



SAR TEST REPORT

Product Name: Smart Pos Payment Terminal

Model Name: SP60

FCC ID: SS4SP60W1

Issued For : Bluebird Inc.

3F, 115, Irwon ro, Gangnam gu, Seoul, Republic of Korea
(06355)

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

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Report Number: LGT24L009HA01

Sample Received Date: Dec. 05, 2024

Date of Test: Dec. 05, 2024 ~ Dec. 15, 2024

Date of Issue: Jan. 14, 2025

Max. SAR: Body: 0.852 W/kg(1g)

Limbs: 1.018 W/kg(10g)

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Rev.	Issue Date	Contents
00	Jan. 14, 2025	Initial Issue



TEST REPORT CERTIFICATION

Applicant Bluebird Inc.

Address 3F, 115, Irwon ro, Gangnam gu, Seoul, Republic of Korea (06355)

Manufacturer Bluebird Inc.

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Factory 1: Mobiwire Mobiles (NingBo) Co.,Ltd.

Address: No. 518, Changting East Road, Yuelin Street, Fenghua District, Ningbo City, Zhejiang Province, China

Factory 2: Bluebird Inc.

Address: SSang-young IT Twin tower-B 7~8F), 531, Dunchon-daero, Jungwon-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Factory 3: DSGLOBAL VINA CO.,LTD

Address: Lot XN3-1E, Dai An expansion Industrial Zone, Lai Cach town Cam Giang district, HaiDuong province, Vietnam

Product Name Smart Pos Payment Terminal

Trademark Bluebird

Model Name SP60

Sample number LGT2412016-7

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
ANSI/IEEE Std. C95.1-1992 FCC 47 CFR Part 2 (2.1093) IEEE 1528: 2013	PASS

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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	Smart Pos Payment Terminal		
Trademark	Bluebird		
Model Name	SP60		
Configuration Variance:	Please see below Note 3		
Device Category	Portable		
Product stage	Production unit		
RF Exposure Environment	General Population / Uncontrolled		
Hardware Version	V1.0		
Software Version	R1.01		
Frequency Range	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 NFC: 13.56MHz		
Max. Reported SAR: Test distance: Body:10mm (Back side 0mm) Limbs: 0mm	SP60 With Printer (Configure A)		
	Mode	Body Worn and Hotspot (W/kg)(1g)	Limbs(W/kg) (10g)
	2.4G WLAN	0.204	0.301
	5.2G WLAN	0.487	0.682
	5.3G WLAN	0.604	0.703
	5.6G WLAN	0.456	0.430
	5.8G WLAN	0.383	0.442
	SP60 Without Printer (Configure B)		
	2.4G WLAN	0.138	0.209
	5.2G WLAN	0.780	0.617
	5.3G WLAN	0.589	0.738
	5.6G WLAN	0.769	0.829
	5.8G WLAN	0.852	1.018
	Limit	1.6	4
Battery:	Configuration 1 Rated Voltage:7.7V Capacity: 3420mAh Configuration 2 Rated Voltage:7.7V Capacity: 2000mAh		
Operating Mode:	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		



	Bluetooth: GFSK + π /4DQPSK+8DPSK BLE: GFSK NFC: ASK
Antenna Specification	Bluetooth: FPC Antenna WLAN: FPC Antenna NFC: Coil Antenna
Operating Mode	Maximum continuous output
Hotspot Mode	Support
DTM Mode	Not Support

Note:

1. The 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.

Model	Battery capacity	Print head	charging stand
SP60 (Configuration 1)	3420mAh	Yes	High configuration: USB1 Output: 5Vdc, 1.0A USB2 Output: 5Vdc, 0.5A
	3420mAh	Yes	Low configuration: No
SP60 (Configuration 2)	2000mAh	No	High configuration: USB1 Output: 5Vdc, 1.0A USB2 Output: 5Vdc, 0.5A
	2000mAh	No	Low configuration: No

No mean not support, Yes means support



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. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz 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 941225 D06 v02r01	Hotspot Mode SAR
8	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
9	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

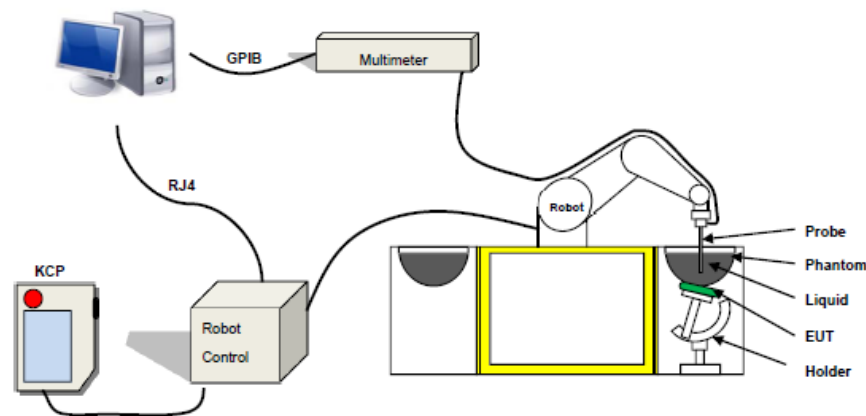
$$SAR = \frac{\sigma E^2}{\rho}$$

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 EPGO364 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.

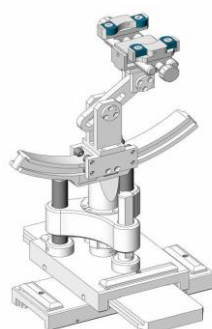


Figure-SN 06/22 SAM 148



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]					
2024-12-07	20.4	58	2450	20.2	Permittivity	39.20	39.44	0.61	±5
					Conductivity	1.80	1.83	1.67	±5
2024-12-06	23.5	60	5200	23.2	Permittivity	36.00	36.48	1.33	±5
					Conductivity	4.66	4.65	-0.21	±5
2024-12-10	23.9	60	5400	23.5	Permittivity	35.80	36.58	2.18	±5
					Conductivity	4.86	4.83	-0.62	±5
2024-12-08	21.5	54	5600	21.2	Permittivity	35.55	36.68	3.18	±5
					Conductivity	5.07	5.08	0.30	±5
2024-12-09	23.4	58	5800	23.1	Permittivity	35.30	35.97	1.90	±5
					Conductivity	5.27	5.25	-0.38	±5

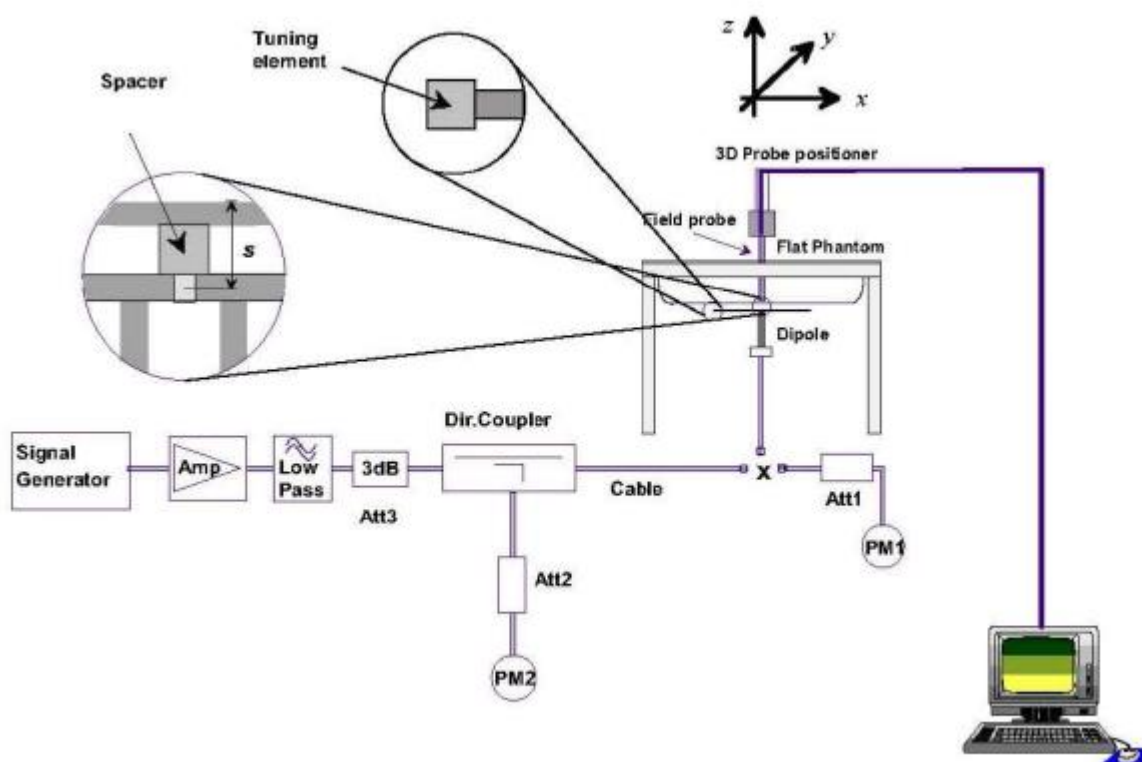


5. SAR System Validation

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)	(%)	(%)
2024-12-07	2450	100	5.408	54.08	54.28	-0.37	10
2024-12-06	5200	100	8.105	81.05	80.97	0.10	10
2024-12-10	5400	100	8.458	84.58	84.61	-0.04	10
2024-12-08	5600	100	8.065	80.65	80.96	-0.38	10
2024-12-09	5800	100	8.148	81.48	81.67	-0.23	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 Smart Pos Payment Terminal, support WLAN/BT mode.

Configure A



Configure B



Antenna Separation Distance(mm)						
ANT	Back Side	Front Side	Left Side	Right Side	Top Side	Bottom Side
WLAN/BT	5	5	64	5	64	103

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

Exposure Position	Wireless Interface	BT	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
	Calculated Frequency	2441	2412	5240	5260	5700	5745
	Maximum Turn-up power (dBm)	4.5	15	15.5	15.7	14.5	15.3
	Maximum rated power(mW)	2.82	31.62	35.48	37.15	28.18	33.88
Back Side	Separation distance (mm)	5	5	5	5	5	5
	exclusion threshold(mW)	9.60	9.66	6.55	6.54	6.28	6.26
	Testing required?	NO	YES	YES	YES	YES	YES
Front Side	Separation distance (mm)	5	5	5	5	5	5
	exclusion threshold(mW)	9.60	9.66	6.55	6.54	6.28	6.26
	Testing required?	NO	YES	YES	YES	YES	YES
Left Side	Separation distance (mm)	64	64	64	64	64	64
	exclusion threshold(mW)	236.01	236.58	205.53	205.40	202.83	202.58
	Testing required?	NO	NO	NO	NO	NO	NO
Right Side	Separation distance (mm)	5	5	5	5	5	5
	exclusion threshold(mW)	9.60	9.66	6.55	6.54	6.28	6.26
	Testing required?	NO	YES	YES	YES	YES	YES
Top Side	Separation distance (mm)	64	64	64	64	64	64
	exclusion threshold(mW)	122.89	123.63	83.88	83.72	80.42	80.10
	Testing required?	NO	NO	NO	NO	NO	NO
Bottom Side	Separation distance (mm)	103	103	103	103	103	103
	exclusion threshold(mW)	626.01	626.58	595.53	595.40	592.83	592.58
	Testing required?	NO	NO	NO	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

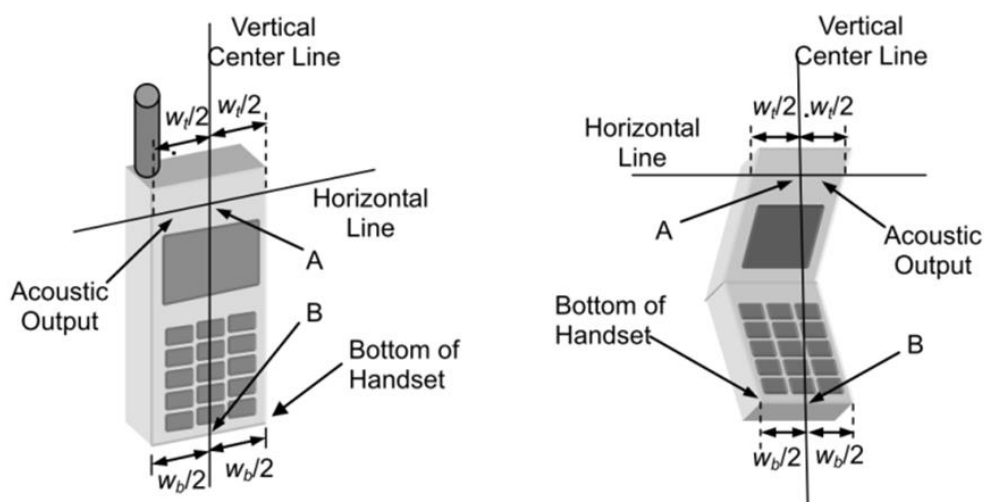
For <50mm distance, we just calculate mW of the exclusion threshold value(3.0) to do compare
5. per KDB 447498 D01, at 100 MHz to 6GHz and for test separation distances >50mm, the SAR test exclusion threshold is determined according to the following
 - a) [threshold at 50mm in step 1] + (test separation distance - 50mm) * (f (MHz)/150) mW, at 100 MHz to 1500 MHz
 - b) [threshold at 50mm in step 1] + (test separation distance - 50mm) * 10 mW at > 1500MHz and $\leq 6\text{GHz}$
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 Right Cheek, Right Titled, Left Cheek, Left Titled, Front Face and Rear Face.

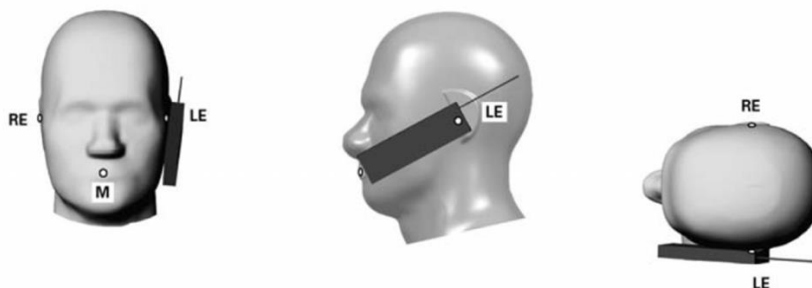
8.1 Define Two Imaginary Lines on the Handset

- (1) The vertical centerline passes through two points on the front side of the handset the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the handset.
- (2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



Cheek Position

- 1) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- 2) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost





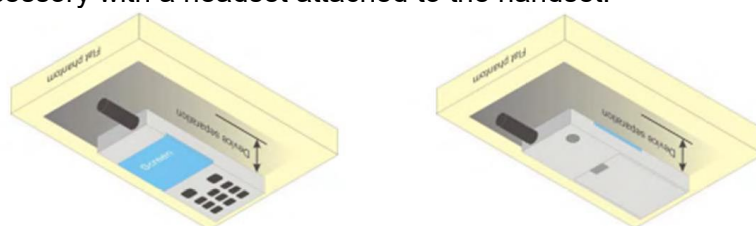
Title Position

- (1) To position the device in the “cheek” position described above.
- (2) While maintaining the device in the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until with the ear is lost.



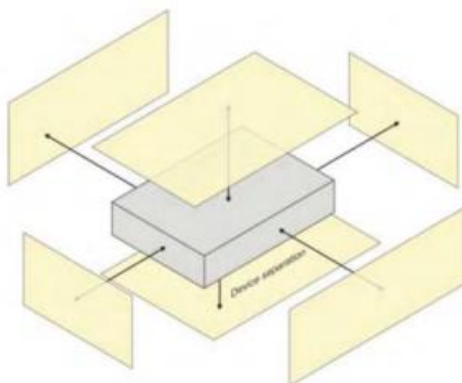
Body-worn Position Conditions:

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.



