



SAR TEST REPORT

Product Name: UniRC 7 Pro Ground Control Station

Model Name: UniRC 7 Pro

FCC ID: 2BN8IUNIRC7PRO

Issued For : Siyi Technology (Shenzhen) Co.,Ltd.

5F, Building 3, Yongqi Science Park, Xixiang Street, Baoan District, Shenzhen, Guangdong, China, 518102.

Issued By : Shenzhen LGT Test Service Co., Ltd.

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Report Number: LGT25E001HA01

Sample Received Date: May. 06, 2025

Date of Test: May. 06, 2025~ May. 10, 2025

Date of Issue: May. 22, 2025

Max. SAR (1g): Body: 0.989 W/kg

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Table of Contents

1. General Information	5
1.1 EUT Description	5
1.2 Test Environment	7
1.3 Test Factory	7
2. Test Standards and Limits	8
3. SAR Measurement System	9
3.1 Definition of Specific Absorption Rate (SAR)	9
3.2 SAR System	9
4. Tissue Simulating Liquids	12
4.1 Simulating Liquids Parameter Check	12
5. SAR System Validation	14
5.1 Validation System	14
5.2 Validation Result	15
6. SAR Evaluation Procedures	16
7. EUT Antenna Location Sketch	17
7.1 SAR test exclusion consider table	18
8. EUT Test Position	22
9. Uncertainty	23
9.1 Measurement Uncertainty	23
9.2 System validation Uncertainty	24
10. Conducted Power Measurement	25
10.1 Test Result	25
10.2 Tune up Power	29
11. EUT and Test Setup Photo	31
11.1 EUT Photos	31
11.2 Setup Photos	31
12. SAR Result Summary	32
12.1 Body SAR	32
12.2 Repeated SAR	34
12.3 Repeated SAR measurement	34
12.4 Simultaneous Multi-band Transmission Evaluation	35
13. Equipment List	37
Appendix A. System Validation Plots	38
Appendix B. SAR Test Plots	48



Revision History

Rev.	Issue Date	Contents
00	May. 22, 2025	Initial Issue



TEST REPORT CERTIFICATION

Applicant Siyi Technology (Shenzhen) Co.,Ltd.
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Manufacture Siyi Technology (Shenzhen) Co.,Ltd.
Address 5F, Building 3, Yongqi Science Park, Xixiang Street, Baoan District, Shenzhen, Guangdong, China,518102.
Product Name UniRC 7 Pro Ground Control Station
Trademark N/A
Model Name UniRC 7 Pro
Sample number LGT2505002-1

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
ANSI/IEEE Std. C95.1-2019 FCC 47 CFR Part 2 (2.1093) IEEE 1528: 2013	PASS

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Approved by:

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1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

1.1 EUT Description

Product Name	UniRC 7 Pro Ground Control Station	
Trademark	N/A	
Model Name	UniRC 7 Pro	
Series Model	N/A	
Model Difference	N/A	
Device Category	Portable	
Product stage	Production unit	
RF Exposure Environment	General Population / Uncontrolled	
Hardware Version	V5.0	
Software Version	V1.0.2	
Frequency Range	2.4G Custom:2406.5 MHz ~2476.5 MHz 5.8G Custom:5734.5 MHz ~5839.5 MHz WLAN 802.11b/g/n20: 2412 MHz ~ 2462 MHz WLAN 802.11n40: 2422 MHz ~ 2452 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5150 ~ 5250 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5250 ~ 5350 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5470 ~ 5725 MHz WLAN 802.11a/n20/n40/ac20/ac40/ac80: 5725 ~ 5850 MHz Bluetooth: 2402 ~ 2480 MHz	
Max. Reported SAR(1g): (Limit:1.6W/kg) Test distance: Body:0mm	Mode	Body (W/kg)
	2.4G Custom ANT 1	0.182
	2.4G Custom ANT 2	0.218
	2.4G WLAN	0.092
	5.2G WLAN	0.298
	5.3G WLAN	0.383
	5.6G WLAN	0.399
	5.8G WLAN	0.503
	5.8G Custom ANT 1	0.989
	5.8G Custom ANT 2	0.954
	BT Module 1 ^{Note}	0.059
	BT Module 2 ^{Note}	0.105
	Limit	1.6W/kg
Battery	Rated Voltage:7.4V Capacity:13400mAh	
Operating Mode:	2.4G Custom: QPSK 2.4G WLAN: 802.11b(DSSS): CCK, DQPSK, DBPSK 802.11g(OFDM): BPSK, QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK, QPSK,16-QAM,64-QAM	



	5G WLAN: 802.11a(OFDM): BPSK, QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK, QPSK,16-QAM,64-QAM 802.11ac (OFDM): BPSK, QPSK,16-QAM,64-QAM,256-QAM 5.8G Custom: QPSK Bluetooth: GFSK + $\pi/4$ DQPSK+8DPSK BLE: GFSK
Antenna Specification	2.4G Custom: External Antenna Bluetooth/WLAN: Internal Antenna 5.8G Custom: Internal Antenna
Operating Mode	Maximum continuous output
Hotspot Mode	Not Support
DTM Mode	Not Support
Note 1: The BT value was Estimated.	



1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (°C)	18-25
Humidity (%RH)	30-70

1.3 Test Factory

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate	FCC Registration No.: 746540
	A2LA Certificate No.: 6727.01
	IC Registration No.: CN0136



2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-2019	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
8	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

(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.

Population/Uncontrolled Environments:

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

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).

NOTE
GENERAL POPULATION/UNCONTROLLED EXPOSURE
PARTIAL BODY LIMIT
1.6 W/kg



3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dv} \right)$$

SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

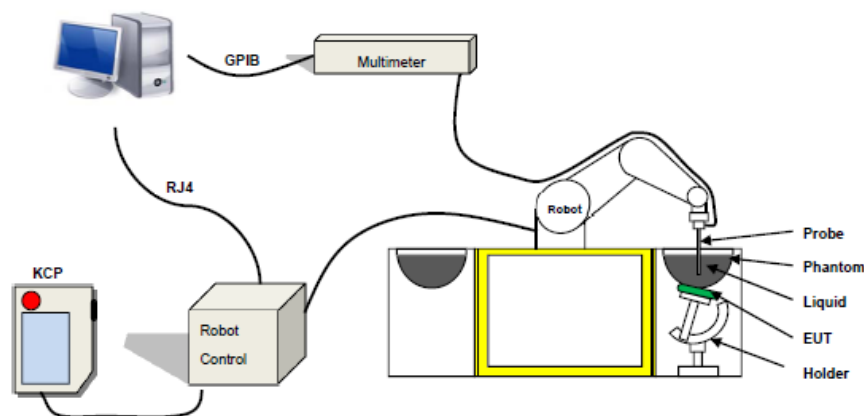
$$SAR = \frac{\sigma E^2}{\rho}$$

Where: σ is the conductivity of the tissue;

ρ is the mass density of the tissue and E is the RMS electrical field strength.

3.2 SAR System

MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 1g mass.

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 04/22 EPG0364 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: <0.10 dB
- Spherical Isotropy: <0.10 dB
- Calibration range: 600 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°



Figure 1-MVG COMOSAR Dosimetric E field Probe

3.2.2 Phantom

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

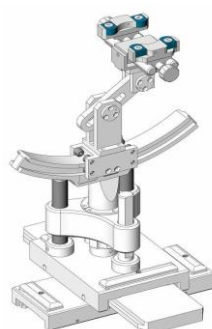


Figure-SN 06/22 SAM 148



Figure-SN 06/22 ELLI 51

3.2.3 Device Holder



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



4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values

The uncertainty due to the liquid conductivity and permittivity arises from two different sources. The first source of error is the deviation of the liquid conductivity from its target value (max _ 5 %) and the second source of error arises from the measurement procedures used to assess conductivity. The uncertainty shall be assessed using a rectangular probability For 1 g averaging, the maximum weighting coefficient for SAR is 0,5.

IEEE SCC-34/SC-2 RECOMMENDED TISSUE DIELECTRIC PARAMETERS

The head and body tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 have been incorporated in the following table.

Frequency	ϵ_r	σ 10g S/m
300	45.3	0.87
450	43.5	0.87
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 to 2000	40.0	1.40
2100	39.8	1.49
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40
3500	37.9	2.91
4000	37.4	3.43
4500	36.8	3.94
5000	36.2	4.45
5200	36.0	4.66
5400	35.8	4.86
5600	35.5	5.07
5800	35.3	5.27



LIQUID MEASUREMENT RESULTS

Date	Ambient		Simulating Liquid		Parameters	Target	Measured	Deviation %	Limited %
	Temp. [°C]	Humidity %	Frequency (MHz)	Temp. [°C]					
2025-05-07	23.2	60	2450	22.9	Permittivity	39.20	39.21	0.03	±5
					Conductivity	1.80	1.84	2.22	±5
2025-05-10	22.2	46	5200	22	Permittivity	36.00	37.10	3.06	±5
					Conductivity	4.66	4.61	-1.07	±5
2025-05-10	22.3	46	5400	22	Permittivity	35.80	36.70	2.51	±5
					Conductivity	4.86	4.87	0.21	±5
2025-05-10	22.3	46	5600	22	Permittivity	35.55	36.44	2.50	±5
					Conductivity	5.07	5.09	0.49	±5
2025-05-09	23.2	56	5800	22.9	Permittivity	35.30	36.31	2.86	±5
					Conductivity	5.27	5.21	-1.14	±5

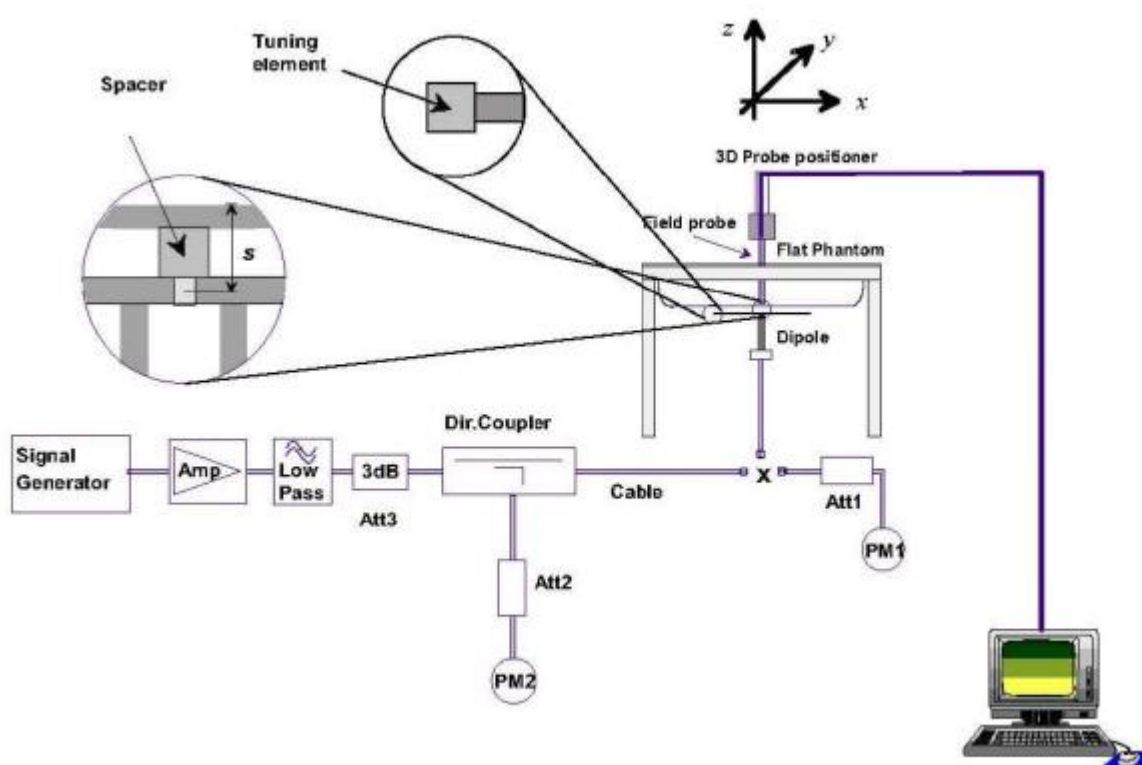


5. SAR System Validation

5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.





5.2 Validation Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of $\pm 10\%$.

Date	Freq.	Power	Tested Value	Normalized SAR	Target SAR	Tolerance	Limit
	(MHz)	(mW)	(W/Kg)	(W/kg)	1g(W/kg)	(%)	(%)
2025-05-07	2450	100	5.448	54.48	54.21	0.50	10
2025-05-10	5200	100	8.153	81.53	80.96	0.70	10
2025-05-10	5400	100	8.654	86.54	84.63	2.26	10
2025-05-10	5600	100	8.210	82.10	80.97	1.40	10
2025-05-09	5800	100	8.262	82.62	81.68	1.15	10

Note:

1. The tolerance limit of System validation $\pm 10\%$.
2. The dipole input power (forward power) was 100 mW.
3. The results are normalized to 1 W input power.



6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps:

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 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.

