716	729-746
	LTE Band 17	704-716	734-746
	LTE Band 41	2535-2655	
	WLAN 2.4G	2412-2462	
	WLAN 5.2G	5180-5240	
	WLAN 5.8G	5745-5825	
	Bluetooth	2402-2480	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink	4	
	Max Number of Timeslots in Downlink	4	
	Max Total Timeslot	5	
Power Class	4, tested with power level 5(GSM 850)		
	1, tested with power level 0(GSM 1900)		
	3, tested with power control “all 1”(WCDMA Band 2)		
	3, tested with power control “all 1”(WCDMA Band 4)		
	3, tested with power control “all 1”(WCDMA Band 5)		
	3, tested with power control all Max.(LTE Band 2)		
	3, tested with power control all Max.(LTE Band 4)		
	3, tested with power control all Max.(LTE Band 5)		
	3, tested with power control all Max.(LTE Band 7)		
	3, tested with power control all Max.(LTE Band 12)		
	3, tested with power control all Max.(LTE Band 17)		
	3, tested with power control all Max.(LTE Band 41)		

1.4. Test specification(s)

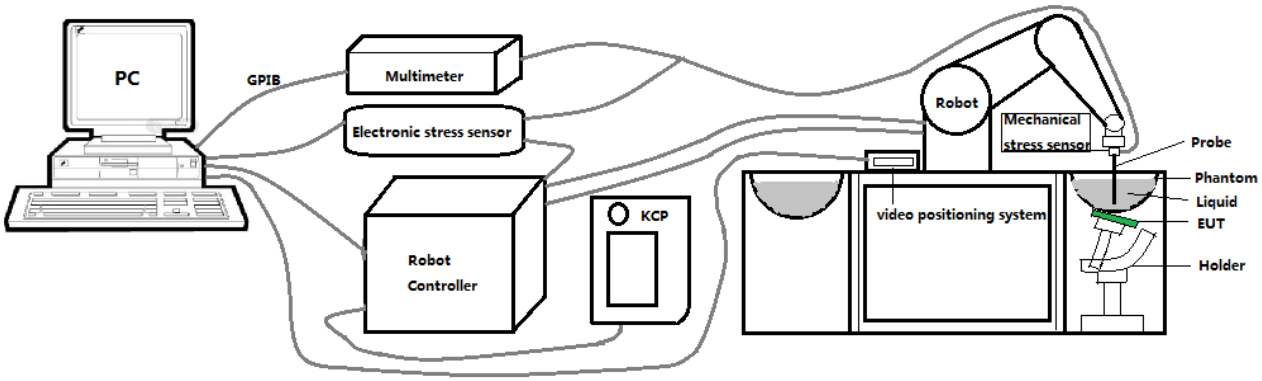
FCC 47 CFR Part 2(2.1093)
IEEE Std 1528-2013
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting
KDB 447498 D01 General RF Exposure Guidance
KDB 248227 D01 802.11 Wi-Fi SAR
KDB 941225 D01 3G SAR Procedures
KDB 941225 D05 SAR for LTE Devices
KDB 616217 D04 SAR for laptop 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 3423-EPGO-426 with following specifications is used

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

Angle between probe axis (evaluation axis) and surface normal line: less than 30°.

2.3.1. E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy shall be evaluated and within ±0.25dB. 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.

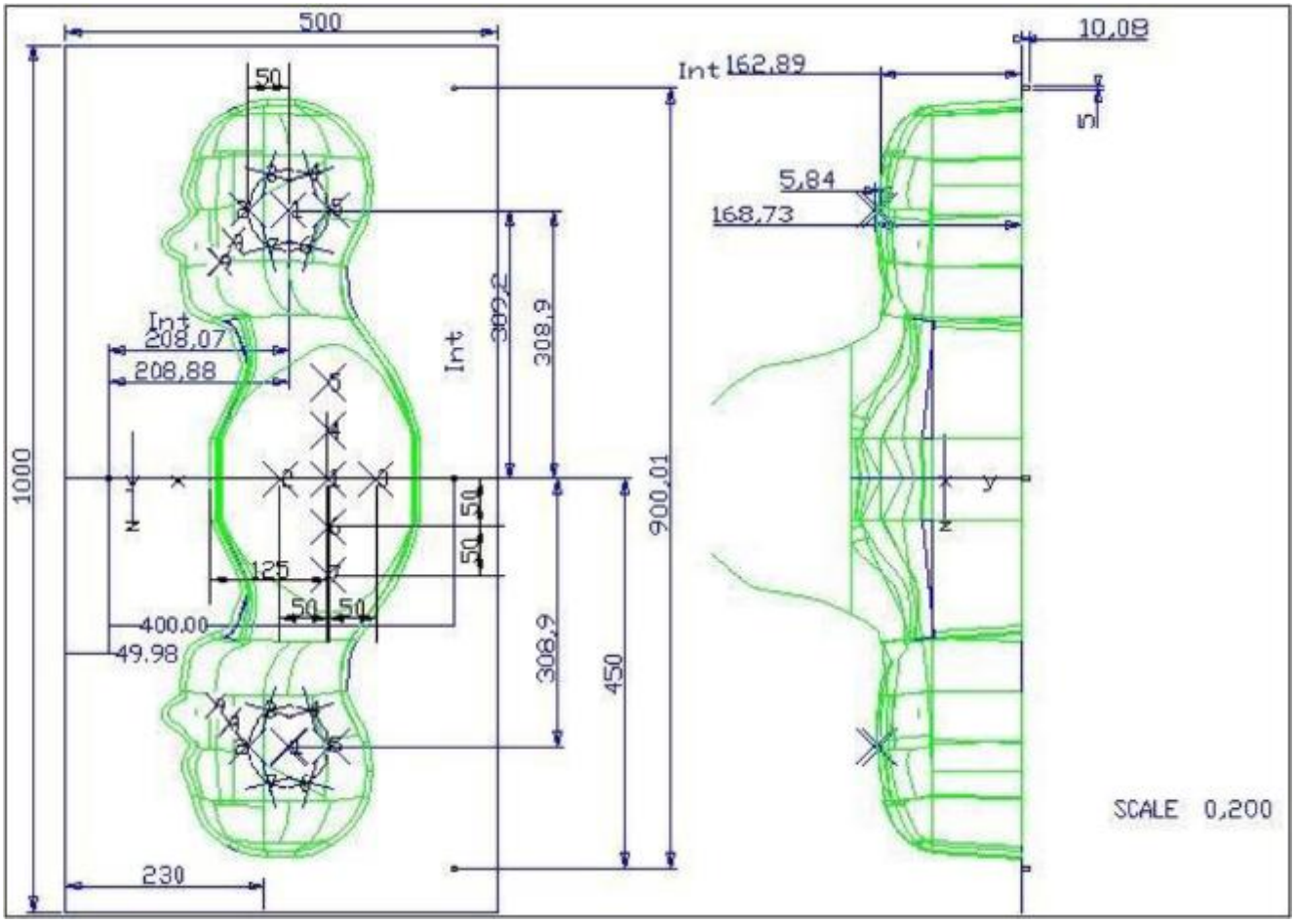
2.4. SAM phantoms

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

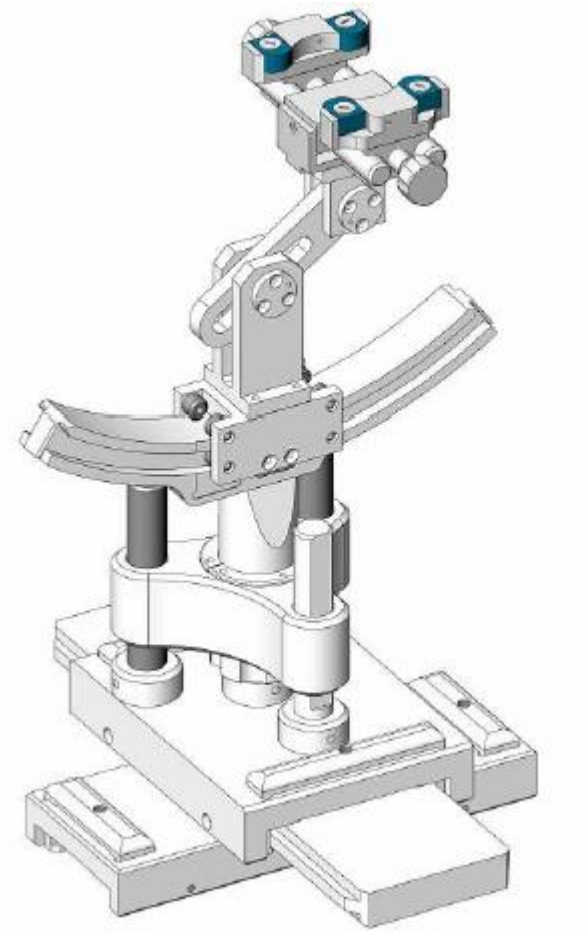


Serial Number	Left Head(mm)		Right Head(mm)		Flat Part(mm)	
SN 16/15 SAM119	2	2.02	2	2.08	1	2.09
	3	2.05	3	2.06	2	2.06
	4	2.07	4	2.07	3	2.08
	5	2.08	5	2.08	4	2.10
	6	2.05	6	2.07	5	2.10
	7	2.05	7	2.05	6	2.07
	8	2.07	8	2.06	7	2.07
	9	2.08	9	2.06	-	-

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	3423-EPGO-426	Sep. 18, 2023	Sep. 17, 2024
☒	MVG	750 MHz Dipole	SID750	SN 03/15 DIP 0G750-355	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	835 MHz Dipole	SID835	SN 03/15 DIP 0G835-347	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	900 MHz Dipole	SID900	SN 03/15 DIP 0G900-348	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1800 MHz Dipole	SID1800	SN 03/15 DIP 1G800-349	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	1900 MHz Dipole	SID1900	SN 03/15 DIP 1G900-350	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2000 MHz Dipole	SID2000	SN 03/15 DIP 2G000-351	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	2300 MHz Dipole	SID2300	SN 03/16 DIP 2G300-358	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	2450 MHz Dipole	SID2450	SN 03/15 DIP 2G450-352	Feb. 21, 2024	Feb. 20, 2027
☒	MVG	2600 MHz Dipole	SID2600	SN 03/15 DIP 2G600-356	Feb. 21, 2024	Feb. 20, 2027
☐	MVG	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	Feb. 21, 2024	Feb. 20, 2027
☒	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	Apr. 26, 2024	Apr. 25, 2025
☒	R&S	Wideband radio communication tester	CMW500	103917	Apr. 26, 2024	Apr. 25, 2025

☒	HP	Network Analyzer	8753D	3410J01136	Apr. 26, 2024	Apr. 25, 2025
☒	Agilent	MXG Vector Signal Generator	N5182A	MY47070317	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power meter	E4419B	MY45102538	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	MY41495644	Apr. 25, 2024	Apr. 24, 2025
☒	Agilent	Power sensor	E9301A	US39212148	Apr. 25, 2024	Apr. 24, 2025
☒	MCLI/USA	Directional Coupler	CB11-20	0D2L51502	Apr. 26, 2024	Apr. 25, 2027
☒	N/A	Thermometer	N/A	LES-085	Mar. 27, 2023	Mar. 26, 2026
☒	MVG	SAM Phantom	SSM2	SN 16/15 SAM119	NCR	NCR
☒	MVG	Device Holder	SMPPD	SN 16/15 MSH100	NCR	NCR
☒	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 5200	Head 5200	NCR	NCR
☒	Shenzhen Tianxu Communication Technology Co., Ltd.	Human Simulating Liquid	Head 5800	Head 5800	NCR	NCR

3. SAR Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.

(b) Read the WWAN RF power level from the base station simulator.

(c) For 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.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">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.</td></tr>
</table>

3.3. Description of interpolation/extrapolation scheme

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimise measurements errors, but the highest local SAR will occur at the surface of the phantom.
An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1 mm step.
The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1 gram requires a very fine resolution in the three dimensional scanned data array.

3.4. Volumetric Scan

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

3.5. Power Drift

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

4. System Verification Procedure

4.1. Tissue Verification

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

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

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

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

4.1.1. Tissue Dielectric Parameter Check Results

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

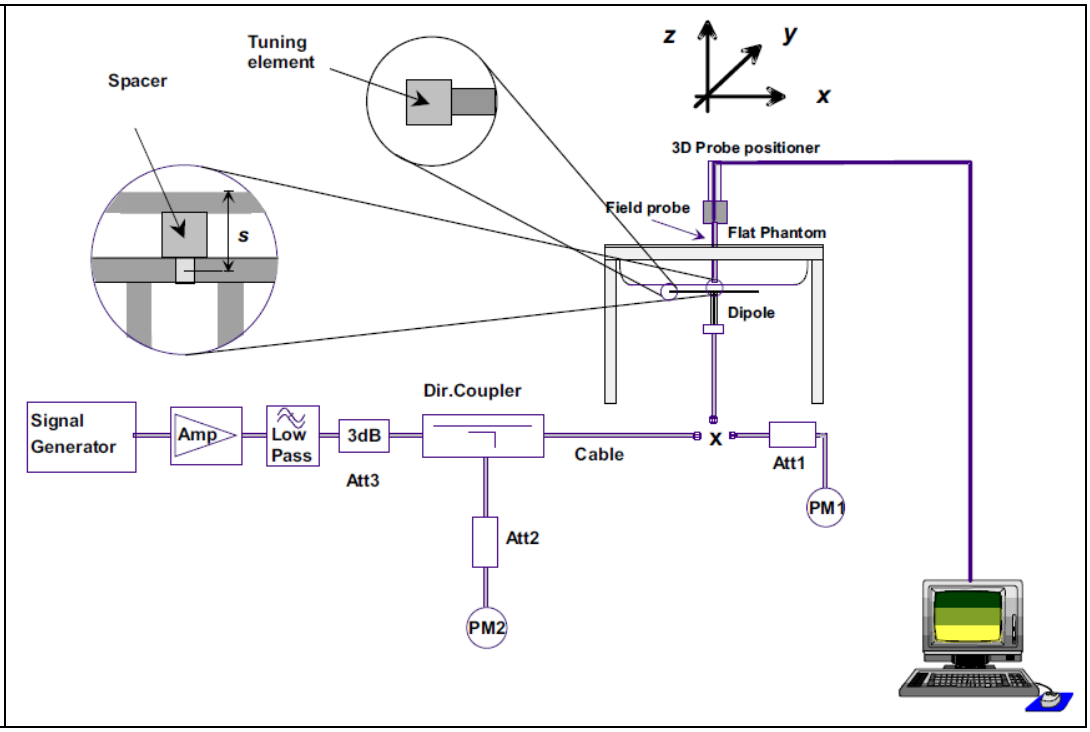
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		εr (±5%)	σ (S/m) (±5%)	εr	σ (S/m)		
Head 750	750	41.96 (39.86~44.06)	0.89 (0.85~0.93)	40.93	0.90	21.3 °C	May. 13, 2024
Head 850	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.53	0.91	21.9 °C	May. 30, 2024
Head 1800	1800	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.34	1.40	21.7 °C	May. 28, 2024
Head 1900	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.93	1.45	21.9 °C	May. 15, 2024
Head 2450	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	37.67	1.78	21.6 °C	May. 14, 2024
Head 2600	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	39.17	2.02	21.4 °C	May. 29, 2024
Head 5200	5200	36.00 (34.20~37.80)	4.66 (4.43~4.89)	34.68	4.56	21.7 °C	May. 11, 2024
Head 5800	5800	35.30 (33.54~37.07)	5.27 (5.01~5.53)	34.11	5.21	21.5 °C	May. 12, 2024

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

Comparing to the original SAR value provided by SATIMO, the verification data should be within its specification of ±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) (±10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (W/Kg)	10-g (W/Kg)	1-g (W/Kg)	10-g (W/Kg)		
750MHz	8.60 (7.74~9.46)	5.78 (5.20~6.36)	8.07	5.89	21.3 °C	May. 13, 2024
835MHz	9.40 (8.46~10.34)	6.28 (5.65~6.91)	9.09	6.80	21.9 °C	May. 30, 2024
1800MHz	37.06 (33.35~40.77)	20.01 (18.01~22.01)	36.71	19.17	21.7 °C	May. 28, 2024
1900MHz	39.69 (35.72~43.66)	20.92 (18.83~23.01)	41.77	20.68	21.9 °C	May. 15, 2024
2450MHz	50.05 (45.05~55.06)	23.80 (21.42~26.18)	50.75	22.86	21.6 °C	May. 14, 2024
2600MHz	54.16 (48.74~59.58)	24.85 (22.37~27.34)	58.46	24.41	21.4 °C	May. 29, 2024
5200MHz	162.59 (146.33~178.85)	56.21 (50.59~61.83)	152.73	53.17	21.7 °C	May. 11, 2024
5800MHz	182.20 (163.98~200.42)	61.32 (55.19~67.45)	173.88	61.75	21.5 °C	May. 12, 2024

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) W hen the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

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

7. RF Output Power

7.1. GSM Conducted Power

Band GSM850	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune - up (dBm)	128	189	251	Tune - up (dBm)	128	189	251
Frequency (MHz)		824.2	836.4	848.8		824.2	836.4	848.8
GSM (GMSK)	32.50	32.15	32.12	32.15	23.47	23.12	23.09	23.12
GPRS(GMSK, 1 TS)	32.50	32.11	32.01	32.06	23.47	23.08	22.98	23.03
GPRS(GMSK, 2 TS)	31.50	31.12	31.06	31.10	25.48	25.10	25.04	25.08
GPRS(GMSK, 3 TS)	29.50	29.17	29.07	29.16	25.24	24.91	24.81	24.90
GPRS(GMSK, 4 TS)	28.00	28.00	27.95	27.98	24.99	24.99	24.94	24.97
EGPRS(8PSK, 1 TS)	27.00	26.58	26.64	26.75	17.97	17.55	17.61	17.72
EGPRS(8PSK, 2 TS)	26.00	25.72	25.55	25.88	19.98	19.70	19.53	19.86
EGPRS(8PSK, 3 TS)	23.00	22.40	22.26	22.59	18.74	18.14	18.00	18.33
EGPRS(8PSK, 4 TS)	21.50	20.94	20.98	21.46	18.49	17.93	17.97	18.45
Band GSM1900	Burst-Averaged output Power (dBm)				Frame-Averaged output Power (dBm)			
Tx Channel	Tune - up (dBm)	512	661	810	Tune - up (dBm)	512	661	810
Frequency (MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8
GSM (GMSK)	28.50	28.24	28.27	28.30	19.47	19.21	19.24	19.27
GPRS(GMSK, 1 TS)	28.50	28.20	28.22	28.27	19.47	19.17	19.19	19.24
GPRS(GMSK, 2 TS)	27.50	27.31	27.33	27.38	21.48	21.29	21.31	21.36
GPRS(GMSK, 3 TS)	26.00	25.44	25.44	25.50	21.74	21.18	21.18	21.24
GPRS(GMSK, 4 TS)	24.50	24.34	24.35	24.40	21.49	21.33	21.34	21.39
EGPRS(8PSK, 1 TS)	27.00	26.58	26.15	25.80	17.97	17.55	17.12	16.77
EGPRS(8PSK, 2 TS)	26.00	25.87	25.62	24.93	19.98	19.85	19.60	18.91
EGPRS(8PSK, 3 TS)	25.00	24.84	24.35	23.98	20.74	20.58	20.09	19.72
EGPRS(8PSK, 4 TS)	24.50	24.02	23.64	23.09	21.49	21.01	20.63	20.08

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	9262	9400	9538
Frequency (MHz)	(dBm)	1852.4	1880	1907.6
RMC12.2K	23.00	22.19	22.90	22.75
HSDPA Sub 1	23.00	22.58	22.28	22.00
HSDPA Sub 2	23.00	22.53	22.12	22.35
HSDPA Sub 3	20.50	20.09	19.16	19.28
HSDPA Sub 4	20.00	19.28	19.50	19.24
HSUPA Sub 1	23.00	21.60	22.53	21.93
HSUPA Sub 2	23.00	22.90	21.93	21.45
HSUPA Sub 3	20.00	19.22	19.57	19.40
HSUPA Sub 4	22.50	22.49	22.23	21.94
HSUPA Sub 5	21.00	19.84	20.78	20.64
WCDMA Band 4	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up	1312	1413	1513
Frequency (MHz)	(dBm)	1712.4	1732.6	1752.6
RMC12.2K	23.50	23.25	23.28	23.23
HSDPA Sub 1	21.00	20.85	20.87	20.83
HSDPA Sub 2	21.00	20.51	20.69	20.51
HSDPA Sub 3	20.00	19.44	19.76	19.64
HSDPA Sub 4	20.00	19.43	19.61	19.33
HSUPA Sub 1	21.00	19.94	20.87	20.60
HSUPA Sub 2	21.00	20.79	20.80	20.71
HSUPA Sub 3	20.00	19.03	19.87	19.70
HSUPA Sub 4	21.00	20.83	20.85	20.81
HSUPA Sub 5	20.50	19.67	20.38	20.07
WCDMA Band 5	Burst-Averaged output Power (dBm)			
Tx Channel	Tune-up	4132	4182	4233
Frequency (MHz)	(dBm)	826.4	836.4	846.6
RMC12.2K	23.50	23.34	23.24	23.24
HSDPA Sub 1	23.00	21.07	21.94	22.55
HSDPA Sub 2	22.00	20.85	20.57	21.55
HSDPA Sub 3	20.50	20.07	19.60	20.02
HSDPA Sub 4	20.50	20.28	20.21	19.60
HSUPA Sub 1	21.50	20.37	20.77	21.29

HSUPA Sub 2	22.50	20.93	20.87	22.49
HSUPA Sub 3	20.50	19.60	20.18	20.27
HSUPA Sub 4	22.00	21.07	20.95	21.56
HSUPA Sub 5	21.50	19.88	20.68	21.32

7.3. LTE Conducted Power

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18607/1850.7	18900/1880	19193/1909.3
LTE Band 2	1.4MHz	QPSK	1	0	23.50	23.04	22.56	22.26
			1	2	23.50	23.04	22.57	22.26
			1	5	23.50	23.05	22.62	22.31
			3	0	23.50	23.11	22.60	22.32
			3	1	23.50	23.08	22.62	22.30
			3	2	23.50	23.10	22.66	22.34
			6	0	22.50	22.44	21.99	21.70
		16QAM	1	0	22.50	22.49	22.21	21.71
			1	2	22.50	22.41	22.19	21.52
			1	5	22.50	22.47	22.23	21.71
			3	0	22.50	22.27	21.94	21.49
			3	1	22.50	22.32	21.93	21.43
			3	2	22.50	22.22	21.97	21.41
			6	0	22.00	21.78	21.34	21.43
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18615/1851.5	18900/1880	19185/1908.5
LTE Band 2	3MHz	QPSK	1	0	23.50	23.04	22.61	22.18
			1	7	23.50	23.04	22.61	22.22
			1	14	23.50	23.03	22.62	22.33
			8	0	23.00	22.47	22.00	21.66
			8	4	23.00	22.50	22.04	21.70
			8	7	23.00	22.50	22.10	21.71
			15	0	23.00	22.52	22.05	21.70
		16QAM	1	0	23.00	22.52	22.20	21.70
			1	7	23.00	22.49	22.04	21.64
			1	14	23.00	22.39	22.21	21.72
			8	0	22.00	21.81	21.39	21.35

			8	4	22.00	21.79	21.43	21.40
			8	7	22.00	21.82	21.46	21.38
			15	0	22.00	21.76	21.31	21.30
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18625/1852.5	18900/1880	19175/1907.5
LTE Band 2	5MHz	QPSK	1	0	23.50	23.22	22.83	22.39
			1	12	23.50	23.27	22.83	22.40
			1	24	23.50	23.30	22.89	22.53
			12	0	23.00	22.58	22.10	21.67
			12	6	23.00	22.63	22.17	21.77
			12	11	23.00	22.65	22.26	21.76
			25	0	23.00	22.63	22.21	21.75
		16QAM	1	0	23.00	22.68	22.30	21.97
			1	12	23.00	22.65	22.42	21.92
			1	24	23.00	22.66	22.50	21.88
			12	0	22.00	21.86	21.40	21.26
			12	6	22.00	21.84	21.49	21.43
			12	11	22.00	21.84	21.54	21.37
			25	0	22.00	21.89	21.52	21.38
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18650/1855	18900/1880	19150/1905
LTE Band 2	10MHz	QPSK	1	0	23.50	23.32	22.81	22.37
			1	24	23.50	23.27	22.81	22.36
			1	49	23.50	23.40	22.99	22.57
			25	0	23.00	22.59	22.02	21.52
			25	12	23.00	22.68	22.19	21.70
			25	24	23.00	22.68	22.31	21.85
			50	0	23.00	22.64	22.21	21.71
		16QAM	1	0	23.00	22.81	22.28	21.93
			1	24	23.00	22.49	22.32	21.93
			1	49	23.00	22.56	22.46	21.87
			25	0	22.00	21.84	21.35	21.14
			25	12	22.00	21.86	21.51	21.37
			25	24	22.00	21.84	21.63	21.50
			50	0	22.00	21.82	21.51	21.34
Band	Band	Modulation	RB		Tune-up	Channel/Frequency(MHz)		

	Width		Configuration		(dBm)			
			RB Size	RB Offset		18675/1857.5	18900/1880	19125/1902.5
LTE Band 2	15MHz	QPSK	1	0	23.50	23.30	22.76	22.66
			1	37	23.50	23.30	22.80	22.31
			1	74	23.50	23.17	23.00	22.56
			36	0	23.00	22.63	22.03	21.79
			36	18	23.00	22.64	22.13	21.63
			36	37	23.00	22.56	22.33	21.84
			75	0	23.00	22.61	22.18	21.80
		16QAM	1	0	23.00	22.84	22.30	21.99
			1	37	23.00	22.44	22.41	21.91
			1	74	23.00	22.28	22.39	21.95
			36	0	22.00	21.84	21.66	21.38
			36	18	22.00	21.74	21.41	21.27
			36	37	22.00	21.66	21.60	21.47
			75	0	22.00	21.75	21.46	21.44
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		18700/1860	18900/1880	19100/1900
LTE Band 2	20MHz	QPSK	1	0	23.50	23.24	22.72	22.94
			1	49	23.50	23.24	23.40	22.34
			1	99	23.50	22.85	22.93	22.53
			50	0	23.00	22.73	21.99	22.26
			50	24	23.00	22.71	22.21	21.82
			50	49	23.00	22.42	22.39	21.96
			100	0	23.00	22.55	22.17	22.04
		16QAM	1	0	23.00	22.75	22.14	22.17
			1	49	23.00	22.32	22.30	21.82
			1	99	23.00	22.16	22.24	21.95
			50	0	22.00	21.85	21.60	21.42
			50	24	22.00	21.77	21.47	21.44
			50	49	22.00	21.53	21.64	21.58
			100	0	22.00	21.65	21.41	21.68

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB	RB		19957/1710.	20175/1732.	20393/1754.