8.2 Hotspot mode exposure position condition

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing function, the relevant hand and body exposure condition are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surface and edges with a transmitting antenna located within 25 mm from that surface or edge. When form factor of a handset is smaller than 9cm x 5cm, a test separation distance of 5mm (instead of 10mm) is required for testing hotspot mode. When the separate distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).





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)	Output Power (dBm)	Output Power (mW)
802.11b	1	2412	14.90	30.90
	7	2437	14.39	27.48
	11	2462	14.57	28.64
802.11g	1	2412	13.53	22.54
	7	2437	13.47	22.23
	11	2462	13.35	21.63
802.11n-HT20	1	2412	13.32	21.48
	7	2437	13.03	20.09
	11	2462	13.10	20.42
802.11n-HT40	3	2422	13.76	23.77
	6	2437	13.33	21.53
	9	2452	13.37	21.73

WLAN (5.2Gband)

5.2G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	36	5180	14.67	29.31
	40	5200	15.32	34.04
	48	5240	15.47	35.24
802.11n-HT20	36	5180	12.95	19.72
	40	5200	12.89	19.45
	48	5240	13.13	20.56
802.11n-HT40	38	5190	12.87	19.36
	46	5230	12.90	19.50
802.11ac-VHT20	36	5180	12.90	19.50
	40	5200	12.98	19.86
	48	5240	13.02	20.04
802.11ac-VHT40	38	5190	12.70	18.62
	46	5230	12.90	19.50
802.11ac-VHT80	42	5210	12.95	19.72



WLAN (5.3G band)

5.3G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	52	5260	15.54	35.81
	60	5300	15.14	32.66
	64	5320	15.04	31.92
802.11n-HT20	52	5260	13.00	19.95
	60	5300	12.81	19.10
	64	5320	12.80	19.05
802.11n-HT40	54	5270	13.02	20.04
	62	5310	12.66	18.45
802.11ac-VHT20	52	5260	13.16	20.70
	60	5300	13.06	20.23
	64	5320	12.72	18.71
802.11ac-VHT40	54	5270	13.05	20.18
	62	5310	12.69	18.58
802.11ac-VHT80	58	5290	13.12	20.51

WLAN (5.6G band)

5.6G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	100	5500	13.50	22.39
	116	5580	13.79	23.93
	140	5700	14.14	25.94
802.11n-HT20	100	5500	11.72	14.86
	116	5580	12.00	15.85
	140	5700	12.12	16.29
802.11n-HT40	102	5510	10.88	12.25
	110	5550	11.04	12.71
	134	5670	11.35	13.65
802.11ac-VHT20	100	5500	11.77	15.03
	116	5580	12.10	16.22
	140	5700	12.13	16.33
802.11ac-VHT40	102	5510	10.97	12.50
	110	5550	11.00	12.59
	134	5670	11.78	15.07
802.11ac-VHT80	106	5530	11.36	13.68
	122	5610	12.03	15.96



WLAN (5.8G band)

5.8G WLAN				
Mode	Channel Number	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11a20	149	5745	15.03	31.84
	157	5785	14.93	31.12
	165	5825	14.60	28.84
802.11n-HT20	149	5745	13.16	20.70
	157	5785	12.93	19.63
	165	5825	12.70	18.62
802.11n-HT40	151	5755	12.77	18.92
	159	5795	12.63	18.32
802.11ac-VHT20	149	5745	12.97	19.82
	157	5785	12.72	18.71
	165	5825	12.60	18.20
802.11ac-VHT40	151	5755	12.97	19.82
	159	5795	12.71	18.66
802.11ac-VHT80	155	5775	12.93	19.63

Bluetooth

BT				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	3.96	2.49
	39	2441	4.23	2.65
	78	2480	3.82	2.41
$\pi/4$ -QPSK(2Mbps)	0	2402	3.23	2.10
	39	2441	3.59	2.29
	78	2480	3.07	2.03
8DPSK(3Mbps)	0	2402	3.23	2.10
	39	2441	3.54	2.26
	78	2480	3.05	2.02

BLE

BLE				
Mode	Channel Number	Frequency (MHz)	Average Power (dBm)	Output Power (mW)
GFSK(1Mbps)	0	2402	-2.70	0.54
	19	2440	-2.34	0.58
	39	2480	-3.02	0.50
GFSK(2Mbps)	0	2402	-2.73	0.53
	19	2440	-2.39	0.58
	39	2480	-3.03	0.50



NFC

Field strength(dBuV/m)	ERP(dBm)
50.36	-44.84

Note. The power of this EUT NFC is -44.84dBm (0.0000001mW), this power is less than the defined low

power exclusion level (Pmax: 39 mW), so NFC is exemption.



10.2 Tune Up Power

Mode	BT
GFSK	3.5±1dBm
$\pi/4$ -DQPSK	3±1dBm
8DPSK	3±1dBm

Mode	BLE
GFSK(1Mbps)	-2.5±1dBm
GFSK(2Mbps)	-2.5±1dBm

Mode	2.4G WLAN
802.11b	14±1dBm
802.11g	13±1dBm
802.11n(HT20)	12.5±1dBm
802.11n(HT40)	13±1dBm

Mode	5.2G WLAN
802.11a	14.5±1dBm
802.11 n-HT20	12.5±1dBm
802.11 n-HT40	12±1dBm
802.11 ac-VHT20	12.5±1dBm
802.11 ac-VHT40	12±1dBm
802.11 ac-VHT80	12±1dBm

Mode	5.3G WLAN
802.11a	14.7±1dBm
802.11 n-HT20	12.5±1dBm
802.11 n-HT40	12.5±1dBm
802.11 ac-VHT20	12.5±1dBm
802.11 ac-VHT40	12.5±1dBm
802.11 ac-VHT80	12.5±1dBm

Mode	5.6G WLAN
802.11a	13.5±1dBm
802.11 n-HT20	11.5±1dBm
802.11 n-HT40	10.5±1dBm
802.11 ac-VHT20	11.5±1dBm
802.11 ac-VHT40	11±1dBm
802.11 ac-VHT80	11.5±1dBm



Mode	5.8G WLAN
802.11a	14.3±1dBm
802.11 n-HT20	12.5±1dBm
802.11 n-HT40	12±1dBm
802.11 ac-VHT20	12±1dBm
802.11 ac-VHT40	12±1dBm
802.11 ac-VHT80	12±1dBm

Mode	NFC
NFC	-45±1dBm



11. EUT and Test Setup Photo

11.1 EUT Photos

Configure A

Front side



Back side





Right Edge



Left Edge





Top Edge



Bottom Edge

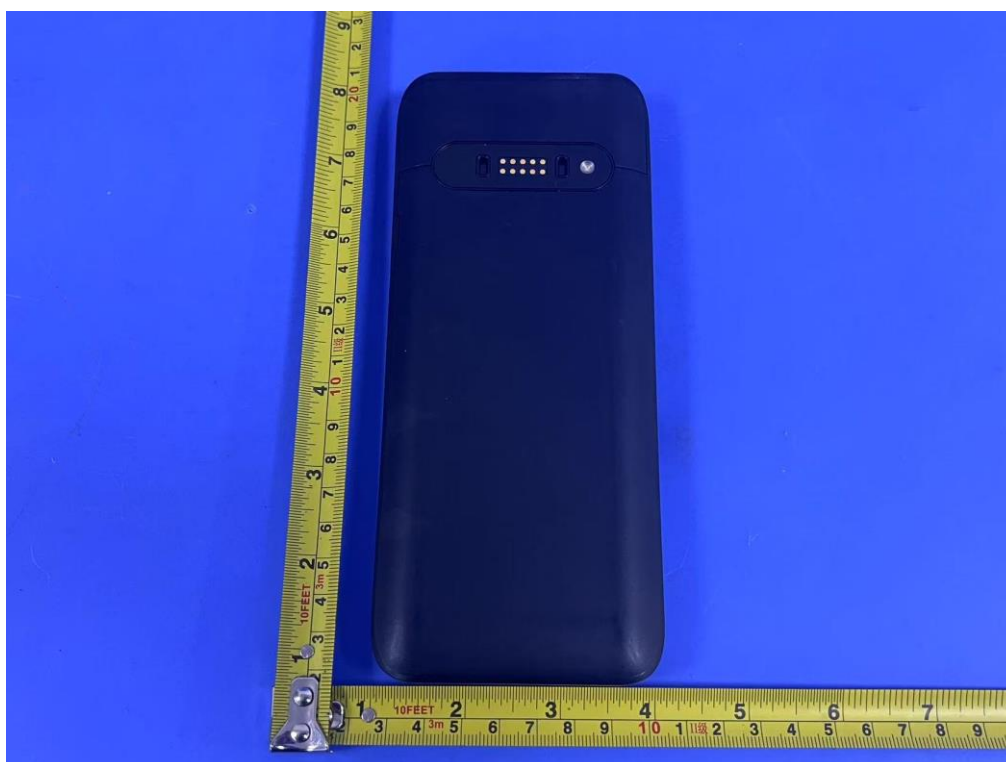




Configure B
Front side



Back side





Right Edge



Left Edge

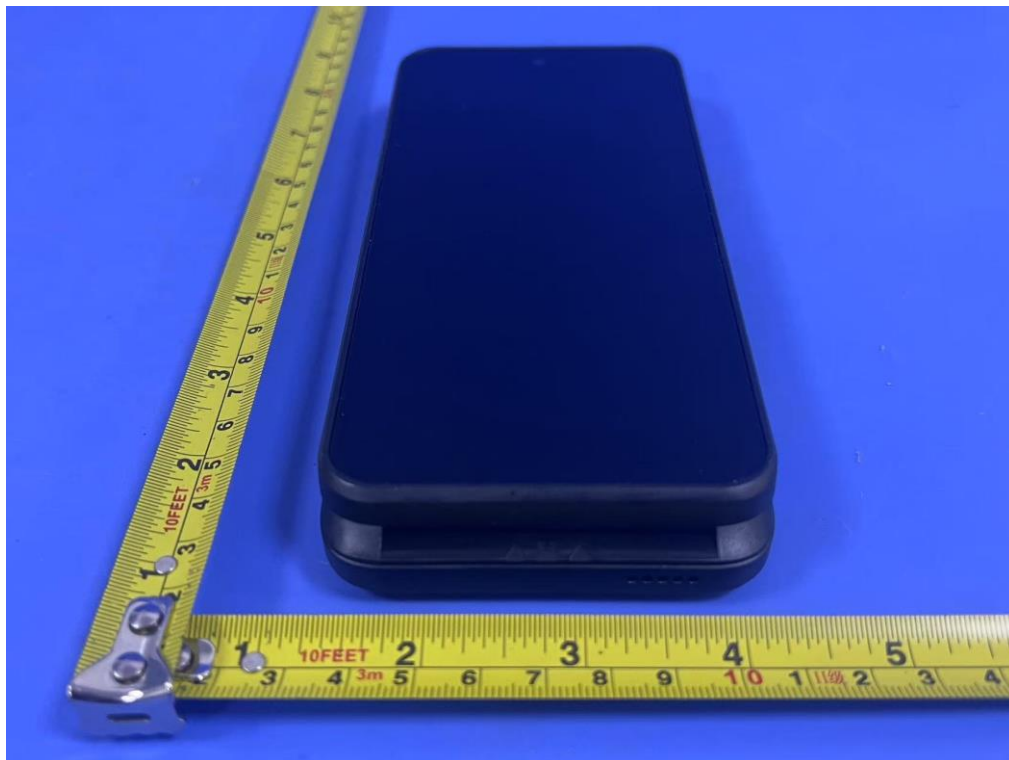




Top Edge



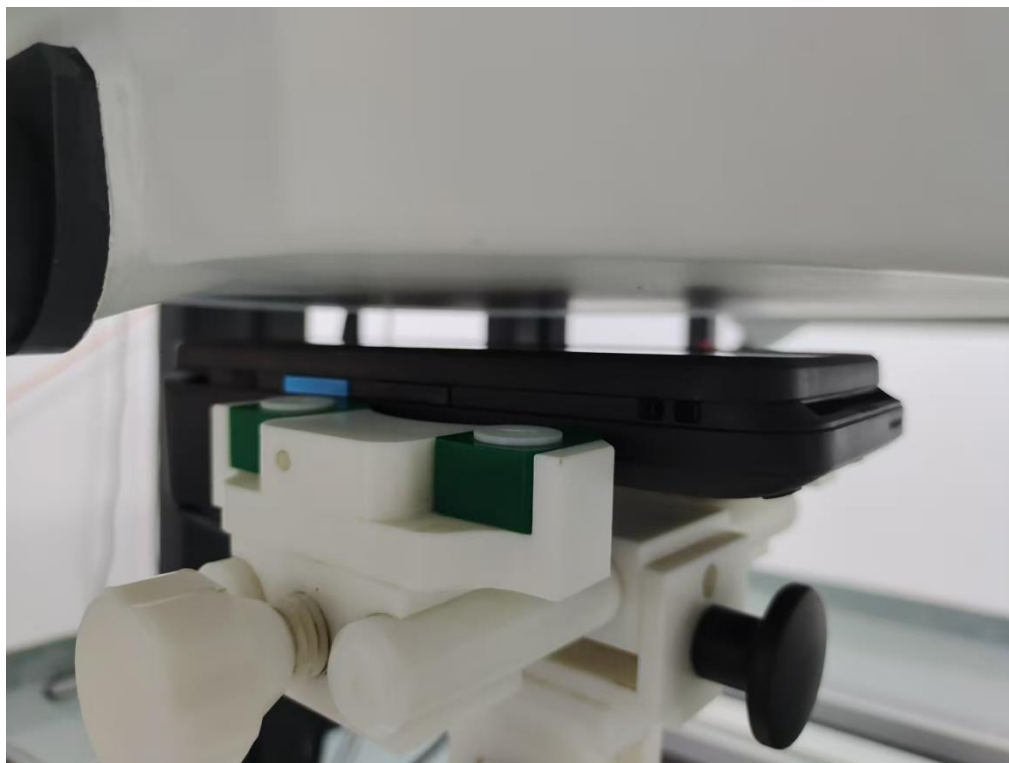
Bottom Edge



11.2 Setup Photos

Configure A

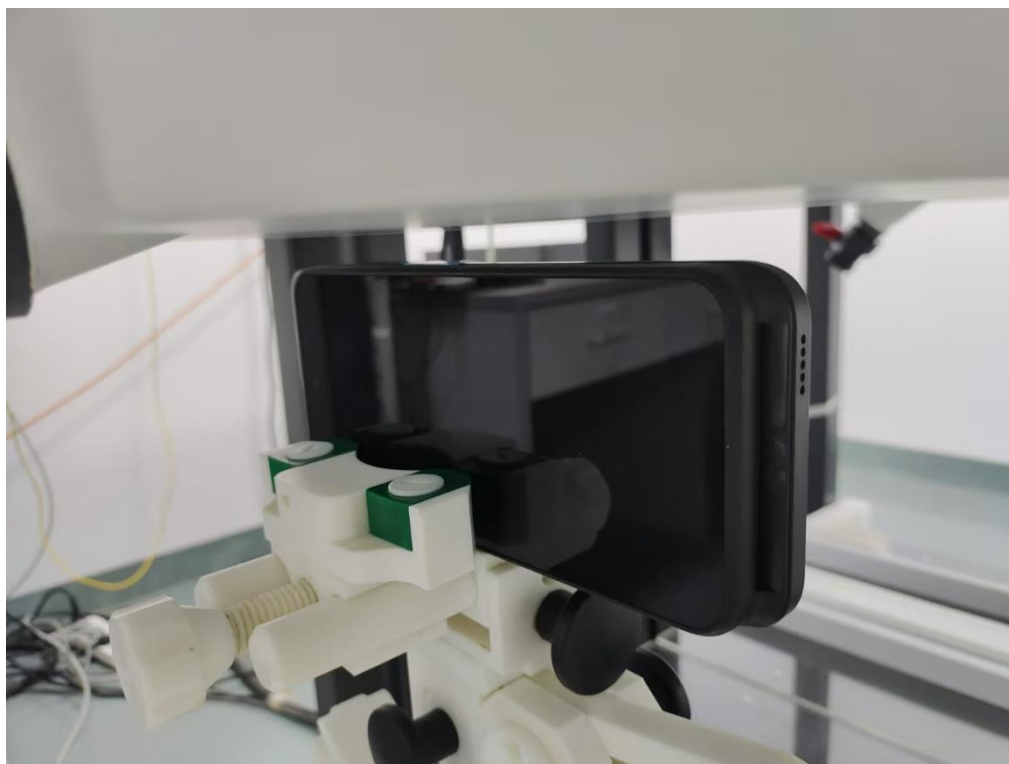
Body and hotspot Front side (separation distance is 10mm)