➤ Area Scan & Zoom Scan

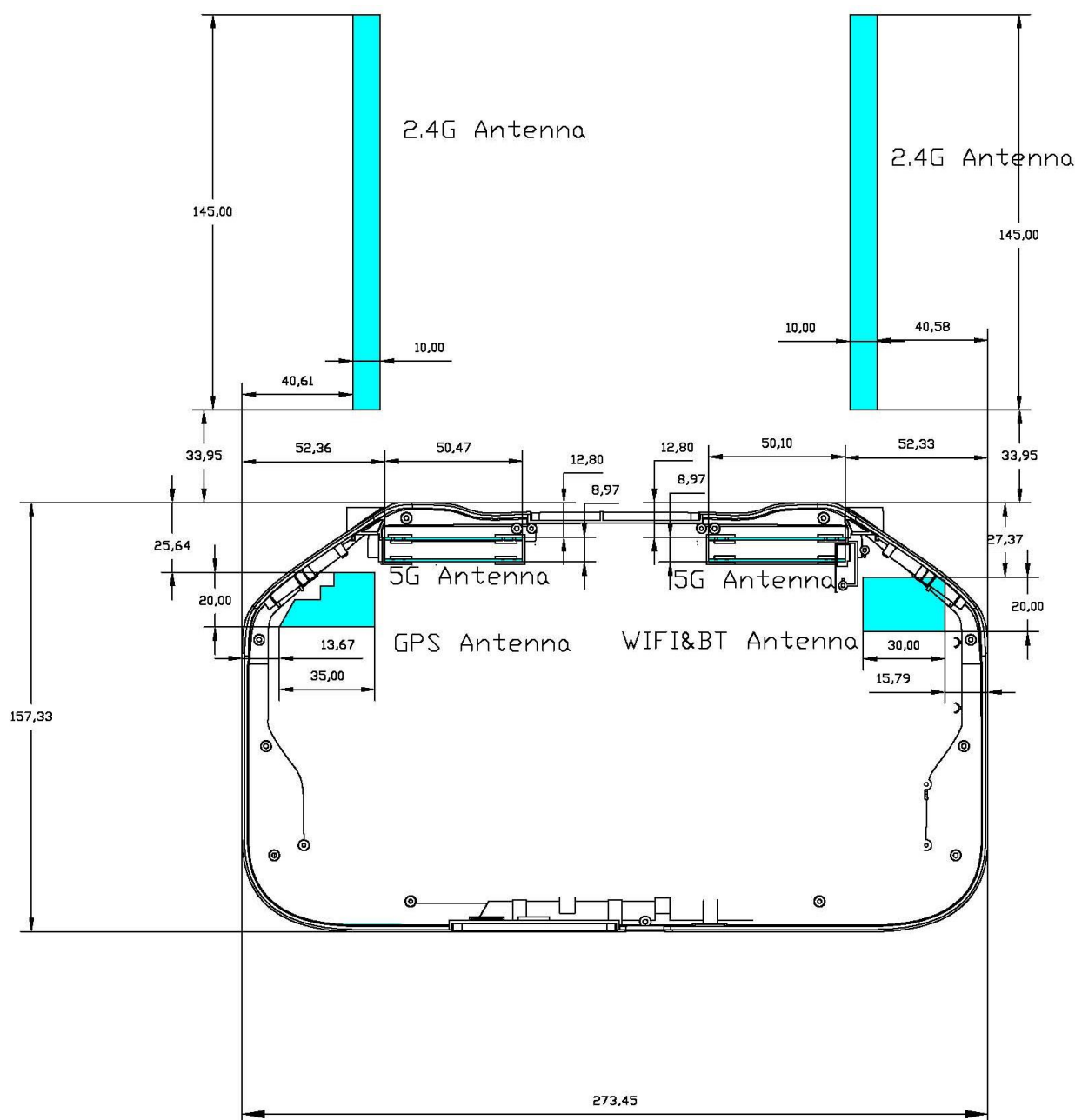
First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01 quoted below.

When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.



7. EUT Antenna Location Sketch

It is a UniRC 7 Pro Ground Control Station, support 2.4G/5.8G/WLAN/BT mode.



(Front view)

ANT	Transmitting antenna located(mm)					
	Back Side	Front Side	Left Side	Right Side	Top Side	Bottom Side
WLAN/BT	≤0.5	≤0.5	221	16	27	110
2.4G Custom 1	≤0.5	≤0.5	41	223	5	191
2.4G Custom 2	≤0.5	≤0.5	223	41	5	191
5G Custom 1	≤0.5	≤0.5	52	171	13	136
5G Custom 2	≤0.5	≤0.5	171	52	13	136

Note 1: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



7.1 SAR test exclusion consider table

The WWAN/WLAN/BT SAR evaluation of Maximum power (dBm) summing tolerance.

Exposure Position	Wireless Interface	BT Module 1	BT Module 2	2.4G Custom 1	2.4G Custom 2
	Calculated Frequency (MHz)	2480	2441	2446.5	2446.5
	Maximum Turn-up power (dBm)	1.5	4	25	25
	Maximum rated power(mW)	1.41	2.51	316.23	316.23
	Separation distance (mm)	5	5	5	5
Back Side	exclusion threshold(mW)	9.53	9.60	9.59	9.59
	Testing required?	NO	NO	YES	YES
	Separation distance (mm)	5	5	5	5
Front Side	exclusion threshold(mW)	9.53	9.60	9.59	9.59
	Testing required?	NO	NO	YES	YES
	Separation distance (mm)	221	221	41	223
Left Edge	exclusion threshold(mW)	1805.25	1806.01	5.90	1825.90
	Testing required?	NO	NO	YES	NO
	Separation distance (mm)	16	16	223	41
Right Edge	exclusion threshold(mW)	30.48	30.72	427.71	78.64
	Testing required?	NO	NO	NO	YES
	Separation distance (mm)	27	27	5	5
Top Edge	exclusion threshold(mW)	51.44	51.84	9.59	9.59
	Testing required?	NO	NO	YES	YES
	Separation distance (mm)	110	110	191	191
Bottom Edge	exclusion threshold(mW)	695.25	696.01	1505.90	1505.90
	Testing required?	NO	NO	NO	NO
	Separation distance (mm)	110	110	191	191



Exposure Position	Wireless Interface	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN
	Calculated Frequency (MHz)	2412	5180	5260	5700
	Maximum Turn-up power (dBm)	16.5	15.5	15	16
	Maximum rated power(mW)	44.67	35.48	31.62	39.81
Back Side	Separation distance (mm)	5	5	5	5
	exclusion threshold(mW)	9.66	6.59	6.54	6.28
	Testing required?	YES	YES	YES	YES
Front Side	Separation distance (mm)	5	5	5	5
	exclusion threshold(mW)	9.66	6.59	6.54	6.28
	Testing required?	YES	YES	YES	YES
Left Edge	Separation distance (mm)	221	221	221	221
	exclusion threshold(mW)	1806.58	1775.91	1775.40	1772.83
	Testing required?	NO	NO	NO	NO
Right Edge	Separation distance (mm)	16	16	16	16
	exclusion threshold(mW)	30.91	21.09	20.93	20.10
	Testing required?	YES	YES	YES	YES
Top Edge	Separation distance (mm)	27	27	27	27
	exclusion threshold(mW)	52.16	35.59	35.32	33.93
	Testing required?	NO	NO	NO	YES
Bottom Edge	Separation distance (mm)	110	110	110	110
	exclusion threshold(mW)	696.58	665.91	665.40	662.83
	Testing required?	NO	NO	NO	NO



Exposure Position	Wireless Interface	5.8G Custom 1	5.8G Custom 2	5.8G WLAN
	Calculated Frequency (MHz)	5734.5	5734.5	5785
	Maximum Turn-up power (dBm)	19.5	19.5	16
	Maximum rated power(mW)	89.13	89.13	39.81
Back Side	Separation distance (mm)	5	5	5
	exclusion threshold(mW)	6.26	6.26	6.24
	Testing required?	YES	YES	YES
Front Side	Separation distance (mm)	5	5	5
	exclusion threshold(mW)	6.26	6.26	6.24
	Testing required?	YES	YES	YES
Left Edge	Separation distance (mm)	52	171	221
	exclusion threshold(mW)	82.64	1272.64	1772.36
	Testing required?	YES	NO	NO
Right Edge	Separation distance (mm)	171	52	16
	exclusion threshold(mW)	214.22	65.14	19.96
	Testing required?	NO	YES	YES
Top Edge	Separation distance (mm)	13	13	27
	exclusion threshold(mW)	16.29	16.29	33.68
	Testing required?	YES	YES	YES
Bottom Edge	Separation distance (mm)	136	136	110
	exclusion threshold(mW)	922.64	922.64	662.36
	Testing required?	NO	NO	NO

Note:

1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. per KDB 447498 D01, standalone SAR test exclusion threshold is applied; if the distance of the antenna to the user is <25mm, 25mm is user to determine SAR exclusion threshold
4. per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distance $\leq 50\text{mm}$ are determined by:

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



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

For <50mm distance, we just calculate mW of the exclusion threshold value(3.0)to do compare

5. per KDB 447498 D01, at 100 MHz to 6GHz and for test separation distances >50mm, the SAR test exclusion threshold is determined according to the following

a)[threshold at 50mm in step 1]+(test separation distance -50mm)*(f (MHz)/150)]mW, at 100 MHz to 1500 MHz

b) [threshold at 50mm in step1]+(test separation distance -50mm) *10]mW at > 1500MHz and ≤ 6GHz

6. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8.for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.

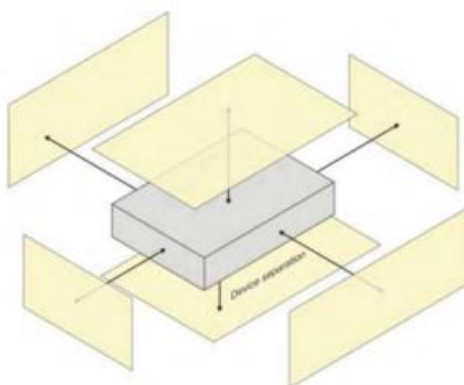


8. EUT Test Position

This EUT was tested in Front side, back side, left side, right side, top side and bottom side.

8.1 Body-worn Position Conditions:

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.





9. Uncertainty

9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Uncertainty Component	Tol (+/- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+/-%)	10g Ui (+/-%)	vi
Measurement System								
Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
Axial Isotropy	3.5	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.43	1.43	∞
Hemispherical Isotropy	5.9	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	2.41	2.41	∞
Boundary effect	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	2.71	2.71	∞
System detection limits	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	$\sqrt{3}$	1	1	0.00	0.00	∞
Integration Time	1.4	R	$\sqrt{3}$	1	1	1.81	1.81	∞
RF ambient conditions-Noise	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation, Interpolation and Integration Algorithms for Max, SAR	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.60	2.60	11
Device holder uncertainty	3	N	1	1	1	3.00	3.00	7
Output Power Variation - SAR Drift Measurement	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	2	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and tissue parameters								
Phantom uncertainty (shape and thickness uncertainty)	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity - Measurement Uncertainty)	4	N	1	0.78	0.71	3.12	2.84	5
Liquid Permittivity - Measurement Uncertainty	5	N	1	0.23	0.26	1.15	1.30	5
Liquid Conductivity (Temperature Uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid Permittivity (Temperature Uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty		RSS				10.47	10.34	
Expanded Uncertainty (95% Confidence interval)		K				20.95	20.69	



9.2 System validation Uncertainty

Uncertainty Component	Tol (+ - %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.8	N	1	1	1	5.8	5.8	∞
Axial Isotropy	3.5	R	$\sqrt{3}$	1	1	2.02	2.02	∞
Hemispherical Isotropy	5.9	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	4.7	R	$\sqrt{3}$	1	1	0.71	0.71	∞
System detection limits	1	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	0	N	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	1.4	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions- reflections	3	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Extrapolation, Interpolation and Integration Algorithms for Max, SAR	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Dipole								
Deviation of Experimental Source from Numerical Source	5	N	1	1	1	5.00	5.00	∞
Input Power and SAR Drift Measurement	0.5	R	$\sqrt{3}$	1	1	0.29	0.29	∞
Dipole Axis to Liquid Distance	2	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and Tissue Parameters								
Phantom uncertainty (shape and thickness uncertainty)	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity - Measurement Uncertainty)	4	N	1	0.78	0.71	3.12	2.84	5
Liquid Permittivity - Measurement Uncertainty	5	N	1	0.23	0.26	1.15	1.30	5
Liquid Conductivity (Temperature Uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid Permittivity (Temperature Uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty		RSS				10.16	10.03	
Expanded Uncertainty (95% Confidence interval)		K				20.32	20.06	



10. Conducted Power Measurement

10.1 Test Result

2.4G WLAN

2.4GWIFI				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
802.11b	1	2412	16.22	41.88
	7	2437	16	39.81
	11	2462	16.17	41.40
802.11g	1	2412	15.29	33.81
	7	2437	15.08	32.21
	11	2462	15.21	33.19
802.11n-HT20	1	2412	15.22	33.27
	7	2437	14.98	31.48
	11	2462	15.11	32.43

Bluetooth Module 1

BT Module 1				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	-1.9	0.65
	39	2441	-1.95	0.64
	78	2480	-0.69	0.85
$\pi/4$ -QPSK(2Mbps)	0	2402	0.05	1.01
	39	2441	0.05	1.01
	78	2480	1.12	1.29
8DPSK(3Mbps)	0	2402	0.24	1.06
	39	2441	0.34	1.08
	78	2480	1.19	1.32

Bluetooth Module 2

BT Module 2				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	2.73	1.87
	39	2441	2.84	1.92
	78	2480	2.68	1.85
$\pi/4$ -QPSK(2Mbps)	0	2402	3.04	2.01
	39	2441	3.18	2.08
	78	2480	3.02	2.00
8DPSK(3Mbps)	0	2402	3.7	2.34
	39	2441	3.81	2.40
	78	2480	3.64	2.31



BLE

BLE				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	0.17	1.04
	19	2440	0.28	1.07
	39	2480	0.83	1.21
GFSK(2Mbps)	0	2402	0.21	1.05
	19	2440	0.39	1.09
	39	2480	0.84	1.21

WLAN 5.2G Band

5.2G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	36	5180	15.26	33.57
	40	5200	14.98	31.48
	48	5240	14.89	30.83
802.11n-HT20	36	5180	14.72	29.65
	40	5200	14.86	30.62
	48	5240	14.86	30.62
802.11n-HT40	38	5190	15.02	31.77
	46	5230	14.56	28.58
802.11ac-VHT20	36	5180	14.14	25.94
	40	5200	14	25.12
	48	5240	13.89	24.49
802.11ac-VHT40	38	5190	13.96	24.89
	46	5230	13.6	22.91
802.11ac-VHT80	42	5210	13.55	22.65

WLAN 5.3G Band

5.3G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	52	5260	14.72	29.65
	56	5280	14.56	28.58
	64	5320	14.57	28.64
802.11n-HT20	52	5260	14.68	29.38
	56	5280	14.47	27.99
	64	5320	14.43	27.73
802.11n-HT40	54	5270	14.2	26.30
	62	5310	14.25	26.61
802.11ac-VHT20	52	5260	13.85	24.27
	56	5280	13.66	23.23
	64	5320	13.5	22.39
802.11ac-VHT40	54	5270	13.23	21.04
	62	5310	13.31	21.43
802.11ac-VHT80	58	5290	13.26	21.18