			Size	Offset		7	5	3
LTE Band 4	1.4MHz	QPSK	1	0	23.50	23.37	23.36	23.36
			1	2	23.50	23.36	23.33	23.33
			1	5	23.50	23.38	23.37	23.35
			3	0	23.50	23.40	23.41	23.42
			3	1	23.50	23.36	23.35	23.39
			3	2	23.50	23.41	23.40	23.41
			6	0	23.00	22.78	22.77	22.81
		16QAM	1	0	23.00	22.84	22.87	22.92
			1	2	23.00	22.86	22.92	22.88
			1	5	23.00	22.86	22.83	22.76
			3	0	23.00	22.67	22.63	22.66
			3	1	23.00	22.55	22.63	22.67
			3	2	23.00	22.70	22.70	22.67
			6	0	21.00	20.51	20.55	20.58
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		19965/1711.5	20175/1732.5	20385/1753.5
LTE Band 4	3MHz	QPSK	1	0	23.50	23.37	23.41	23.45
			1	7	23.50	23.34	23.35	23.35
			1	14	23.50	23.44	23.40	23.38
			8	0	23.00	22.83	22.84	22.89
			8	4	23.00	22.86	22.81	22.85
			8	7	23.00	22.87	22.84	22.87
			15	0	23.00	22.85	22.81	22.85
		16QAM	1	0	23.50	22.76	23.00	22.95
			1	7	23.50	22.93	22.83	22.91
			1	14	23.50	22.95	23.01	22.82
			8	0	21.00	20.44	20.50	20.60
			8	4	21.00	20.54	20.55	20.58
			8	7	21.00	20.53	20.49	20.59
			15	0	20.50	20.44	20.46	20.49
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	5MHz	QPSK	1	0	24.00	23.60	23.60	23.59

Band 4			1	12	24.00	23.65	23.59	23.59
			1	24	24.00	23.66	23.62	23.59
			12	0	23.50	22.95	22.94	22.99
			12	6	23.50	22.96	22.94	22.98
			12	11	23.50	23.02	22.96	22.97
			25	0	23.00	22.97	22.96	22.99
		16QAM	1	0	23.50	23.12	23.24	23.17
			1	12	23.50	23.12	23.10	23.14
			1	24	23.50	23.26	23.15	23.16
			12	0	21.00	20.52	20.52	20.62
			12	6	21.00	20.55	20.55	20.66
			12	11	21.00	20.57	20.52	20.62
			25	0	21.00	20.59	20.56	20.64

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20000/1715	20175/1732.5	20350/1750
LTE Band 4	10MHz	QPSK	1	0	24.00	23.67	23.74	23.68
			1	24	24.00	23.62	23.59	23.61
			1	49	24.00	23.78	23.72	23.66
			25	0	23.50	22.93	22.90	22.96
			25	12	23.50	23.01	22.95	22.98
			25	24	23.50	23.02	22.96	22.96
			50	0	23.00	22.99	22.95	22.99
		16QAM	1	0	23.50	23.14	23.24	23.20
			1	24	23.50	23.16	23.10	23.06
			1	49	23.50	23.29	23.20	23.13
			25	0	21.00	20.55	20.53	20.59
			25	12	21.00	20.64	20.60	20.66
			25	24	21.00	20.62	20.56	20.62
			50	0	21.00	20.59	20.56	20.61

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20025/1717.5	20175/1732.5	20325/1747.5
LTE Band 4	15MHz	QPSK	1	0	24.00	23.63	23.66	23.66
			1	37	24.00	23.64	23.57	23.57
			1	74	24.00	23.76	23.73	23.66

			36	0	23.50	23.01	22.91	22.98
			36	18	23.50	22.98	22.90	22.95
			36	37	23.50	23.04	22.98	22.99
			75	0	23.50	23.01	22.93	22.98
		16QAM	1	0	23.50	23.13	23.27	23.19
			1	37	23.50	23.14	23.12	23.03
			1	74	23.50	23.41	23.20	23.25
			36	0	21.00	20.57	20.50	20.57
			36	18	21.00	20.61	20.56	20.59
			36	37	21.00	20.64	20.57	20.61
			75	0	21.00	20.61	20.55	20.60

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20050/1720	20175/1732.5	20300/1745
LTE Band 4	20MHz	QPSK	1	0	24.00	23.59	23.63	23.52
			1	49	24.00	23.66	23.59	23.64
			1	99	24.00	23.67	23.88	23.64
			50	0	23.50	22.99	22.88	22.93
			50	24	23.50	23.02	22.94	22.99
			50	49	23.50	23.03	23.01	23.02
			100	0	23.50	23.03	22.96	22.97
		16QAM	1	0	23.50	23.01	23.18	23.11
			1	49	23.50	23.13	23.14	23.03
			1	99	23.50	23.26	23.19	23.13
			50	0	21.00	20.57	20.48	20.52
			50	24	21.00	20.63	20.57	20.64
			50	49	21.00	20.62	20.60	20.61
			100	0	21.00	20.60	20.56	20.56

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20407/824.7	20525/836.5	20643/848.3
LTE Band 5	1.4MHz	QPSK	1	0	23.50	23.32	23.27	23.05
			1	2	23.50	23.24	23.18	22.99
			1	5	23.50	23.27	23.22	22.99
			3	0	23.50	23.34	23.27	23.09
			3	1	23.50	23.31	23.21	23.02

			3	2	23.50	23.32	23.28	23.06
			6	0	23.00	22.61	22.59	22.35
		16QAM	1	0	23.00	22.87	22.88	22.59
			1	2	23.00	22.87	22.72	22.52
			1	5	23.00	22.78	22.87	22.49
			3	0	23.00	22.66	22.60	22.35
			3	1	23.00	22.56	22.50	22.27
			3	2	23.00	22.59	22.53	22.32
			6	0	22.00	20.48	21.98	20.21
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20415/825.5	20525/836.5	20635/847.5
LTE Band 5	3MHz	QPSK	1	0	23.50	23.31	23.28	23.20
			1	7	23.50	23.25	23.19	23.06
			1	14	23.50	23.28	23.20	22.95
			8	0	23.00	22.68	22.71	22.60
			8	4	23.00	22.69	22.69	22.51
			8	7	23.00	22.72	22.61	22.44
			15	0	23.00	22.65	22.64	22.48
		16QAM	1	0	23.00	22.77	22.77	22.81
			1	7	23.00	22.85	22.78	22.61
			1	14	23.00	22.90	22.73	22.60
			8	0	22.00	20.45	21.09	21.97
			8	4	22.00	20.45	22.00	20.28
			8	7	22.00	20.45	21.97	20.22
			15	0	22.00	20.36	21.91	20.19
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	24.00	23.54	23.53	23.40
			1	12	24.00	23.52	23.45	23.34
			1	24	24.00	23.52	23.38	23.23
			12	0	23.00	22.78	22.83	22.73
			12	6	23.00	22.77	22.75	22.70
			12	11	23.00	22.83	22.70	22.53
			25	0	23.00	22.80	22.74	22.62
		16QAM	1	0	23.50	23.14	23.13	23.00
			1	12	23.50	23.00	23.10	22.89

			1	24	23.50	23.12	23.02	22.72
			12	0	22.50	21.44	22.16	22.03
			12	6	22.50	21.49	22.02	21.98
			12	11	22.50	21.52	21.99	21.18
			25	0	22.50	21.48	22.07	21.34
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	24.00	23.62	23.64	23.46
			1	24	24.00	23.44	23.39	23.34
			1	49	24.00	23.61	23.40	23.32
			25	0	23.00	22.72	22.83	22.65
			25	12	23.00	22.78	22.72	22.68
			25	24	23.00	22.85	22.58	22.56
			50	0	23.00	22.77	22.69	22.60
		16QAM	1	0	23.50	23.23	23.21	22.97
			1	24	23.50	22.92	23.05	22.89
			1	49	23.50	23.11	23.06	22.84
			25	0	22.50	21.40	22.15	21.34
			25	12	22.50	21.51	22.04	21.98
			25	24	22.50	22.15	21.28	21.86
			50	0	22.00	20.47	21.96	20.30

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20775/2502.5	21100/2535	21425/2567.5
LTE Band 7	5MHz	QPSK	1	0	22.00	21.30	21.79	21.74
			1	12	22.00	21.45	21.79	21.70
			1	24	22.00	21.47	21.81	21.65
			12	0	21.50	20.63	21.04	20.97
			12	6	21.50	20.70	21.10	21.02
			12	11	21.50	20.79	21.13	21.01
			25	0	21.50	20.74	21.09	21.01
		16QAM	1	0	21.50	20.88	21.21	21.21
			1	12	21.50	20.98	21.27	21.10
			1	24	21.50	20.93	21.32	21.05
			12	0	20.50	19.96	20.34	20.28
			12	6	20.50	20.05	20.41	20.31

			12	11	20.50	20.13	20.42	20.28
			25	0	20.50	20.07	20.39	20.31
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20800/2505	21100/2535	21400/2565
LTE Band 7	10MHz	QPSK	1	0	22.00	21.40	21.80	21.90
			1	24	22.00	21.51	21.80	21.72
			1	49	22.00	21.61	21.89	21.72
			25	0	21.50	20.67	21.02	21.03
			25	12	21.50	20.83	21.09	21.05
			25	24	21.50	20.89	21.14	21.03
			50	0	21.50	20.81	21.12	21.07
		16QAM	1	0	21.50	20.90	21.35	21.49
			1	24	21.50	20.95	21.29	21.34
			1	49	21.50	21.09	21.30	21.13
			25	0	20.50	20.02	20.34	20.35
			25	12	20.50	20.14	20.40	20.36
			25	24	20.50	20.19	20.45	20.34
			50	0	20.50	20.09	20.40	20.34
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		20825/2507.5	21100/2535	21375/2562.5
LTE Band 7	15MHz	QPSK	1	0	22.00	21.35	21.75	21.84
			1	37	22.00	21.56	21.80	21.82
			1	74	22.00	21.56	21.86	21.67
			36	0	21.50	20.73	20.99	21.12
			36	18	21.50	20.85	21.09	21.06
			36	37	21.50	20.82	21.15	21.04
			75	0	21.50	20.78	21.07	21.08
		16QAM	1	0	21.50	20.92	21.22	21.35
			1	37	21.50	21.00	21.30	21.37
			1	74	21.50	21.07	21.34	21.06
			36	0	20.50	20.02	20.28	20.40
			36	18	20.50	20.14	20.37	20.34
			36	37	20.50	20.11	20.42	20.34
			75	0	20.50	20.05	20.34	20.35
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		

			RB Size	RB Offset		20850/2510	21100/2535	21350/2560
LTE Band 7	20MHz	QPSK	1	0	22.00	21.29	21.63	21.78
			1	49	22.00	21.55	21.80	21.83
			1	99	22.00	21.37	21.85	21.63
			50	0	21.50	20.74	20.93	21.17
			50	24	21.50	20.89	21.12	21.12
			50	49	21.50	20.70	21.11	21.13
			100	0	21.50	20.70	21.02	21.14
		16QAM	1	0	21.50	20.84	21.19	21.29
			1	49	21.50	21.07	21.31	21.28
			1	99	21.50	20.96	21.28	21.01
			50	0	20.50	20.00	20.21	20.46
			50	24	20.50	20.14	20.38	20.42
			50	49	20.50	19.99	20.38	20.41
			100	0	20.50	19.96	20.29	20.40

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	24.50	23.75	24.02	23.84
			1	2	24.50	23.87	23.95	23.81
			1	5	24.50	23.94	24.03	23.85
			3	0	24.50	23.79	24.04	23.92
			3	1	24.50	23.89	24.03	23.83
			3	2	24.50	23.97	24.06	23.89
			6	0	23.50	23.24	23.38	23.25
		16QAM	1	0	24.00	23.30	23.56	23.29
			1	2	24.00	23.21	23.52	23.40
			1	5	24.00	23.51	23.60	23.27
			3	0	23.50	23.09	23.34	23.11
			3	1	23.50	23.02	23.28	23.13
			3	2	23.50	23.16	23.31	23.19
			6	0	21.50	21.03	21.27	21.12
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	3MHz	QPSK	1	0	24.50	23.78	24.04	24.01

Band 12			1	7	24.50	23.94	23.98	23.83
			1	14	24.50	23.97	24.08	23.87
			8	0	24.00	23.36	23.42	23.40
			8	4	24.00	23.37	23.45	23.33
			8	7	24.00	23.40	23.54	23.33
			15	0	23.50	23.37	23.42	23.38
		16QAM	1	0	24.00	23.36	23.59	23.52
			1	7	24.00	23.35	23.62	23.27
			1	14	24.00	23.49	23.66	23.31
			8	0	21.50	21.08	21.17	21.18
			8	4	21.50	21.18	21.25	21.11
			8	7	21.50	21.14	21.27	21.06
			15	0	21.50	21.00	21.13	21.05

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		23035/701.5	23095/707.5	23155/713.5
LTE Band 12	5MHz	QPSK	1	0	24.50	24.01	24.20	24.33
			1	12	24.50	24.17	24.23	24.15
			1	24	24.50	24.15	24.34	24.06
			12	0	24.00	23.55	23.45	23.71
			12	6	24.00	23.47	23.58	23.56
			12	11	24.00	23.43	23.71	23.45
			25	0	24.00	23.51	23.59	23.62
		16QAM	1	0	24.00	23.57	23.70	23.82
			1	12	24.00	23.69	23.83	23.69
			1	24	24.00	23.69	23.81	23.58
			12	0	21.50	21.21	21.13	21.42
			12	6	21.50	21.15	21.28	21.21
			12	11	21.50	21.06	21.43	21.10
			25	0	21.50	21.18	21.28	21.28

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	24.50	24.12	24.22	24.29
			1	24	24.50	24.11	24.20	24.30
			1	49	24.50	24.34	24.32	24.11
			25	0	24.00	23.62	23.43	23.50
			25	12	24.00	23.48	23.54	23.61

			25	24	24.00	23.67	23.63	23.35
			50	0	24.00	23.66	23.54	23.48
		16QAM	1	0	24.00	23.61	23.71	23.79
			1	24	24.00	23.71	23.81	23.70
			1	49	24.00	23.89	23.81	23.62
			25	0	21.50	21.30	21.07	21.13
			25	12	21.50	21.23	21.30	21.34
			25	24	21.50	21.36	21.34	21.00
			50	0	21.50	21.31	21.22	21.09

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	23.71	23.93	23.92
			1	12	24.00	23.74	23.96	23.80
			1	24	24.00	23.93	23.90	23.68
			12	0	23.50	22.40	22.19	23.35
			12	6	23.50	21.56	22.26	23.15
			12	11	23.50	21.71	22.20	22.46
			25	0	23.50	21.57	22.20	23.23
		16QAM	1	0	24.00	22.61	23.56	23.48
			1	12	24.00	22.87	23.44	23.26
			1	24	24.00	23.50	23.38	22.76
			12	0	21.00	20.63	20.79	20.97
			12	6	21.00	20.78	20.93	20.82
			12	11	21.00	20.95	20.80	20.66
			25	0	21.00	20.81	20.83	20.86

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	23.83	23.90	23.89
			1	24	24.00	23.87	23.90	23.87
			1	49	24.00	23.92	23.82	23.76
			25	0	23.50	22.30	22.37	23.10
			25	12	23.50	23.20	23.22	23.21
			25	24	23.50	23.10	23.02	22.98
			50	0	23.50	22.41	23.02	23.07
		16QAM	1	0	23.50	21.87	21.84	21.86

			1	24	23.50	23.42	23.49	23.42
			1	49	23.50	23.39	23.39	21.80
			25	0	21.00	20.53	20.59	20.70
			25	12	21.00	20.88	20.91	20.91
			25	24	21.00	20.75	20.63	20.60
			50	0	21.00	20.62	20.60	20.65

Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40415/2572.5	40640/2595	40865/2617.5
LTE Band 41	5MHz	QPSK	1	0	22.50	22.01	22.23	22.06
			1	12	22.50	22.03	22.16	22.11
			1	24	22.50	21.98	22.06	22.08
			12	0	21.50	21.26	21.46	21.33
			12	6	21.50	21.25	21.39	21.32
			12	11	21.50	21.28	21.35	21.32
			25	0	21.50	21.31	21.42	21.34
		16QAM	1	0	22.00	21.45	21.65	21.49
			1	12	22.00	21.47	21.59	21.54
			1	24	22.00	21.46	21.47	21.51
			12	0	21.00	20.58	20.77	20.62
			12	6	21.00	20.55	20.71	20.62
			12	11	21.00	20.58	20.66	20.64
			25	0	21.00	20.63	20.76	20.69
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40440/2575	40640/2595	40840/2615
LTE Band 41	10MHz	QPSK	1	0	22.50	22.09	22.37	22.02
			1	24	22.50	22.05	22.14	22.04
			1	49	22.50	22.20	22.03	22.11
			25	0	22.00	21.33	21.53	21.32
			25	12	22.00	21.32	21.43	21.35
			25	24	22.00	21.36	21.33	21.30
			50	0	21.50	21.31	21.40	21.26
		16QAM	1	0	22.00	21.55	21.82	21.46
			1	24	22.00	21.44	21.59	21.49
			1	49	22.00	21.64	21.46	21.58
			25	0	21.00	20.66	20.85	20.67

			25	12	21.00	20.64	20.76	20.66
			25	24	21.00	20.68	20.64	20.64
			50	0	21.00	20.65	20.73	20.59
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40465/2577.5	40640/2595	40815/2612.5
LTE Band 41	15MHz	QPSK	1	0	22.50	22.05	22.37	21.92
			1	37	22.50	22.11	22.14	22.00
			1	74	22.50	22.32	21.93	22.09
			36	0	22.00	21.26	21.51	21.14
			36	18	22.00	21.30	21.36	21.18
			36	37	22.00	21.43	21.22	21.23
			75	0	21.50	21.43	21.46	21.27
		16QAM	1	0	22.00	21.51	21.81	21.36
			1	37	22.00	21.55	21.56	21.50
			1	74	22.00	21.74	21.36	21.53
			36	0	21.00	20.53	20.76	20.41
			36	18	21.00	20.55	20.62	20.45
			36	37	21.00	20.68	20.50	20.49
			75	0	21.00	20.75	20.79	20.61
Band	Band Width	Modulation	RB Configuration		Tune-up (dBm)	Channel/Frequency(MHz)		
			RB Size	RB Offset		40490/2580	40640/2595	40790/2610
LTE Band 41	20MHz	QPSK	1	0	22.50	22.01	22.34	21.95
			1	49	22.50	22.19	22.16	21.92
			1	99	22.50	22.30	21.82	22.04
			50	0	22.00	21.32	21.53	21.17
			50	24	22.00	21.47	21.42	21.20
			50	49	22.00	21.51	21.17	21.17
			100	0	21.50	21.42	21.35	21.16
		16QAM	1	0	22.00	21.47	21.76	21.38
			1	49	22.00	21.62	21.57	21.35
			1	99	22.00	21.73	21.26	21.46
			50	0	21.00	20.65	20.87	20.49
			50	24	21.00	20.77	20.73	20.51
			50	49	21.00	20.83	20.51	20.51
			100	0	21.00	20.73	20.65	20.47

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	10.50	9.43
	6	2437	10.50	10.28
	11	2462	10.50	9.12
802.11g	1	2412	10.00	9.38
	6	2437	10.00	9.94
	11	2462	10.00	9.22
802.11n HT20	1	2412	10.50	9.17
	6	2437	10.50	10.25
	11	2462	10.50	9.42
802.11n HT40	3	2422	10.50	10.23
	6	2437	10.50	9.99
	9	2452	10.50	9.46

NOTE: Power measurement results of WLAN 2.4G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	36	5180	11.50	10.66
	40	5200	11.50	10.65
	48	5240	11.50	11.10
802.11n HT20	36	5180	11.50	10.55
	40	5200	11.50	10.76
	48	5240	11.50	11.19
802.11n HT40	38	5190	11.50	10.97
	46	5230	11.50	11.22
802.11ac VHT20	36	5180	11.50	10.96
	40	5200	11.50	11.08
	48	5240	11.50	11.43
802.11ac VHT40	38	5190	11.50	11.10
	46	5230	11.50	11.25
802.11ac VHT80	42	5210	11.50	11.08

NOTE: Power measurement results of WLAN 5.2G.

Mode	Channel	Frequency (MHz)	Tune-up (dBm)	Output Power (dBm)
802.11a	149	5745	12.50	11.82
	157	5785	12.50	11.50
	165	5825	12.50	12.15
802.11n HT20	149	5745	12.00	10.97
	157	5785	12.00	11.39
	165	5825	12.00	11.64
802.11n HT40	151	5755	12.50	11.78
	159	5795	12.50	12.10
802.11ac VHT20	149	5745	12.50	11.06
	157	5785	12.50	11.97
	165	5825	12.50	12.06
802.11ac VHT40	151	5755	12.50	11.68
	159	5795	12.50	12.18
802.11ac VHT80	155	5775	12.00	11.80

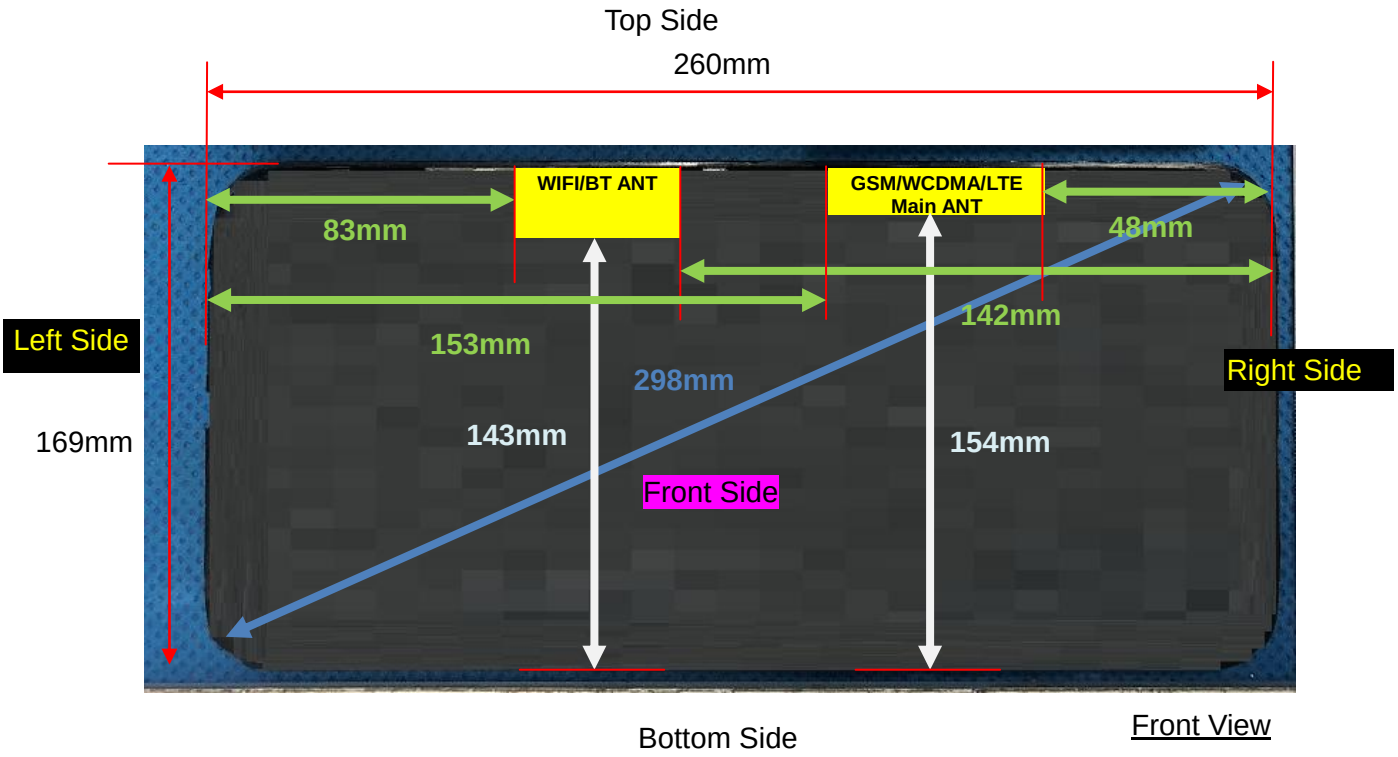
NOTE: Power measurement results of WLAN 5.8G.