Body and hotspot Back side (separation distance is 0mm)



Body and hotspot Right side (separation distance is 10mm)

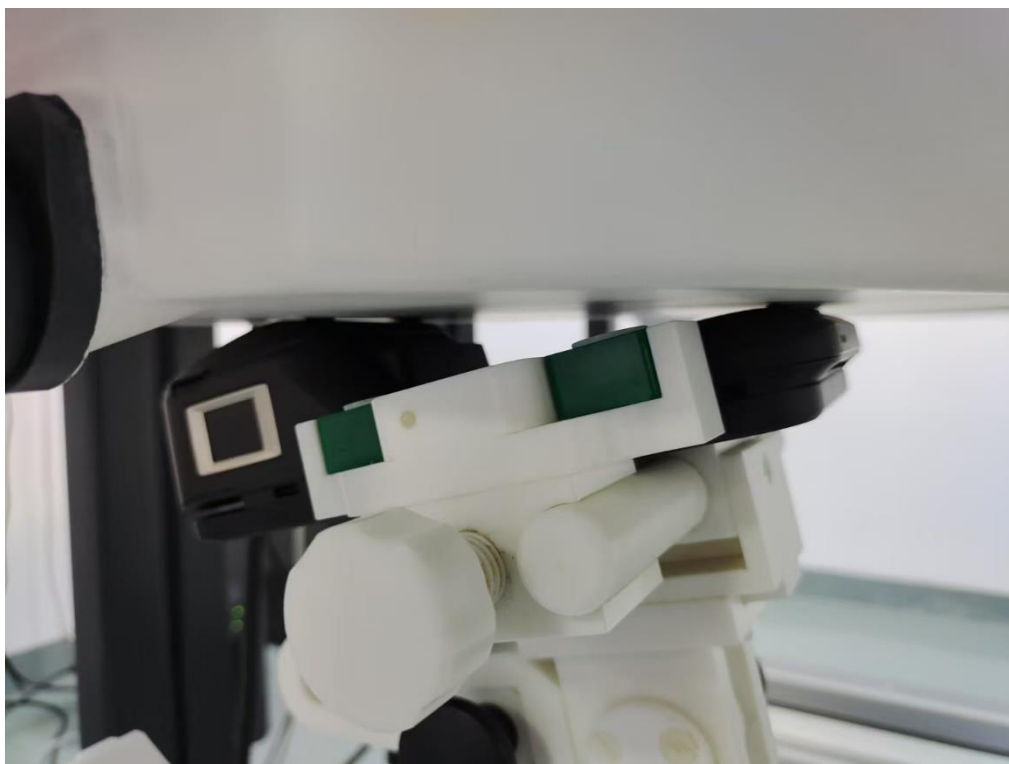


Limbs Front side (separation distance is 0mm)

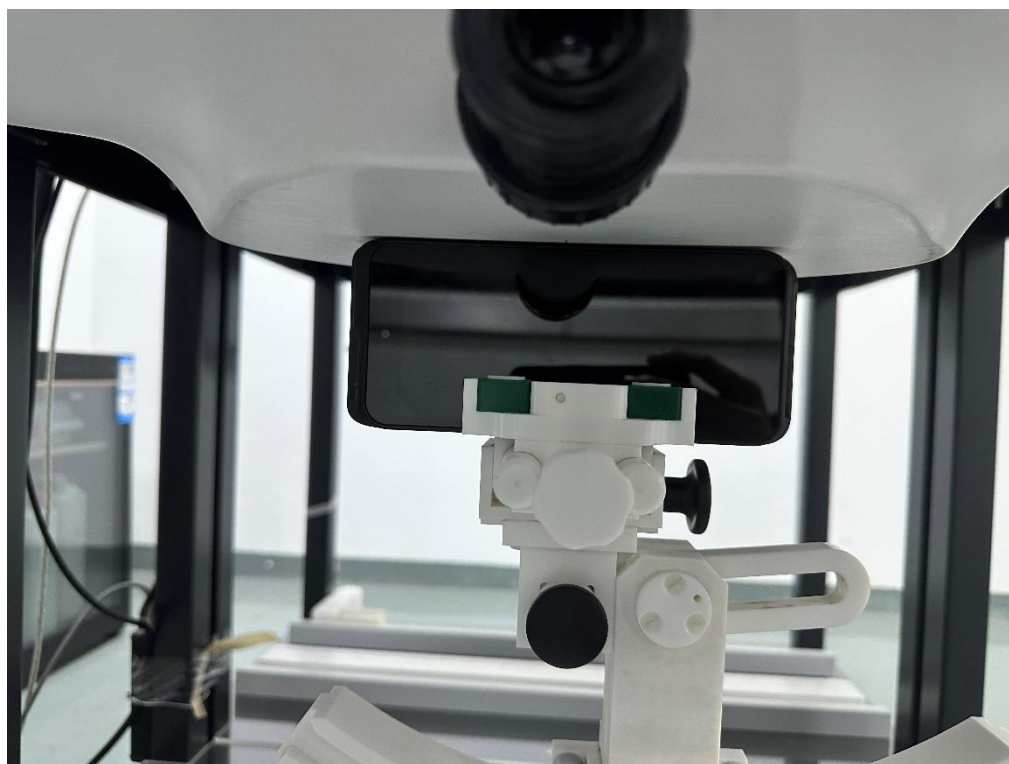




Limbs Back side (separation distance is 0mm)



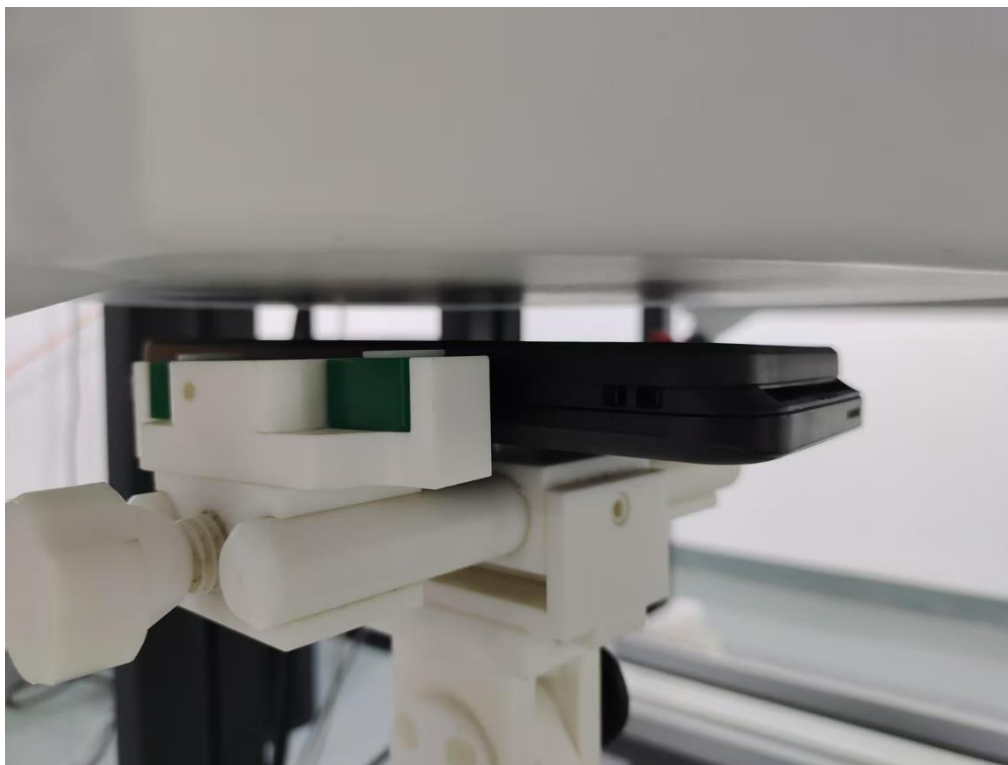
Limbs Right side (separation distance is 0mm)



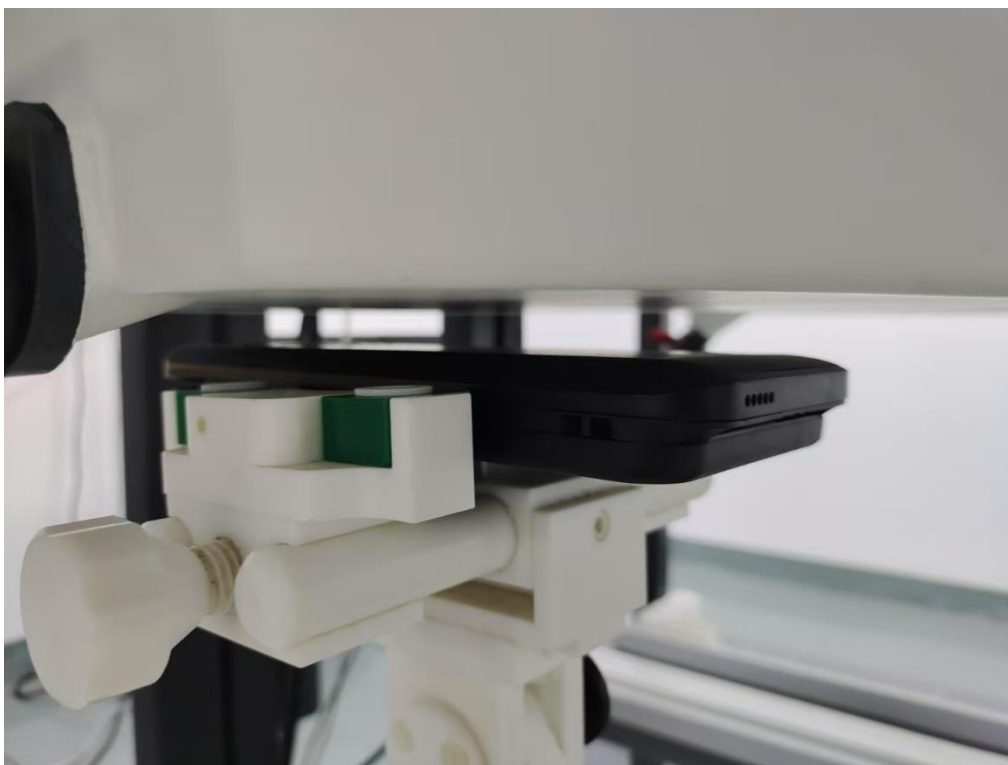


Configure B

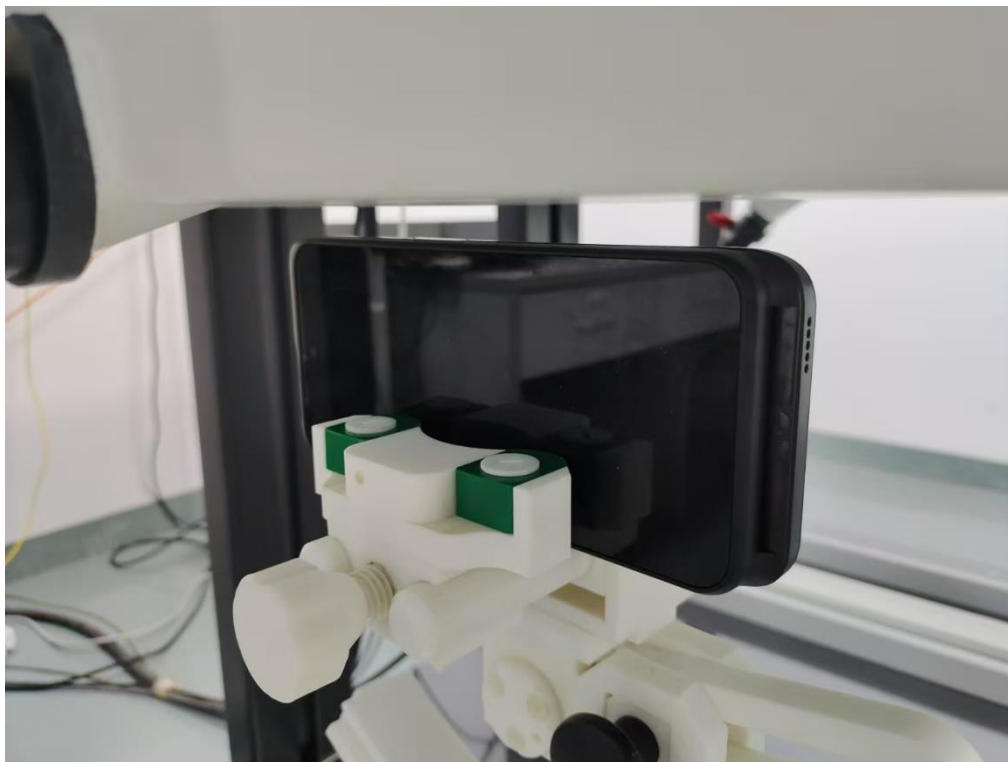
Body and hotspot Front side (separation distance is 10mm)



Body and hotspot Back side (separation distance is 10mm)



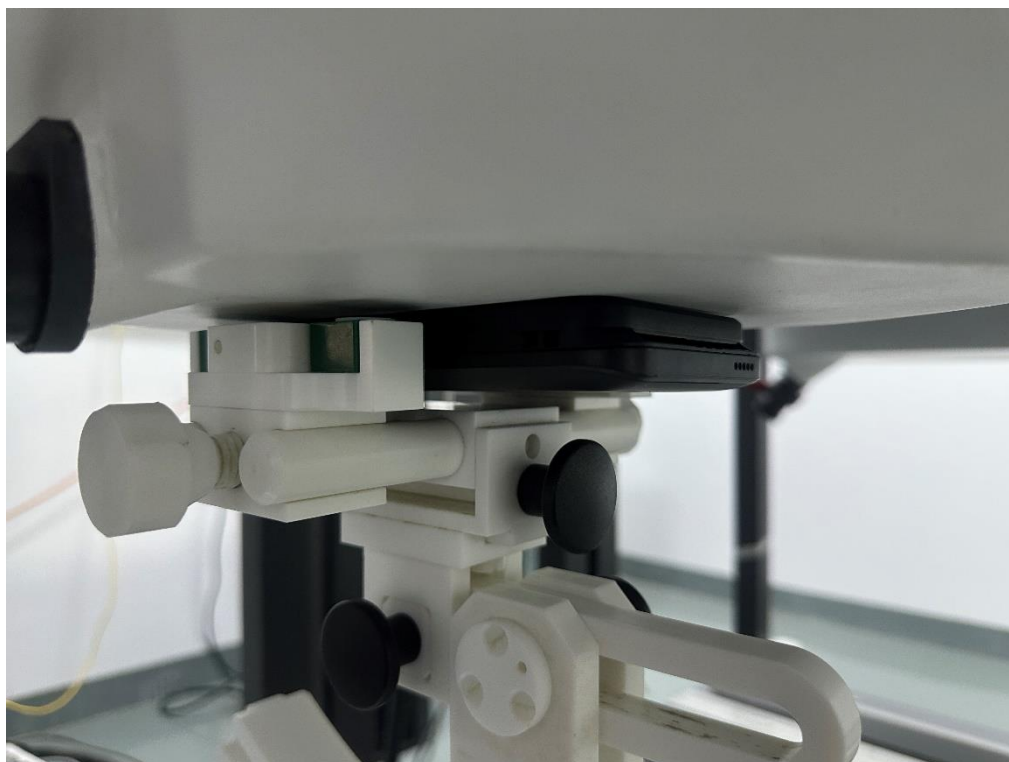
Body and hotspot Right side (separation distance is 10mm)