WLAN 5.6G Band

5.6G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	100	5500	14.4	27.54
	120	5600	14.88	30.76
	140	5700	15.76	37.67
802.11n-HT20	100	5500	14.19	26.24
	120	5600	14.81	30.27
	140	5700	15.66	36.81
802.11n-HT40	102	5510	13.48	22.28
	118	5590	14.77	29.99
	134	5670	14.97	31.41
802.11ac-VHT20	100	5500	13.33	21.53
	120	5600	13.95	24.83
	140	5700	14.62	28.97
802.11ac-VHT40	102	5510	13.16	20.70
	118	5590	14	25.12
	134	5670	13.93	24.72
802.11ac-VHT80	106	5530	13.36	21.68
	122	5610	13.24	21.09

WLAN 5.8G Band

5.8G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	149	5745	15.58	36.14
	157	5785	15.58	36.14
	165	5825	15.04	31.92
802.11n-HT20	149	5745	15.34	34.20
	157	5785	15.36	34.36
	165	5825	14.93	31.12
802.11n-HT40	151	5755	15.13	32.58
	159	5795	15.2	33.11
802.11ac-VHT20	149	5745	14.4	27.54
	157	5785	14.45	27.86
	165	5825	14.06	25.47
802.11ac-VHT40	151	5755	14.19	26.24
	159	5795	14.27	26.73
802.11ac-VHT80	155	5775	14.28	26.79



2.4G Custom Band

2.4G Custom				
Mode	Antenna	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
QPSK	ANT 1	2406.5	24.34	271.64
		2446.5	24.52	283.14
		2476.5	24.23	264.85
	ANT 2	2406.5	23.96	248.89
		2446.5	24.6	288.40
		2476.5	24.45	278.61

5.8G Custom Band

5.8G Custom				
Mode	Antenna	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
QPSK	ANT 1	5734.5	19.07	80.72
		5794.5	19.06	80.54
		5839.5	19.01	79.62
	ANT 2	5734.5	19.12	81.66
		5794.5	19.06	80.54
		5839.5	19.12	81.66



10.2 Tune up Power

Mode	BT Module 2
GFSK	-1±1dBm
$\pi/4$ -DQPSK	0.5±1dBm
8DPSK	0.5±1dBm

Mode	BT Module 2
GFSK	2±1dBm
$\pi/4$ -DQPSK	2.5±1dBm
8DPSK	3±1dBm

Mode	BLE
GFSK(1Mbps)	0.5±1dBm
GFSK(2Mbps)	0.5±1dBm

Mode	2.4G WLAN
802.11b	15.5±1dBm
802.11g	14.5±1dBm
802.11n(HT20)	14.5±1dBm

2.4G Custom				
Mode	ANT	LOW	MID	HIGH
QPSK	ANT1	23.5±1dBm	24±1dBm	23.5±1dBm
	ANT2	23±1dBm	24±1dBm	23.5±1dBm

Mode	5.2G WLAN
802.11a	14.5±1dBm
802.11 n-HT20	14±1dBm
802.11 n-HT40	13.5±1dBm
802.11 ac-VHT20	13.5±1dBm
802.11 ac-VHT40	13±1dBm
802.11 ac-VHT80	13±1dBm

Mode	5.3G WLAN
802.11a	14±1dBm
802.11 n-HT20	14±1dBm
802.11 n-HT40	13.5±1dBm
802.11 ac-VHT20	13±1dBm
802.11 ac-VHT40	12.5±1dBm
802.11 ac-VHT80	12.5±1dBm



Mode	5.6G WLAN
802.11a	15±1dBm
802.11 n-HT20	15±1dBm
802.11 n-HT40	14±1dBm
802.11 ac-VHT20	14±1dBm
802.11 ac-VHT40	13±1dBm
802.11 ac-VHT80	12.5±1dBm

Mode	5.8G WLAN
802.11a	15±1dBm
802.11 n-HT20	14.5±1dBm
802.11 n-HT40	14.5±1dBm
802.11 ac-VHT20	13.5±1dBm
802.11 ac-VHT40	13.5±1dBm
802.11 ac-VHT80	13.5±1dBm

5.8G Custom				
Mode	ANT	LOW	MID	HIGH
QPSK	ANT1	18.5±1dBm	18.5±1dBm	18.5±1dBm
	ANT2	18.5±1dBm	18.5±1dBm	18.5±1dBm



11. EUT and Test Setup Photo

11.1 EUT Photos

Please refer to the appendix EUT photos.

11.2 Setup Photos

Please refer to the appendix SAR test setup photos.



12. SAR Result Summary

12.1 Body SAR

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift (%)	Max. Turn-up Power (dBm)	Meas. Output Power (dBm)	Scaling Factor	Scaled SAR (W/Kg)	Meas. No.
2.4G Custom 1	QPSK	Front Side Antenna Horizontal	2446.5	0.073	-0.99	25.00	24.52	1.117	0.082	/
		Front Side Antenna Vertical	2446.5	0.069	0.60	25.00	24.52	1.117	0.077	/
		Back Side Antenna Horizontal	2446.5	0.072	2.36	25.00	24.52	1.117	0.080	/
		Back Side Antenna Vertical	2446.5	0.044	-2.09	25.00	24.52	1.117	0.049	/
		Left Side Antenna Horizontal	2446.5	0.114	0.14	25.00	24.52	1.117	0.127	/
		Left Side Antenna Vertical	2446.5	0.033	3.50	25.00	24.52	1.117	0.037	/
		Top Side Antenna Horizontal	2446.5	0.163	2.91	25.00	24.52	1.117	0.182	1
		Top Side Antenna Vertical	2446.5	0.030	1.84	25.00	24.52	1.117	0.034	/
2.4G Custom2	QPSK	Front Side Antenna Horizontal	2446.5	0.086	3.12	25.00	24.60	1.096	0.094	/
		Front Side Antenna Vertical	2446.5	0.074	2.30	25.00	24.60	1.096	0.081	/
		Back Side Antenna Horizontal	2446.5	0.065	-1.10	25.00	24.60	1.096	0.071	/
		Back Side Antenna Vertical	2446.5	0.088	1.25	25.00	24.60	1.096	0.096	/
		Right Side Antenna Horizontal	2446.5	0.183	2.30	25.00	24.60	1.096	0.201	/
		Right Side Antenna Vertical	2446.5	0.101	3.04	25.00	24.60	1.096	0.111	/
		Top Side Antenna Horizontal	2446.5	0.177	-0.56	25.00	24.60	1.096	0.194	/
		Top Side Antenna Vertical	2446.5	0.199	1.64	25.00	24.60	1.096	0.218	2
2.4GHz WLAN	802.11b	Front Side	2412	0.063	3.39	16.50	16.22	1.067	0.067	/
		Back Side	2412	0.057	-1.20	16.50	16.22	1.067	0.061	/
		Left Side	2412	0.066	3.47	16.50	16.22	1.067	0.070	/
		Right Side	2412	0.086	-2.05	16.50	16.22	1.067	0.092	3
		Top Side	2412	0.078	-3.08	16.50	16.22	1.067	0.083	/
5.2GHz WLAN	802.11a	Front Side	5180	0.138	-3.58	15.50	15.26	1.057	0.146	/
		Back Side	5180	0.090	-1.04	15.50	15.26	1.057	0.095	/
		Left Side	5180	0.158	-3.24	15.50	15.26	1.057	0.167	/
		Right Side	5180	0.199	-1.19	15.50	15.26	1.057	0.210	/
		Top Side	5180	0.282	3.95	15.50	15.26	1.057	0.298	4
5.3GHz WLAN	802.11a	Front Side	5260	0.273	-1.52	15.00	14.72	1.067	0.291	/
		Back Side	5260	0.206	-2.18	15.00	14.72	1.067	0.220	/
		Left Side	5260	0.272	-0.69	15.00	14.72	1.067	0.290	/
		Right Side	5260	0.327	1.07	15.00	14.72	1.067	0.349	/
		Top Side	5260	0.359	-0.61	15.00	14.72	1.067	0.383	5
5.6GHz WLAN	802.11a	Front Side	5700	0.284	-1.90	16.00	15.76	1.057	0.300	/
		Back Side	5700	0.220	3.54	16.00	15.76	1.057	0.232	/
		Left Side	5700	0.186	-2.49	16.00	15.76	1.057	0.197	/
		Right Side	5700	0.344	1.86	16.00	15.76	1.057	0.364	/
		Top Side	5700	0.378	0.08	16.00	15.76	1.057	0.399	6
5.8GHz WLAN	802.11a	Front Side	5785	0.347	-0.13	16.00	15.58	1.102	0.382	/
		Back Side	5785	0.265	-1.85	16.00	15.58	1.102	0.292	/



		Left Side	5785	0.225	-0.81	16.00	15.58	1.102	0.248	/
		Right Side	5785	0.412	3.01	16.00	15.58	1.102	0.454	/
		Top Side	5785	0.457	2.56	16.00	15.58	1.102	0.503	7
5.8G Custom 1	QPSK	Front Side	5734.5	0.674	-3.45	19.50	19.07	1.104	0.744	/
		Back Side	5734.5	0.512	-1.32	19.50	19.07	1.104	0.565	/
		Left Side	5734.5	0.674	-0.44	19.50	19.07	1.104	0.744	/
		Top Side	5734.5	0.896	1.47	19.50	19.07	1.104	0.989	8
		Top Side	5794.5	0.825	-0.14	19.50	19.06	1.107	0.913	/
		Top Side	5839.5	0.798	3.16	19.50	19.01	1.119	0.893	/
5.8G Custom 2	QPSK	Front Side	5734.5	0.660	-2.42	19.50	19.12	1.091	0.720	/
		Back Side	5734.5	0.502	1.31	19.50	19.12	1.091	0.548	/
		Right Side	5734.5	0.723	-3.26	19.50	19.12	1.091	0.789	/
		Top Side	5734.5	0.874	-3.01	19.50	19.12	1.091	0.954	9
		Top Side	5794.5	0.803	3.65	19.50	19.06	1.107	0.889	/
		Top Side	5839.5	0.861	-1.46	19.50	19.12	1.091	0.940	/

Note:

1. The test separation of all above table is 0mm.
2. The manufacturer declares that Antenna 1 and Antenna 2 can work independently at the same time and do not support MIMO.
3. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. Scaled SAR(W/kg) = Measured SAR(W/kg) *Tune-up Scaling Factor



12.2 Repeated SAR

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift (%)	Max. Turn-up Power (dBm)	Meas. Output Power (dBm)	Scaling Factor	Scaled SAR(W/Kg)
5.8G Custom 1	QPSK	Top Side	5734.5	0.886	-1.26	19.50	19.07	1.104	0.979
		Top Side	5794.5	0.798	3.18	19.50	19.06	1.107	0.883
		Top Side	5839.5	0.771	-1.11	19.50	19.01	1.119	0.864
5.8G Custom 2	QPSK	Top Side	5734.5	0.857	-2.07	19.50	19.12	1.091	0.935
		Top Side	5794.5	0.800	1.01	19.50	19.06	1.107	0.886
		Top Side	5839.5	0.830	-0.41	19.50	19.12	1.091	0.906

12.3 Repeated SAR measurement

Band	Mode	Test Position	Ch.	Original Measured SAR 1g(W/kg)	1 st Repeated SAR 1g	Ratio
5.8G Custom 1	QPSK	Top Side	5735	0.896	0.886	1.011
		Top Side	5795	0.825	0.798	1.034
		Top Side	5840	0.798	0.771	1.035
5.8G Custom 2	QPSK	Top Side	5735	0.874	0.857	1.020
		Top Side	5795	0.803	0.800	1.003
		Top Side	5840	0.861	0.830	1.037

Note:

1. Per KDB 865664 D01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/Kg.
2. Per KDB 865664 D01,if the ratio of largest to smallest SAR for the original and first repeated measurement is ≤ 1.2 and the measured SAR < 1.45 W/Kg, only one repeated measurement is required.
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.
4. The ratio is the difference in percentage between original and repeated measured SAR.



12.4 Simultaneous Multi-band Transmission Evaluation

Application Simultaneous Transmission information:

Position	Simultaneous State
Body	1. 2.4G+2.4G/5G WLAN
	2. 2.4G+BT module 1
	3. 2.4G+BT module 2
	4. 5.8G+2.4G/5G WLAN
	5. 5.8G+BT module 1
	6. 5.8G+BT module 2

NOTE:

1. Bluetooth and WLAN can't simultaneous transmission at the same time.
2. The 2.4GHz WLAN and 5GHz WLAN can't simultaneous transmission at the same time.
3. The 2.4G and 5.8G can't simultaneous transmission at the same time.
4. BT module 1 and module 2 can't simultaneous transmission at the same time.
5. The manufacturer declares that 2.4G, 5.8G Antenna 1 and Antenna 2 can work independently at the same time and do not support MIMO.
6. For simultaneous transmission at head and body exposure position, 2 transmitters simultaneous transmission was the worst state.
7. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
8. KDB 447498 / 4.3.2 (2) 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:
 - a) $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f} \text{ (GHz)} / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$;
Where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - b) 0.4 W/Kg for 1-g SAR and 1.0 W/Kg for 10-g SAR, when the separation distance is $>50 \text{ mm}$.

Estimated SAR		Maximum Turn-up Power		Antenna to user(mm)	Frequency(GHz)	Stand Alone SAR(1g) [W/kg]
		dBm	mW			
BT Module 1	Body	1.5	1.413	5	2.480	0.059
BT Module 2	Body	4	2.512	5	2.441	0.105



Simultaneous Mode	Position	Mode	Max. 1-g SAR	1-g Sum SAR
			(W/kg)	(W/kg)
2.4G + 2.4GHz WLAN	Body	2.4G Custom	0.218	0.310
		2.4G WLAN	0.092	
2.4G + BT Module 1	Body	2.4G Custom	0.218	0.277
		BT Module 1	0.059	
2.4G + BT Module 2	Body	2.4G Custom	0.218	0.323
		BT Module 2	0.105	
2.4G + 5GHz WLAN	Body	2.4G Custom	0.218	0.721
		5G WLAN	0.503	
5.8G + 2.4GHz WLAN	Body	5.8G Custom	0.989	1.081
		2.4G WLAN	0.092	
5.8G + BT Module 1	Body	5.8G Custom	0.989	1.048
		BT Module 1	0.059	
5.8G + BT Module 2	Body	5.8G Custom	0.989	1.094
		BT Module 2	0.105	
5.8G + 5GHz WLAN	Body	5.8G Custom	0.989	1.492
		5G WLAN	0.503	

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR-1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR-1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.