7.4.2. Output Power Results Of Bluetooth

	Output Power (dBm)				
BR+EDR	Channel	Tune-up (dBm)	Data Rates		
			1M	2M	3M
	0CH	2.00	1.61	0.73	0.53
	39CH	2.00	1.08	0.32	0.13
	78CH	2.00	1.77	1.02	0.82

	Channel	Tune-up (dBm)	Output Power (dBm)
BLE			1M
	0CH	0.00	-0.52
	19CH	0.00	-0.92
	39CH	0.00	-0.41

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/Bluetooth	5	5	83	142	5	143
WWAN	5	5	153	48	5	154

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

Positions for SAR tests		
Test separation distances > 50 mm		
Exposure Positions	Tune-up Maximum power of WLAN 2.4G	
	10.50 dBm	11.22 mW
Left Side	Antenna to user(mm)	83
	SAR exclusion threshold(mW)	426
	SAR testing required?	NO
Right Side	Antenna to user(mm)	142
	SAR exclusion threshold(mW)	1016
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	1026
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.2G	

	11.50 dBm	14.13 mW
Left Side	Antenna to user(mm)	83
	SAR exclusion threshold(mW)	396
	SAR testing required?	NO
Right Side	Antenna to user(mm)	142
	SAR exclusion threshold(mW)	986
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	996
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WLAN 5.8G	
	12.50 dBm	17.78 mW
Left Side	Antenna to user(mm)	83
	SAR exclusion threshold(mW)	392
	SAR testing required?	NO
Right Side	Antenna to user(mm)	142
	SAR exclusion threshold(mW)	982
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	143
	SAR exclusion threshold(mW)	992
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of GSM 850	
	31.50 dBm	1412.54 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	737
	SAR testing required?	YES
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	743
	SAR testing required?	YES
Exposure Positions	Tune-up Maximum power of GSM 1900	
	26.00 dBm	398.11 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1139
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1149
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 2	
	23.00 dBm	199.53 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1139

	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1149
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of WCDMA Band 4	
	23.50 dBm	223.87 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1139
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1149
	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)	153
	SAR exclusion threshold(mW)	737
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	743
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 2	
	23.50 dBm	223.87 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1139
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1149
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 4	
	24.00 dBm	251.19 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1139
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1149
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 5	
	24.00 dBm	251.19 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	737
	SAR testing required?	NO

Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	743
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 7	
	22.00 dBm	158.49 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1126
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1136
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 12	
	24.50 dBm	281.84 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	737
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	743
	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)	153
	SAR exclusion threshold(mW)	737
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	743
	SAR testing required?	NO
Exposure Positions	Tune-up Maximum power of LTE Band 41	
	22.50 dBm	177.83 mW
Left Side	Antenna to user(mm)	153
	SAR exclusion threshold(mW)	1126
	SAR testing required?	NO
Bottom Side	Antenna to user(mm)	154
	SAR exclusion threshold(mW)	1136
	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:

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

- $f_{(GHZ)}$ 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	2.00	1.58	5	2.480	0.5	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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] * [$\sqrt{f_{(GHZ)}}$/x] W/kg for test separation distances ≤ 50mm, 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	2.00	1.58	5	2.48	7.5	0.066
Bluetooth	Hotspot	2.00	1.58	5	2.48	7.5	0.066

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)	0.252	0.150	-0.01	31.06	31.50	0.279	2024/5/30	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.371	0.223	-2.39	31.06	31.50	0.411	2024/5/30	1#

NOTE: Body-Worn SAR test results of GSM850

Test Position	Test channel	Mode	SAR Value (W/kg)	Power Drift(%)	Conducted Power	Tune-up Power	Scaled SAR	Date	Plot

of Hotspot with 0mm	/Freq.		1-g	10-g		(dBm)	(dBm)	1-g (W/Kg)		
Front Side	189/836.4	GPRS(GMSK 2TS)	0.252	0.150	-0.01	31.06	31.50	0.279	2024/5/30	
Back Side	189/836.4	GPRS(GMSK 2TS)	0.371	0.223	-2.39	31.06	31.50	0.411	2024/5/30	1#
Left Side	189/836.4	GPRS(GMSK 2TS)	0.114	0.065	-2.30	31.06	31.50	0.126	2024/5/30	
Right Side	189/836.4	GPRS(GMSK 2TS)	0.120	0.067	-3.84	31.06	31.50	0.133	2024/5/30	
Top Side	189/836.4	GPRS(GMSK 2TS)	0.210	0.134	-3.84	31.06	31.50	0.232	2024/5/30	
Bottom Side	189/836.4	GPRS(GMSK 2TS)	0.098	0.059	1.57	31.06	31.50	0.108	2024/5/30	

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 3TS)	0.168	0.117	-1.79	25.44	26.00	0.191	2024/5/15	
Back Side	661/1880	GPRS(GMSK 3TS)	0.232	0.169	-2.37	25.44	26.00	0.264	2024/5/15	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 3TS)	0.168	0.117	-1.79	25.44	26.00	0.191	2024/5/15	
Back Side	661/1880	GPRS(GMSK 3TS)	0.232	0.169	-2.37	25.44	26.00	0.264	2024/5/15	2#
Right Side	661/1880	GPRS(GMSK 3TS)	0.072	0.051	-0.12	25.44	26.00	0.082	2024/5/15	
Top Side	661/1880	GPRS(GMSK 3TS)	0.081	0.058	1.57	25.44	26.00	0.092	2024/5/15	

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	0.462	0.224	3.99	22.90	23.00	0.473	2024/5/15	
Back Side	9400/1880	RMC12.2K	0.746	0.381	-0.25	22.90	23.00	0.763	2024/5/15	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	0.462	0.224	3.99	22.90	23.00	0.473	2024/5/15	
Back Side	9400/1880	RMC12.2K	0.746	0.381	-0.25	22.90	23.00	0.763	2024/5/15	3#
Right Side	9400/1880	RMC12.2K	0.237	0.115	-2.94	22.90	23.00	0.243	2024/5/15	
Top Side	9400/1880	RMC12.2K	0.228	0.114	1.49	22.90	23.00	0.233	2024/5/15	

NOTE: Hotspot SAR test results of WCDMA Band 2

10.1.4. SAR measurement Result of WCDMA 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
			1g	10g						
Front Side	1413/1732.6	RMC12.2K	0.456	0.237	0.62	23.28	23.50	0.480	2024/5/28	
Back Side	1413/1732.6	RMC12.2K	0.738	0.388	-1.11	23.28	23.50	0.776	2024/5/28	4#

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

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

0mm										
Front Side	1413/1732.6	RMC12.2K	0.456	0.237	0.62	23.28	23.50	0.480	2024/5/28	
Back Side	1413/1732.6	RMC12.2K	0.738	0.388	-1.11	23.28	23.50	0.776	2024/5/28	4#
Right Side	1413/1732.6	RMC12.2K	0.231	0.121	-1.51	23.28	23.50	0.243	2024/5/28	
Top Side	1413/1732.6	RMC12.2K	0.225	0.116	0.99	23.28	23.50	0.237	2024/5/28	

NOTE: Hotspot SAR test results of WCDMA Band 4

10.1.5. 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	0.264	0.120	2.88	23.24	23.50	0.280	2024/5/30	
Back Side	4182/836.4	RMC12.2K	0.433	0.201	-2.22	23.24	23.50	0.460	2024/5/30	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	0.264	0.120	2.88	23.24	23.50	0.280	2024/5/30	
Back Side	4182/836.4	RMC12.2K	0.433	0.201	-2.22	23.24	23.50	0.460	2024/5/30	5#
Right Side	4182/836.4	RMC12.2K	0.141	0.065	-0.41	23.24	23.50	0.150	2024/5/30	
Top Side	4182/836.4	RMC12.2K	0.138	0.062	0.70	23.24	23.50	0.147	2024/5/30	

NOTE: Hotspot SAR test results of WCDMA Band 5

10.1.6. SAR measurement Result of LTE Band 2

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

with 0mm								(W/Kg)		
1RB										
Front Side	18900/1880	20M QPSK(1,49)	0.486	0.247	0.48	23.40	23.50	0.497	2024/5/15	
Back Side	18900/1880	20M QPSK(1,49)	0.767	0.393	-0.85	23.40	23.50	0.785	2024/5/15	9#
50%RB										
Front Side	18900/1880	20M QPSK(50,0)	0.266	0.132	4.40	21.99	23.00	0.336	2024/5/15	
Back Side	18900/1880	20M QPSK(50,0)	0.386	0.204	-4.81	21.99	23.00	0.487	2024/5/15	

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)	0.486	0.247	0.48	23.40	23.50	0.497	2024/5/15	
Back Side	18900/1880	20M QPSK(1,49)	0.767	0.393	-0.85	23.40	23.50	0.785	2024/5/15	9#
Right Side	18900/1880	20M QPSK(1,49)	0.240	0.121	-3.98	23.40	23.50	0.246	2024/5/15	
Top Side	18900/1880	20M QPSK(1,49)	0.231	0.114	-2.21	23.40	23.50	0.236	2024/5/15	
50%RB										
Front Side	18900/1880	20M QPSK(50,0)	0.266	0.132	4.40	21.99	23.00	0.336	2024/5/15	
Back Side	18900/1880	20M QPSK(50,0)	0.386	0.204	-4.81	21.99	23.00	0.487	2024/5/15	
Right Side	18900/1880	20M QPSK(50,0)	0.140	0.072	-4.39	21.99	23.00	0.177	2024/5/15	
Top Side	18900/1880	20M QPSK(50,0)	0.138	0.058	-0.93	21.99	23.00	0.174	2024/5/15	

NOTE: Hotspot SAR test results of LTE Band 2

10.1.7. SAR measurement Result of LTE Band 4

Test	Test channel	Test Mode	SAR Value	Power	Conducted	Tune-up	Scaled	Date	Plot

Position of Body-Worn with 0mm	/Freq.		(W/kg)		Drift (±5%)	power (dBm)	power (dBm)	SAR 1g (W/Kg)		
			1-g	10-g						
1RB										
Front Side	20175/1732.5	20M QPSK(1,99)	0.462	0.241	2.69	23.88	24.00	0.475	2024/5/28	
Back Side	20175/1732.5	20M QPSK(1,99)	0.760	0.400	-1.15	23.88	24.00	0.781	2024/5/28	10#
50%RB										
Front Side	20175/1732.5	20M QPSK(50,49)	0.231	0.139	-0.88	23.01	23.50	0.259	2024/5/28	
Back Side	20175/1732.5	20M QPSK(50,49)	0.445	0.216	-2.10	23.01	23.50	0.498	2024/5/28	

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(1,99)	0.462	0.241	2.69	23.88	24.00	0.475	2024/5/28	
Back Side	20175/1732.5	20M QPSK(1,99)	0.760	0.400	-1.15	23.88	24.00	0.781	2024/5/28	10#
Right Side	20175/1732.5	20M QPSK(1,99)	0.245	0.126	2.06	23.88	24.00	0.252	2024/5/28	
Top Side	20175/1732.5	20M QPSK(1,99)	0.243	0.124	-2.13	23.88	24.00	0.250	2024/5/28	
50%RB										
Front Side	20175/1732.5	20M QPSK(50,49)	0.231	0.139	-0.88	23.01	23.50	0.259	2024/5/28	
Back Side	20175/1732.5	20M QPSK(50,49)	0.445	0.216	-2.10	23.01	23.50	0.498	2024/5/28	
Right Side	20175/1732.5	20M QPSK(50,49)	0.146	0.074	0.09	23.01	23.50	0.163	2024/5/28	
Top Side	20175/1732.5	20M QPSK(50,49)	0.144	0.070	-2.93	23.01	23.50	0.161	2024/5/28	

NOTE: Hotspot SAR test results of LTE Band 4

10.1.8. 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(1,0)	0.252	0.153	3.93	23.64	24.00	0.274	2024/5/30	
Back Side	20525/836.5	10M QPSK(1,0)	0.371	0.227	-0.88	23.64	24.00	0.403	2024/5/30	11#
50%RB										
Front Side	20525/836.5	10M QPSK(25,24)	0.132	0.081	-1.72	22.58	23.00	0.145	2024/5/30	
Back Side	20525/836.5	10M QPSK(25,24)	0.215	0.117	2.85	22.58	23.00	0.237	2024/5/30	

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(1,0)	0.252	0.153	3.93	23.64	24.00	0.274	2024/5/30	
Back Side	20525/836.5	10M QPSK(1,0)	0.371	0.227	-0.88	23.64	24.00	0.403	2024/5/30	11#
Right Side	20525/836.5	10M QPSK(1,0)	0.129	0.078	3.78	23.64	24.00	0.140	2024/5/30	
Top Side	20525/836.5	10M QPSK(1,0)	0.126	0.077	2.29	23.64	24.00	0.137	2024/5/30	
50%RB										
Front Side	20525/836.5	10M QPSK(25,24)	0.132	0.081	-1.72	22.58	23.00	0.145	2024/5/30	
Back Side	20525/836.5	10M QPSK(25,24)	0.215	0.117	2.85	22.58	23.00	0.237	2024/5/30	
Right Side	20525/836.5	10M QPSK(25,24)	0.068	0.045	-4.77	22.58	23.00	0.075	2024/5/30	
Top	20525/836.5	10M	0.066	0.042	-1.11	22.58	23.00	0.073	2024/5/30	

Side		QPSK(25,24)								

NOTE: Hotspot SAR test results of LTE Band 5

10.1.9. 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(1,99)	0.408	0.184	3.76	21.85	22.00	0.422	2024/5/29	
Back Side	21100/2535	20M QPSK(1,99)	0.668	0.304	-0.59	21.85	22.00	0.691	2024/5/29	12#
50%RB										
Front Side	21100/2535	20M QPSK(50,0)	0.241	0.096	3.18	20.93	21.50	0.275	2024/5/29	
Back Side	21100/2535	20M QPSK(50,0)	0.384	0.182	-3.94	20.93	21.50	0.438	2024/5/29	

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(1,99)	0.408	0.184	3.76	21.85	22.00	0.422	2024/5/29	
Back Side	21100/2535	20M QPSK(1,99)	0.668	0.304	-0.59	21.85	22.00	0.691	2024/5/29	12#
Right Side	21100/2535	20M QPSK(1,99)	0.213	0.095	3.22	21.85	22.00	0.220	2024/5/29	
Top Side	21100/2535	20M QPSK(1,99)	0.210	0.091	-3.42	21.85	22.00	0.217	2024/5/29	
50%RB										
Front Side	21100/2535	20M QPSK(50,0)	0.241	0.096	3.18	20.93	21.50	0.275	2024/5/29	
Back Side	21100/2535	20M QPSK(50,0)	0.384	0.182	-3.94	20.93	21.50	0.438	2024/5/29	

Right Side	21100/2535	20M QPSK(50,0)	0.127	0.055	0.43	20.93	21.50	0.145	2024/5/29	
Top Side	21100/2535	20M QPSK(50,0)	0.118	0.052	3.19	20.93	21.50	0.135	2024/5/29	

NOTE: Hotspot SAR test results of LTE Band 7

10.1.10. 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(1,49)	0.174	0.112	3.43	24.32	24.50	0.181	2024/5/13	
Back Side	23095/707.5	10M QPSK(1,49)	0.260	0.171	-0.75	24.32	24.50	0.271	2024/5/13	13#
50%RB										
Front Side	23095/707.5	10M QPSK(25,24)	0.100	0.060	0.50	23.63	24.00	0.109	2024/5/13	
Back Side	23095/707.5	10M QPSK(25,24)	0.134	0.096	4.23	23.63	24.00	0.146	2024/5/13	

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(1,49)	0.174	0.112	3.43	24.32	24.50	0.181	2024/5/13	
Back Side	23095/707.5	10M QPSK(1,49)	0.260	0.171	-0.75	24.32	24.50	0.271	2024/5/13	13#
Right Side	23095/707.5	10M QPSK(1,49)	0.095	0.060	-2.05	24.32	24.50	0.099	2024/5/13	
Top Side	23095/707.5	10M QPSK(1,49)	0.093	0.059	2.55	24.32	24.50	0.097	2024/5/13	
50%RB										
Front	23095/707.5	10M	0.100	0.060	0.50	23.63	24.00	0.109	2024/5/13	

Side		QPSK(25,24)								
Back Side	23095/707.5	10M QPSK(25,24)	0.134	0.096	4.23	23.63	24.00	0.146	2024/5/13	
Right Side	23095/707.5	10M QPSK(25,24)	0.058	0.035	-0.49	23.63	24.00	0.063	2024/5/13	
Top Side	23095/707.5	10M QPSK(25,24)	0.056	0.033	-2.27	23.63	24.00	0.061	2024/5/13	

NOTE: Hotspot SAR test results of LTE Band 12

10.1.11. SAR measurement Result of LTE Band 17

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	23790/710	10M QPSK(1,49)	0.438	0.304	-1.26	23.82	24.00	0.457	2024/5/13	
Back Side	23790/710	10M QPSK(1,49)	0.696	0.504	-4.96	23.82	24.00	0.725	2024/5/13	14#
50%RB										
Front Side	23790/710	10M QPSK(25,12)	0.225	0.179	2.25	23.22	23.50	0.240	2024/5/13	
Back Side	23790/710	10M QPSK(25,12)	0.384	0.285	4.89	23.22	23.50	0.410	2024/5/13	

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

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	23790/710	10M QPSK(1,49)	0.438	0.304	-1.26	23.82	24.00	0.457	2024/5/13	
Back Side	23790/710	10M QPSK(1,49)	0.696	0.504	-4.96	23.82	24.00	0.725	2024/5/13	14#
Right Side	23790/710	10M QPSK(1,49)	0.219	0.154	3.58	23.82	24.00	0.228	2024/5/13	
Top	23790/710	10M	0.210	0.148	-0.73	23.82	24.00	0.219	2024/5/13	

Side		QPSK(1,49)								
50%RB										
Front Side	23790/710	10M QPSK(25,12)	0.225	0.179	2.25	23.22	23.50	0.240	2024/5/13	
Back Side	23790/710	10M QPSK(25,12)	0.384	0.285	4.89	23.22	23.50	0.410	2024/5/13	
Right Side	23790/710	10M QPSK(25,12)	0.125	0.092	3.99	23.22	23.50	0.133	2024/5/13	
Top Side	23790/710	10M QPSK(25,12)	0.123	0.085	-1.31	23.22	23.50	0.131	2024/5/13	

NOTE: Hotspot SAR test results of LTE Band 17

10.1.12. SAR measurement Result of LTE Band 41

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	40640/2595	20M QPSK(1,0)	0.264	0.116	1.19	22.34	22.50	0.274	2024/5/29	
Back Side	40640/2595	20M QPSK(1,0)	0.428	0.194	-3.80	22.34	22.50	0.444	2024/5/29	15#
50%RB										
Front Side	40640/2595	20M QPSK(50,0)	0.145	0.069	-2.42	21.53	22.00	0.162	2024/5/29	
Back Side	40640/2595	20M QPSK(50,0)	0.253	0.115	-0.83	21.53	22.00	0.282	2024/5/29	

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

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	40640/2595	20M QPSK(1,0)	0.264	0.116	1.19	22.34	22.50	0.274	2024/5/29	
Back Side	40640/2595	20M QPSK(1,0)	0.428	0.194	-3.80	22.34	22.50	0.444	2024/5/29	15#
Right	40640/2595	20M	0.145	0.065	3.96	22.34	22.50	0.150	2024/5/29	

Side		QPSK(1,0)								
Top Side	40640/2595	20M QPSK(1,0)	0.138	0.062	0.50	22.34	22.50	0.143	2024/5/29	
50%RB										
Front Side	40640/2595	20M QPSK(50,0)	0.145	0.069	-2.42	21.53	22.00	0.162	2024/5/29	
Back Side	40640/2595	20M QPSK(50,0)	0.253	0.115	-0.83	21.53	22.00	0.282	2024/5/29	
Right Side	40640/2595	20M QPSK(50,0)	0.080	0.035	-3.86	21.53	22.00	0.089	2024/5/29	
Top Side	40640/2595	20M QPSK(50,0)	0.078	0.032	1.81	21.53	22.00	0.087	2024/5/29	

NOTE: Hotspot SAR test results of LTE Band 41

10.1.13. 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	0.324	0.122	-1.58	10.28	10.50	0.341	2024/5/14	
Back Side	6/2437	802.11b	0.526	0.202	3.03	10.28	10.50	0.553	2024/5/14	8#

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	0.324	0.122	-1.58	10.28	10.50	0.341	2024/5/14	
Back Side	6/2437	802.11b	0.526	0.202	3.03	10.28	10.50	0.553	2024/5/14	8#
Top Side	6/2437	802.11b	0.490	0.211	-4.55	10.28	10.50	0.515	2024/5/14	

NOTE: Hotspot SAR test results of WLAN 2.4G

10.1.14. SAR measurement Result of WLAN 5.2G

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

with 0mm								(W/Kg)		
Front Side	48/5240	802.11ac VHT20	0.349	0.097	-4.97	11.43	11.50	0.355	2024/5/11	
Back Side	48/5240	802.11ac VHT20	0.597	0.195	-0.81	11.43	11.50	0.607	2024/5/11	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	802.11ac VHT20	0.349	0.097	-4.97	11.43	11.50	0.355	2024/5/11	
Back Side	48/5240	802.11ac VHT20	0.597	0.195	-0.81	11.43	11.50	0.607	2024/5/11	6#
Top Side	48/5240	802.11ac VHT20	0.467	0.139	-0.47	11.43	11.50	0.475	2024/5/11	

NOTE: Hotspot SAR test results of WLAN 5.2G

10.1.15. 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	159/5795	802.11ac VHT40	0.384	0.091	3.34	12.18	12.50	0.413	2024/5/12	
Back Side	159/5795	802.11ac VHT40	0.619	0.150	-0.31	12.18	12.50	0.666	2024/5/12	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	159/5795	802.11ac VHT40	0.384	0.091	3.34	12.18	12.50	0.413	2024/5/12	
Back	159/5795	802.11ac	0.619	0.150	-0.31	12.18	12.50	0.666	2024/5/12	7#

Side		VHT40								
Top Side	159/5795	802.11ac VHT40	0.374	0.120	-1.31	12.18	12.50	0.403	2024/5/12	

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 < 1.6W/kg.

2) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (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 SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

Test Position		Scaled SARMAX		∑1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DTS			
Body-Worn	Front Side	0.497	0.341	0.838	N/A	N/A
	Back Side	0.785	0.553	1.338	N/A	N/A
Hotspot	Front Side	0.497	0.341	0.838	N/A	N/A
	Back Side	0.785	0.553	1.338	N/A	N/A
	Left Side	0.126	N/A	0.126	N/A	N/A
	Right Side	0.252	N/A	0.252	N/A	N/A
	Top Side	0.250	0.515	0.765	N/A	N/A
	Bottom Side	0.108	N/A	0.108	N/A	N/A

Test Position		Scaled SARMAX		∑1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	NII			
Body-Worn	Front Side	0.497	0.413	0.910	N/A	N/A
	Back Side	0.785	0.666	1.451	N/A	N/A
Hotspot	Front Side	0.497	0.413	0.910	N/A	N/A
	Back Side	0.785	0.666	1.451	N/A	N/A
	Left Side	0.126	N/A	0.126	N/A	N/A
	Right Side	0.252	N/A	0.252	N/A	N/A
	Top Side	0.250	0.475	0.725	N/A	N/A
	Bottom Side	0.108	N/A	0.108	N/A	N/A

Test Position		Scaled SARMAX		∑1-g SAR (W/Kg)	SPLSR	Remark
		WWAN	DSS			
Body-Worn	Front Side	0.497	0.066	0.563	N/A	N/A

	Back Side	0.785	0.066	0.851	N/A	N/A
Hotspot	Front Side	0.497	0.066	0.563	N/A	N/A
	Back Side	0.785	0.066	0.851	N/A	N/A
	Left Side	0.126	N/A	0.126	N/A	N/A
	Right Side	0.252	N/A	0.252	N/A	N/A
	Top Side	0.250	0.066	0.316	N/A	N/A
	Bottom Side	0.108	N/A	0.108	N/A	N/A

11. Appendix A. Photo documentation

Refer to appendix Test Setup photo---SAR

12. Appendix B. System Check Plots

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MEASUREMENT 1 System Performance Check - 750MHz
MEASUREMENT 2 System Performance Check - 835MHz
MEASUREMENT 3 System Performance Check - 1800MHz
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MEASUREMENT 5 System Performance Check - 2450MHz
MEASUREMENT 6 System Performance Check - 2600MHz
MEASUREMENT 7 System Performance Check - 5200MHz
MEASUREMENT 8 System Performance Check - 5800MHz

MEASUREMENT 1

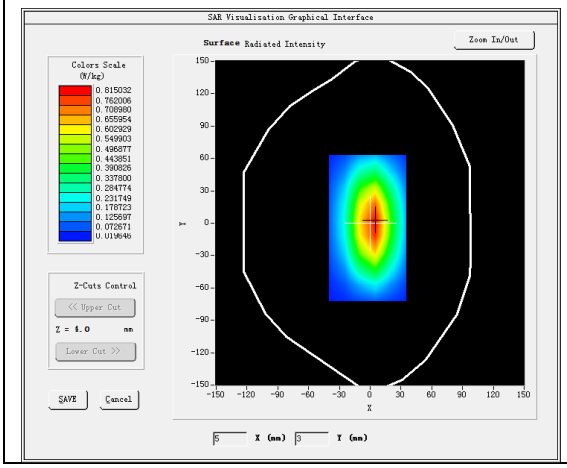
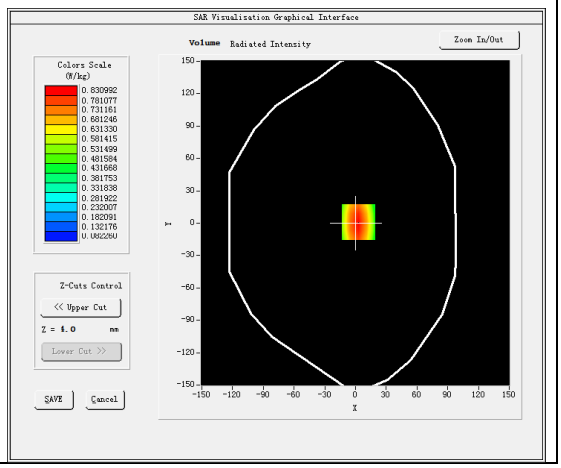
Date of measurement: 13/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

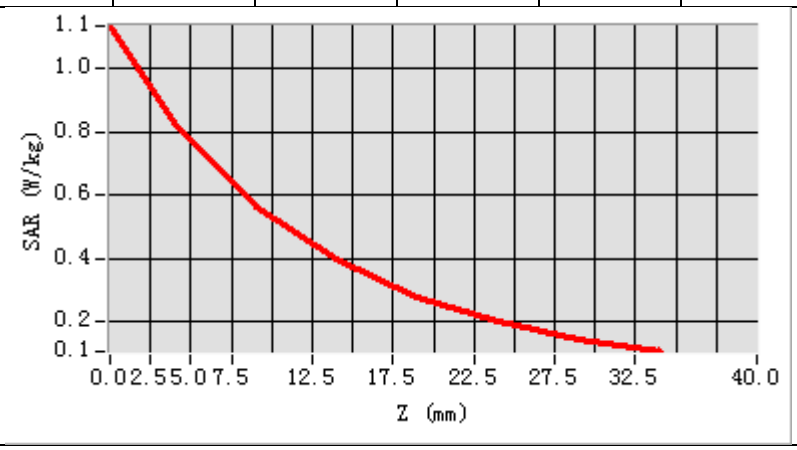
Frequency (MHz)	750.000000
Relative permittivity (real part)	40.925091
Relative permittivity (imaginary part)	21.574963
Conductivity (S/m)	0.898957
Variation (%)	2.730000

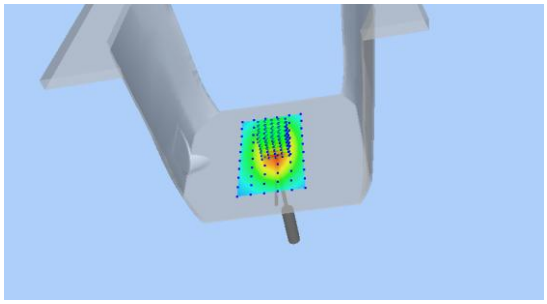
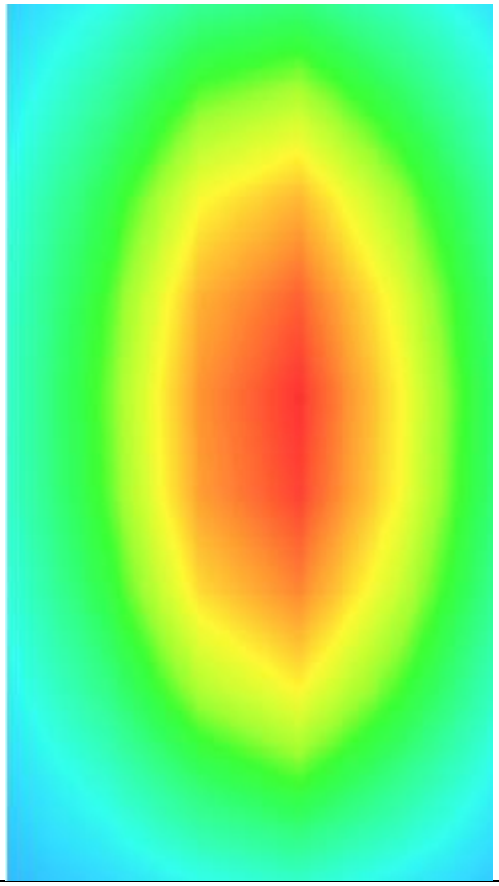
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=1.00
SAR Peak: 1.13 W/kg

SAR 10g (W/Kg)	0.589332
SAR 1g (W/Kg)	0.807321

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.1392	0.8317	0.5683	0.3987	0.2835	0.2035	0.1445



3D screen shot	Hot spot position
	

MEASUREMENT 2

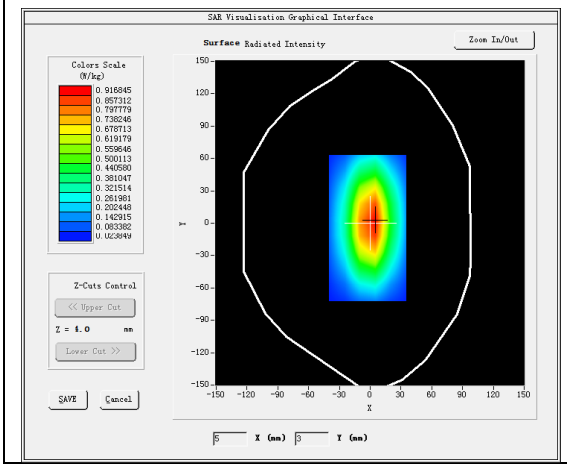
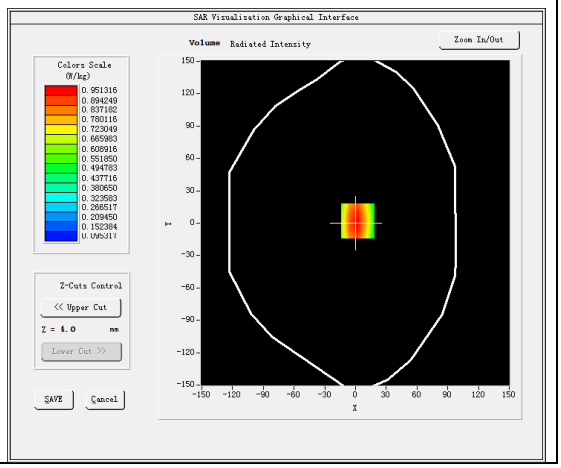
Date of measurement: 30/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

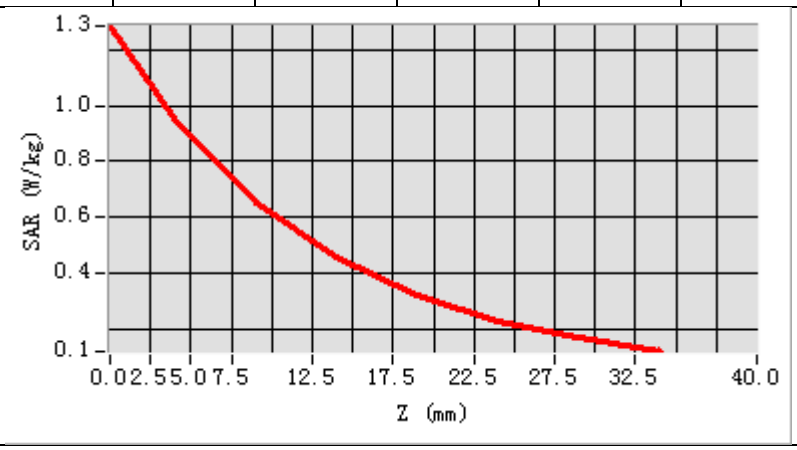
Frequency (MHz)	835.000000
Relative permittivity (real part)	41.528502
Relative permittivity (imaginary part)	19.541862
Conductivity (S/m)	0.906525
Variation (%)	-2.720000

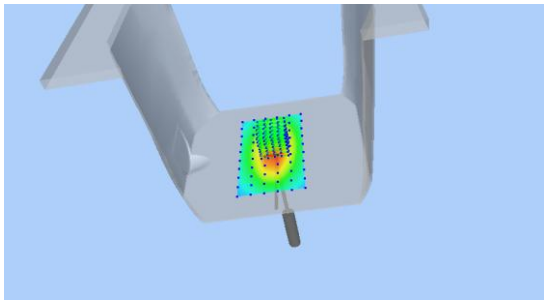
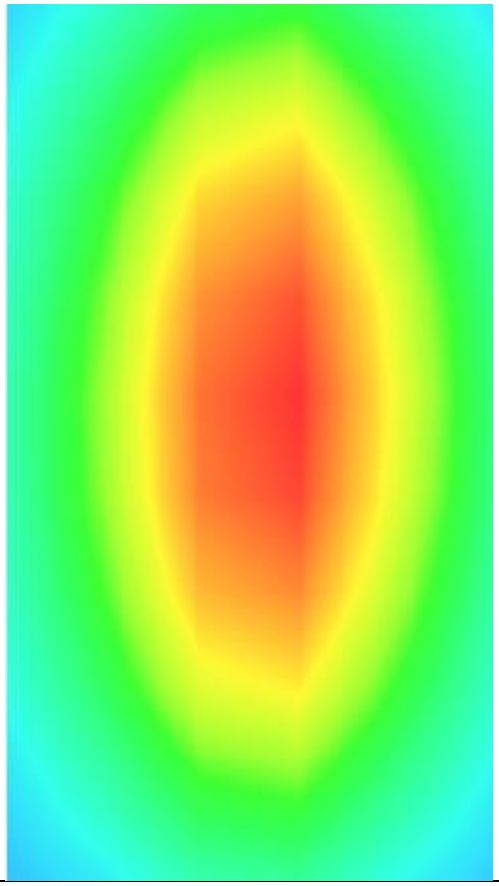
SURFACE SAR	VOLUME SAR
	

Maximum location: X=2.00, Y=2.00
SAR Peak: 1.29 W/kg

SAR 10g (W/Kg)	0.680333
SAR 1g (W/Kg)	0.909172

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2821	0.9559	0.6532	0.4562	0.3263	0.2309	0.1726



3D screen shot	Hot spot position
	

MEASUREMENT 3

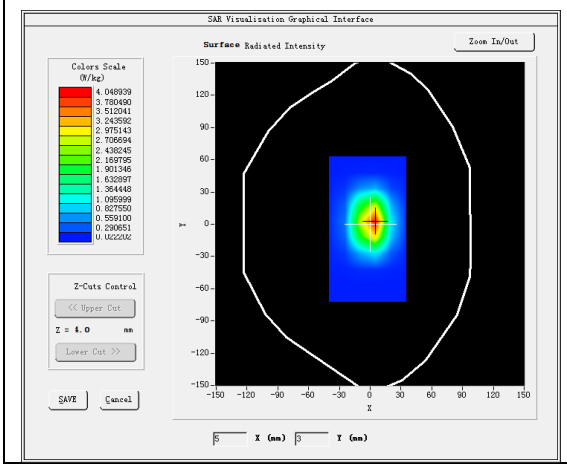
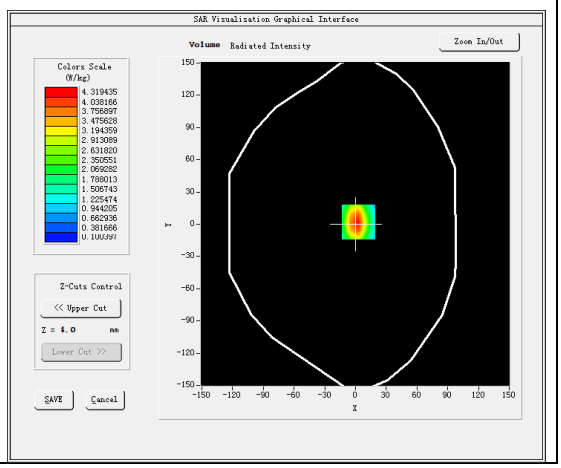
Date of measurement: 28/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

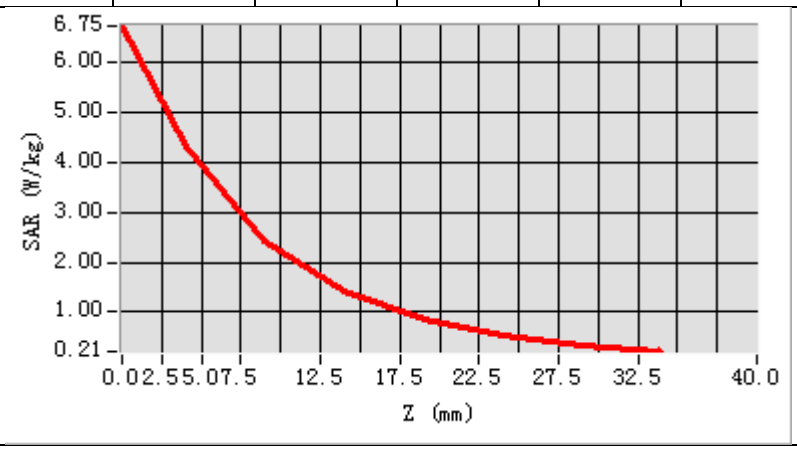
Frequency (MHz)	1800.000000
Relative permittivity (real part)	39.335125
Relative permittivity (imaginary part)	13.968965
Conductivity (S/m)	1.396897
Variation (%)	2.980000

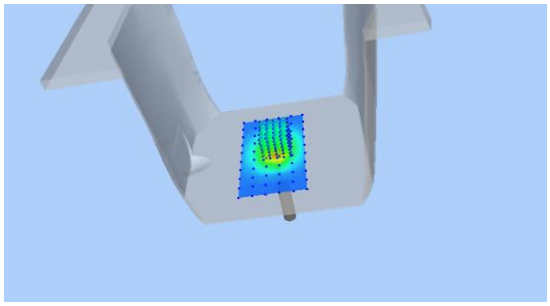
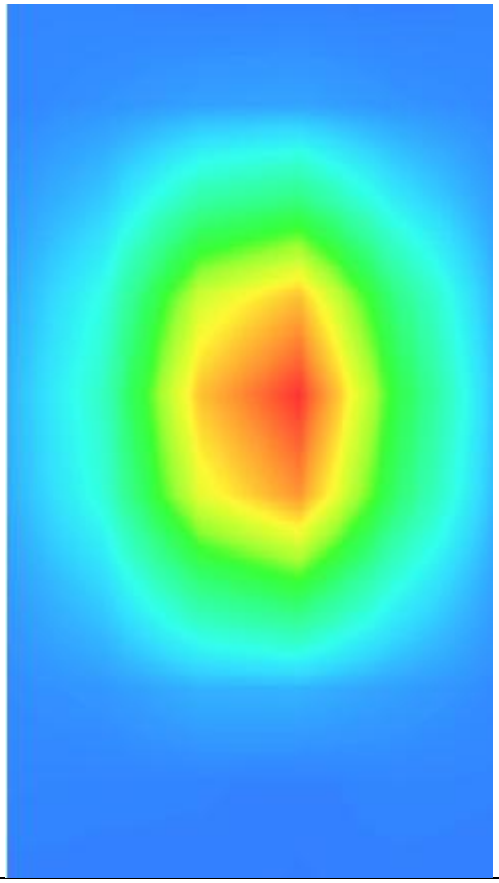
SURFACE SAR	VOLUME SAR
	

Maximum location: X=3.00, Y=2.00
SAR Peak: 6.82 W/kg

SAR 10g (W/Kg)	1.917307
SAR 1g (W/Kg)	3.671066

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.7474	4.3111	2.4329	1.4203	0.8572	0.5231	0.3234



3D screen shot	Hot spot position
	

MEASUREMENT 4

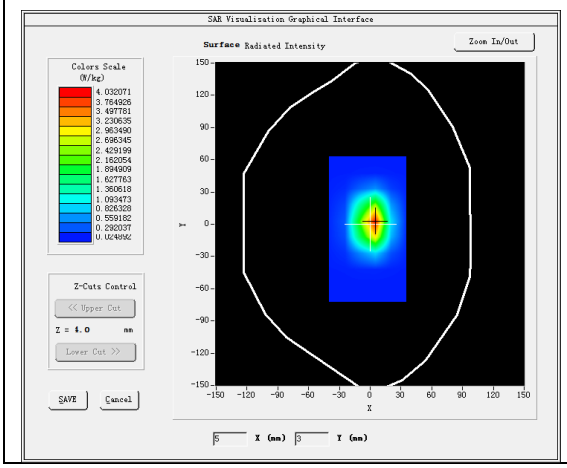
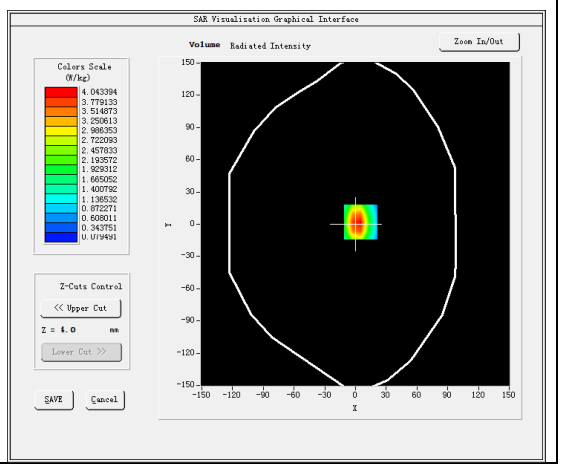
Date of measurement: 15/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

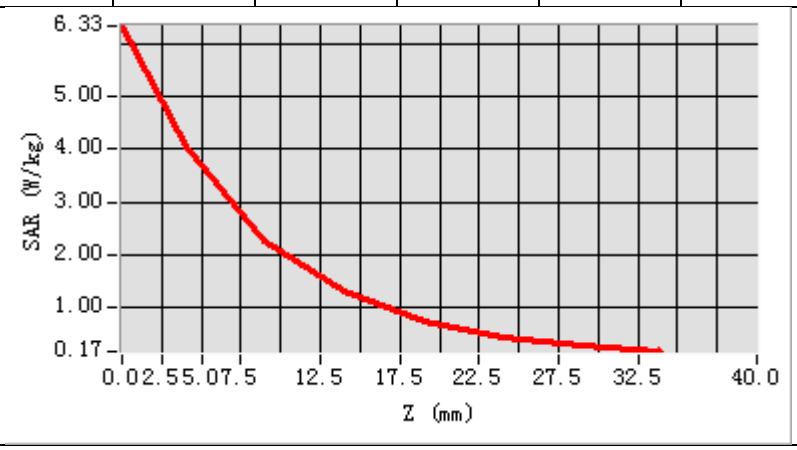
Frequency (MHz)	1900.000000
Relative permittivity (real part)	38.930002
Relative permittivity (imaginary part)	13.743476
Conductivity (S/m)	1.450700
Variation (%)	2.220000

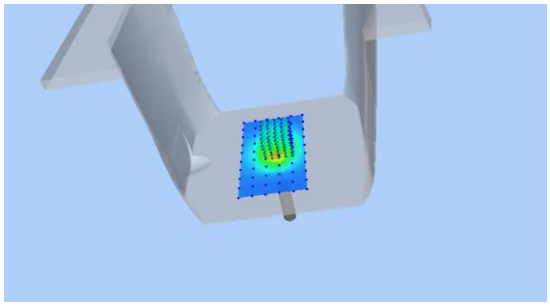
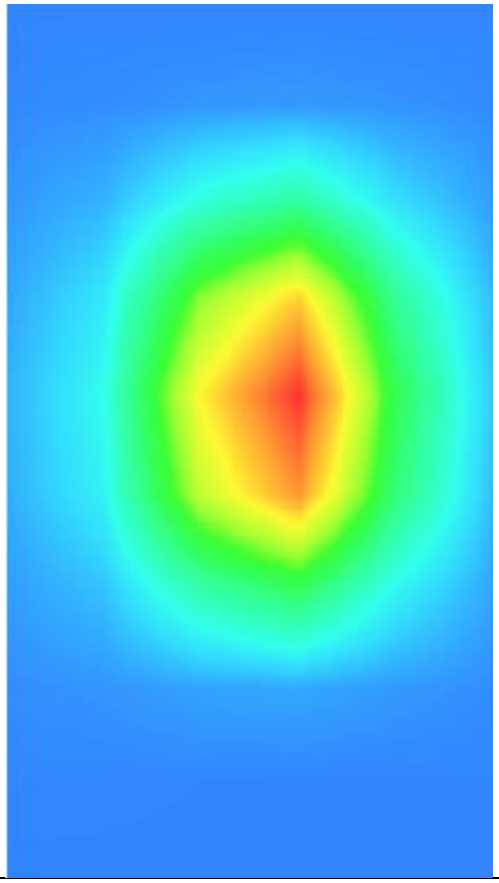
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=5.00, Y=2.00
SAR Peak: 6.70 W/kg

SAR 10g (W/Kg)	2.068347
SAR 1g (W/Kg)	4.177221

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	6.3247	4.0419	2.2630	1.3026	0.7618	0.4514	0.2794



3D screen shot	Hot spot position
	

MEASUREMENT 5

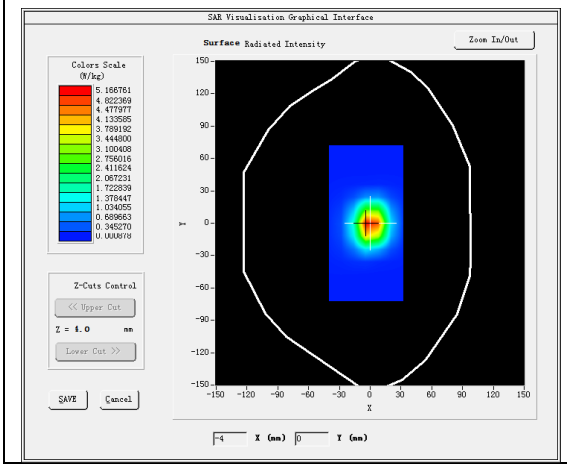
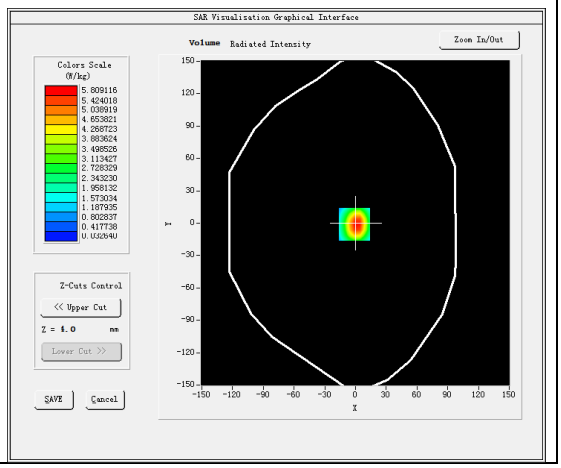
Date of measurement: 14/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

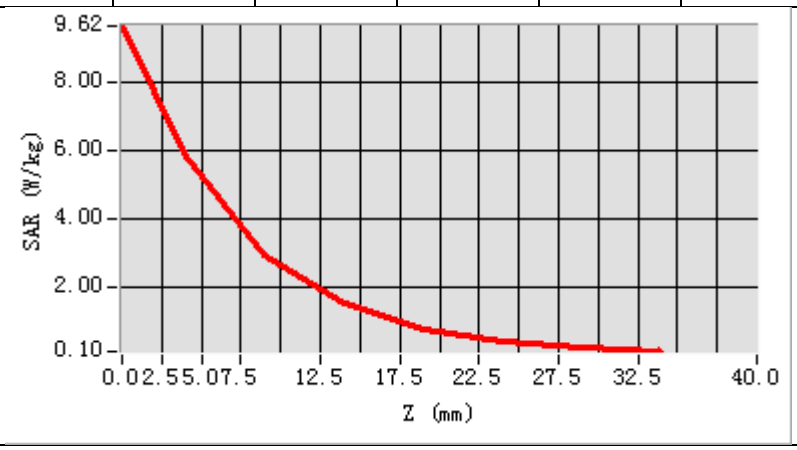
Frequency (MHz)	2450.000000
Relative permittivity (real part)	37.667635
Relative permittivity (imaginary part)	13.049236
Conductivity (S/m)	1.776146
Variation (%)	1.290000

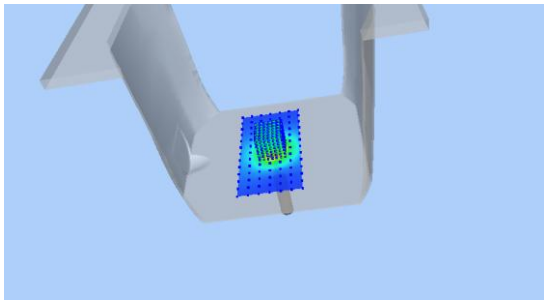
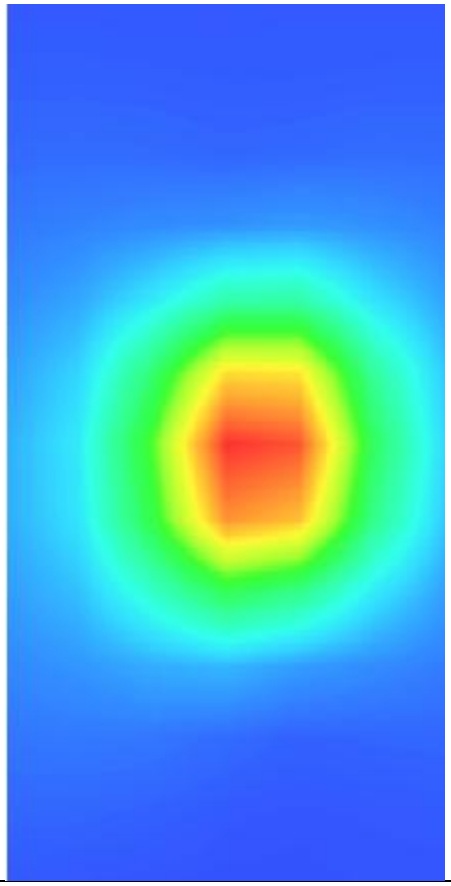
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-1.00, Y=-1.00
SAR Peak: 9.73 W/kg

SAR 10g (W/Kg)	2.286106
SAR 1g (W/Kg)	5.075340

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	9.6297	5.8053	2.9327	1.4826	0.7561	0.3898	0.1960