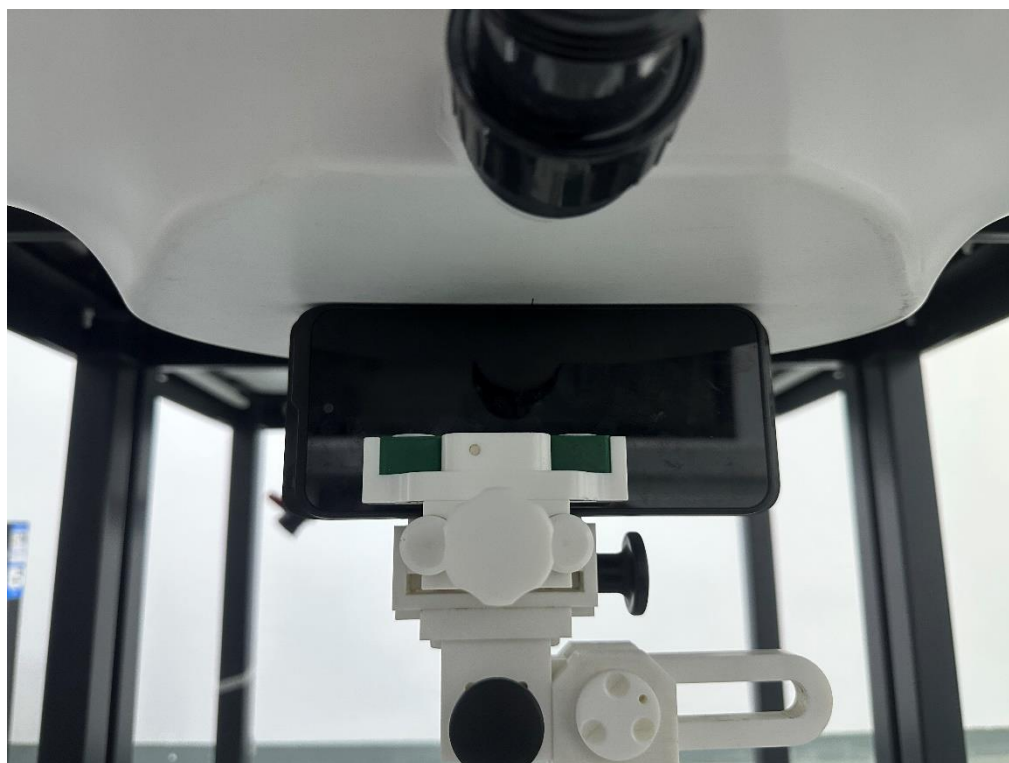
Limbs Front side (separation distance is 0mm)



Limbs Back side (separation distance is 0mm)

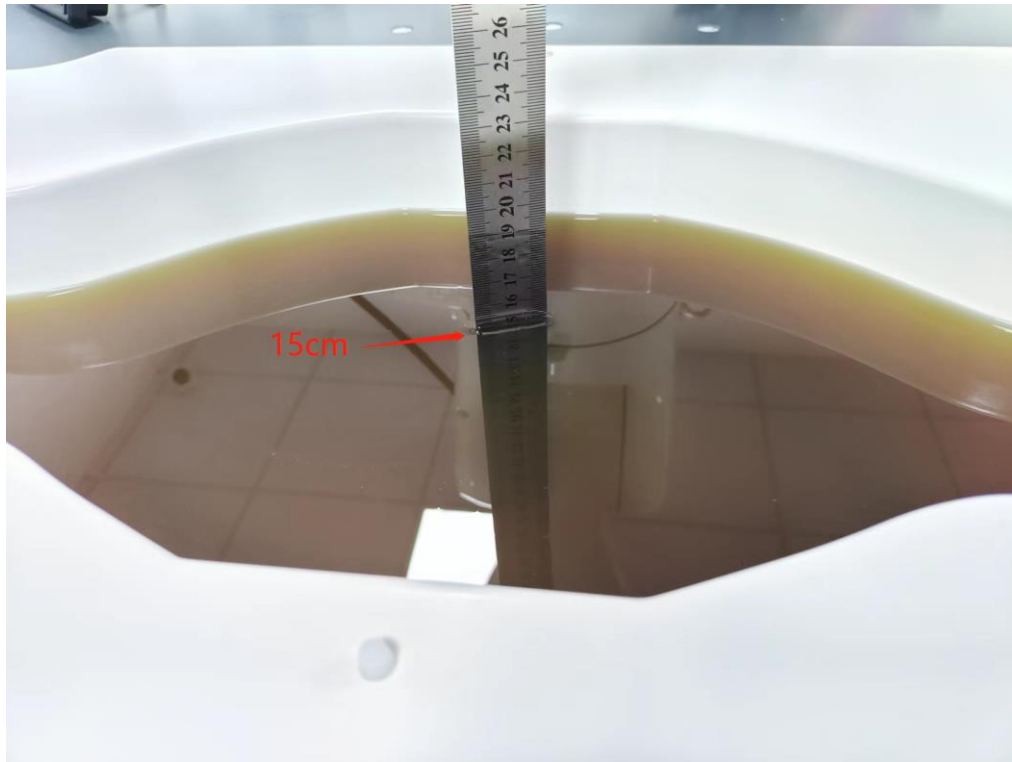


Limbs Right side (separation distance is 0mm)





Liquid depth (15 cm)





12. SAR Result Summary

12.1 Body-worn and Hotspot SAR

Configure A

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift (%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
2.4GHz WLAN	802.11b	Front Side	2412	0.115	1.78	15.00	14.90	0.118	/
		Back Side	2412	0.098	-0.42	15.00	14.90	0.100	/
		Right Side	2412	0.199	-2.89	15.00	14.90	0.204	1
5.2GHz WLAN	802.11a	Front Side	5240	0.348	-1.99	15.50	15.47	0.350	/
		Back Side	5240	0.293	-2.89	15.50	15.47	0.295	/
		Right Side	5240	0.484	3.61	15.50	15.47	0.487	2
5.3GHz WLAN	802.11a	Front Side	5260	0.411	3.44	15.70	15.54	0.426	/
		Back Side	5260	0.351	-2.76	15.70	15.54	0.364	/
		Right Side	5260	0.471	0.18	15.70	14.67	0.597	/
		Right Side	5300	0.534	0.18	15.70	15.32	0.583	/
		Right Side	5320	0.582	0.18	15.70	15.54	0.604	3
5.6GHz WLAN	802.11a	Front Side	5700	0.306	1.92	14.50	14.14	0.332	/
		Back Side	5700	0.255	2.73	14.50	14.14	0.277	/
		Right Side	5700	0.420	0.44	14.50	14.14	0.456	4
5.8GHz WLAN	802.11a	Front Side	5745	0.254	2.98	15.30	15.03	0.270	/
		Back Side	5745	0.223	-1.58	15.30	15.03	0.237	/
		Right Side	5745	0.360	0.70	15.30	15.03	0.383	5

Configure B

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift (%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
2.4GHz WLAN	802.11b	Front Side	2412	0.100	-1.86	15.00	14.90	0.102	/
		Back Side	2412	0.090	0.82	15.00	14.90	0.092	/
		Right Side	2412	0.135	1.67	15.00	14.90	0.138	11
5.2GHz WLAN	802.11a	Front Side	5240	0.561	-3.50	15.50	15.47	0.565	/
		Back Side	5240	0.475	-0.94	15.50	15.47	0.478	/
		Right Side	5240	0.775	-0.42	15.50	15.47	0.780	12
5.3GHz WLAN	802.11a	Front Side	5260	0.401	2.80	15.70	15.54	0.416	/
		Back Side	5260	0.354	3.12	15.70	15.54	0.367	/
		Right Side	5260	0.568	-1.33	15.70	15.54	0.589	13
5.6GHz WLAN	802.11a	Front Side	5700	0.509	-1.82	14.50	14.14	0.553	/
		Back Side	5700	0.434	3.30	14.50	14.14	0.472	/
		Right Side	5700	0.708	3.25	14.50	14.14	0.769	14
5.8GHz WLAN	802.11a	Front Side	5745	0.564	-1.29	15.30	15.03	0.600	/
		Back Side	5745	0.489	0.84	15.30	15.03	0.520	/
		Right Side	5745	0.801	-2.79	15.30	15.03	0.852	15
		Right Side	5785	0.768	-2.79	15.30	14.93	0.836	/
		Right Side	5825	0.722	-2.79	15.30	14.60	0.848	/

Note:

- The test separation of all above table Configure A back side is 0mm, other all side is 10mm.
- Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - 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.
 - Scaled SAR(W/kg) = Measured SAR(W/kg) *Tune-up Scaling Factor
- When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.



12.2 Limbs SAR

Configure A

Band	Model	Test Position	Freq.	SAR (10g) (W/kg)	Power Drift (%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
2.4GHz WLAN	802.11b	Front Side	2412	0.224	-0.04	15.00	14.90	0.229	/
		Back Side	2412	0.183	-1.35	15.00	14.90	0.187	/
		Right Side	2412	0.294	2.29	15.00	14.90	0.301	6
5.2GHz WLAN	802.11a	Front Side	5240	0.490	1.07	15.50	15.47	0.493	/
		Back Side	5240	0.416	3.44	15.50	15.47	0.419	/
		Right Side	5240	0.677	3.22	15.50	15.47	0.682	7
5.3GHz WLAN	802.11a	Front Side	5260	0.491	-3.18	15.70	15.54	0.509	/
		Back Side	5260	0.424	-3.45	15.70	15.54	0.440	/
		Right Side	5260	0.678	-3.25	15.70	15.54	0.703	8
		Right Side	5300	0.603	-3.25	15.70	15.14	0.686	/
		Right Side	5320	0.580	-3.25	15.70	15.04	0.675	/
5.6GHz WLAN	802.11a	Front Side	5700	0.292	-0.71	14.50	14.14	0.317	/
		Back Side	5700	0.245	0.57	14.50	14.14	0.266	/
		Right Side	5700	0.396	-2.31	14.50	14.14	0.430	9
5.8GHz WLAN	802.11a	Front Side	5745	0.309	1.33	15.30	15.03	0.329	/
		Back Side	5745	0.263	0.19	15.30	15.03	0.280	/
		Right Side	5745	0.415	-3.68	15.30	15.03	0.442	10

Configure B

Band	Model	Test Position	Freq.	SAR (10g) (W/kg)	Power Drift (%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
2.4GHz WLAN	802.11b	Front Side	2412	0.149	-2.95	15.00	14.90	0.152	/
		Back Side	2412	0.129	-1.32	15.00	14.90	0.132	/
		Right Side	2412	0.204	1.61	15.00	14.90	0.209	16
5.2GHz WLAN	802.11a	Front Side	5240	0.442	0.37	15.50	15.47	0.445	/
		Back Side	5240	0.382	0.71	15.50	15.47	0.385	/
		Right Side	5240	0.613	-2.42	15.50	15.47	0.617	17
5.3GHz WLAN	802.11a	Front Side	5260	0.504	2.31	15.70	15.54	0.523	/
		Back Side	5260	0.432	3.87	15.70	15.54	0.448	/
		Right Side	5260	0.711	3.82	15.70	15.54	0.738	18
5.6GHz WLAN	802.11a	Front Side	5700	0.550	0.34	14.50	14.14	0.598	/
		Back Side	5700	0.474	-2.19	14.50	14.14	0.515	/
		Right Side	5700	0.763	-3.16	14.50	14.14	0.829	19
5.8GHz WLAN	802.11a	Front Side	5745	0.677	2.04	15.30	15.03	0.720	/
		Back Side	5745	0.589	-0.07	15.30	15.03	0.627	/
		Right Side	5745	0.957	-2.24	15.30	15.03	1.018	20
		Right Side	5785	0.893	-2.24	15.30	14.93	0.972	/
		Right Side	5825	0.815	-2.24	15.30	14.60	0.958	/

Note:

- The test separation of all above table is 0mm.
- Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - 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.
 - Scaled SAR(W/kg) = Measured SAR(W/kg) *Tune-up Scaling Factor
- When the user enables the personal Wireless router functions for the handsets, actual operations include simultaneous transmission of both the Wi-Fi transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.



12.3 Repeated SAR

Configure B

Band	Mode	Test Position	Ch.	Result 1g (W/Kg)	Power Drift (%)	Max. Turn-up Power (dBm)	Meas. Output Power (dBm)	Scaled SAR (W/Kg)
5.8GHz WLAN	802.11a	Right Side	5745	0.920	4.00	15.30	15.03	0.979
		Right Side	5785	0.891	1.52	15.30	14.93	0.970
		Right Side	5825	0.796	0.31	15.30	14.60	0.935

12.4 Repeated SAR measurement

Configure B

Band	Mode	Test Position	Ch.	Original Measured SAR 1g(W/kg)	1 st Repeated SAR 1g	Ratio
5.8GHz WLAN	802.11a	Right Side	5745	0.801	0.769	1.041
		Right Side	5785	0.768	0.760	1.010
		Right Side	5825	0.722	0.709	1.018

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.



13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
2450MHz Dipole	MVG	DIP2G450	SN 06/22 DIP2G450-645	2022.02.11	2025.02.10
5000MHz Dipole	MVG	DIP5G000	SN 06/22 DIP5G000-653	2022.02.11	2025.02.10
E-Field Probe	MVG	EPGO364	SN 04/22 EPGO364	2024.02.07	2025.02.06
Liquid Calibration Kit	MVG	OCPG 87	SN 06/22 OCPG87	2024.02.07	2025.02.06
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-HC	2024.03.25	2025.03.24
Multi Meter	DMM6500	Keithley	4527252	2024.03.15	2025.03.14
Signal Generator	Keysight	N5182B	MY59100717	2024.03.09	2025.03.08
Wireless Communication Test Set	R&S	CMW500	137737	2024.03.09	2025.03.08
Power Sensor	R&S	Z11	116184	2024.02.23	2025.02.22
Electronic Temperature hygrometer	N/A	ST-W2318	N/A	2024.03.11	2025.03.10
Temperature hygrometer	N/A	TP101	N/A	2024.03.11	2025.03.10



Appendix A. System Validation Plots

System Performance Check Data (2450MHz)

Type: Phone measurement (Complete)

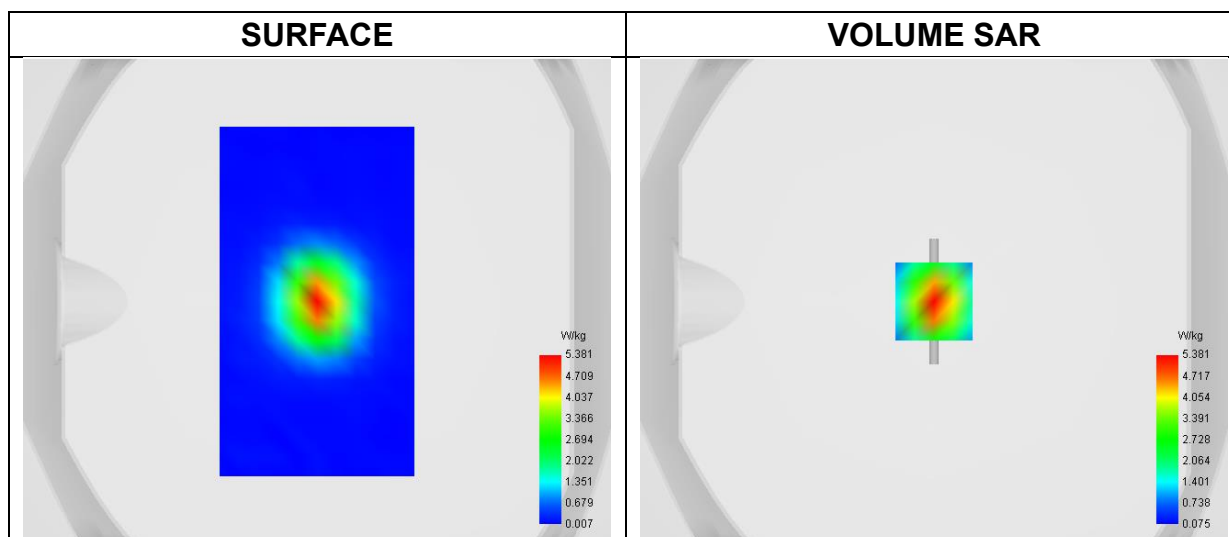
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement:2024-12-07