13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
2450MHz Dipole	MVG	DIP2G450	SN 06/22 DIP2G450-645	2025.02.05	2028.02.04
5000MHz Dipole	MVG	DIP5G000	SN 06/22 DIP5G000-653	2025.02.05	2028.02.04
E-Field Probe	MVG	EPGO364	SN 04/22 EPGO364	2025.02.05	2026.02.04
Liquid Calibration Kit	MVG	OCPG 87	SN 06/22 OCPG87	2025.02.05	2026.02.04
Antenna	MVG	ANTA 73	SN 06/22 ANTA 73	N/A	N/A
Ellipsoid Phantom	MVG	ELLI 51	SN 06/22 ELLI 51	N/A	N/A
Phantom	MVG	SAM 148	SN 06/22 SAM148	N/A	N/A
Phone holder	MVG	MSH 117	SN 06/22 MSH 117	N/A	N/A
Laptop positioner	MVG	LSH 36	SN 06/22 LSH 38	N/A	N/A
Directional coupler	SHW	SHWDCP	202203280013	N/A	N/A
Network Analyzer	ZVL	R&S	116184	2025.03.05	2026.03.04
Multi Meter	DMM6500	Keithley	4527252	2025.03.06	2026.03.05
Signal Generator	Keysight	N5182B	MY59100717	2025.03.05	2026.03.04
Wireless Communication Test Set	R&S	CMW500	137737	2025.03.05	2026.03.04
Power Sensor	R&S	Z11	116184	2025.03.05	2026.03.04
Electronic Temperature hygrometer	N/A	ST-W2318	N/A	2025.03.05	2026.03.04
Temperature hygrometer	N/A	TP101	N/A	2025.03.05	2026.03.04



Appendix A. System Validation Plots

System Performance Check Data (2450MHz)

Type: Phone measurement (Complete)

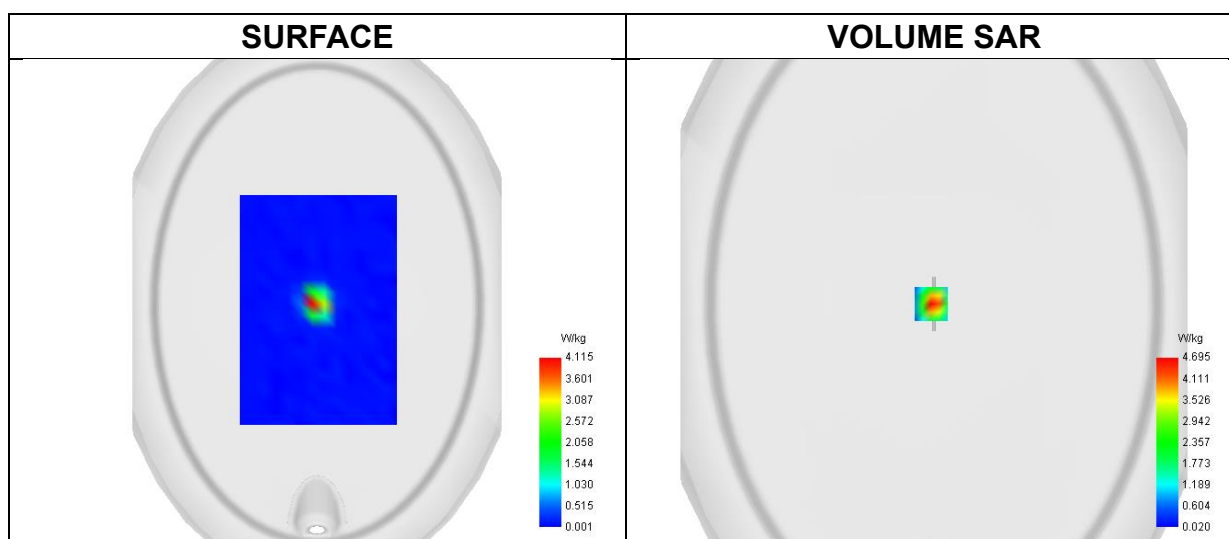
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm

Date of measurement: 2025-05-07

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW
Frequency (MHz)	2450.000
Relative permittivity	39.21
Conductivity (S/m)	1.84
Probe	SN 04/22 EPGO364
ConvF	2.33
Crest factor:	1:1

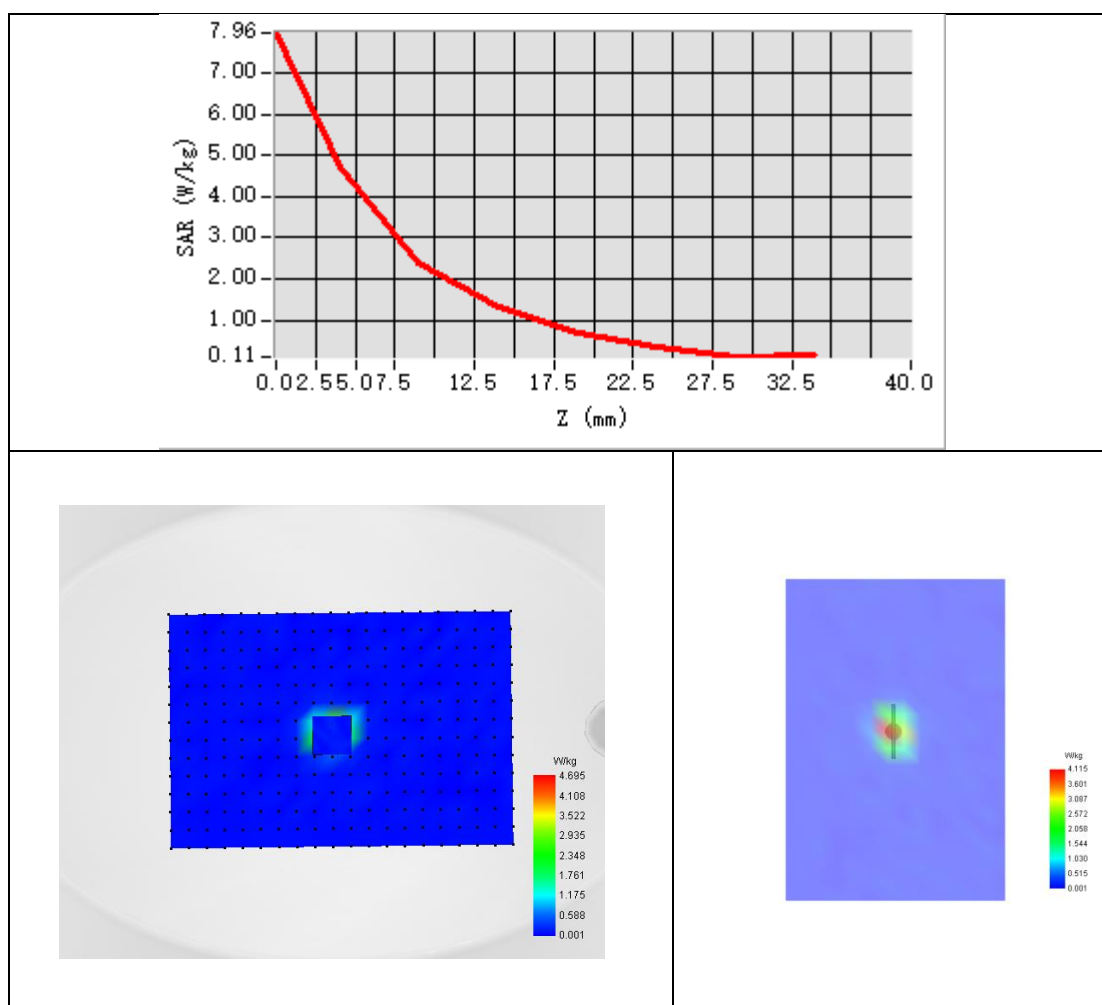


Maximum location: X=3.00, Y=0.00 ; SAR Peak: 8.18 W/kg

SAR 10g (W/Kg)	2.396
SAR 1g (W/Kg)	5.448



Z Axis Scan





System Performance Check Data (5200MHz)

Type: Phone measurement (Complete)

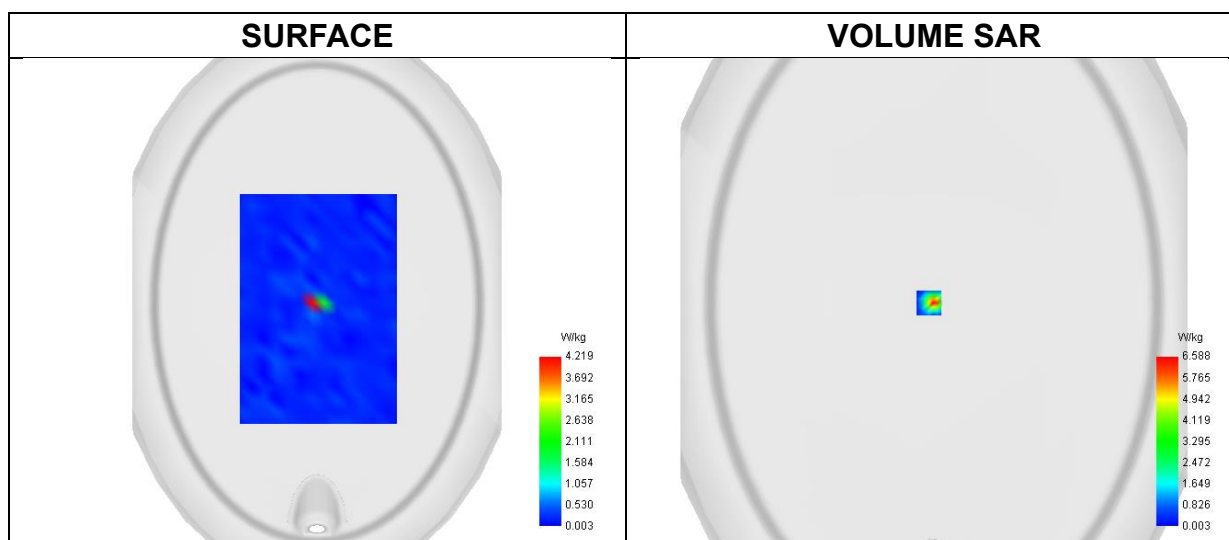
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement:2025-05-10

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW
Frequency (MHz)	5200.000
Relative permittivity	37.10
Conductivity (S/m)	4.61
Probe	SN 04/22 EPGO364
ConvF	1.99
Crest factor:	1:1

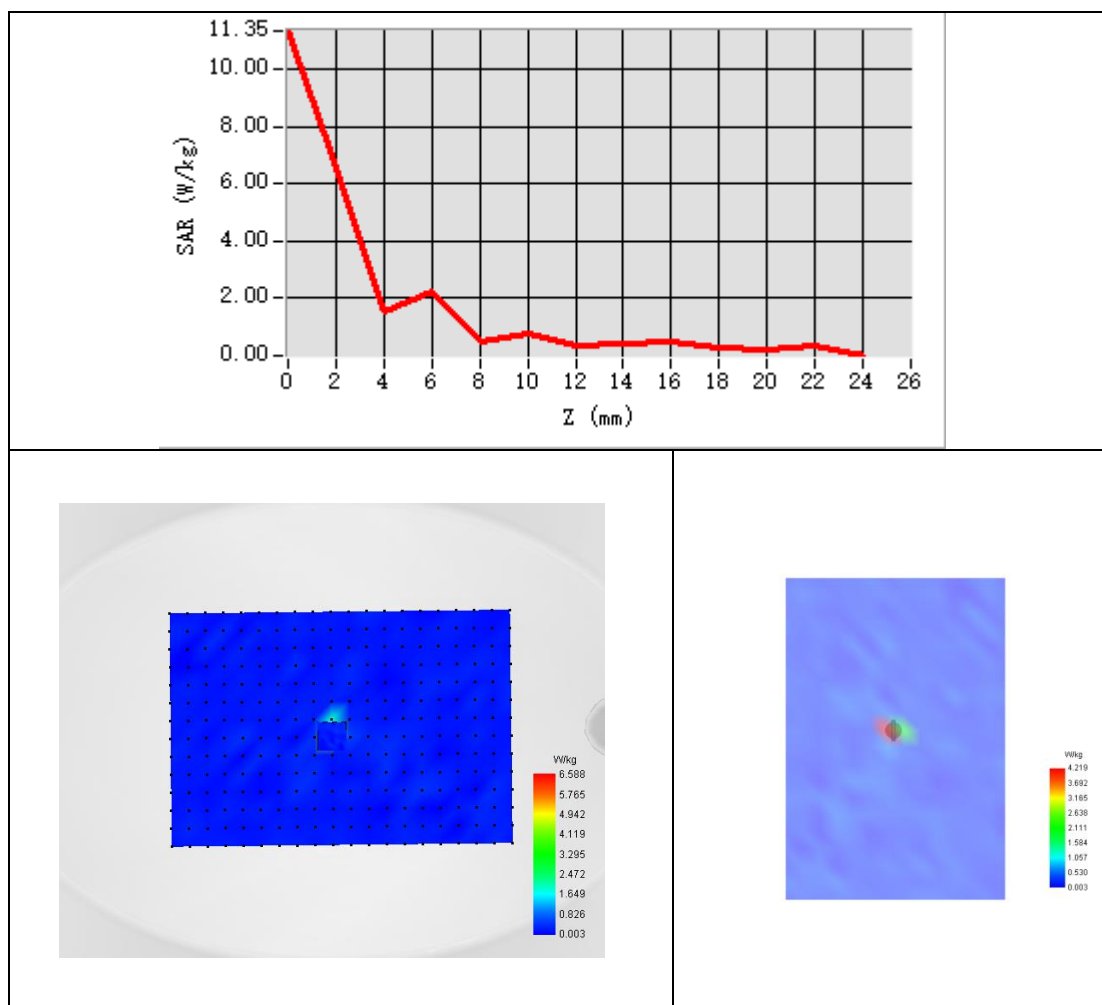


Maximum location: X=5.00, Y=0.00 ; SAR Peak: 11.83 W/kg

SAR 10g (W/Kg)	2.332
SAR 1g (W/Kg)	8.153



Z Axis Scan





System Performance Check Data (5400MHz)