3D screen shot	Hot spot position
	

MEASUREMENT 6

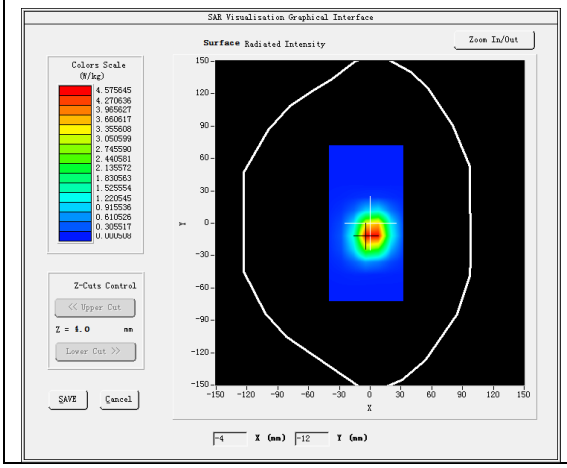
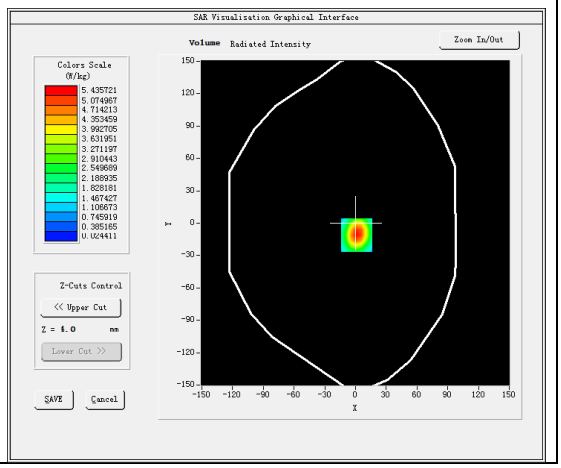
Date of measurement: 29/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

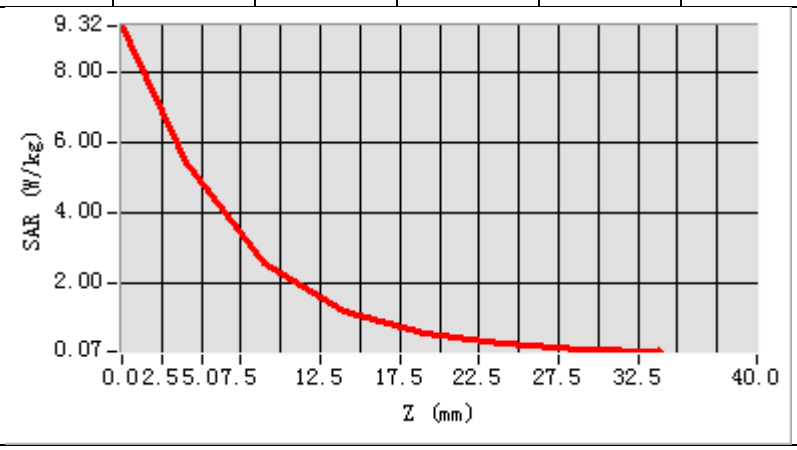
Frequency (MHz)	2600.000000
Relative permittivity (real part)	39.173484
Relative permittivity (imaginary part)	13.966388
Conductivity (S/m)	2.017367
Variation (%)	0.250000

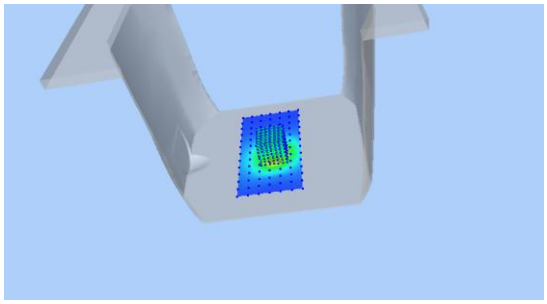
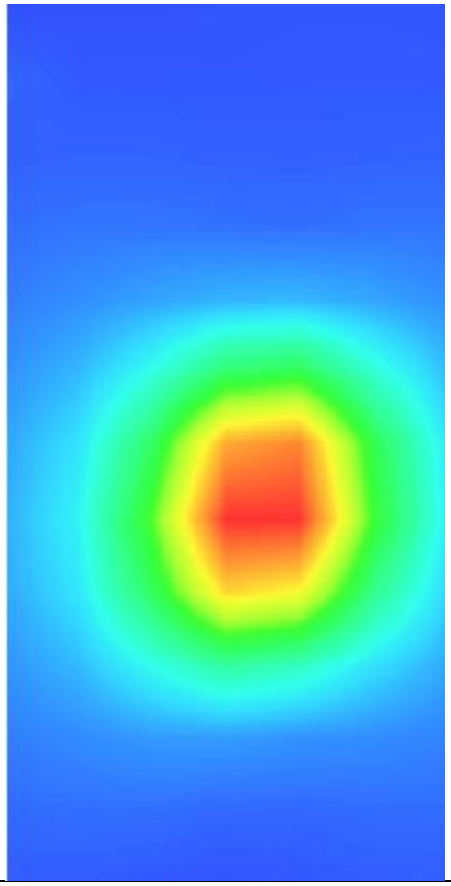
SURFACE SAR	VOLUME SAR
	

Maximum location: X=1.00, Y=-11.00
SAR Peak: 9.29 W/kg

SAR 10g (W/Kg)	2.441037
SAR 1g (W/Kg)	5.846199

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	9.3168	5.4332	2.5963	1.2356	0.5961	0.2869	0.1379



3D screen shot	Hot spot position
	

MEASUREMENT 7

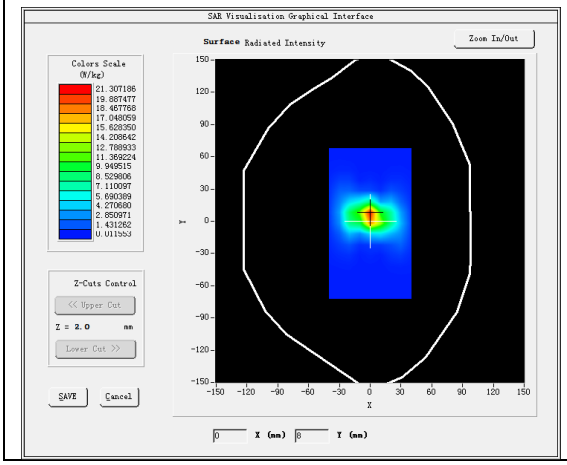
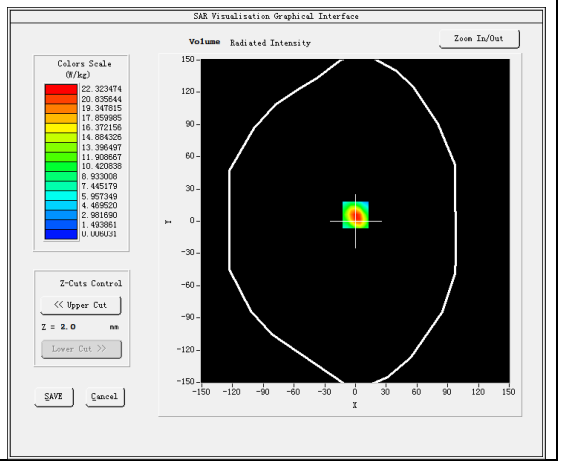
Date of measurement: 11/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

Frequency (MHz)	5200.000000
Relative permittivity (real part)	34.675906
Relative permittivity (imaginary part)	15.795970
Conductivity (S/m)	4.563280
Variation (%)	2.800000

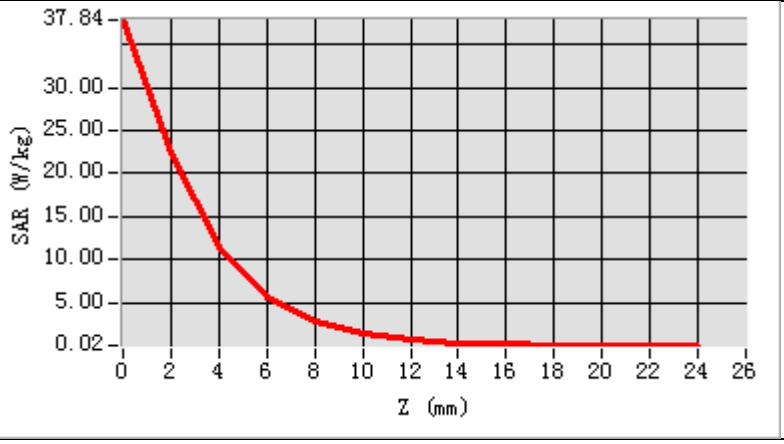
SURFACE SAR	VOLUME SAR
	

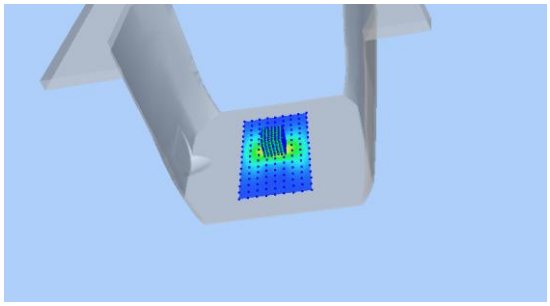
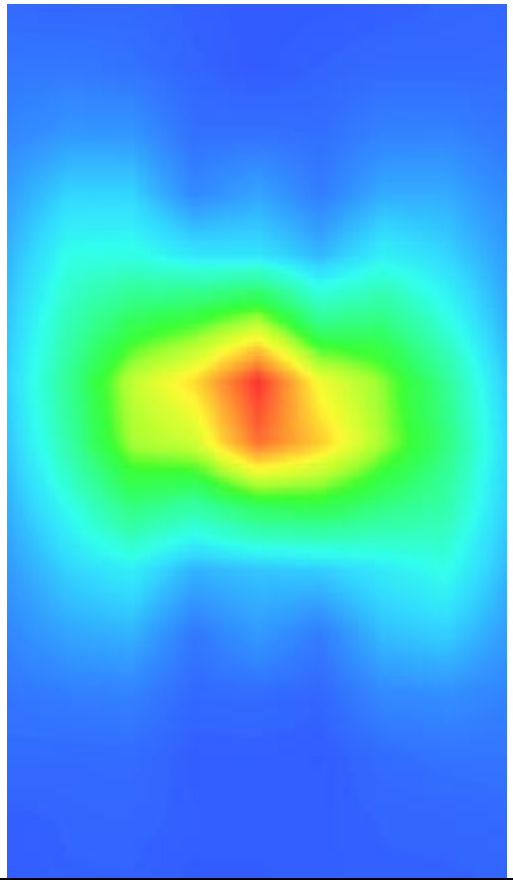
Maximum location: X=0.00, Y=6.00

SAR Peak: 40.06 W/kg

SAR 10g (W/Kg)	5.317162
SAR 1g (W/Kg)	15.273032

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	37.891	22.391	11.377	5.6694	2.8291	1.4043	0.7150	0.3637	0.1802	0.1008	0.0527	0.0397



3D screen shot	Hot spot position
	

MEASUREMENT 8

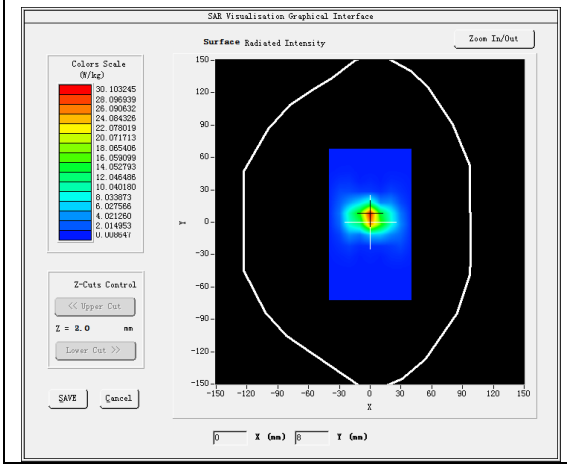
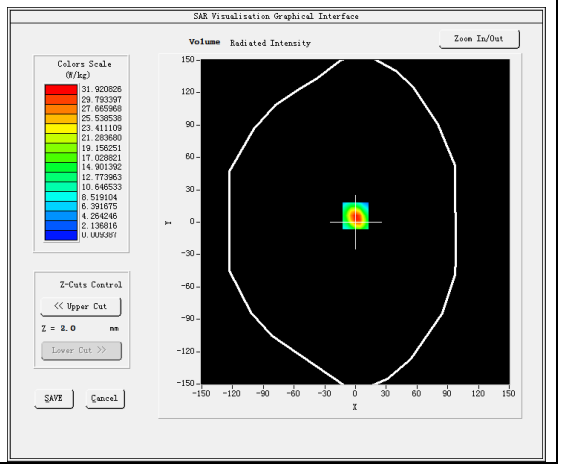
Date of measurement: 12/5/2024

A. Experimental conditions.

Area Scan	dx=10mm dy=10mm, h= 2.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)
ConvF	2.04

B. SAR Measurement Results

Frequency (MHz)	5800.000000
Relative permittivity (real part)	34.107056
Relative permittivity (imaginary part)	16.182741
Conductivity (S/m)	5.214439
Variation (%)	-0.500000

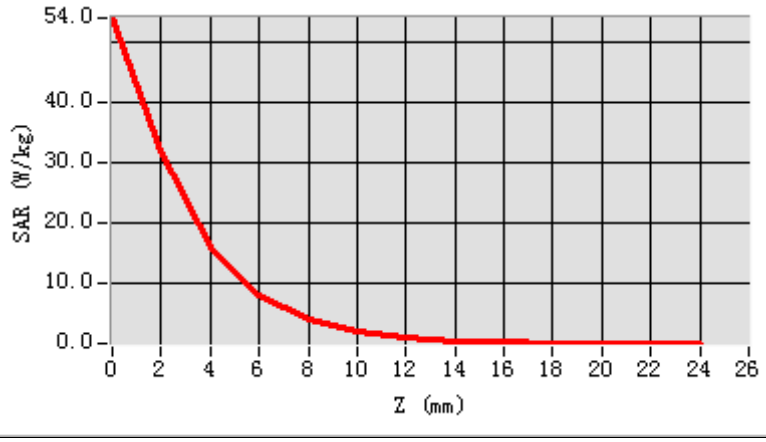
SURFACE SAR	VOLUME SAR
	

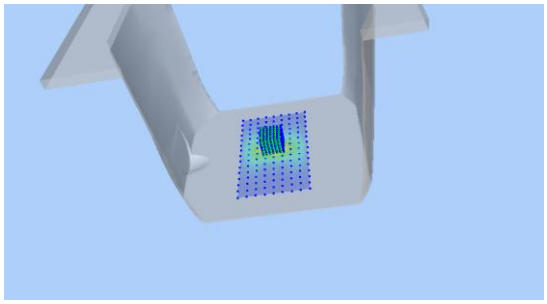
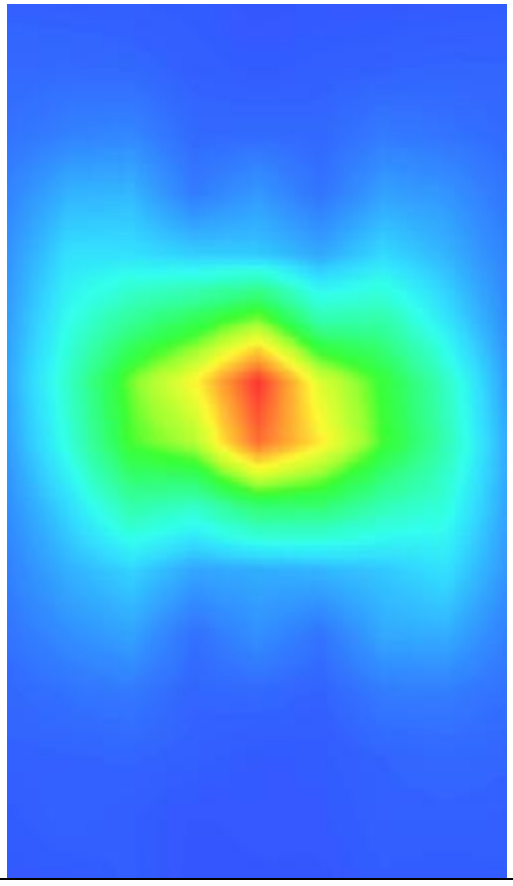
Maximum location: X=0.00, Y=6.00

SAR Peak: 57.37 W/kg

SAR 10g (W/Kg)	6.175228
SAR 1g (W/Kg)	17.388190

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	54.036	31.948	16.144	8.1766	4.0890	2.0550	1.0361	0.5144	0.2795	0.1572	0.0788	0.0438



3D screen shot	Hot spot position
	

13. Appendix C. Plots of High SAR Measurement

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MEASUREMENT 15 LTE Band 41 Body

MEASUREMENT 1

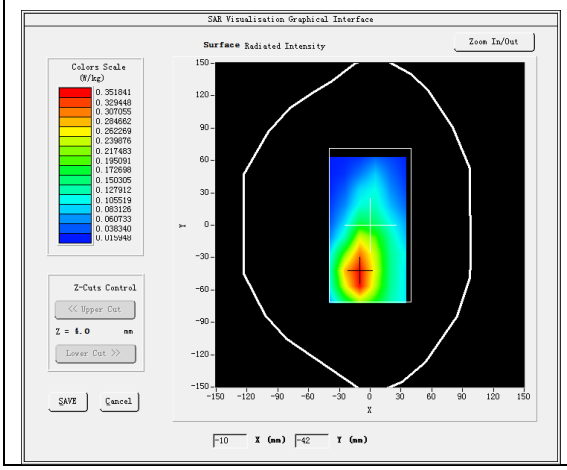
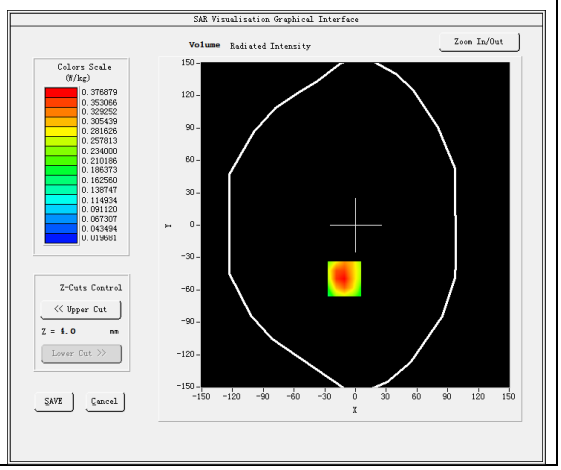
Date of measurement: 30/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	TDMA (Crest factor: 4.0)
ConvF	2.32

B. SAR Measurement Results

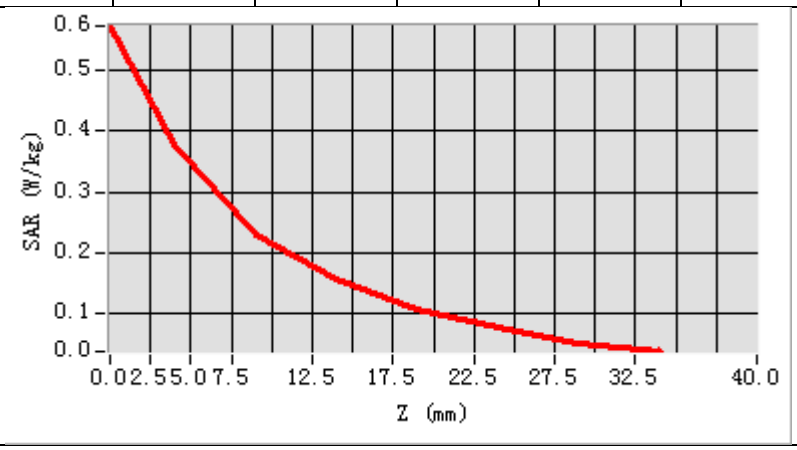
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.537582
Relative permittivity (imaginary part)	19.549063
Conductivity (S/m)	0.908380
Variation (%)	-2.390000

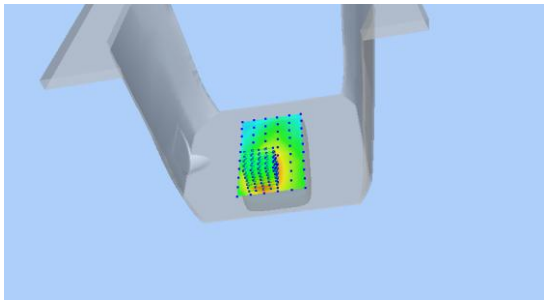
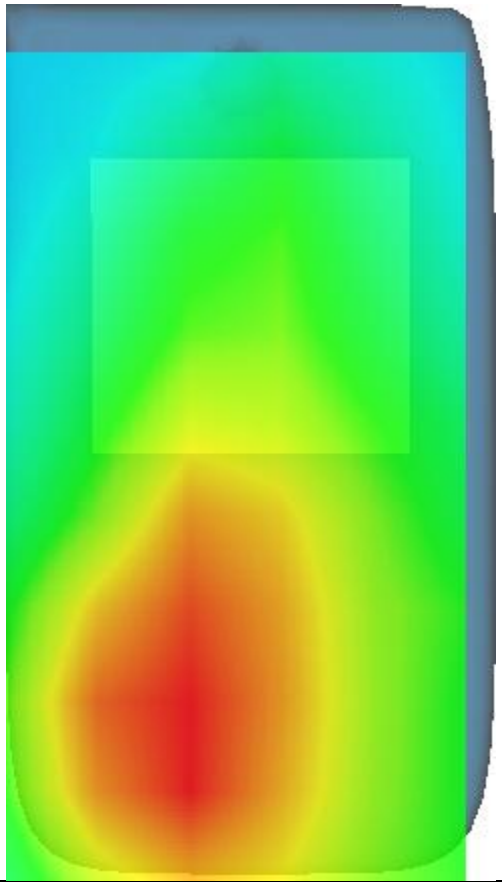
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-11.00, Y=-50.00
SAR Peak: 0.59 W/kg

SAR 10g (W/Kg)	0.222567
SAR 1g (W/Kg)	0.371496

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5719	0.3769	0.2301	0.1584	0.1087	0.0778	0.0532



3D screen shot	Hot spot position
	

MEASUREMENT 2

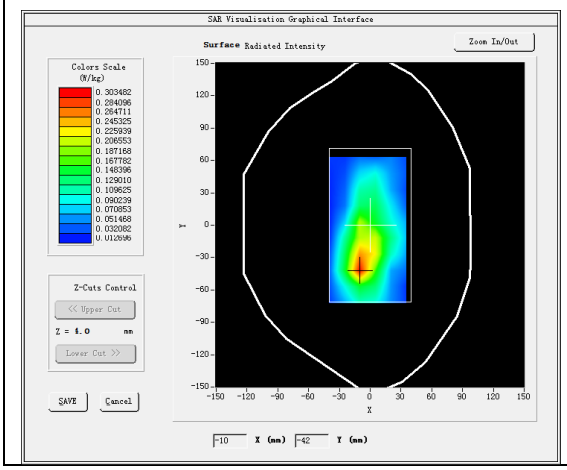
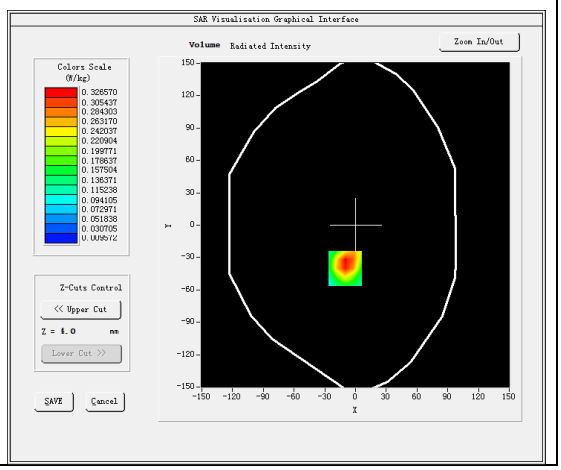
Date of measurement: 15/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	TDMA (Crest factor: 2.7)
ConvF	2.63

B. SAR Measurement Results

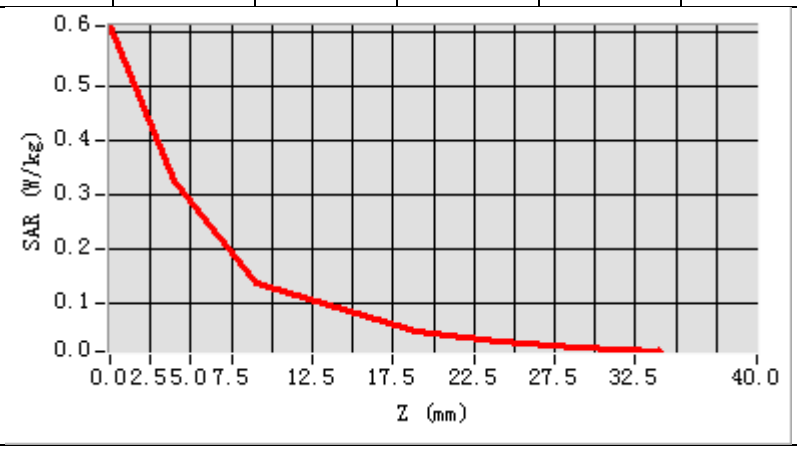
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.005302
Relative permittivity (imaginary part)	13.791376
Conductivity (S/m)	1.440433
Variation (%)	-2.370000