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW
Frequency (MHz)	2450.000
Relative permittivity	39.44
Conductivity (S/m)	1.83
Probe	SN 04/22 EPGO364
ConvF	2.30
Crest factor:	1:1

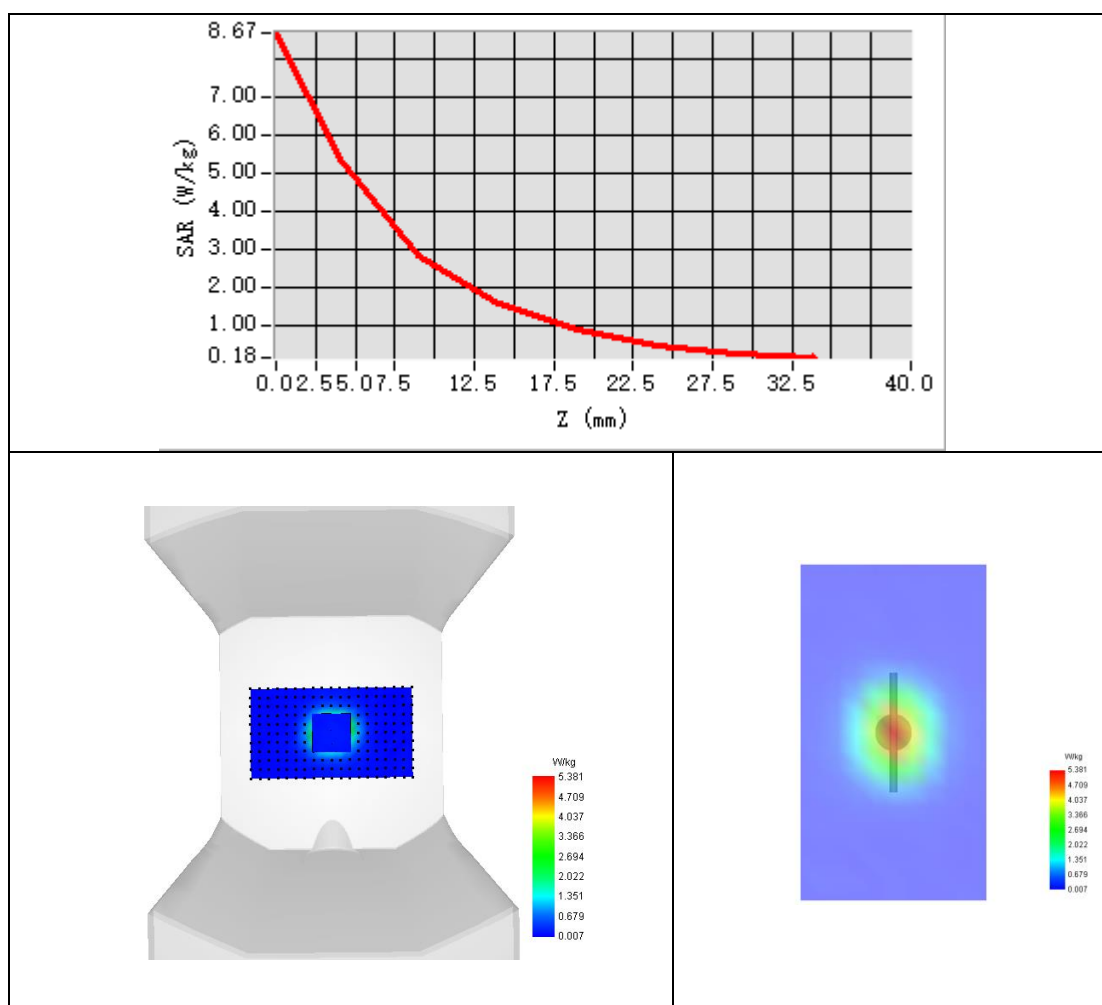


Maximum location: X=0.00, Y=0.00 ; SAR Peak: 8.61 W/kg

SAR 10g (W/Kg)	2.404
SAR 1g (W/Kg)	5.408



Z Axis Scan





System Performance Check Data (5200MHz)

Type: Phone measurement (Complete)

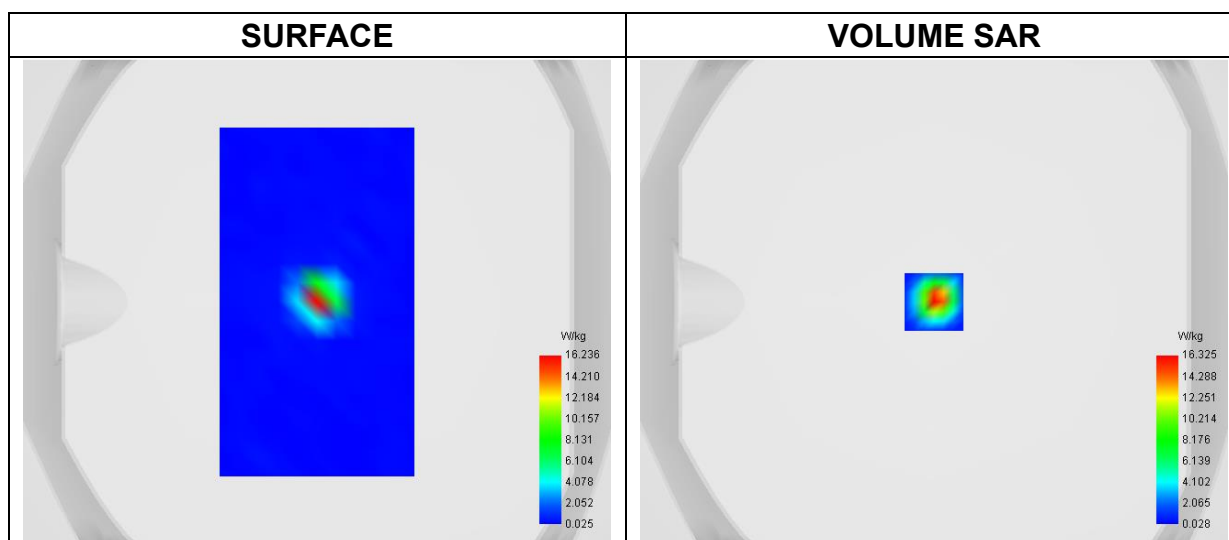
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement:2024-12-06

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW
Frequency (MHz)	5200.000
Relative permittivity	36.48
Conductivity (S/m)	4.65
Probe	SN 04/22 EPGO364
ConvF	1.98
Crest factor:	1:1

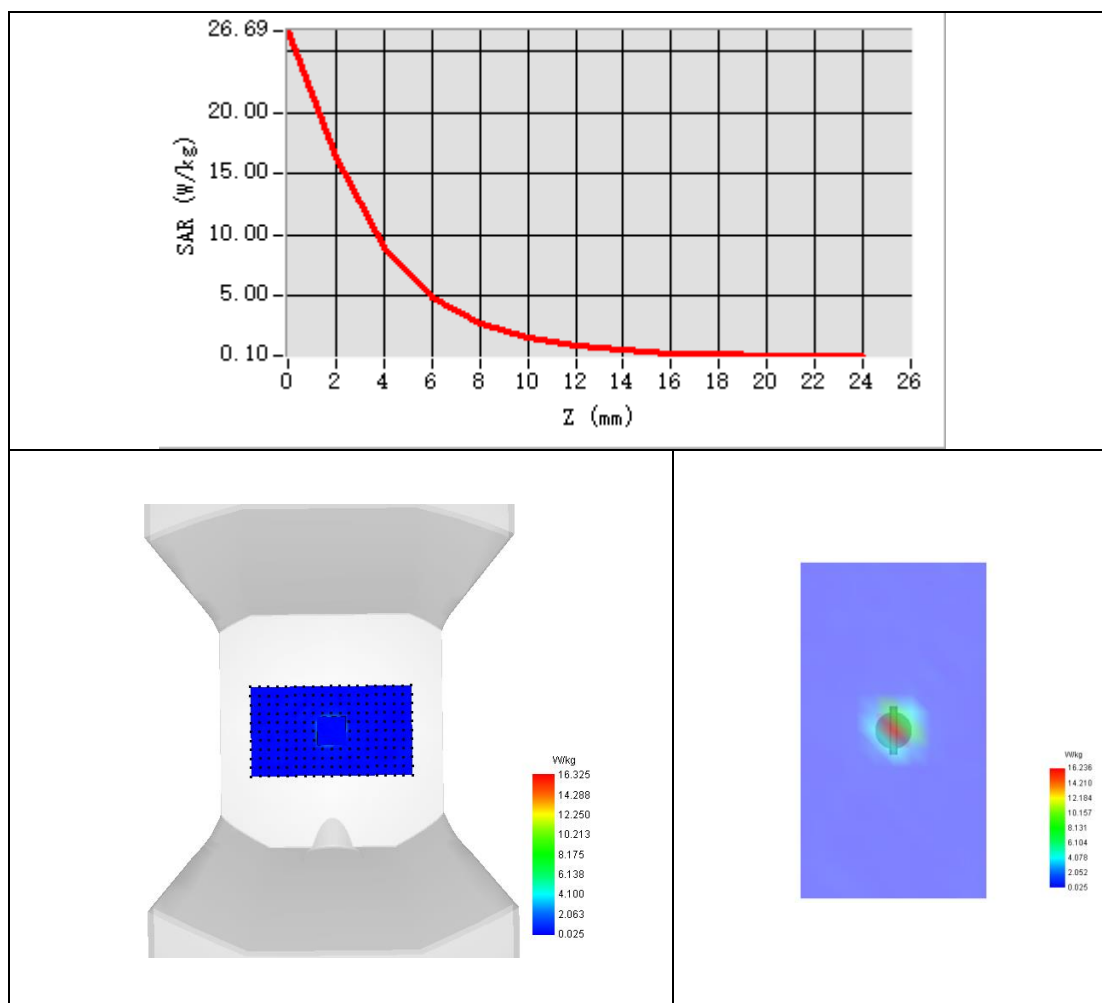


Maximum location: X=0.00, Y=0.00 ; SAR Peak: 28.79 W/kg

SAR 10g (W/Kg)	2.312
SAR 1g (W/Kg)	8.105



Z Axis Scan





System Performance Check Data (5400MHz)

Type: Phone measurement (Complete)

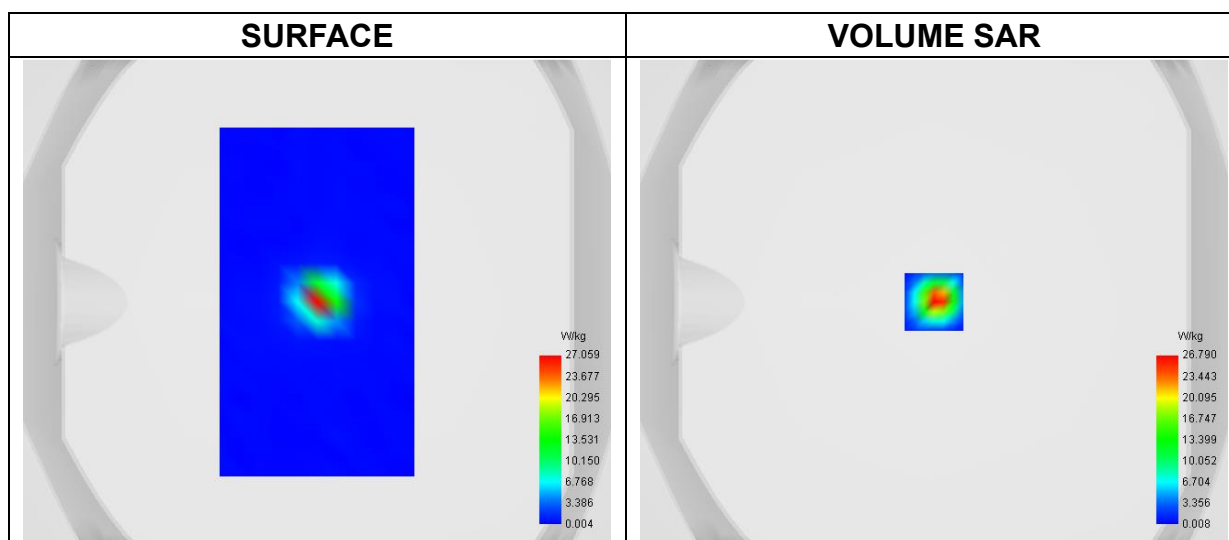
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement:2024-12-10

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5400
Channels	Middle
Signal	CW
Frequency (MHz)	5400.000
Relative permittivity	36.58
Conductivity (S/m)	4.83
Probe	SN 04/22 EPGO364
ConvF	1.83
Crest factor:	1:1

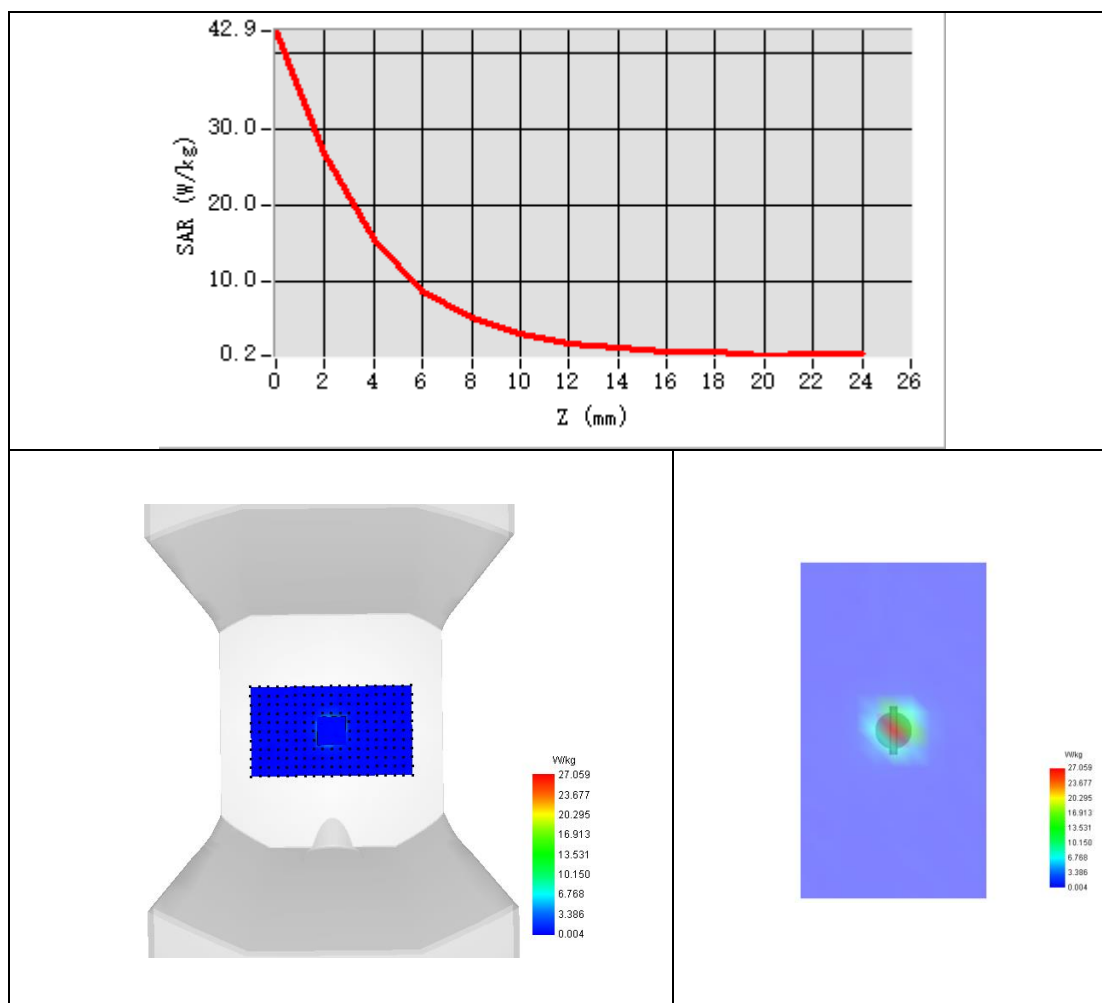


Maximum location: X=0.00, Y=0.00 ; SAR Peak: 46.43 W/kg

SAR 10g (W/Kg)	2.384
SAR 1g (W/Kg)	8.458



Z Axis Scan





System Performance Check Data (5600MHz)