Type: Phone measurement (Complete)

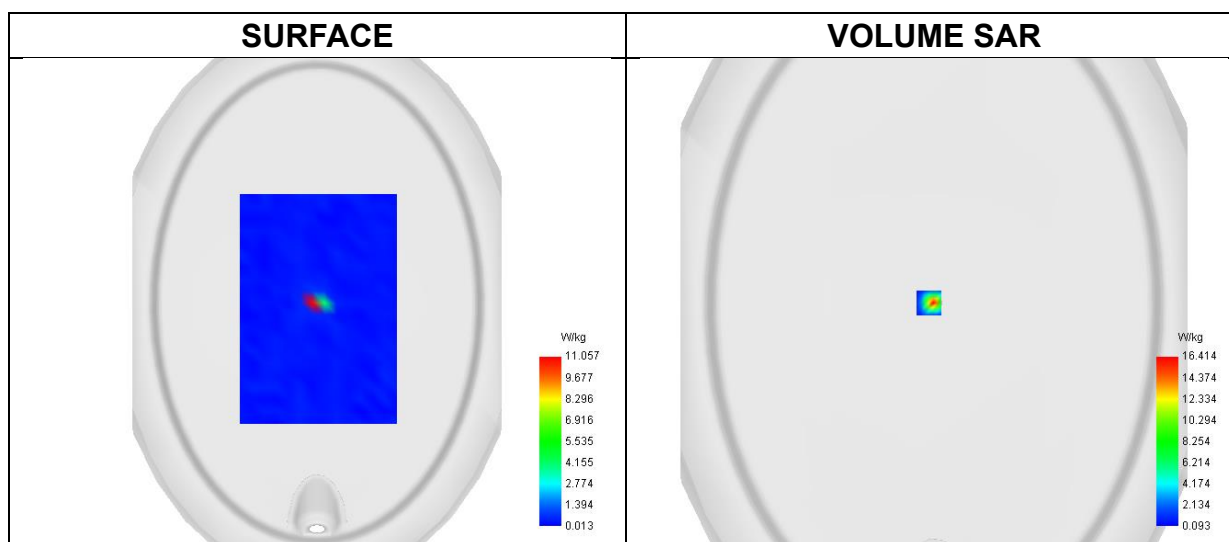
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement:2025-05-10

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5400
Channels	Middle
Signal	CW
Frequency (MHz)	5400.000
Relative permittivity	36.70
Conductivity (S/m)	4.87
Probe	SN 04/22 EPGO364
ConvF	1.87
Crest factor:	1:1

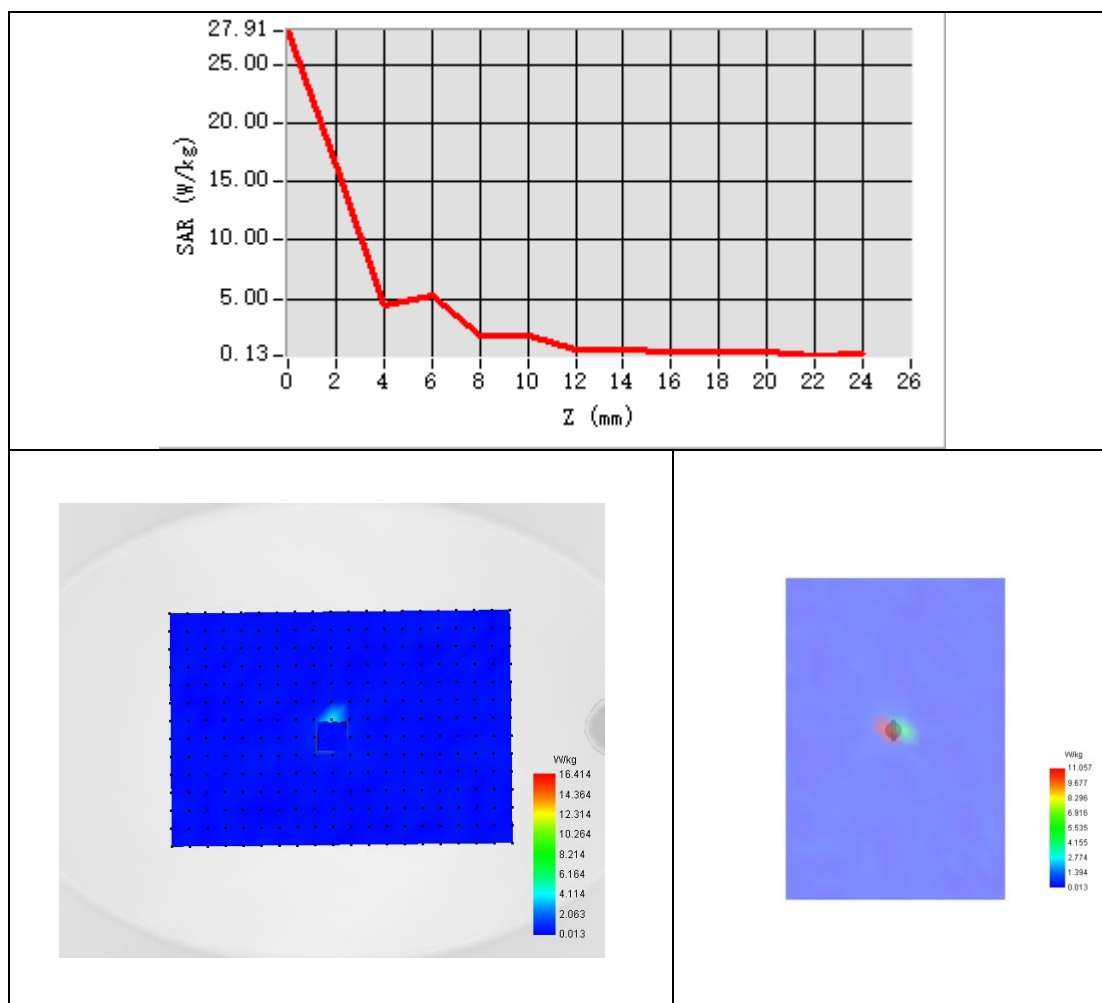


Maximum location: X=5.00, Y=0.00 ; SAR Peak: 27.73 W/kg

SAR 10g (W/Kg)	2.448
SAR 1g (W/Kg)	8.654



Z Axis Scan





System Performance Check Data (5600MHz)

Type: Phone measurement (Complete)

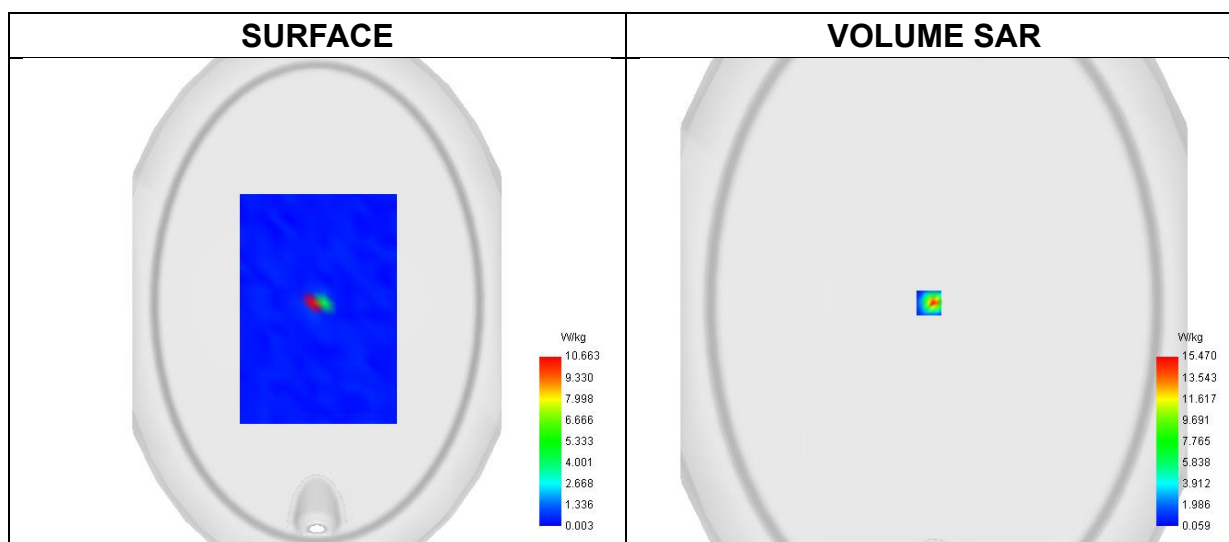
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement:2025-05-10

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5600
Channels	Middle
Signal	CW
Frequency (MHz)	5600.000
Relative permittivity	36.44
Conductivity (S/m)	5.09
Probe	SN 04/22 EPGO364
ConvF	1.87
Crest factor:	1:1

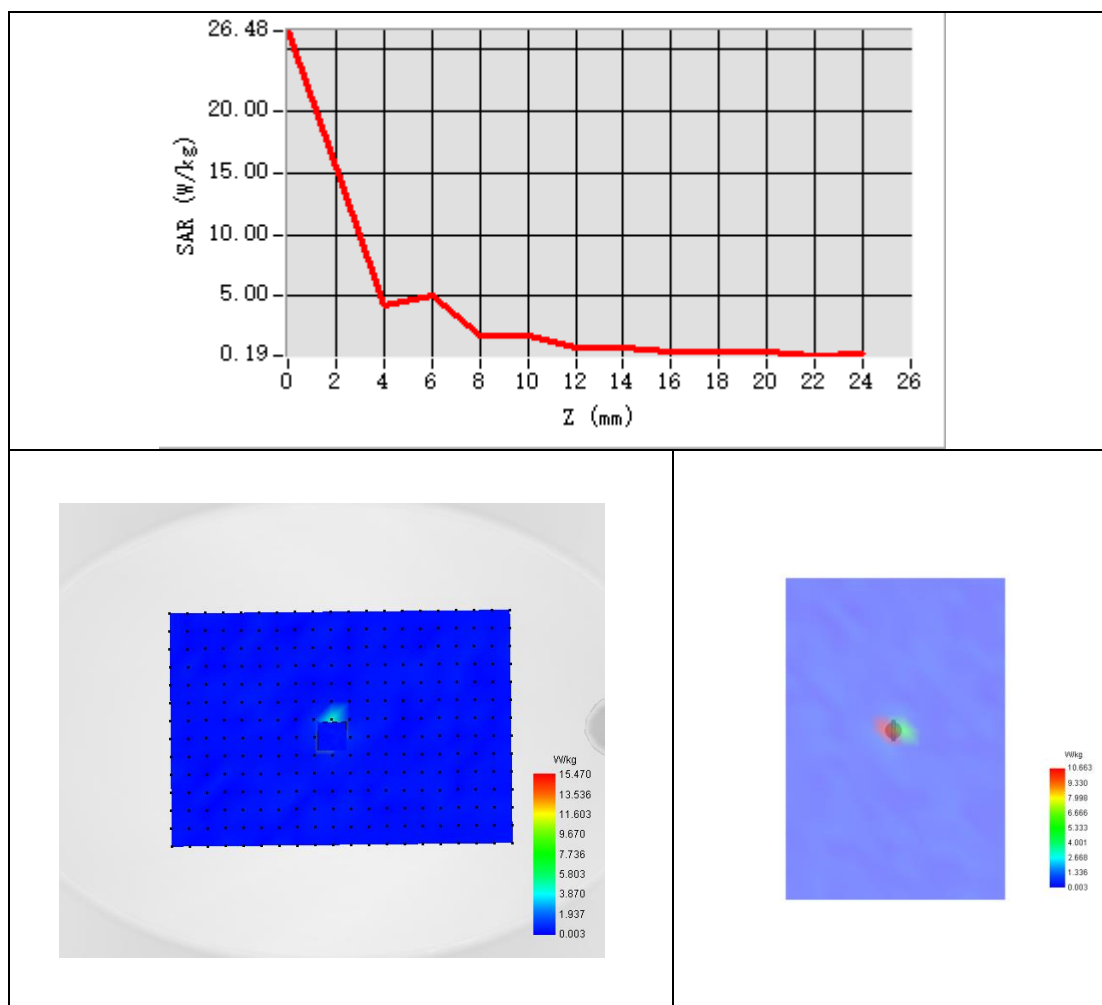


Maximum location: X=-5.00, Y=0.00 ; SAR Peak: 26.39 W/kg

SAR 10g (W/Kg)	2.308
SAR 1g (W/Kg)	8.210



Z Axis Scan





System Performance Check Data (5800MHz)

Type: Phone measurement (Complete)

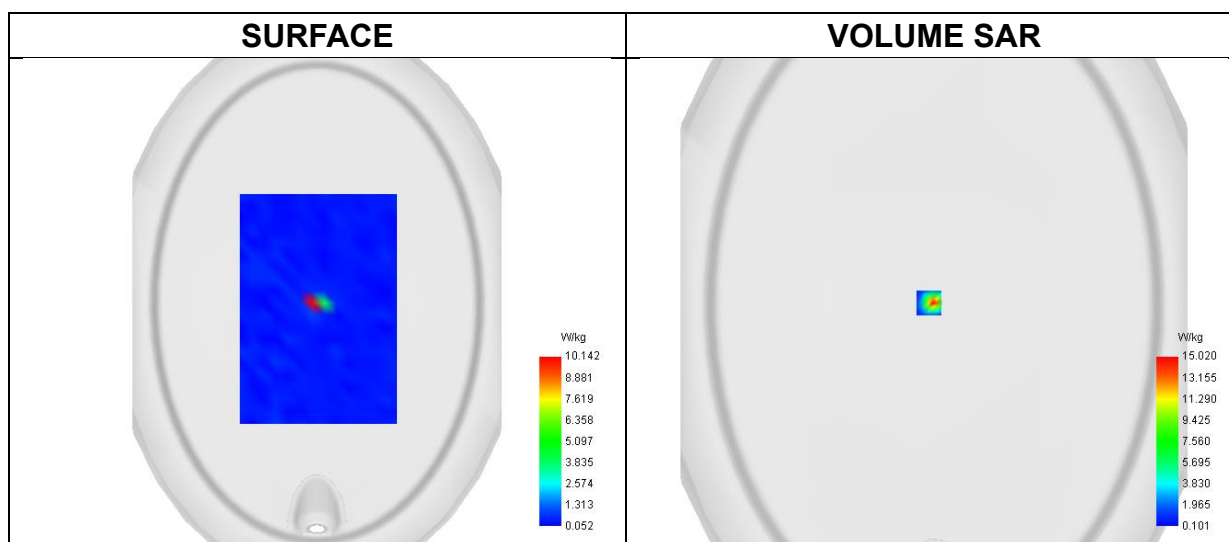
Area scan resolution: dx=8mm, dy=8mm

Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm

Date of measurement:2025-05-09

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW
Frequency (MHz)	5800.000
Relative permittivity	36.31
Conductivity (S/m)	5.21
Probe	SN 04/22 EPGO364
ConvF	1.70
Crest factor:	1:1