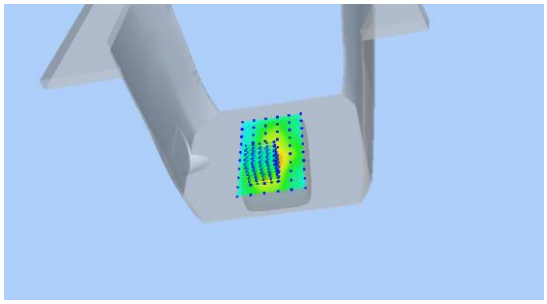
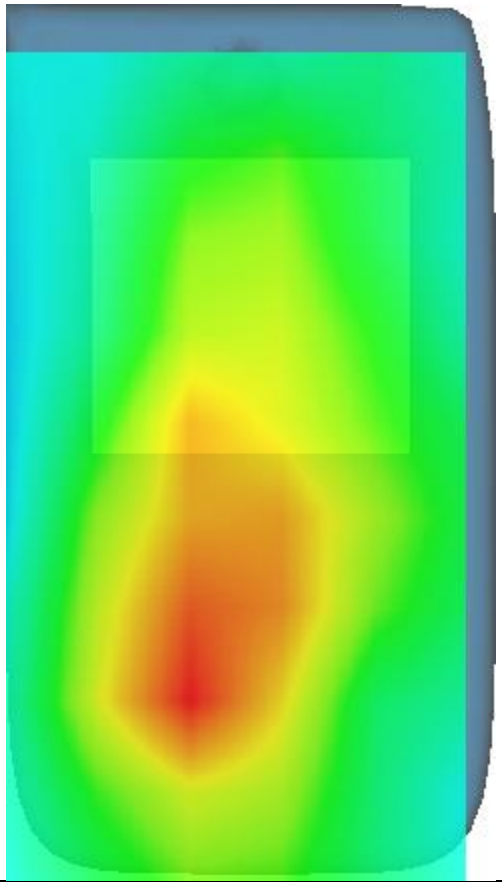
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-10.00, Y=-40.00
SAR Peak: 0.53 W/kg

SAR 10g (W/Kg)	0.168878
SAR 1g (W/Kg)	0.231725

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.6103	0.3266	0.1379	0.0937	0.0502	0.0302	0.0203



3D screen shot	Hot spot position
	

MEASUREMENT 3

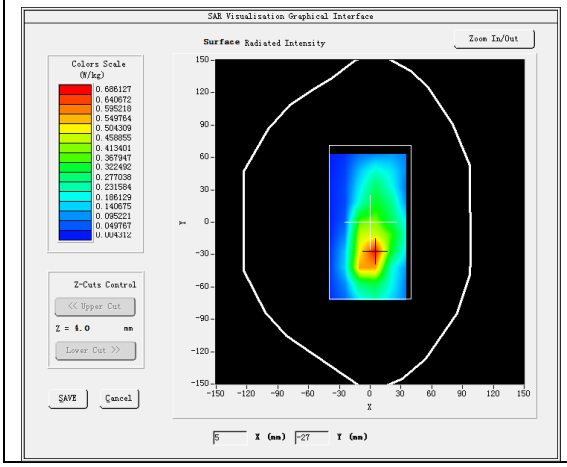
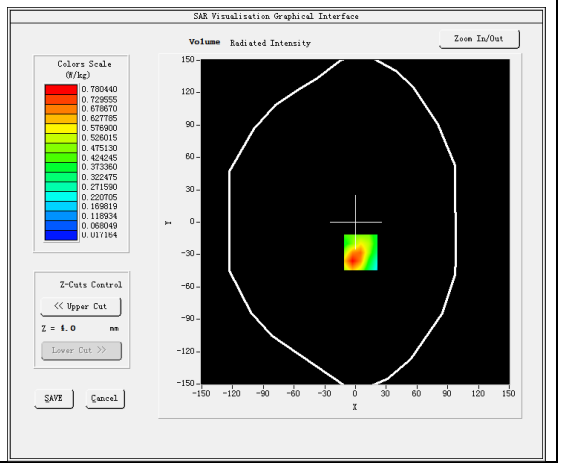
Date of measurement: 15/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	2.63

B. SAR Measurement Results

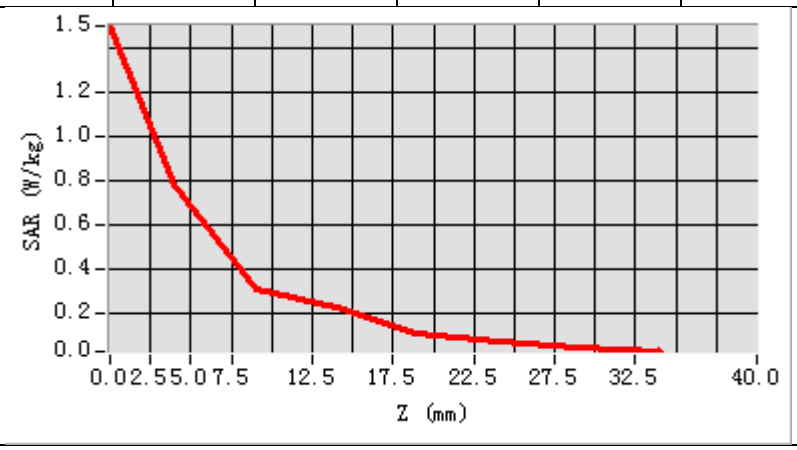
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.005302
Relative permittivity (imaginary part)	13.791376
Conductivity (S/m)	1.440433
Variation (%)	-0.250000

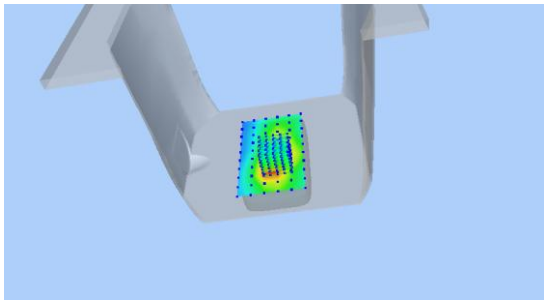
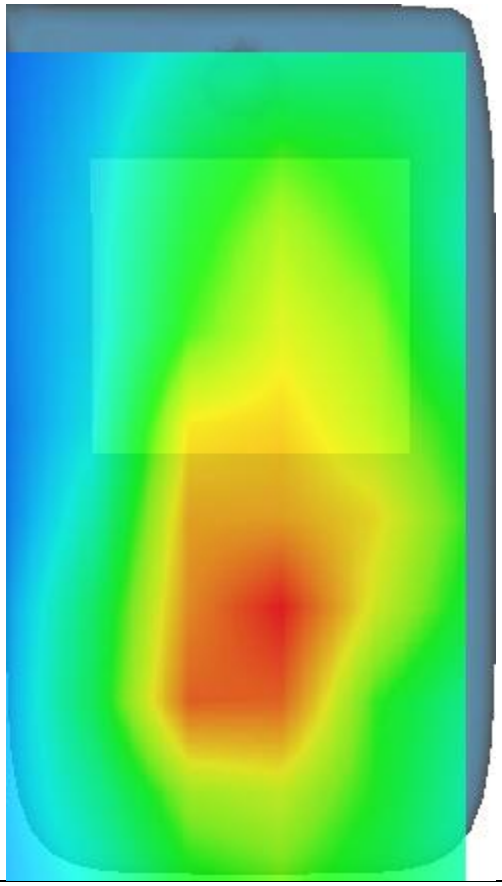
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=-28.00
SAR Peak: 1.27 W/kg

SAR 10g (W/Kg)	0.381038
SAR 1g (W/Kg)	0.745909

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.4992	0.7804	0.3114	0.2232	0.1112	0.0693	0.0408



3D screen shot	Hot spot position
	

MEASUREMENT 4

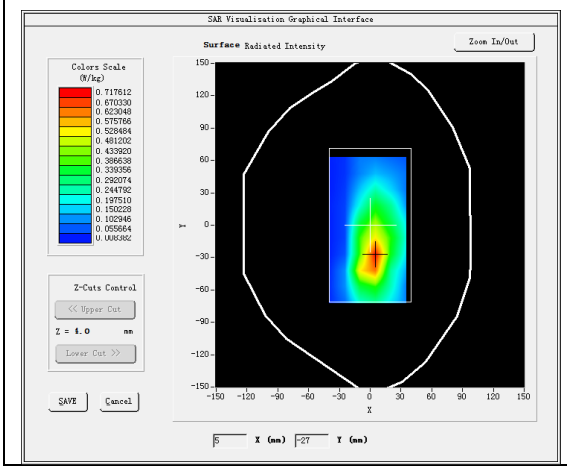
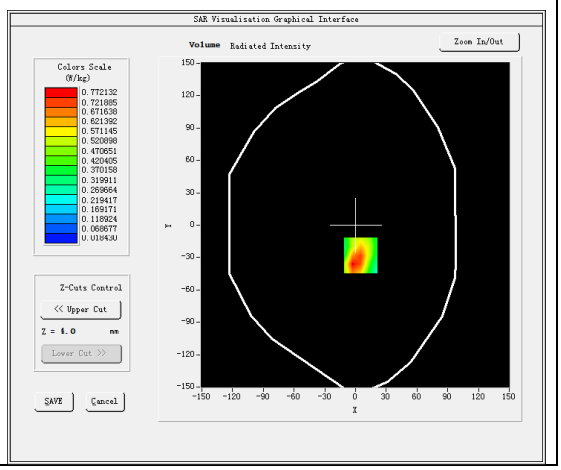
Date of measurement: 28/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band4_WCDMA1700
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	2.45

B. SAR Measurement Results

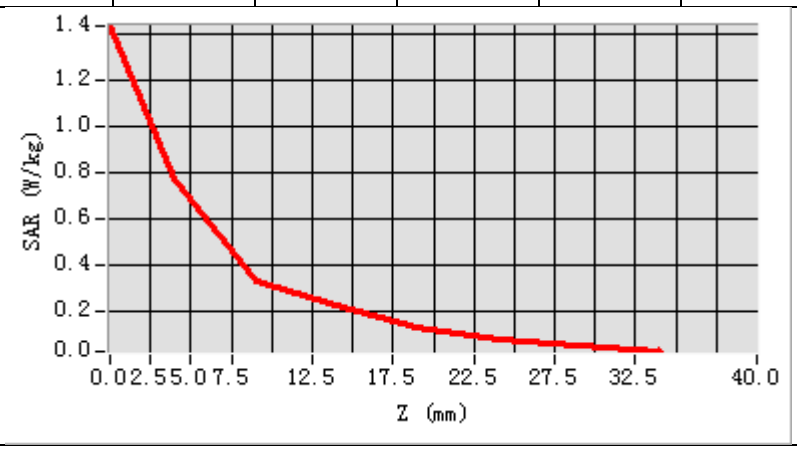
Frequency (MHz)	1732.600000
Relative permittivity (real part)	39.794827
Relative permittivity (imaginary part)	13.921265
Conductivity (S/m)	1.339535
Variation (%)	-1.110000

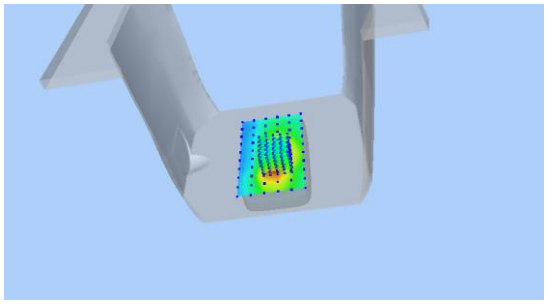
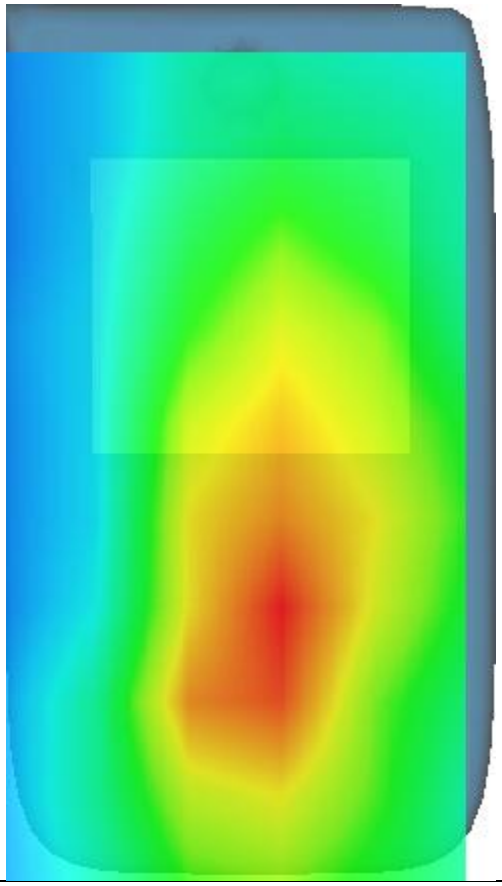
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=-28.00
SAR Peak: 1.27 W/kg

SAR 10g (W/Kg)	0.387684
SAR 1g (W/Kg)	0.738471

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.4349	0.7721	0.3364	0.2285	0.1349	0.0781	0.0528



3D screen shot	Hot spot position
	

MEASUREMENT 5

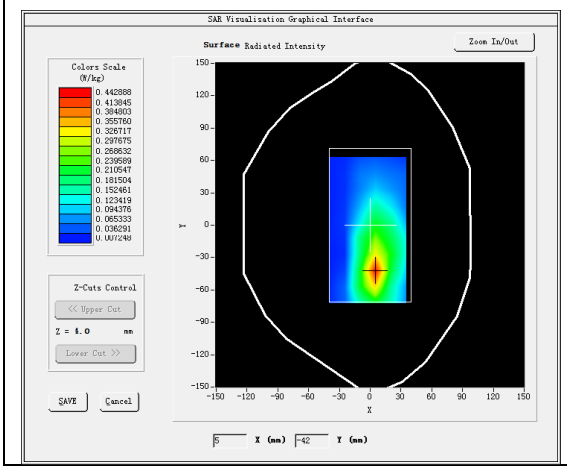
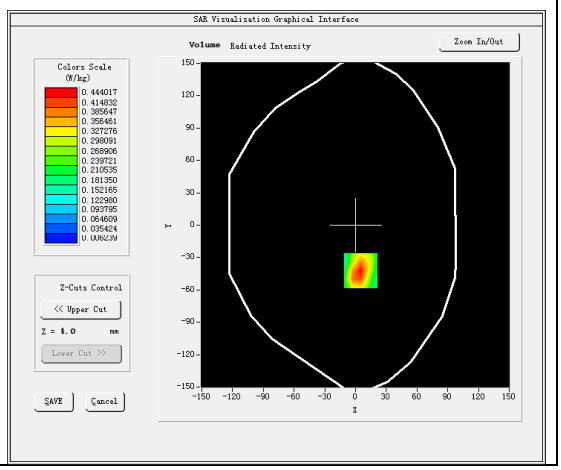
Date of measurement: 30/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band5_WCDMA850
Channels	Middle
Signal	WCDMA (Crest factor: 1.0)
ConvF	2.32

B. SAR Measurement Results

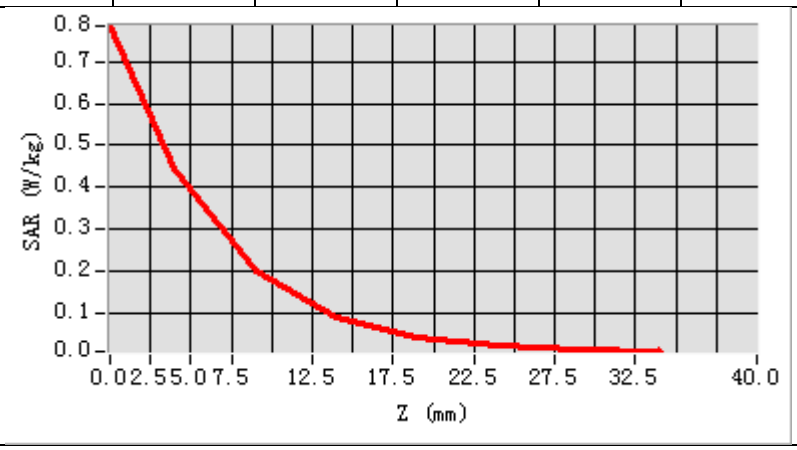
Frequency (MHz)	836.400000
Relative permittivity (real part)	41.537582
Relative permittivity (imaginary part)	19.549063
Conductivity (S/m)	0.908380
Variation (%)	-2.220000

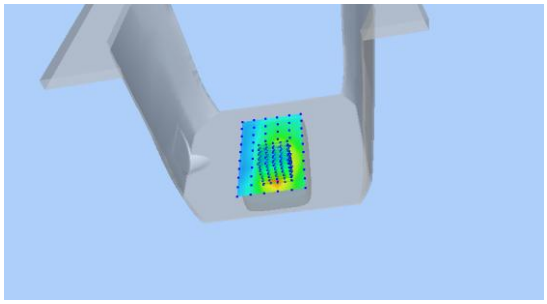
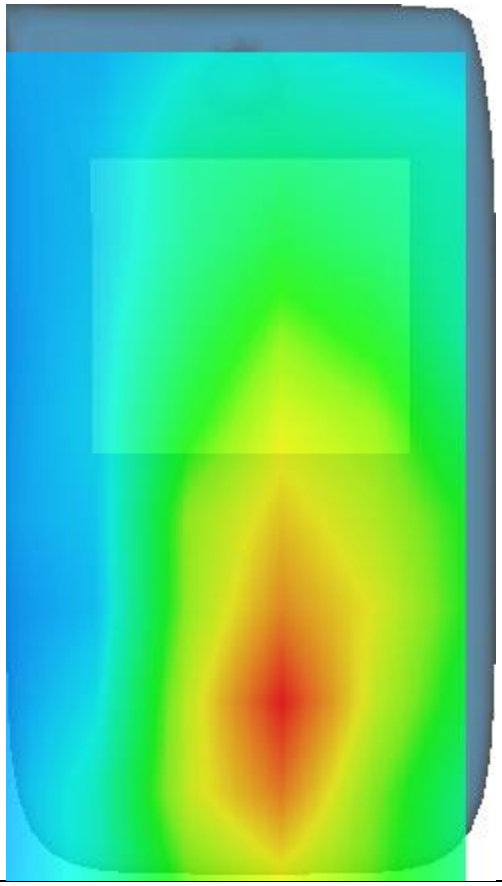
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=5.00, Y=-42.00
SAR Peak: 0.81 W/kg

SAR 10g (W/Kg)	0.200879
SAR 1g (W/Kg)	0.432883

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.7849	0.4440	0.2006	0.0921	0.0431	0.0226	0.0127



3D screen shot	Hot spot position
	

MEASUREMENT 6

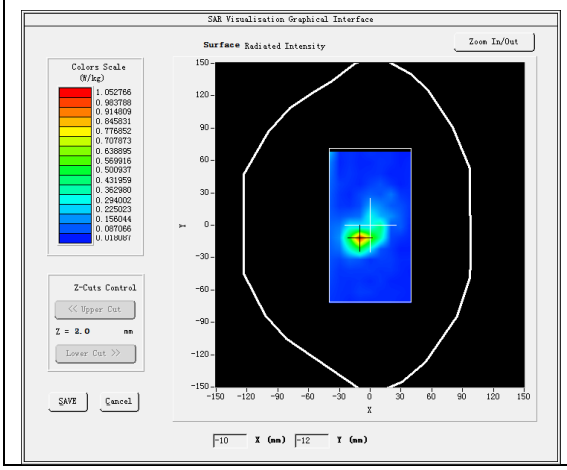
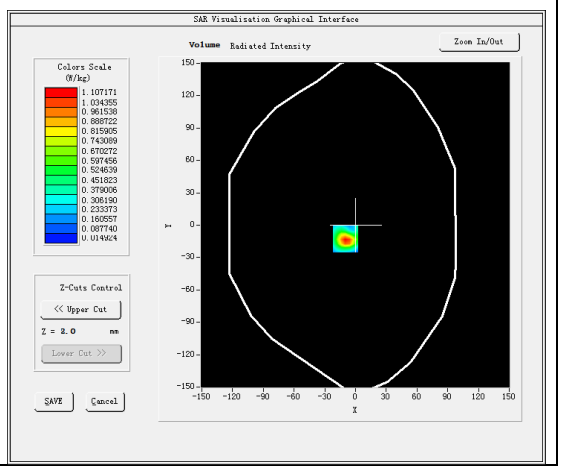
Date of measurement: 11/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

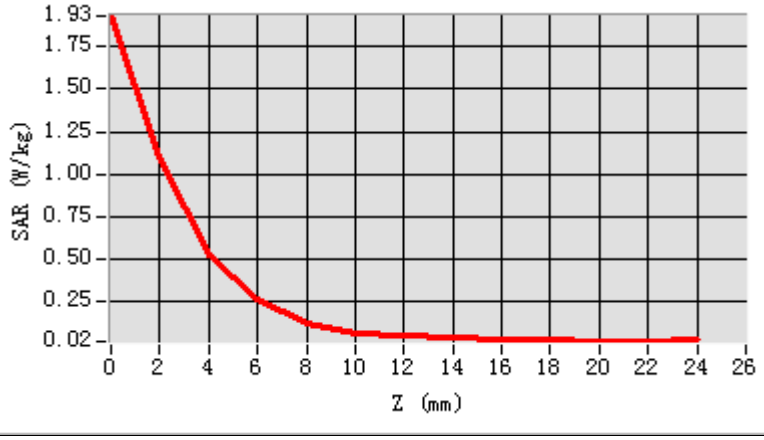
Frequency (MHz)	5240.000000
Relative permittivity (real part)	34.521382
Relative permittivity (imaginary part)	15.807355
Conductivity (S/m)	4.601697
Variation (%)	-0.809999

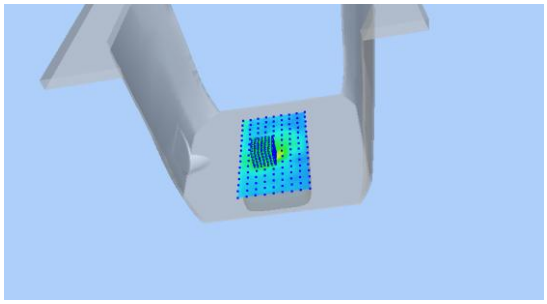
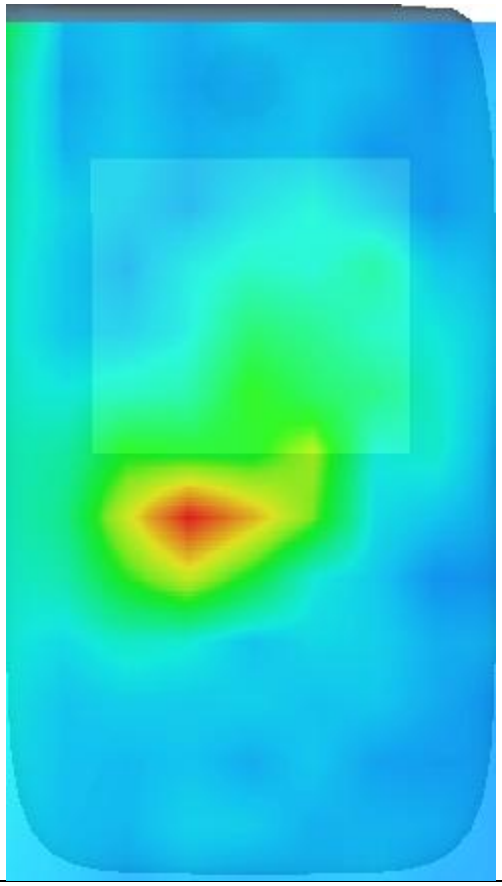
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-10.00, Y=-13.00
SAR Peak: 2.05 W/kg

SAR 10g (W/Kg)	0.194609
SAR 1g (W/Kg)	0.596657

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	1.9295	1.1072	0.5221	0.2626	0.1243	0.0616	0.0467	0.0377	0.0220	0.0217	0.0175	0.0158



3D screen shot	Hot spot position
	

MEASUREMENT 7

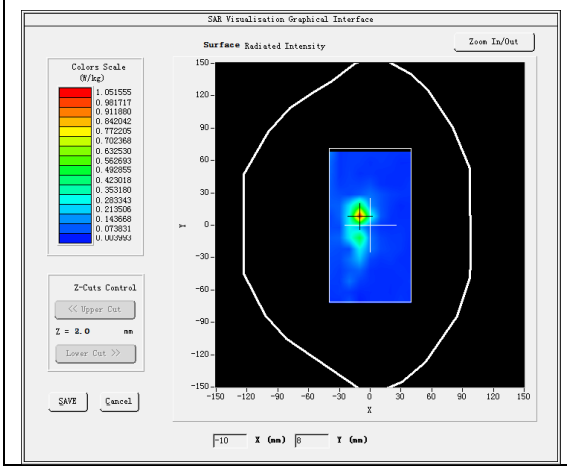
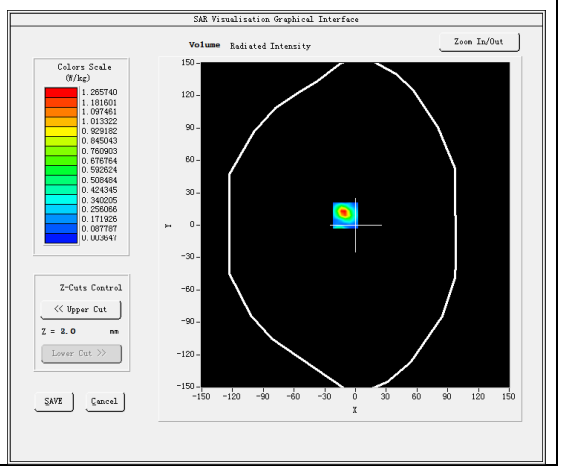
Date of measurement: 12/5/2024

A. Experimental conditions.

Area Scan	dx=10mm dy=10mm, h= 2.00 mm
ZoomScan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11ac U-NII
Channels	High
Signal	IEEE802.11ac (Crest factor: 1.0)
ConvF	2.04