Type: Phone measurement (Complete)

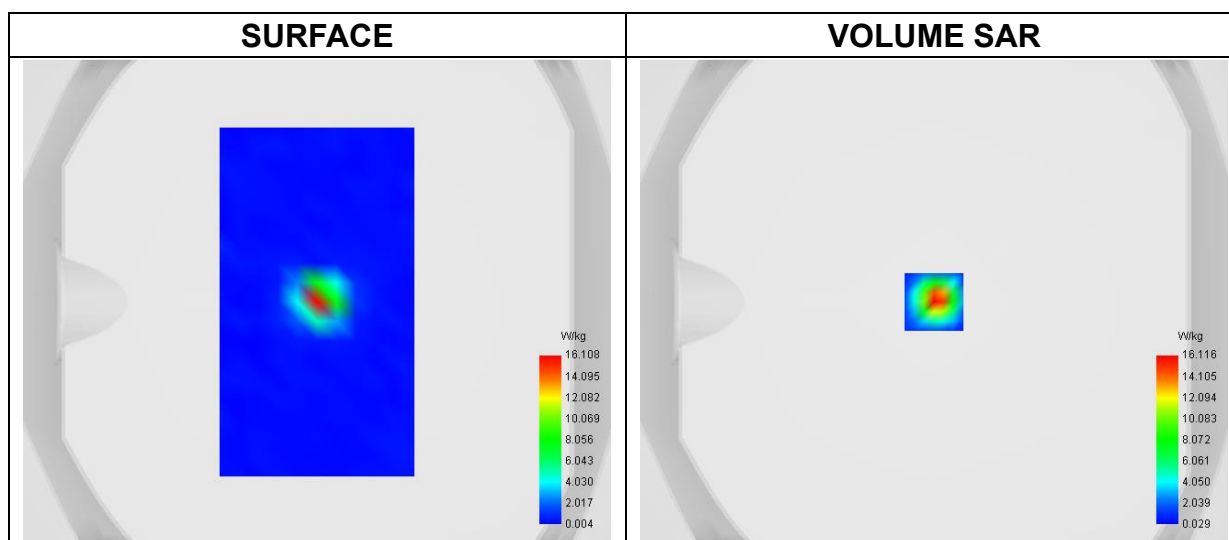
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement:2024-12-08

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5600
Channels	Middle
Signal	CW
Frequency (MHz)	5600.000
Relative permittivity	36.68
Conductivity (S/m)	5.08
Probe	SN 04/22 EPG0364
ConvF	1.86
Crest factor:	1:1

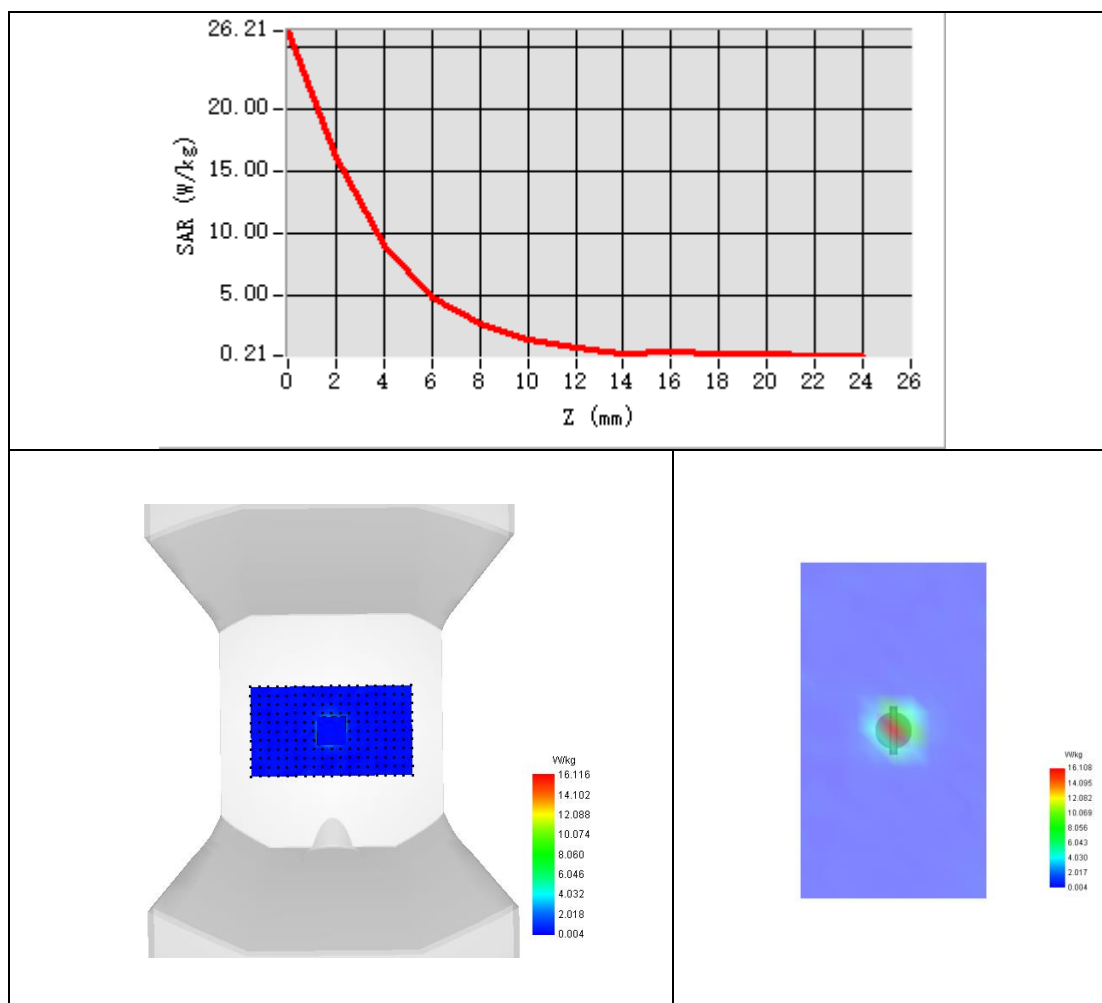


Maximum location: X=-0.00, Y=0.00 ; SAR Peak: 27.99 W/kg

SAR 10g (W/Kg)	2.374
SAR 1g (W/Kg)	8.065



Z Axis Scan





System Performance Check Data (5800MHz)

Type: Phone measurement (Complete)

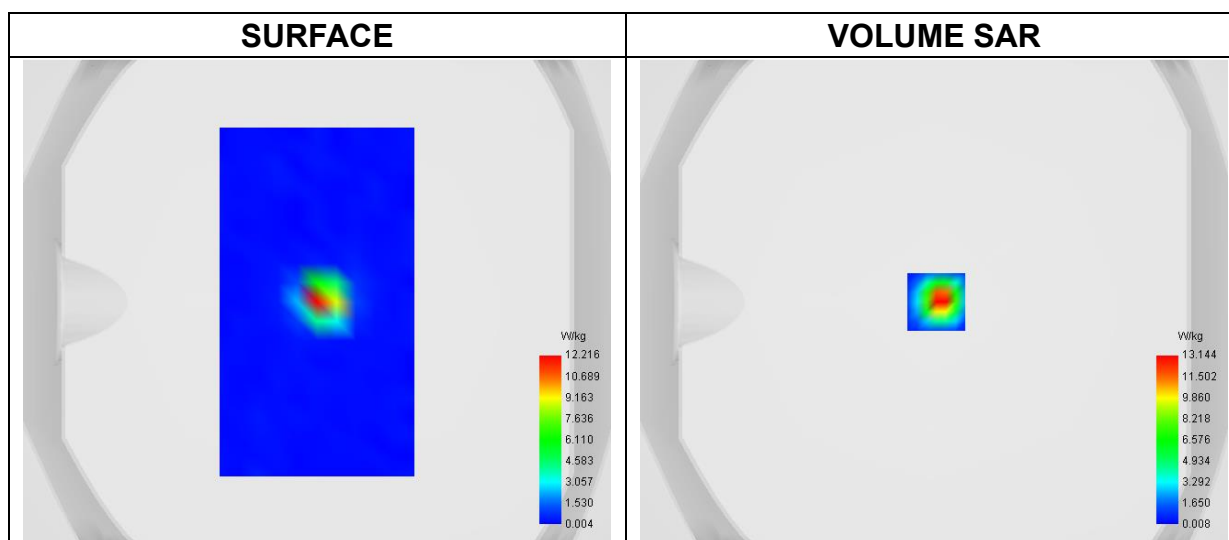
Area scan resolution: dx=8mm, dy=8mm

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

Date of measurement:2024-12-09

Experimental conditions.

Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW
Frequency (MHz)	5800.000
Relative permittivity	35.97
Conductivity (S/m)	5.25
Probe	SN 04/22 EPGO364
ConvF	1.71
Crest factor:	1:1

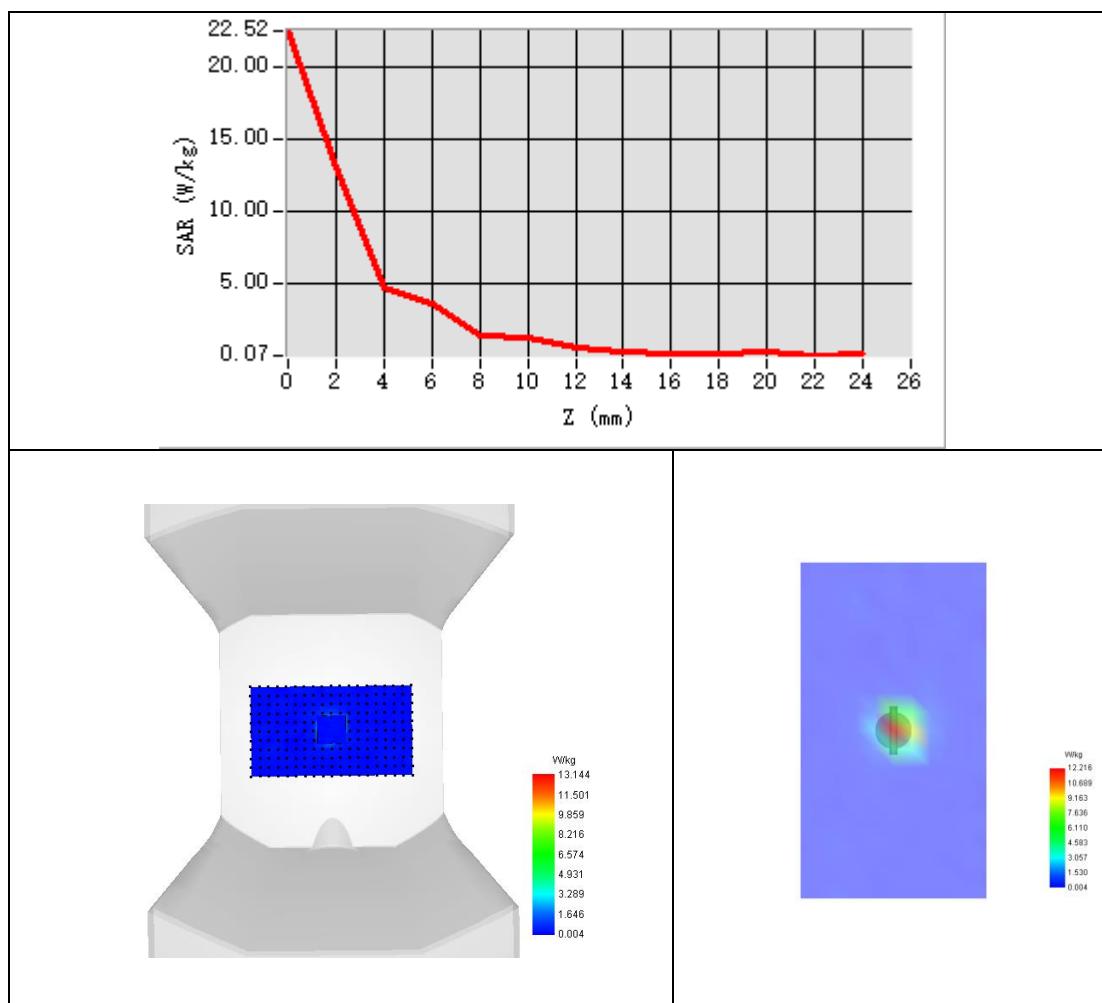


Maximum location: X=1.00, Y=0.00 ; SAR Peak: 24.09 W/kg

SAR 10g (W/Kg)	2.367
SAR 1g (W/Kg)	8.148



Z Axis Scan



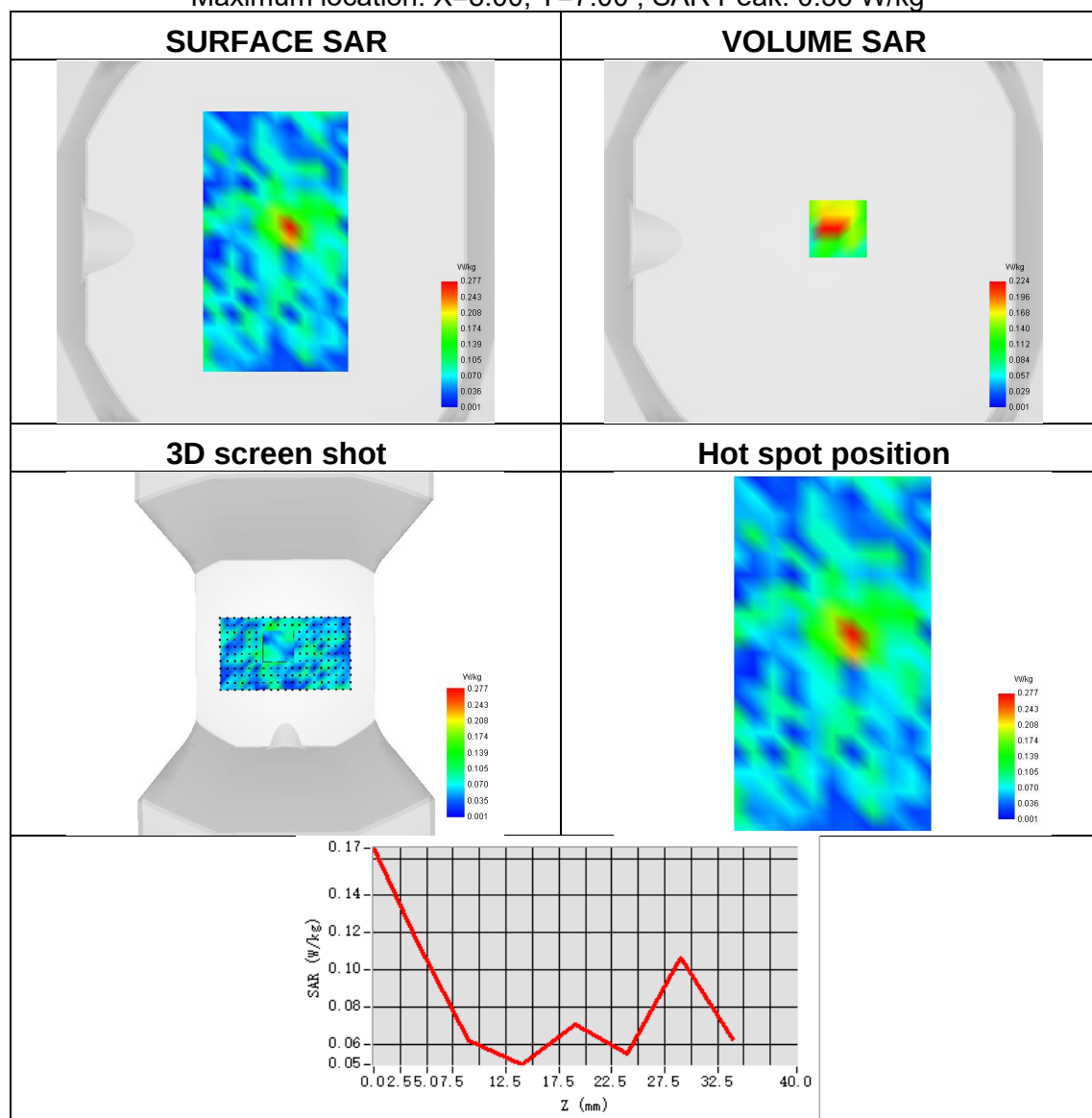


Appendix B. SAR Test Plots

Plot 1: SP60 with printer

Test Date	2024-12-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7, dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Right Side
Band	ISM
Signal	IEEE 802.11b
Frequency	2412
SAR 10g (W/Kg)	0.119
SAR 1g (W/Kg)	0.199
ConvF	2.24
Relative permittivity	39.44
Conductivity (S/m)	1.83