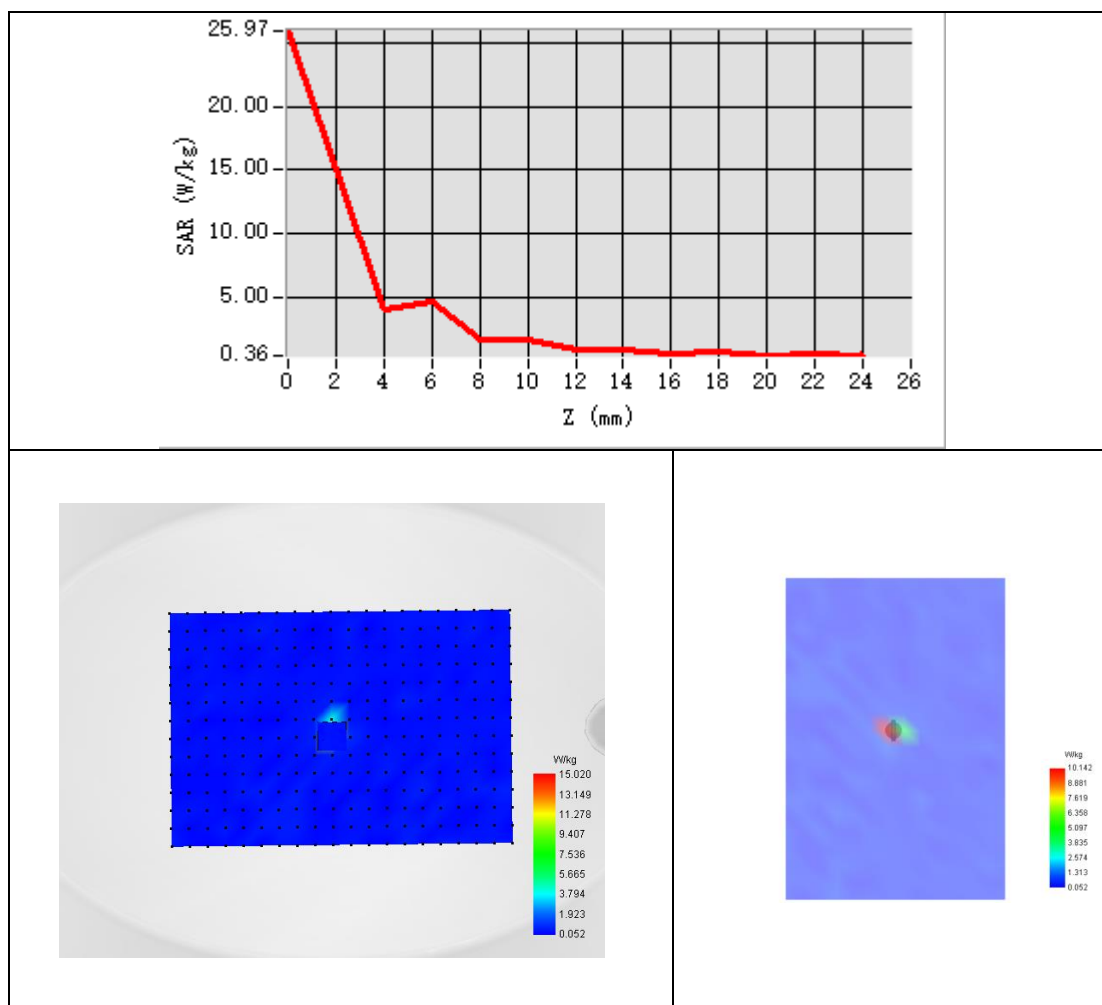


Maximum location: X=-5.00, Y=0.00 ; SAR Peak: 24.86 W/kg

SAR 10g (W/Kg)	2.384
SAR 1g (W/Kg)	8.262



Z Axis Scan



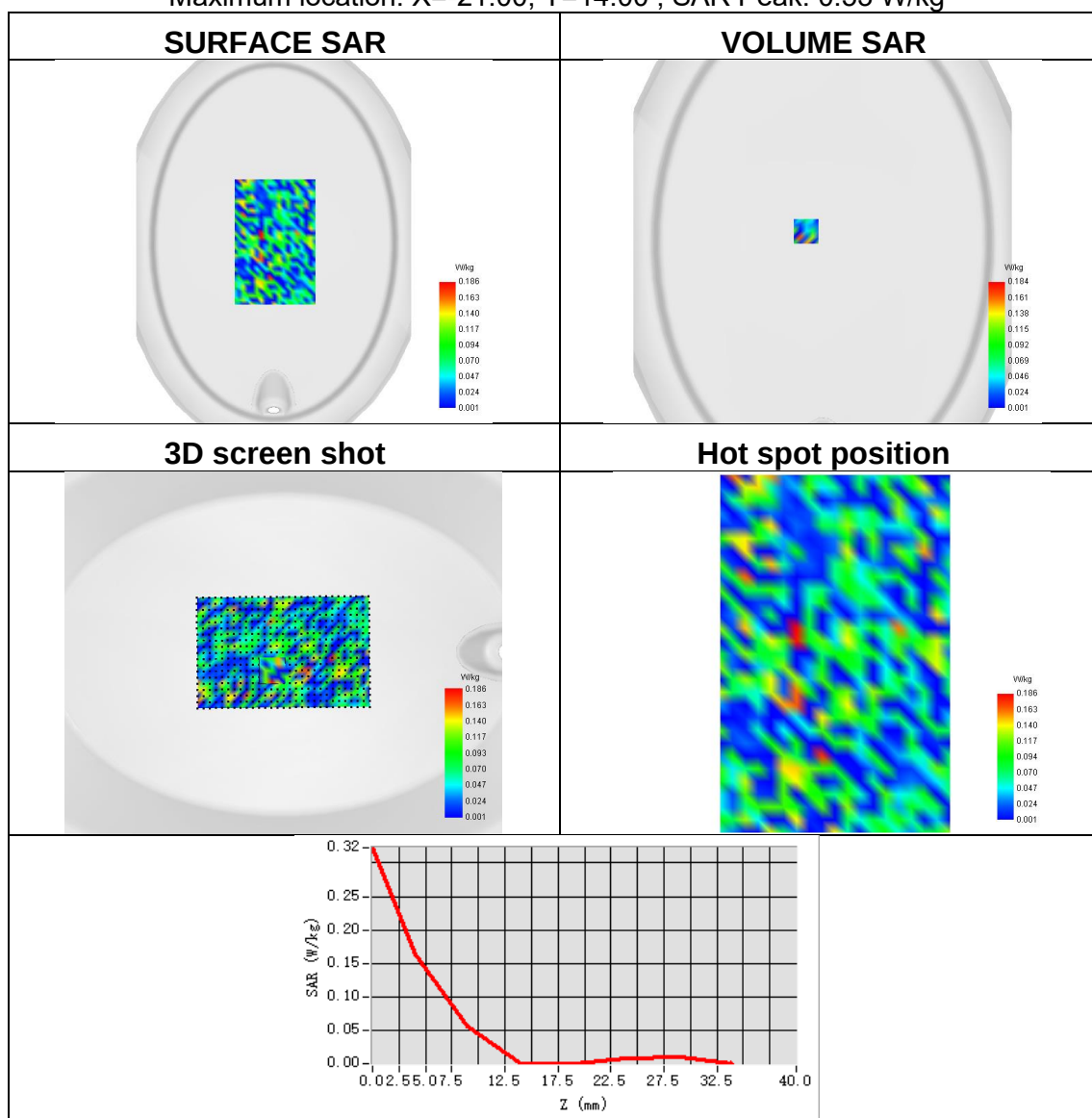


Appendix B. SAR Test Plots

Plot 1:

Test Date	2025-05-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7, dx=8mm dy=8mm dz=5mm
Phantom	ELLI
Device Position	Top Side
Band	2.4_CustomBand 1
Signal	Custom
Frequency	2446.5
SAR 10g (W/Kg)	0.061
SAR 1g (W/Kg)	0.163
ConvF	2.33
Relative permittivity	39.21
Conductivity (S/m)	1.84

Maximum location: X=-21.00, Y=14.00 ; SAR Peak: 0.53 W/kg

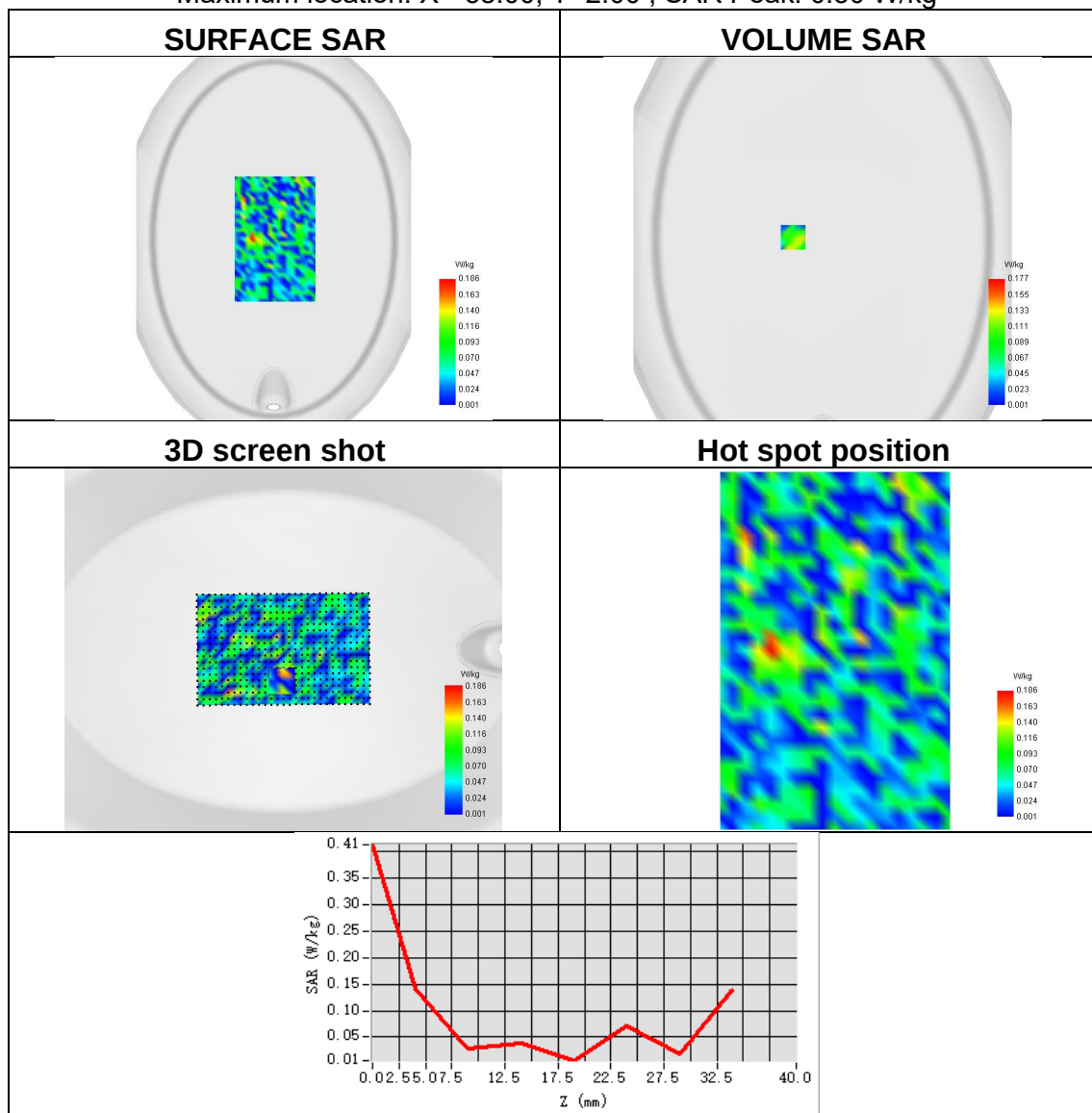




Plot 2:

Test Date	2025-05-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	ELLI
Device Position	Top Side
Band	2.4_CustomBand 2
Signal	Custom
Frequency	2446.5
SAR 10g (W/Kg)	0.088
SAR 1g (W/Kg)	0.199
ConvF	2.33
Relative permittivity	39.21
Conductivity (S/m)	1.84