B. SAR Measurement Results

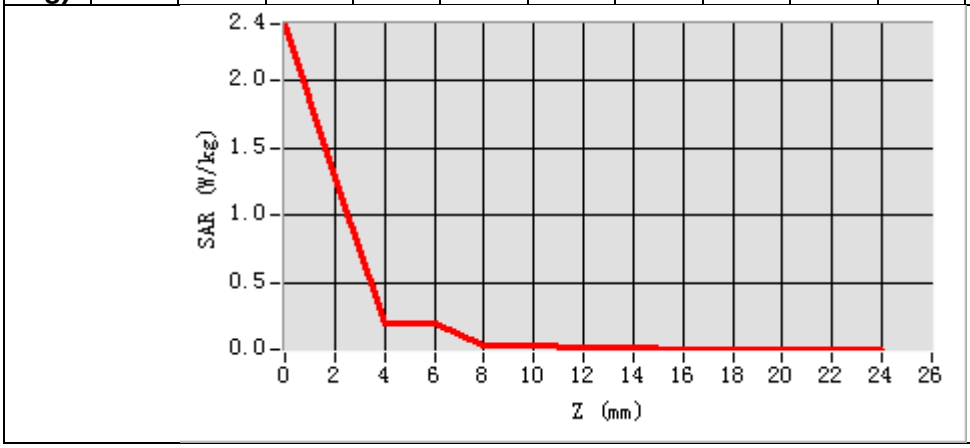
Frequency (MHz)	5795.000000
Relative permittivity (real part)	34.097264
Relative permittivity (imaginary part)	16.229417
Conductivity (S/m)	5.224971
Variation (%)	-0.309999

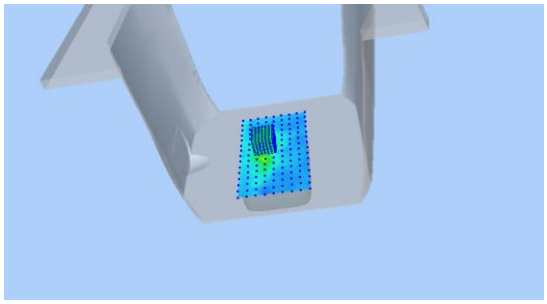
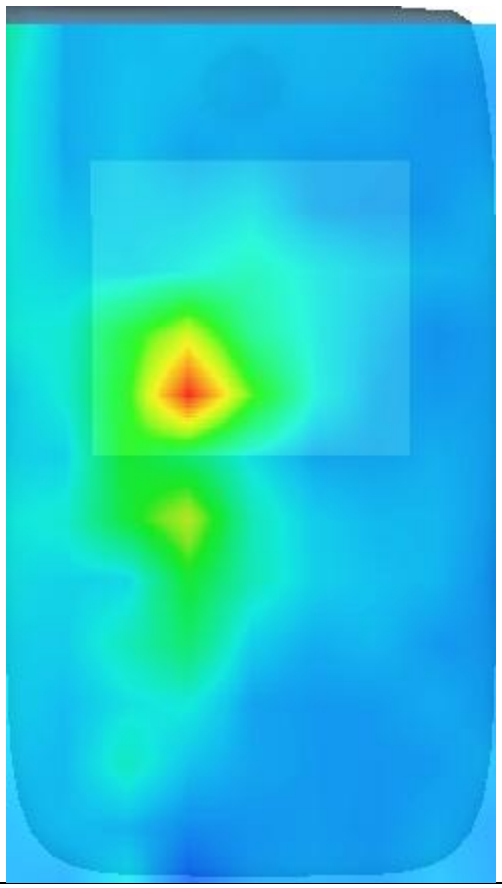
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-10.00, Y=9.00
SAR Peak: 2.68 W/kg

SAR 10g (W/Kg)	0.150343
SAR 1g (W/Kg)	0.618557

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	2.4080	1.2657	0.2028	0.2146	0.0418	0.0487	0.0334	0.0346	0.0233	0.0235	0.0183	0.0198



3D screen shot	Hot spot position
	

MEASUREMENT 8

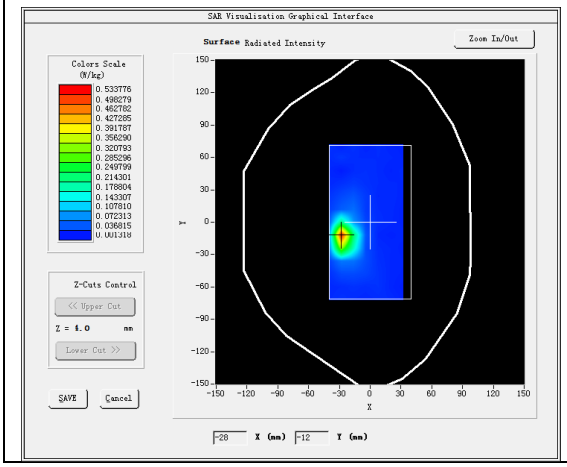
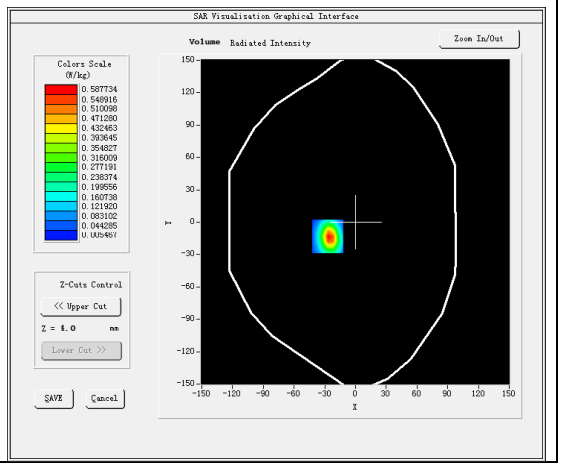
Date of measurement: 14/5/2024

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	IEEE 802.11b ISM
Channels	Middle
Signal	IEEE802.11b (Crest factor: 1.0)
ConvF	2.85

B. SAR Measurement Results

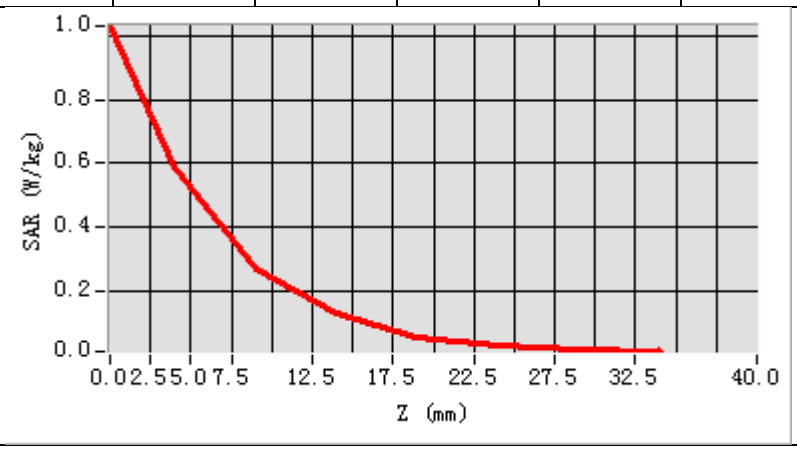
Frequency (MHz)	2437.000000
Relative permittivity (real part)	37.719734
Relative permittivity (imaginary part)	12.967736
Conductivity (S/m)	1.755687
Variation (%)	3.030000

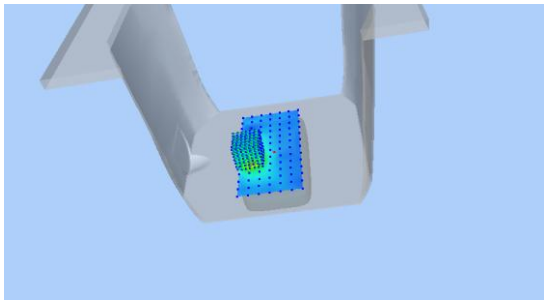
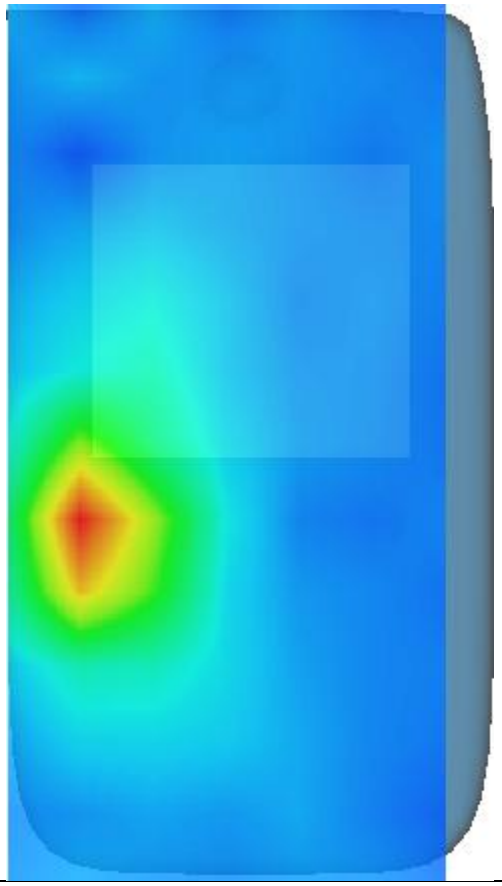
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-27.00, Y=-13.00
SAR Peak: 1.07 W/kg

SAR 10g (W/Kg)	0.201752
SAR 1g (W/Kg)	0.526370

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.0297	0.5877	0.2681	0.1296	0.0570	0.0300	0.0161



3D screen shot	Hot spot position
	

MEASUREMENT 9

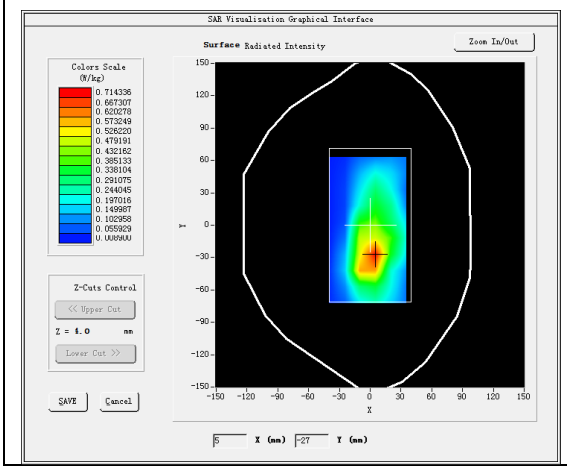
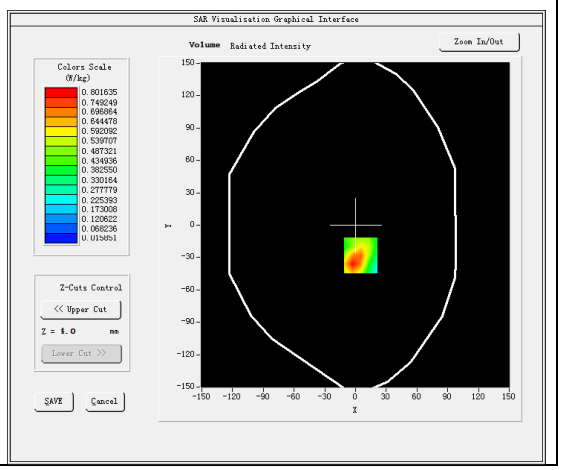
Date of measurement: 15/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	2.63

B. SAR Measurement Results

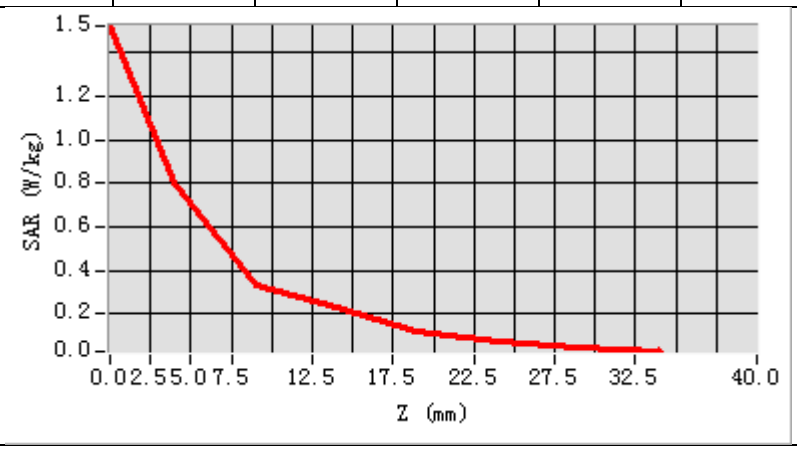
Frequency (MHz)	1880.000000
Relative permittivity (real part)	39.005302
Relative permittivity (imaginary part)	13.791376
Conductivity (S/m)	1.440433
Variation (%)	-0.850000

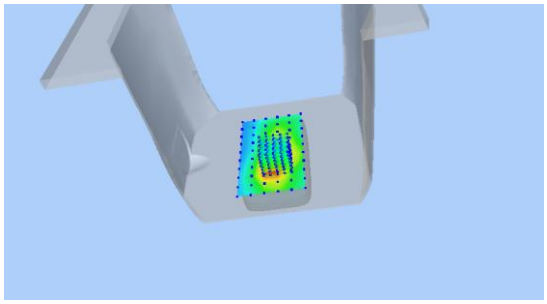
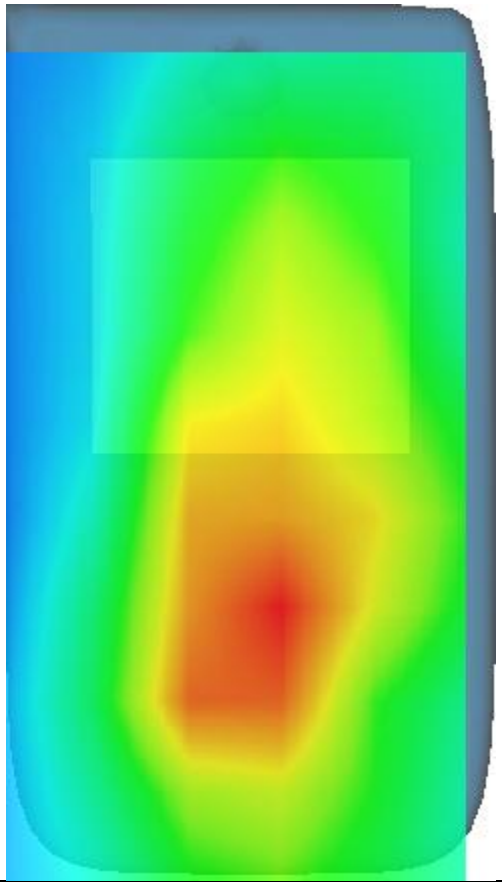
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=-28.00
SAR Peak: 1.31 W/kg

SAR 10g (W/Kg)	0.392620
SAR 1g (W/Kg)	0.766872

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.5247	0.8016	0.3287	0.2291	0.1175	0.0715	0.0406



3D screen shot	Hot spot position
	

MEASUREMENT 10

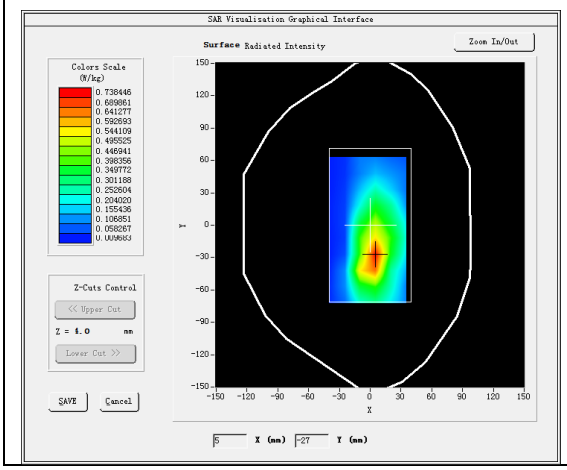
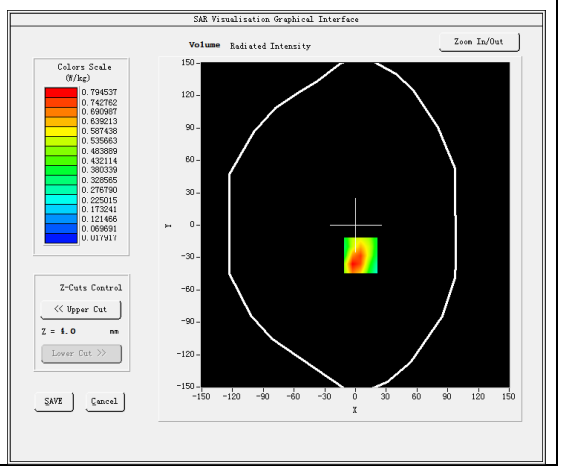
Date of measurement: 28/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

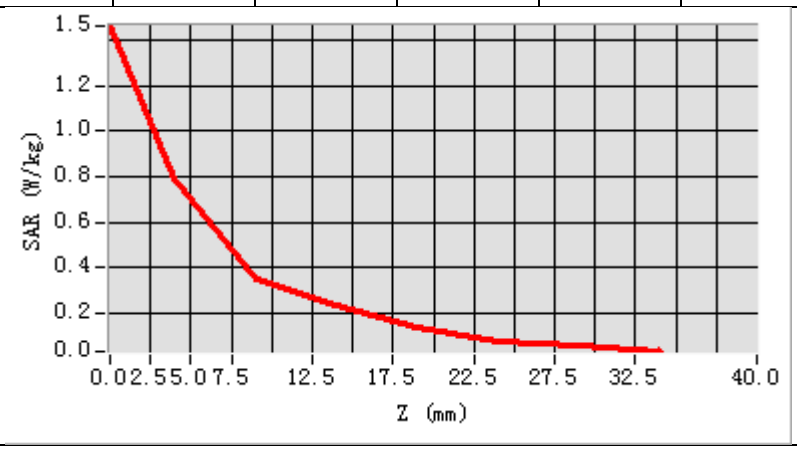
Frequency (MHz)	1732.500000
Relative permittivity (real part)	39.802727
Relative permittivity (imaginary part)	13.906115
Conductivity (S/m)	1.338464
Variation (%)	-1.150000

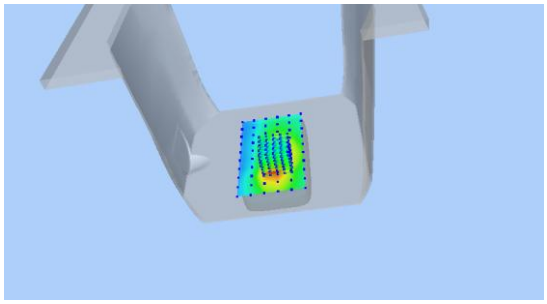
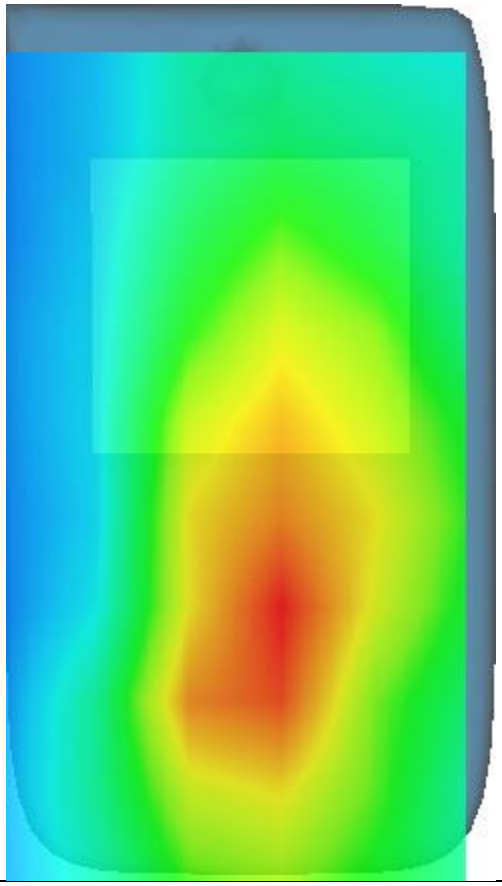
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=-28.00
SAR Peak: 1.30 W/kg

SAR 10g (W/Kg)	0.399514
SAR 1g (W/Kg)	0.760440

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.4618	0.7945	0.3506	0.2369	0.1378	0.0780	0.0541



3D screen shot	Hot spot position
	

MEASUREMENT 11

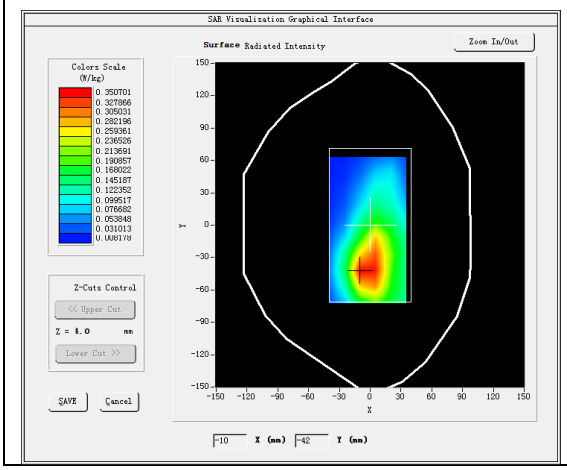
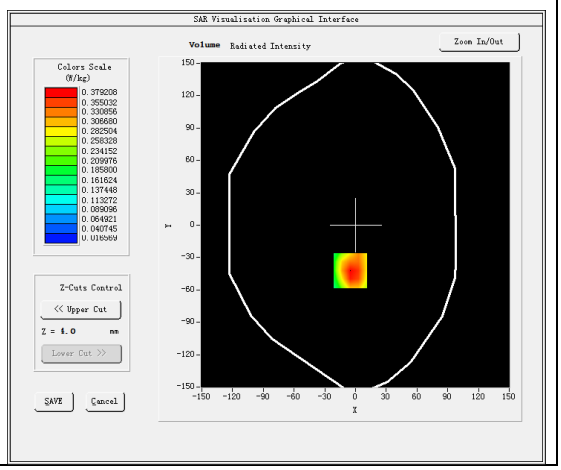
Date of measurement: 30/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

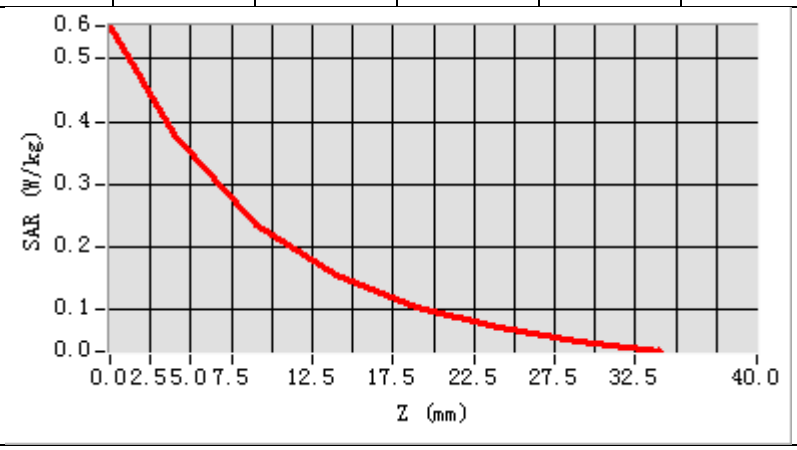
Frequency (MHz)	836.500000
Relative permittivity (real part)	41.539852
Relative permittivity (imaginary part)	19.550861
Conductivity (S/m)	0.908572
Variation (%)	-0.880000

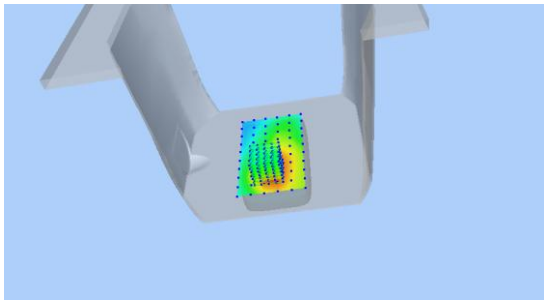
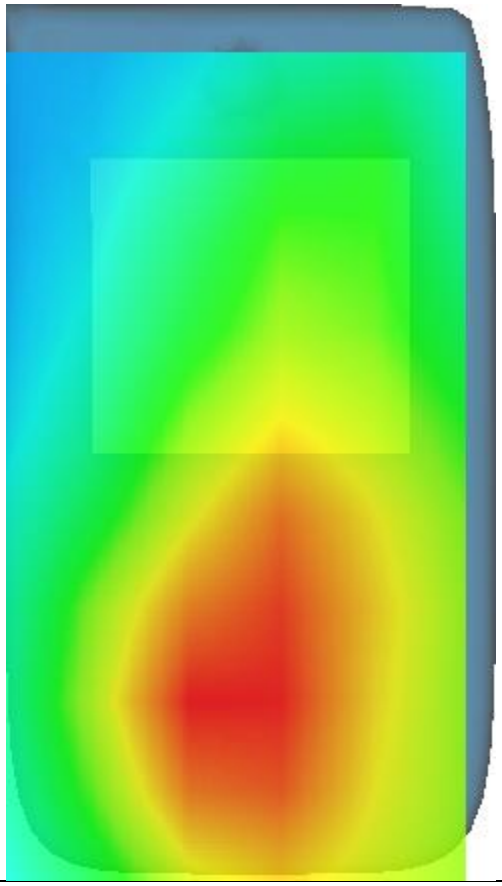
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=-42.00
SAR Peak: 0.56 W/kg