Maximum location: X=8.00, Y=7.00 ; SAR Peak: 0.36 W/kg

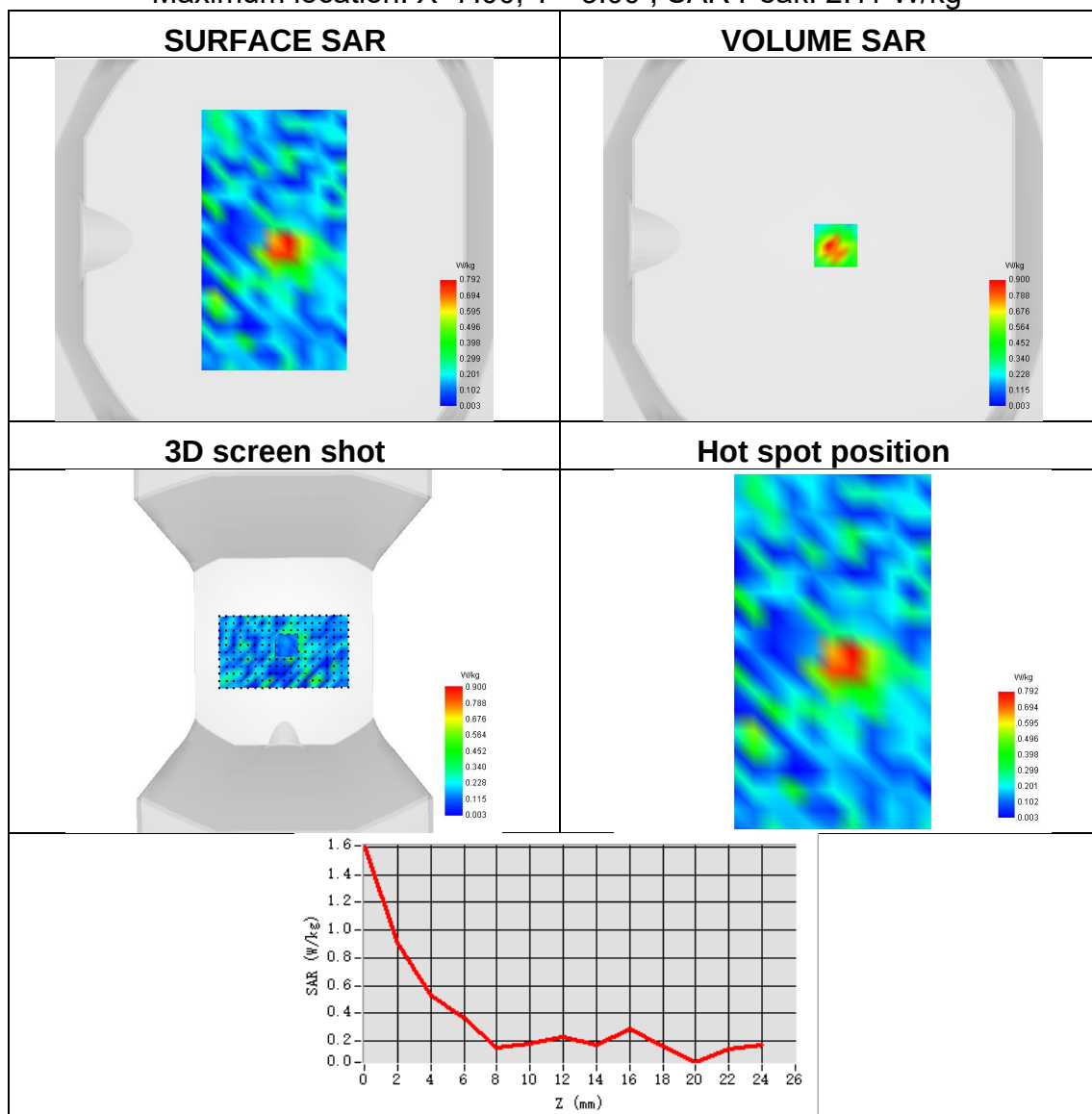




Plot 2:

Test Date	2024-12-06
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-1
Signal	IEEE 802.11a
Frequency	5240
SAR 10g (W/Kg)	0.208
SAR 1g (W/Kg)	0.484
ConvF	1.91
Relative permittivity	36.48
Conductivity (S/m)	4.65

Maximum location: X=7.00, Y=-3.00 ; SAR Peak: 2.11 W/kg

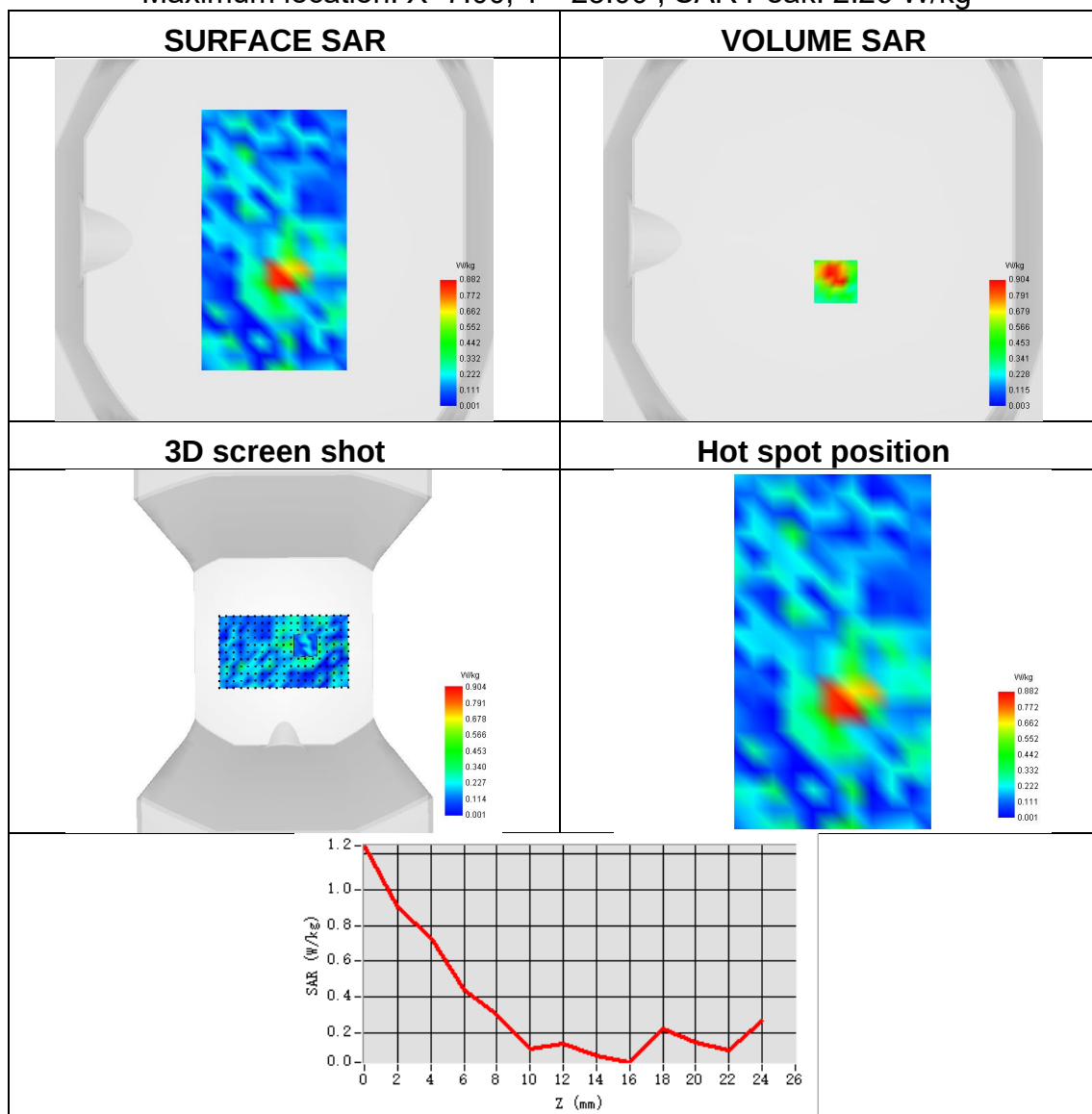




Plot 3:

Test Date	2024-12-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2a
Signal	IEEE 802.11a
Frequency	5260
SAR 10g (W/Kg)	0.231
SAR 1g (W/Kg)	0.582
ConvF	1.91
Relative permittivity	36.58
Conductivity (S/m)	4.83

Maximum location: X=7.00, Y=-23.00 ; SAR Peak: 2.26 W/kg

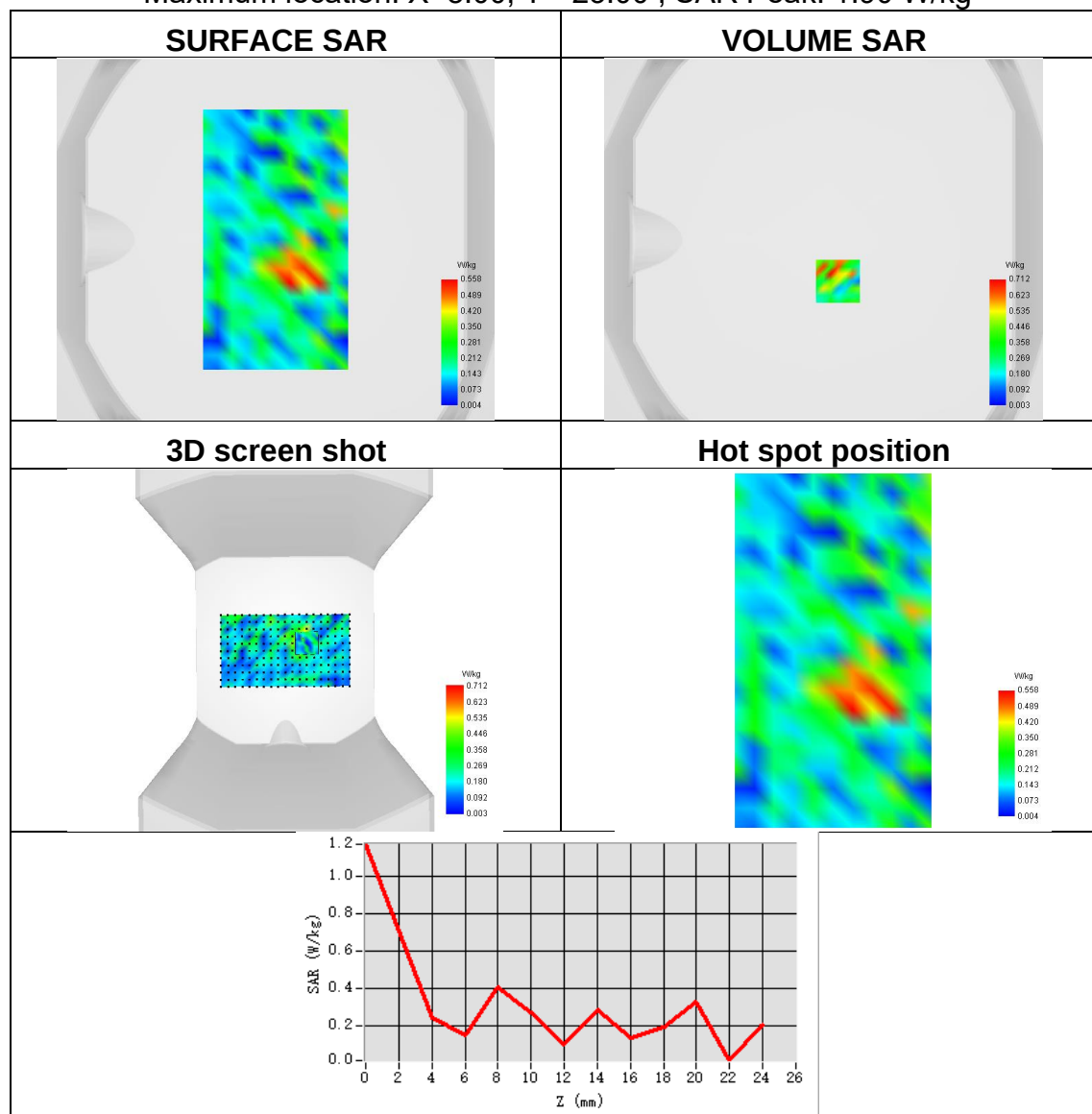




Plot 4:

Test Date	2024-12-08
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2c
Signal	IEEE 802.11a
Frequency	5700
SAR 10g (W/Kg)	0.196
SAR 1g (W/Kg)	0.420
ConvF	1.76
Relative permittivity	36.68
Conductivity (S/m)	5.08