Maximum location: X=-38.00, Y=2.00 ; SAR Peak: 0.50 W/kg

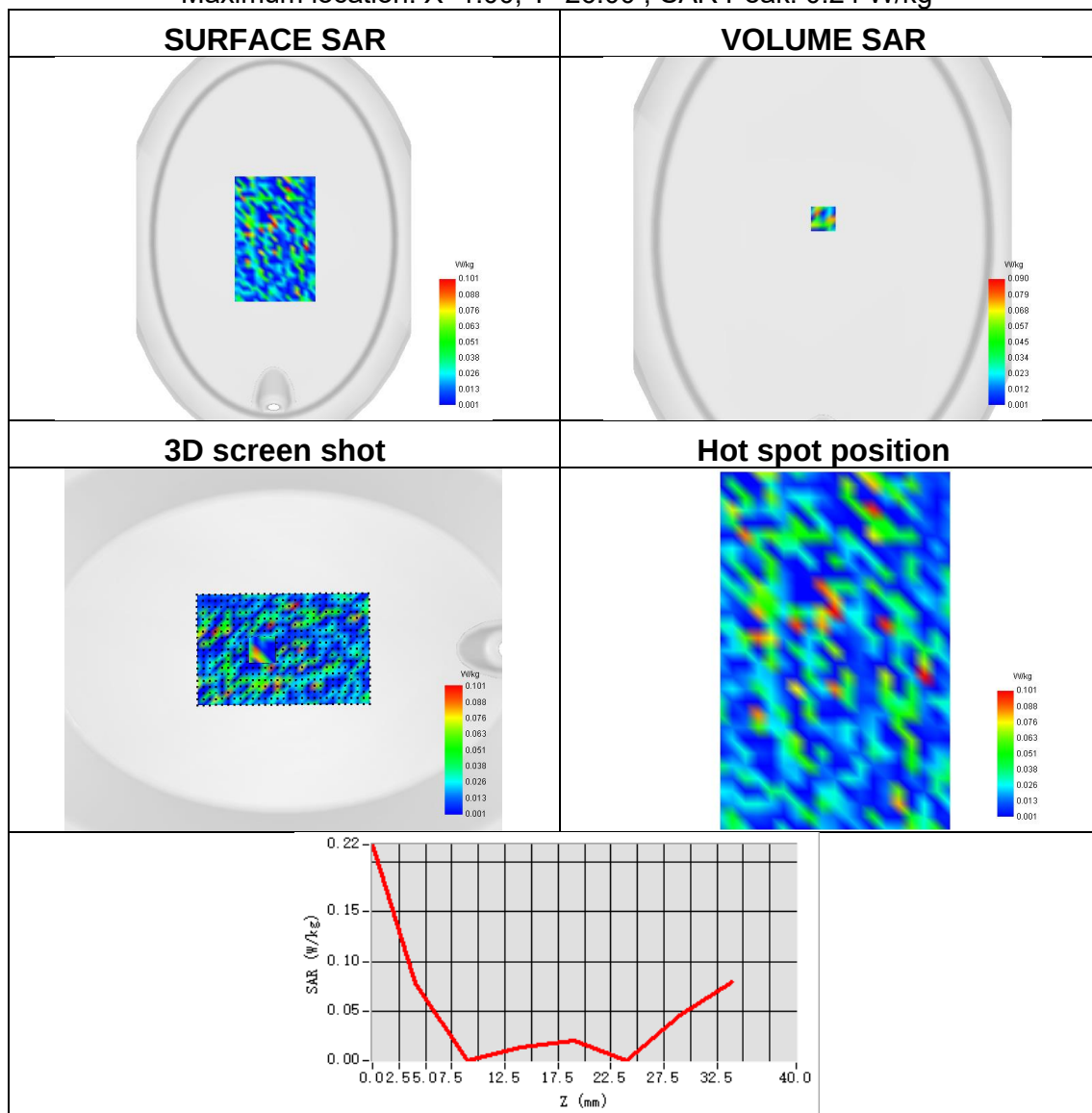




Plot 3:

Test Date	2025-05-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	ELLI
Device Position	Right Side
Band	ISM
Signal	IEEE 802.11b
Frequency	2412
SAR 10g (W/Kg)	0.029
SAR 1g (W/Kg)	0.086
ConvF	2.33
Relative permittivity	39.21
Conductivity (S/m)	1.84

Maximum location: X=1.00, Y=26.00 ; SAR Peak: 0.24 W/kg

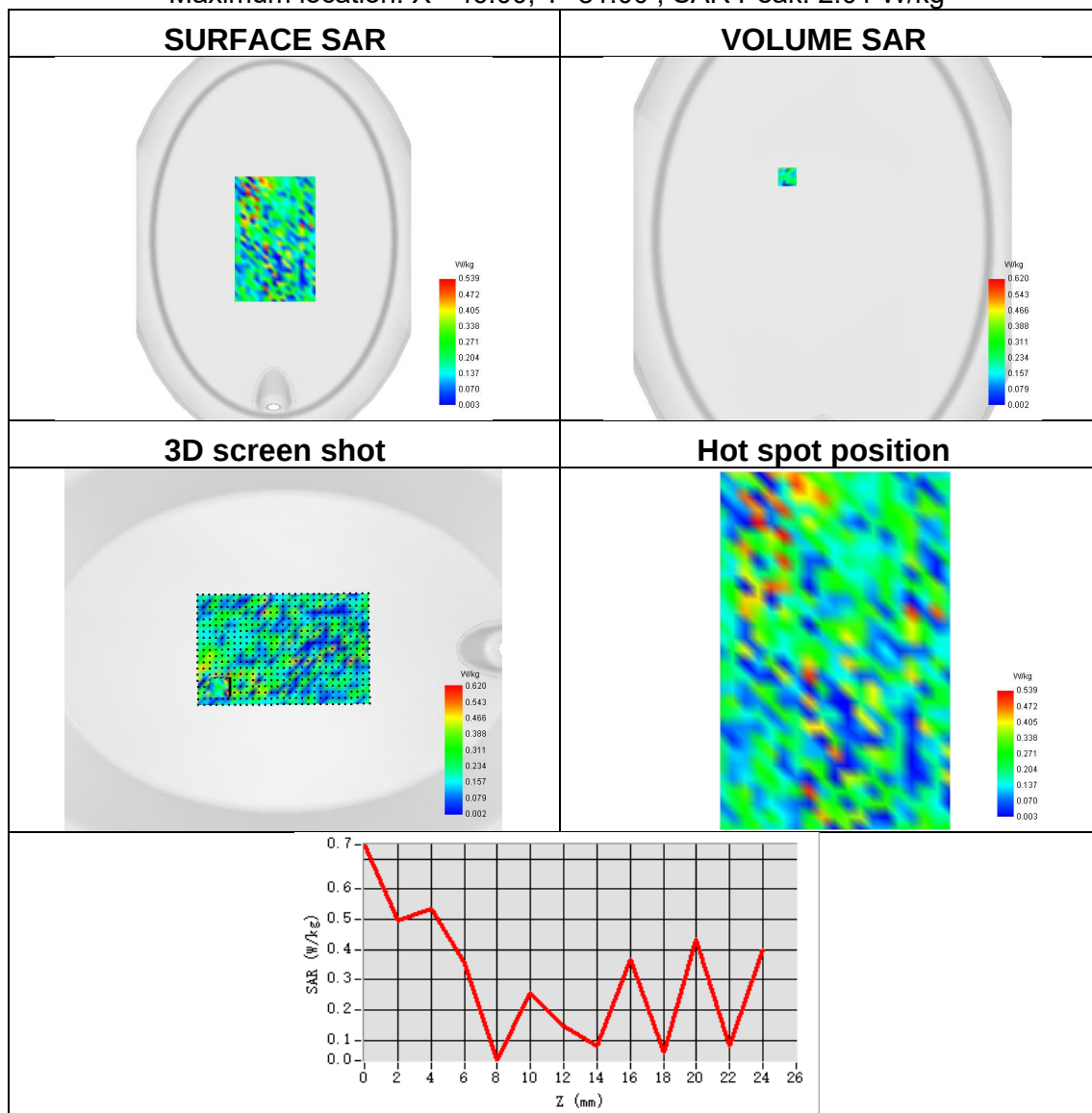




Plot 4:

Test Date	2025-05-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	U-NII-1
Signal	IEEE 802.11a
Frequency	5180
SAR 10g (W/Kg)	0.181
SAR 1g (W/Kg)	0.282
ConvF	1.99
Relative permittivity	37.10
Conductivity (S/m)	4.61

Maximum location: X=-46.00, Y=81.00 ; SAR Peak: 2.01 W/kg

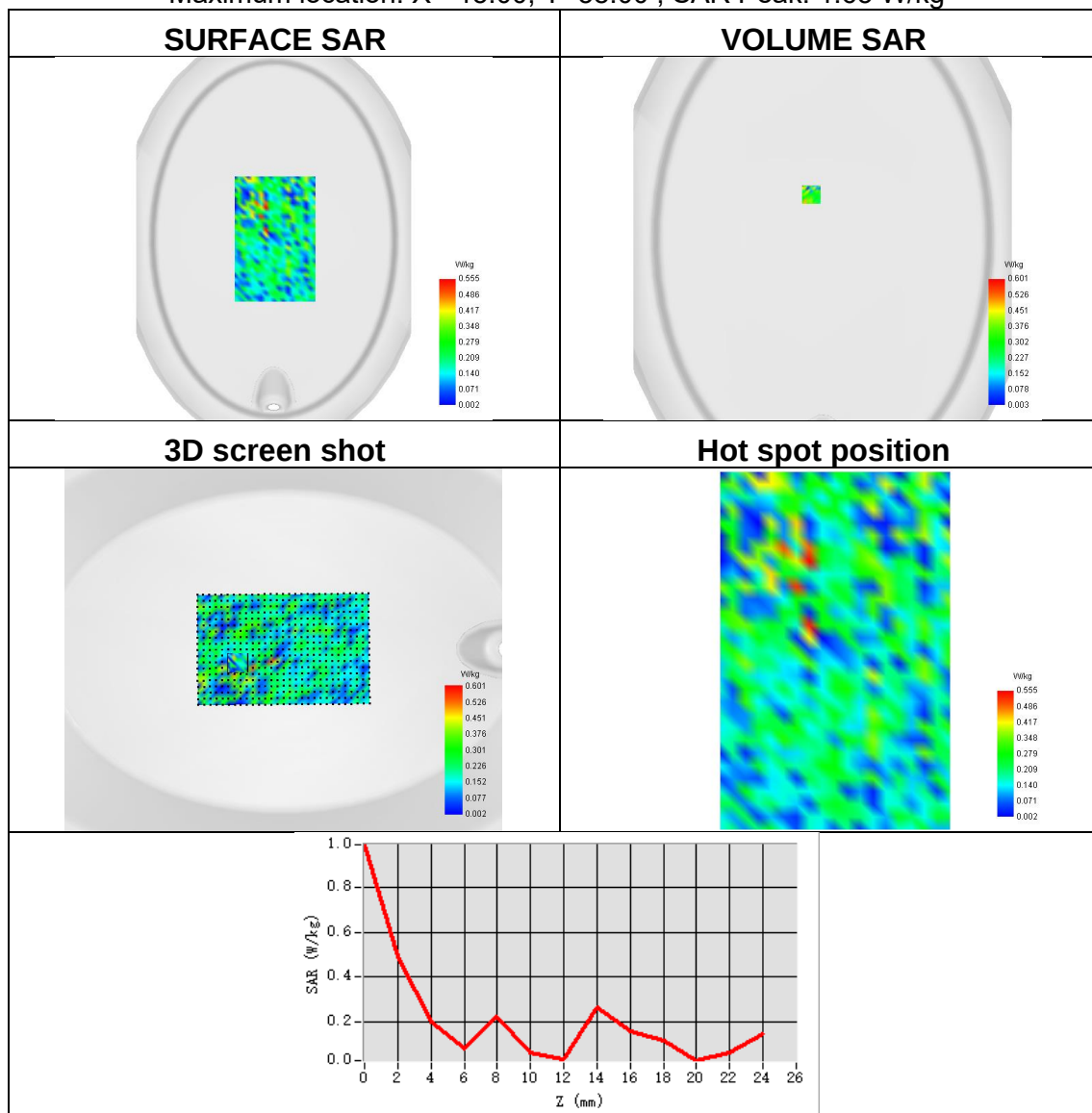




Plot 5:

Test Date	2025-05-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	U-NII-2a
Signal	IEEE 802.11a
Frequency	5260
SAR 10g (W/Kg)	0.170
SAR 1g (W/Kg)	0.359
ConvF	1.87
Relative permittivity	36.70
Conductivity (S/m)	4.87

Maximum location: X=-15.00, Y=58.00 ; SAR Peak: 1.65 W/kg

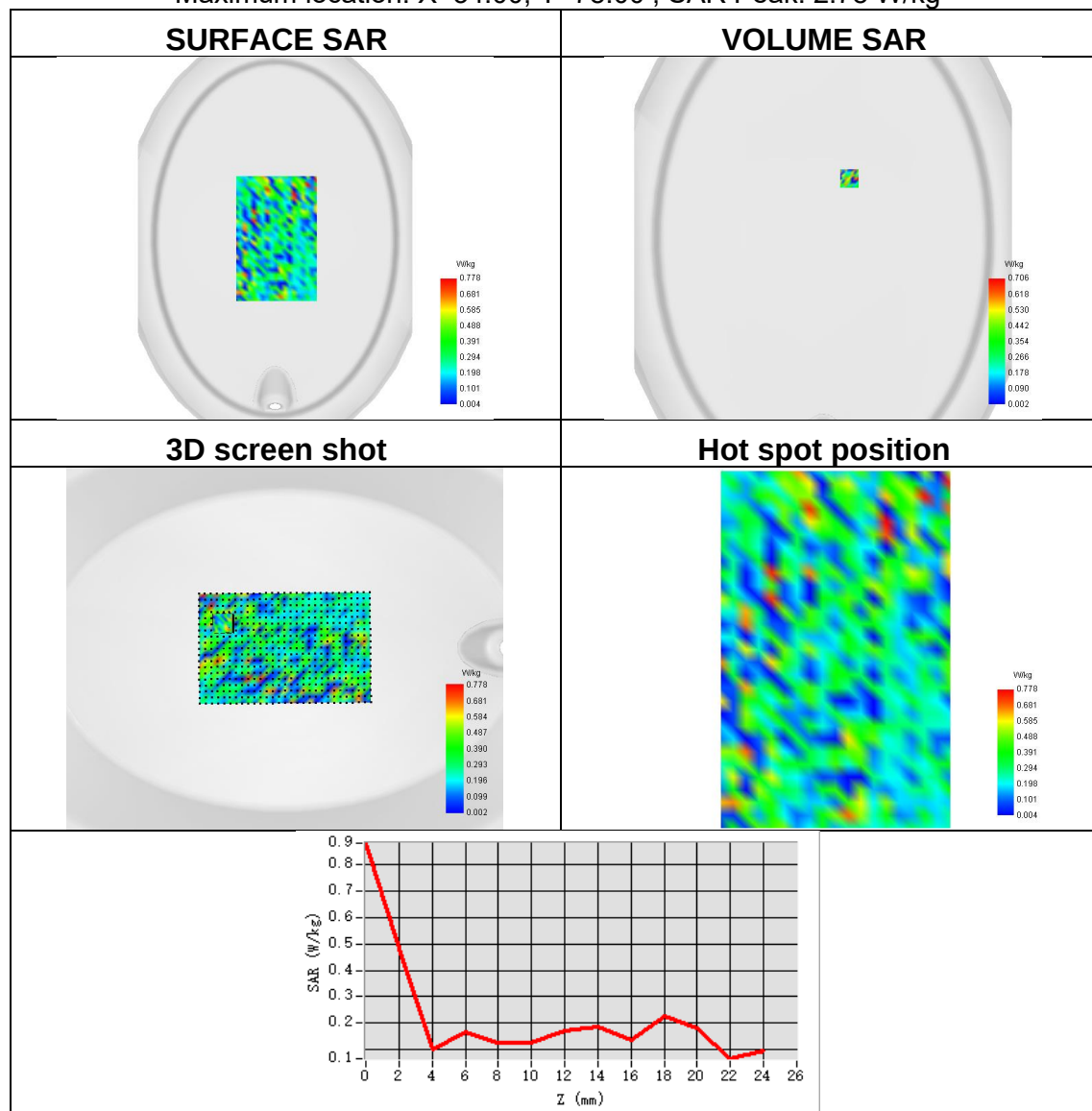




Plot 6:

Test Date	2025-05-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	U-NII-2c
Signal	IEEE 802.11a
Frequency	5700
SAR 10g (W/Kg)	0.191
SAR 1g (W/Kg)	0.378
ConvF	1.87
Relative permittivity	36.44
Conductivity (S/m)	5.09

Maximum location: X=34.00, Y=78.00 ; SAR Peak: 2.78 W/kg

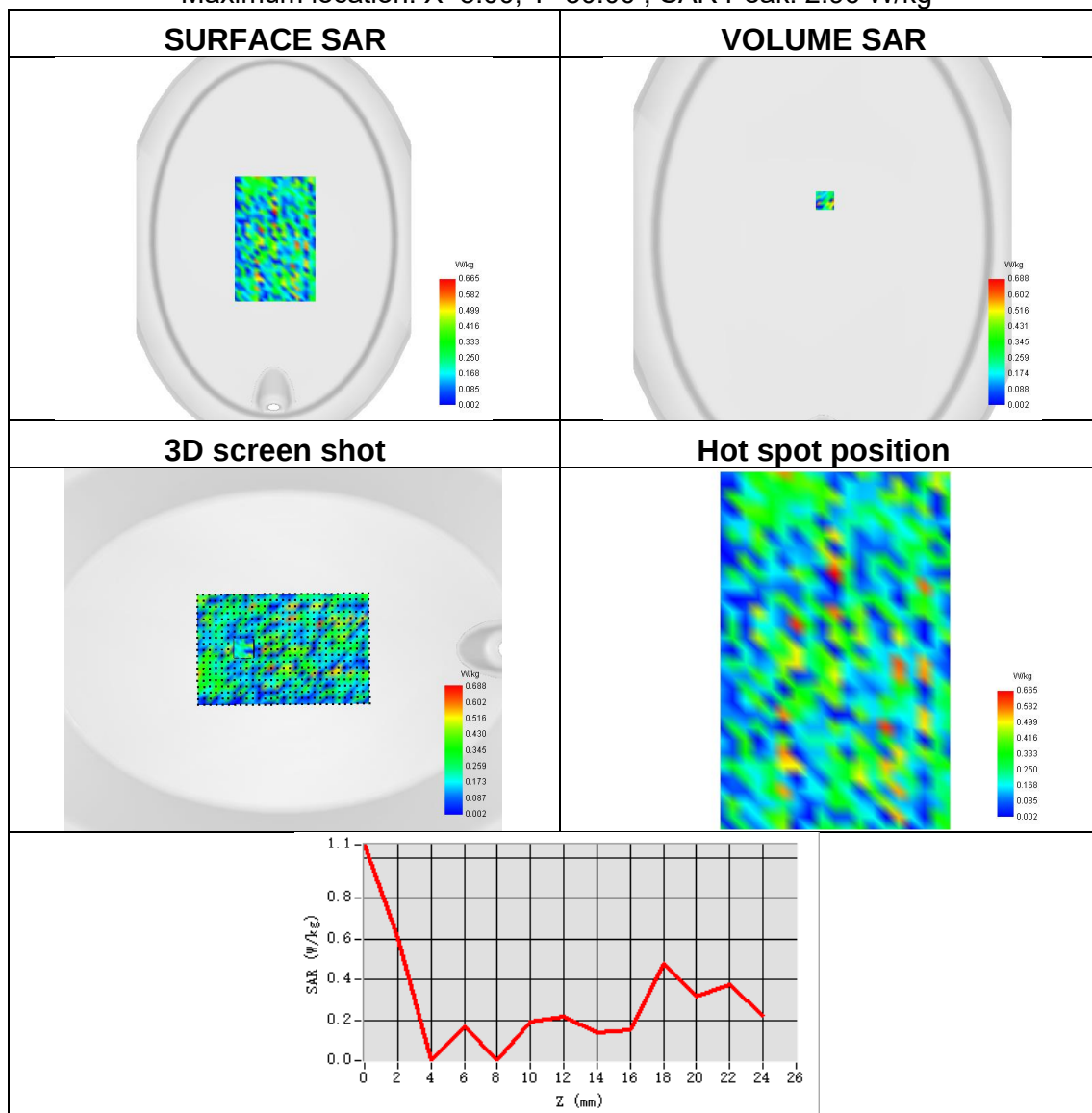




Plot 7:

Test Date	2025-05-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	U-NII-3
Signal	IEEE 802.11a
Frequency	5785
SAR 10g (W/Kg)	0.214
SAR 1g (W/Kg)	0.457
ConvF	1.70
Relative permittivity	36.31
Conductivity (S/m)	5.21

Maximum location: X=3.00, Y=50.00 ; SAR Peak: 2.96 W/kg

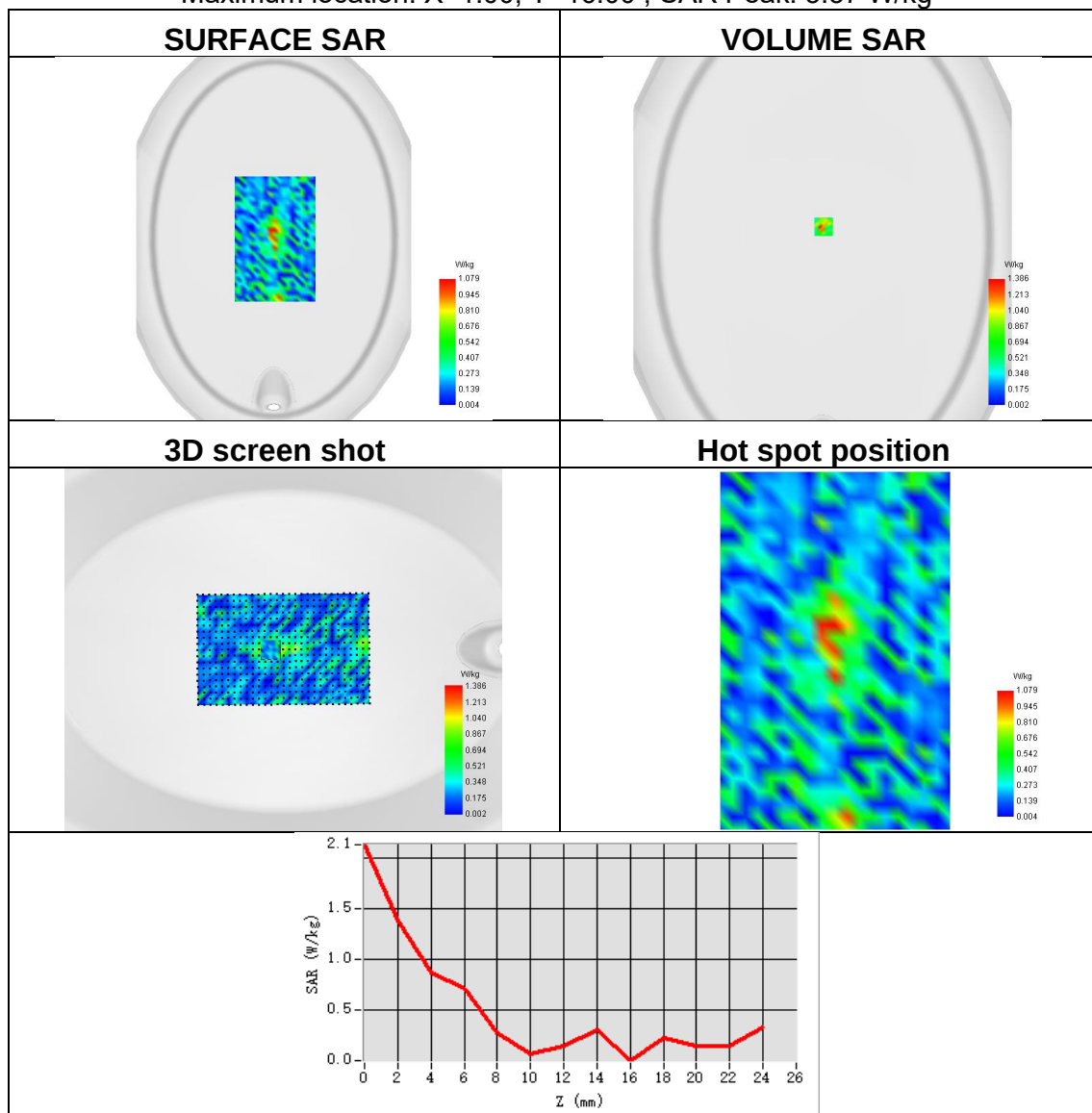




Plot 8:

Test Date	2025-05-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	5.8_CustomBand 1
Signal	Custom
Frequency	5734.5
SAR 10g (W/Kg)	0.370
SAR 1g (W/Kg)	0.896
ConvF	1.70
Relative permittivity	36.31
Conductivity (S/m)	5.21

Maximum location: X=1.00, Y=16.00 ; SAR Peak: 3.37 W/kg

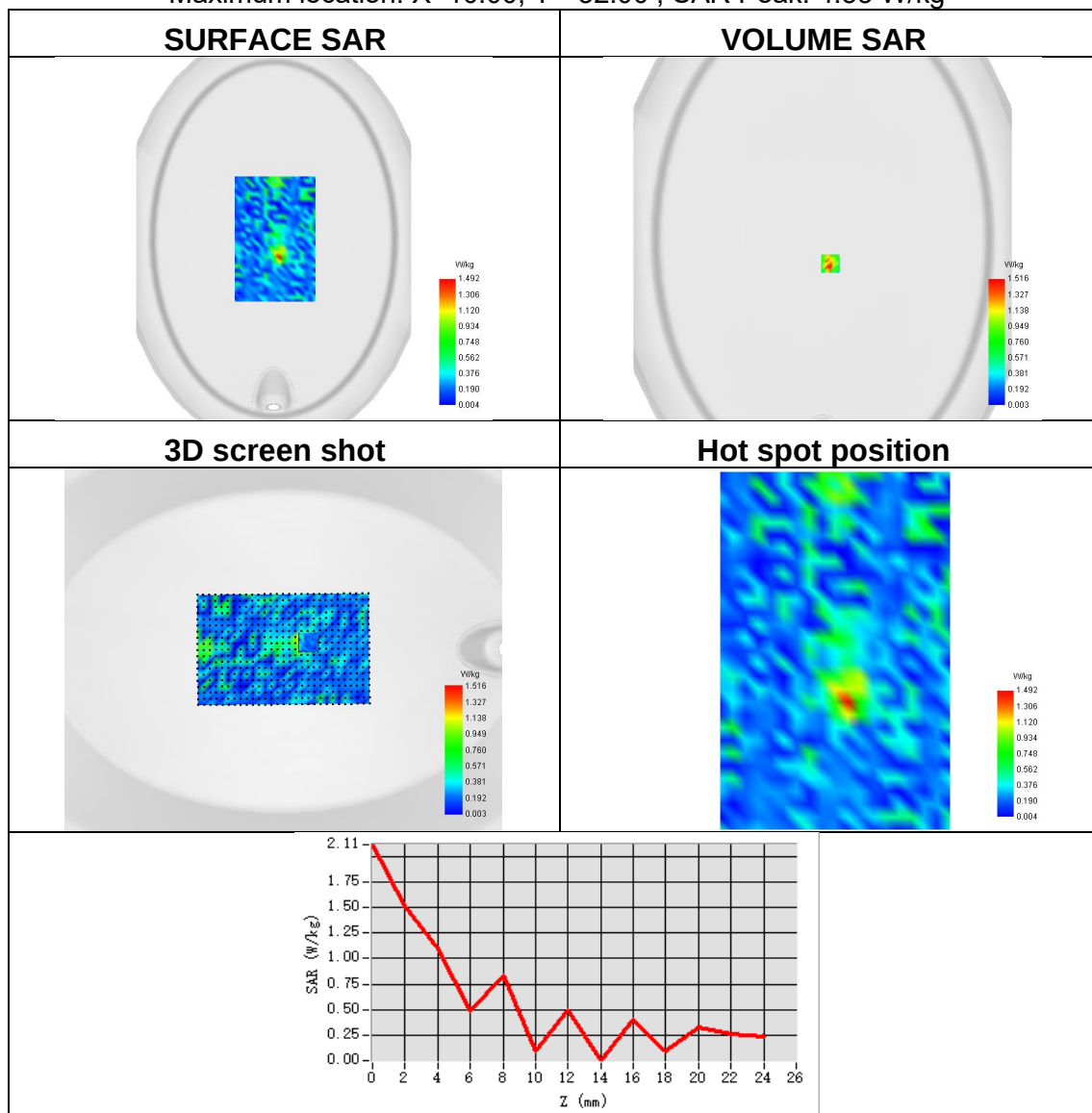




Plot 9 :

Test Date	2025-05-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	ELLI
Device Position	Top Side
Band	5.8_CustomBand 2
Signal	Custom
Frequency	5734.5
SAR 10g (W/Kg)	0.374
SAR 1g (W/Kg)	0.874
ConvF	1.70
Relative permittivity	36.31
Conductivity (S/m)	5.21

Maximum location: X=10.00, Y=-32.00 ; SAR Peak: 4.53 W/kg





Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※