SAR 10g (W/Kg)	0.227323
SAR 1g (W/Kg)	0.371318

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.5528	0.3792	0.2369	0.1544	0.1029	0.0711	0.0498



3D screen shot	Hot spot position
	

MEASUREMENT 12

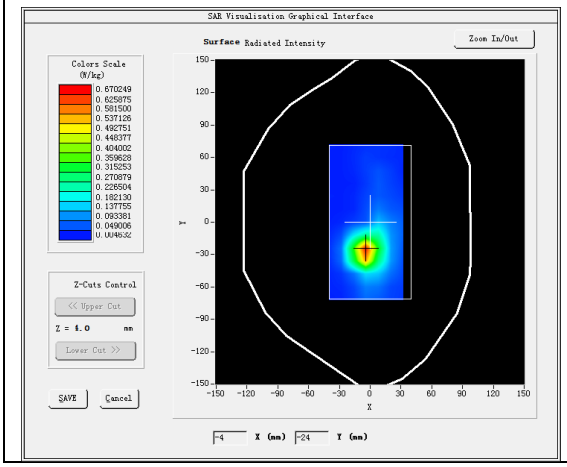
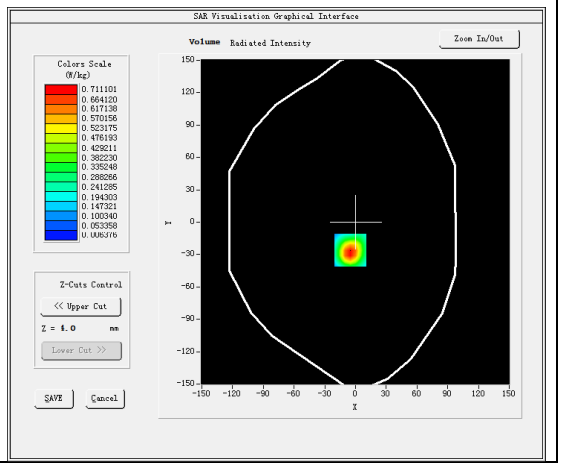
Date of measurement: 29/5/2024

A. Experimental conditions.

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

B. SAR Measurement Results

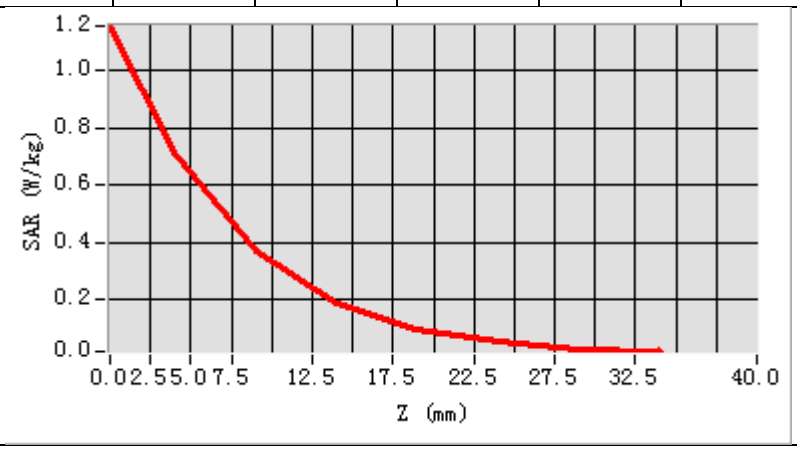
Frequency (MHz)	2535.000000
Relative permittivity (real part)	39.508785
Relative permittivity (imaginary part)	13.834288
Conductivity (S/m)	1.948329
Variation (%)	-0.590000

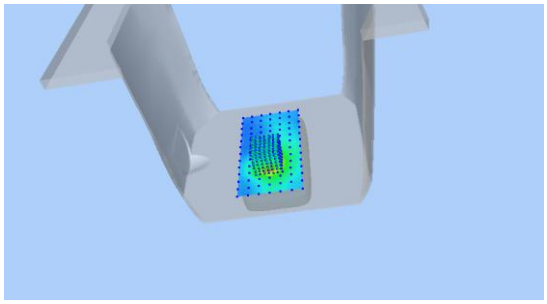
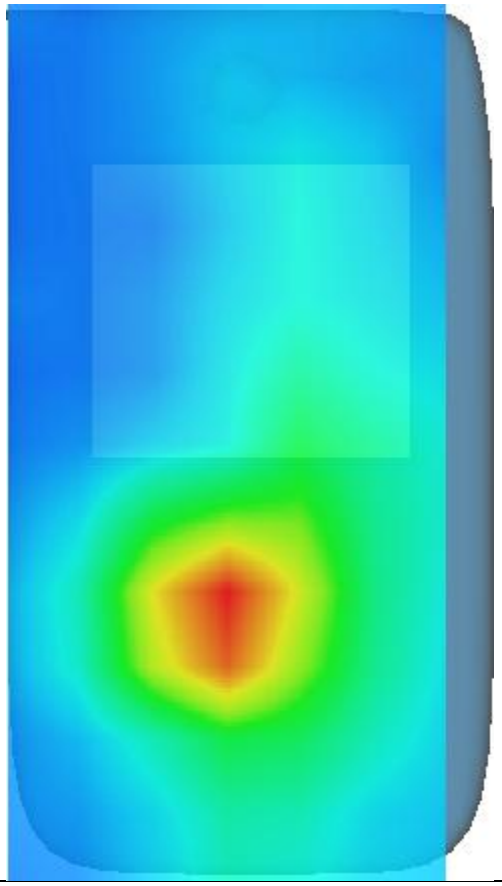
SURFACE SAR	VOLUME SAR
	

Maximum location: X=-5.00, Y=-26.00
SAR Peak: 1.19 W/kg

SAR 10g (W/Kg)	0.304058
SAR 1g (W/Kg)	0.667503

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.1571	0.7111	0.3697	0.1886	0.0978	0.0516	0.0274



3D screen shot	Hot spot position
	

MEASUREMENT 13

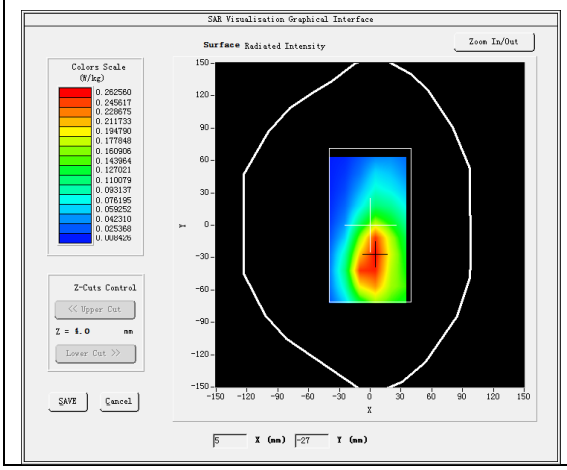
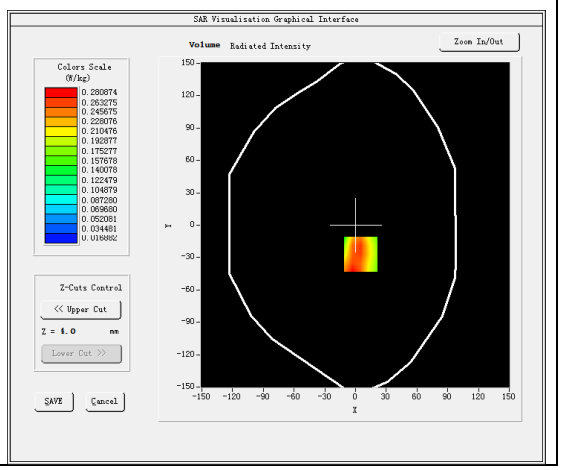
Date of measurement: 13/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 12
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	2.37

B. SAR Measurement Results

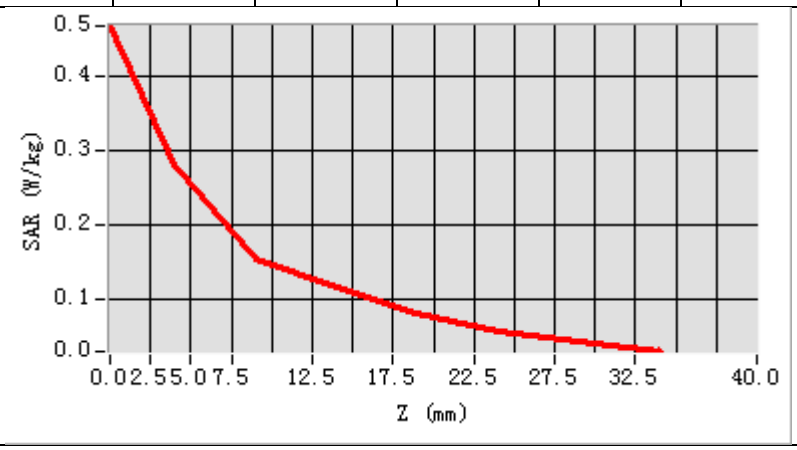
Frequency (MHz)	707.500000
Relative permittivity (real part)	41.467739
Relative permittivity (imaginary part)	21.886713
Conductivity (S/m)	0.860269
Variation (%)	-0.750000

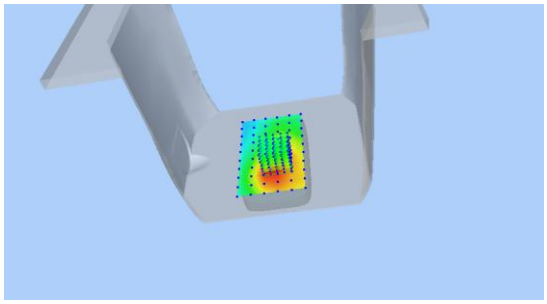
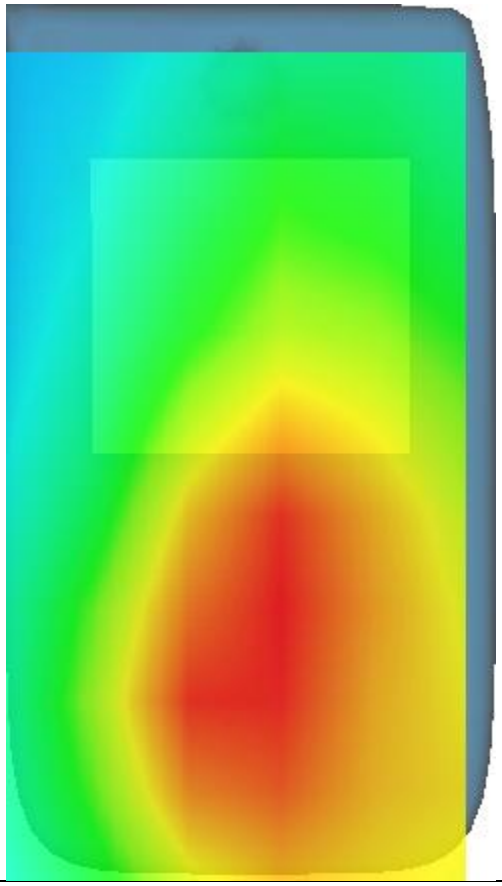
SURFACE SAR	VOLUME SAR
	

Maximum location: X=5.00, Y=-27.00
SAR Peak: 0.41 W/kg

SAR 10g (W/Kg)	0.170892
SAR 1g (W/Kg)	0.260001

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.4679	0.2809	0.1540	0.1160	0.0826	0.0577	0.0438



3D screen shot	Hot spot position
	

MEASUREMENT 14

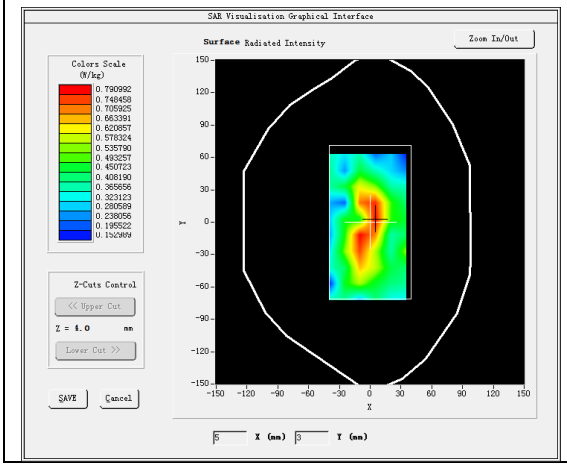
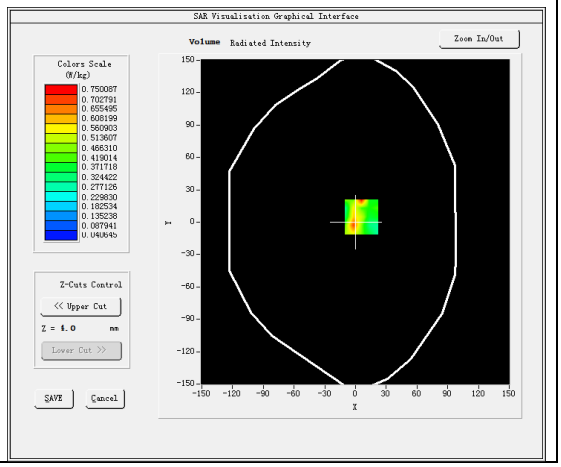
Date of measurement: 13/5/2024

A. Experimental conditions.

Area Scan	dx=15mm dy=15mm, h= 5.00 mm
ZoomScan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 17
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	2.37

B. SAR Measurement Results

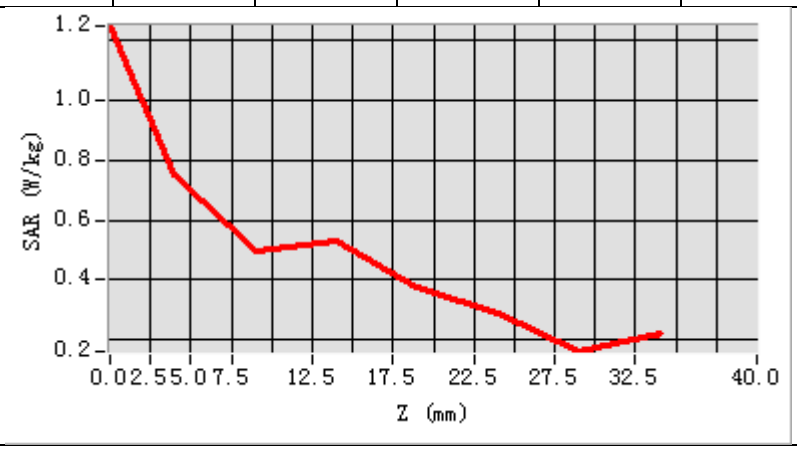
Frequency (MHz)	710.000000
Relative permittivity (real part)	41.452393
Relative permittivity (imaginary part)	21.827164
Conductivity (S/m)	0.860960
Variation (%)	-4.959999

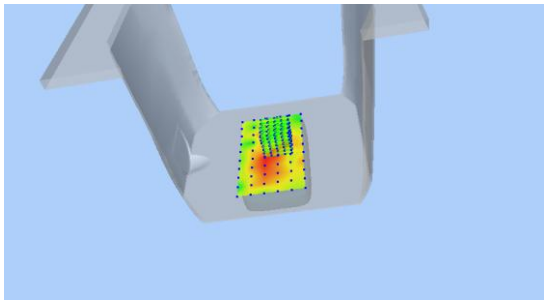
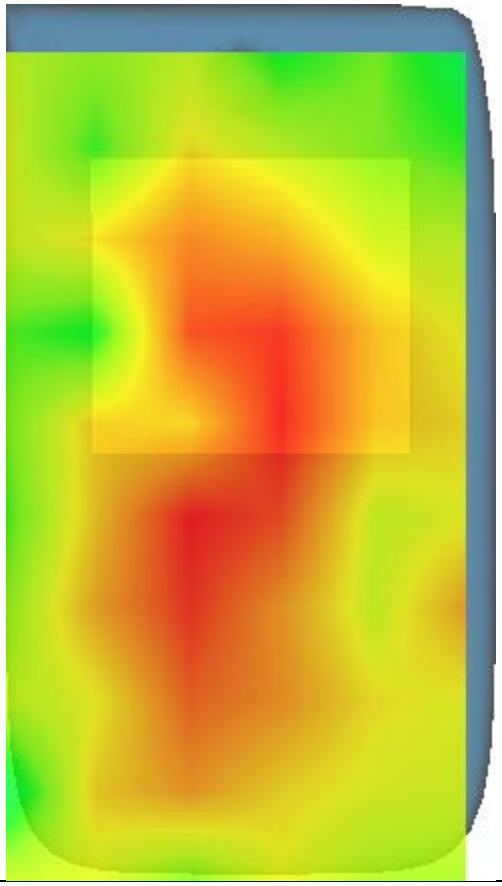
SURFACE SAR	VOLUME SAR
	

Maximum location: X=6.00, Y=5.00
SAR Peak: 1.75 W/kg

SAR 10g (W/Kg)	0.503984
SAR 1g (W/Kg)	0.696233

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.2451	0.7501	0.4964	0.5270	0.3778	0.2926	0.1623



3D screen shot	Hot spot position
	

MEASUREMENT 15

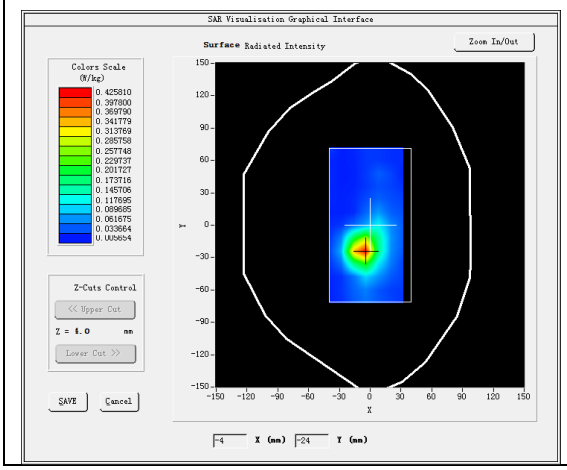
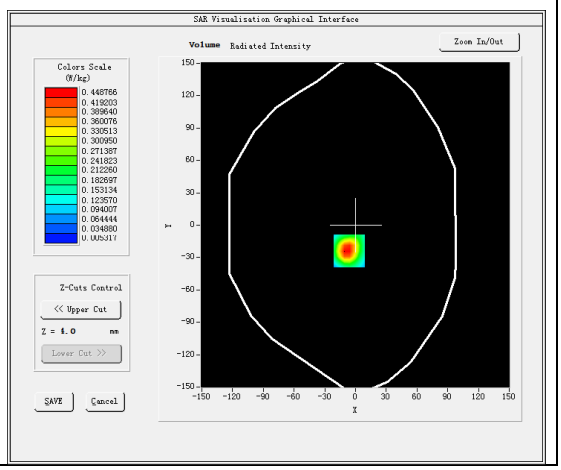
Date of measurement: 29/5/2024

A. Experimental conditions.

Area Scan	dx=12mm dy=12mm, h= 5.00 mm
ZoomScan	7x7x7,dx=5mm dy=5mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 41
Channels	Middle
Signal	LTE (Crest factor: 1.0)
ConvF	2.65

B. SAR Measurement Results

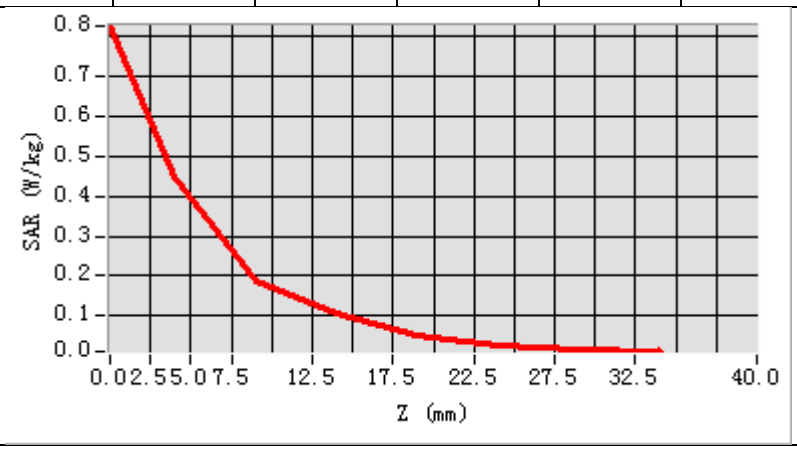
Frequency (MHz)	2595.000000
Relative permittivity (real part)	39.140884
Relative permittivity (imaginary part)	14.048088
Conductivity (S/m)	2.025266
Variation (%)	-3.800000

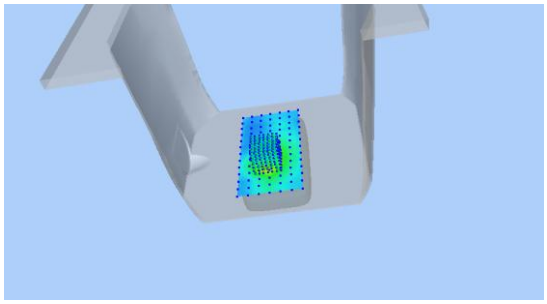
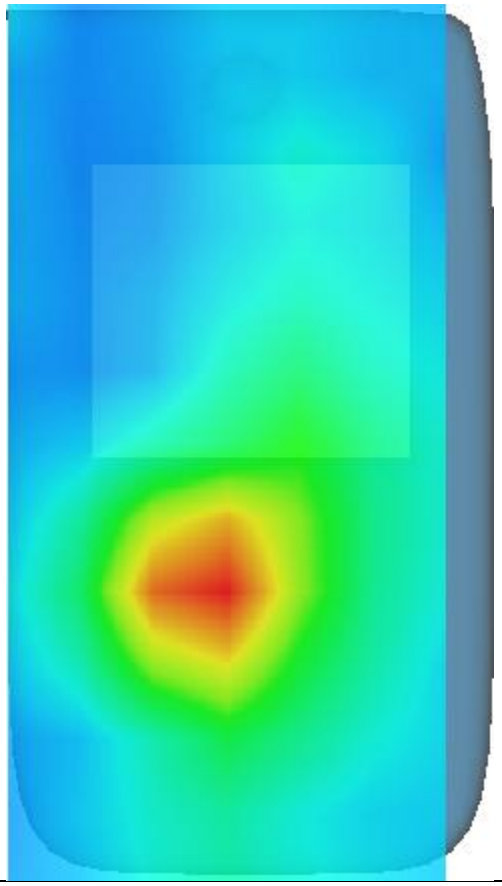
SURFACE SAR	**VOLUME SAR**
	

Maximum location: X=-6.00, Y=-24.00
SAR Peak: 0.76 W/kg

SAR 10g (W/Kg)	0.193794
SAR 1g (W/Kg)	0.427573

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	0.8275	0.4488	0.1892	0.1087	0.0502	0.0274	0.0161



3D screen shot	Hot spot position
	

14. Appendix D. Calibration Certificate

Table of contents
E Field Probe - 3423-EPGO-426
750 MHz Dipole - SN 03/15 DIP 0G750-355
835 MHz Dipole - SN 03/15 DIP 0G835-347
1800 MHz Dipole - SN 03/15 DIP 1G800-349
1900 MHz Dipole - SN 03/15 DIP 1G900-350
2450 MHz Dipole - SN 03/15 DIP 2G450-352
2600 MHz Dipole - SN 03/15 DIP 2G600-356
5000-6000 MHz Dipole - SN 13/14 WGA 33

COMOSAR E-Field Probe Calibration Report

Ref : ACR.261.11.23.BES.A

SHENZHEN NTEK TESTING TECHNOLOGY CO., LTD.

BUILDING E, FENDA SCIENCE PARK, SANWEI COMMUNITY, XIXIANG STREET,
BAO'AN DISTRICT, SHENZHEN GUANGDONG, CHINA

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: 3423-EPGO-426

Calibrated at MVG

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

Calibration date: 09/18/2023

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

Summary:

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

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.261.11.23.BES.A

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

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

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

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

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5 Calibration Results 6
5.1 Calibration in air 6
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1 DEVICE UNDER TEST

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

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

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

Figure 1 – *MVG COMOSAR Dosimetric E field Probe*

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

3 MEASUREMENT METHOD

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

3.1 SENSITIVITY

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

3.2 LINEARITY

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

3.3 ISOTROPY

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

3.4 BOUNDARY EFFECT

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

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

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

where

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

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

4 MEASUREMENT UNCERTAINTY

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

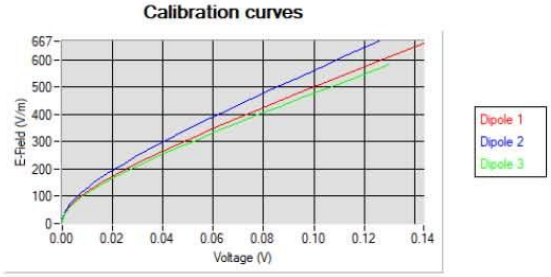
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-11% for the frequency range 150-450MHz.
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

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

5.1 CALIBRATION IN AIR

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



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

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

where
Vi=voltage readings on the 3 channels of the probe
DCPi=diode compression point given below for the 3 channels of the probe
Normi=dipole sensitivity given below for the 3 channels of the probe

Normx dipole 1 (μV/(V/m)^2)	Normy dipole 2 (μV/(V/m)^2)	Normz dipole 3 (μV/(V/m)^2)
0.78	0.62	0.85

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

5.2 CALIBRATION IN LIQUID

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

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

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

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

where
σ=the conductivity of the liquid
ρ=the volumetric density of the liquid
SAR=the SAR measured from the formula that depends on the setup used. The SAR formulas are given below

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

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

where
c=the specific heat for the liquid
dT/dt=the temperature rises over the time

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

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

where
a=the larger cross-sectional of the waveguide
b=the smaller cross-sectional of the waveguide
δ=the skin depth for the liquid in the waveguide
Pw=the power delivered to the liquid