Maximum location: X=8.00, Y=-23.00 ; SAR Peak: 1.90 W/kg

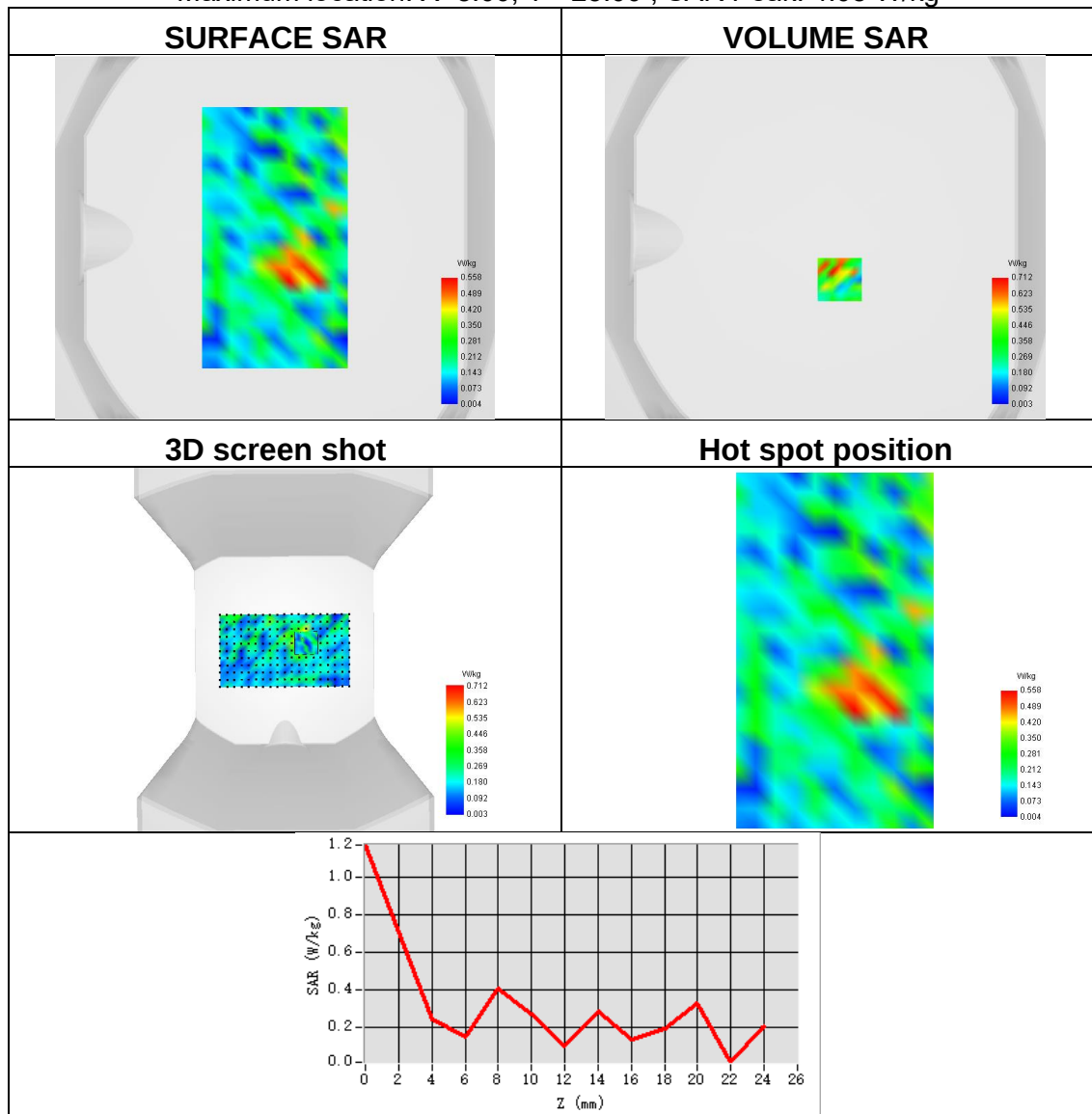




Plot 5:

Test Date	2024-12-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-3
Signal	IEEE 802.11a
Frequency	5745
SAR 10g (W/Kg)	0.397
SAR 1g (W/Kg)	0.937
ConvF	1.70
Relative permittivity	35.97
Conductivity (S/m)	5.25

Maximum location: X=8.00, Y=-25.00 ; SAR Peak: 4.08 W/kg

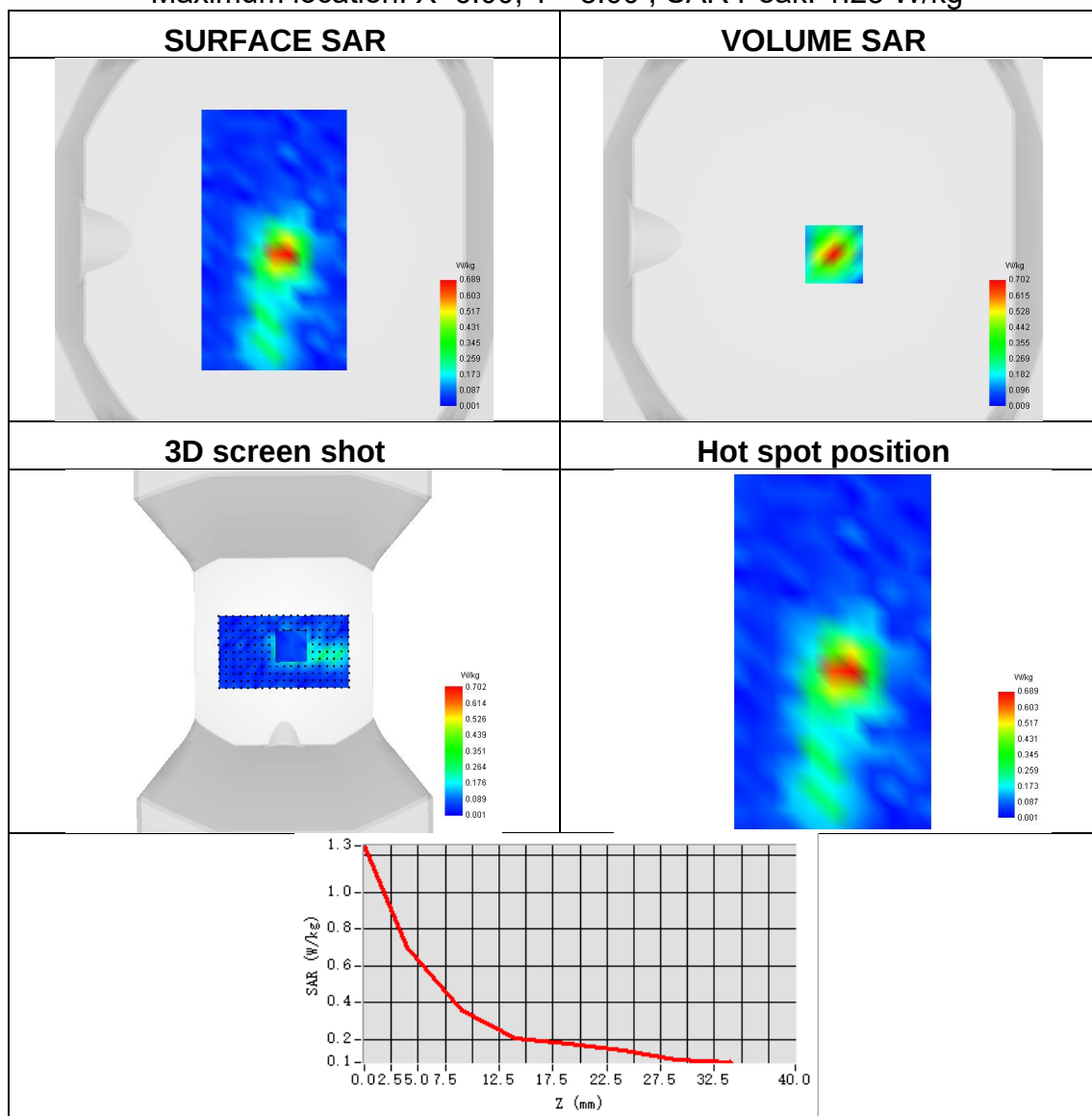




Plot 6:

Test Date	2024-12-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Right Side
Band	ISM
Signal	IEEE 802.11b
Frequency	2412
SAR 10g (W/Kg)	0.294
SAR 1g (W/Kg)	0.639
ConvF	2.24
Relative permittivity	39.44
Conductivity (S/m)	1.83

Maximum location: X=6.00, Y=-8.00 ; SAR Peak: 1.23 W/kg

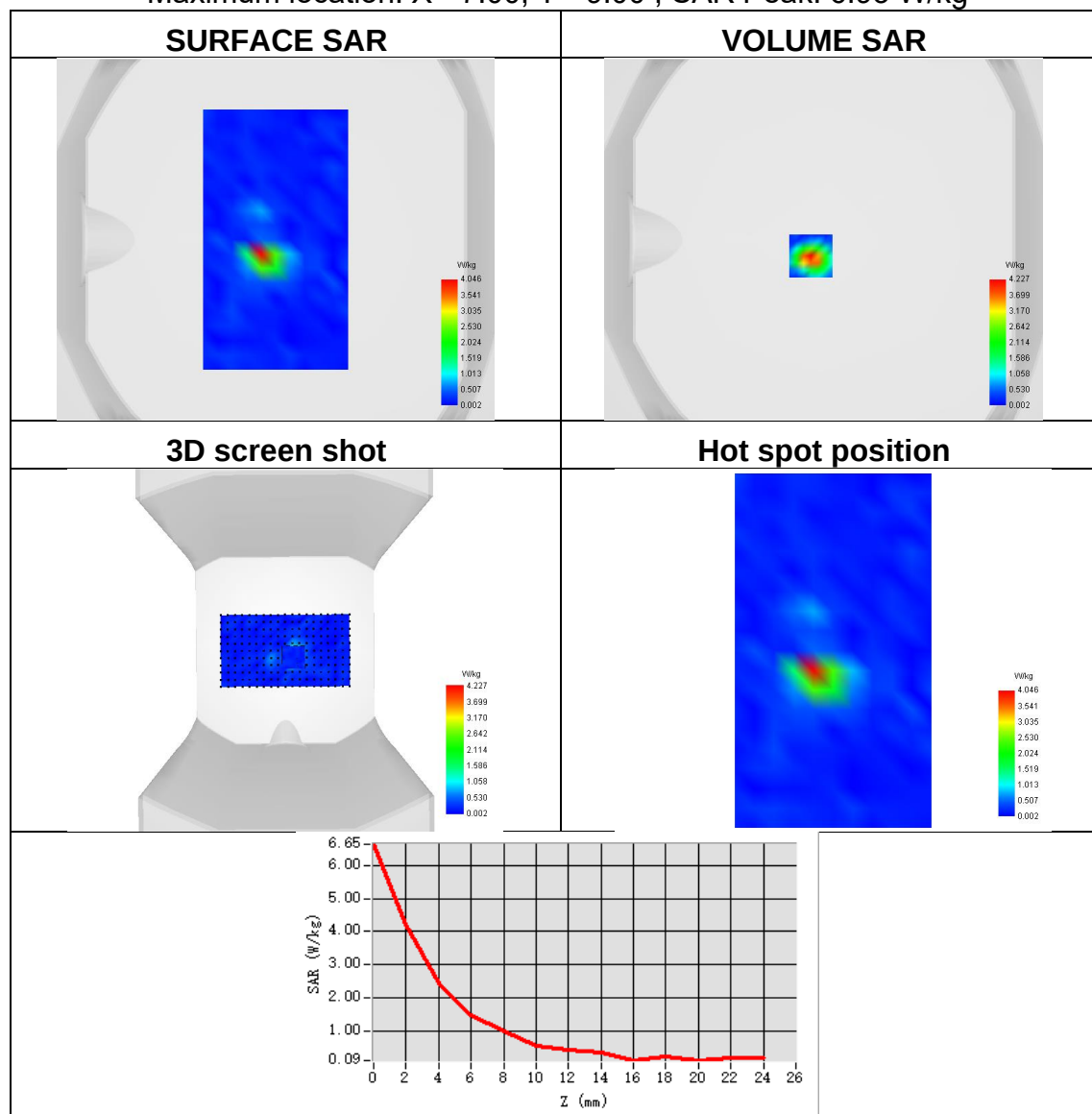




Plot 7:

Test Date	2024-12-06
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-1
Signal	IEEE 802.11a
Frequency	5240
SAR 10g (W/Kg)	0.677
SAR 1g (W/Kg)	2.205
ConvF	1.91
Relative permittivity	36.48
Conductivity (S/m)	4.65

Maximum location: X=-7.00, Y=-9.00 ; SAR Peak: 6.93 W/kg

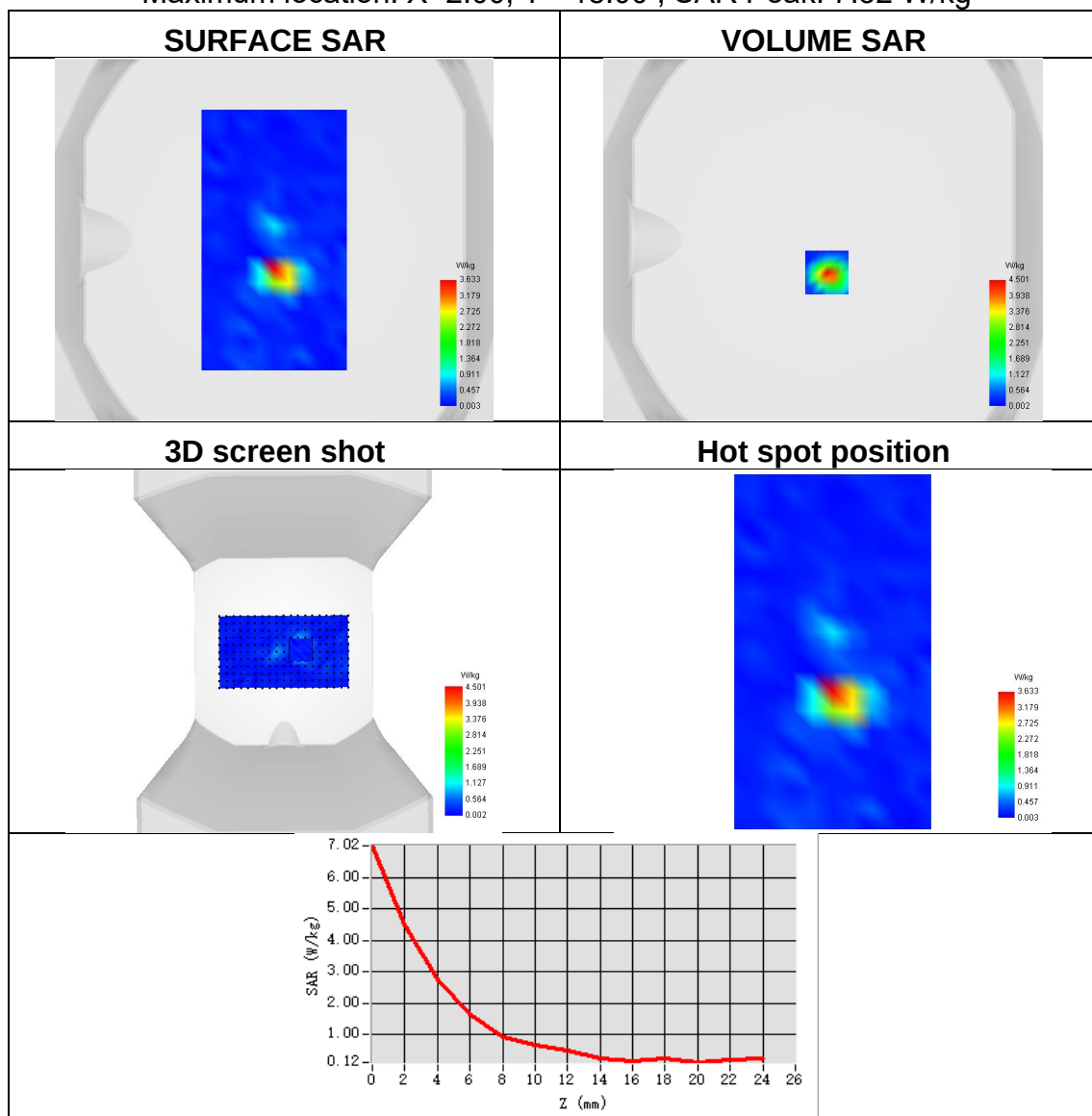




Plot 8:

Test Date	2024-12-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2a
Signal	IEEE 802.11a
Frequency	5260
SAR 10g (W/Kg)	0.678
SAR 1g (W/Kg)	2.333
ConvF	1.91
Relative permittivity	36.58
Conductivity (S/m)	4.83

Maximum location: X=2.00, Y=-18.00 ; SAR Peak: 7.32 W/kg

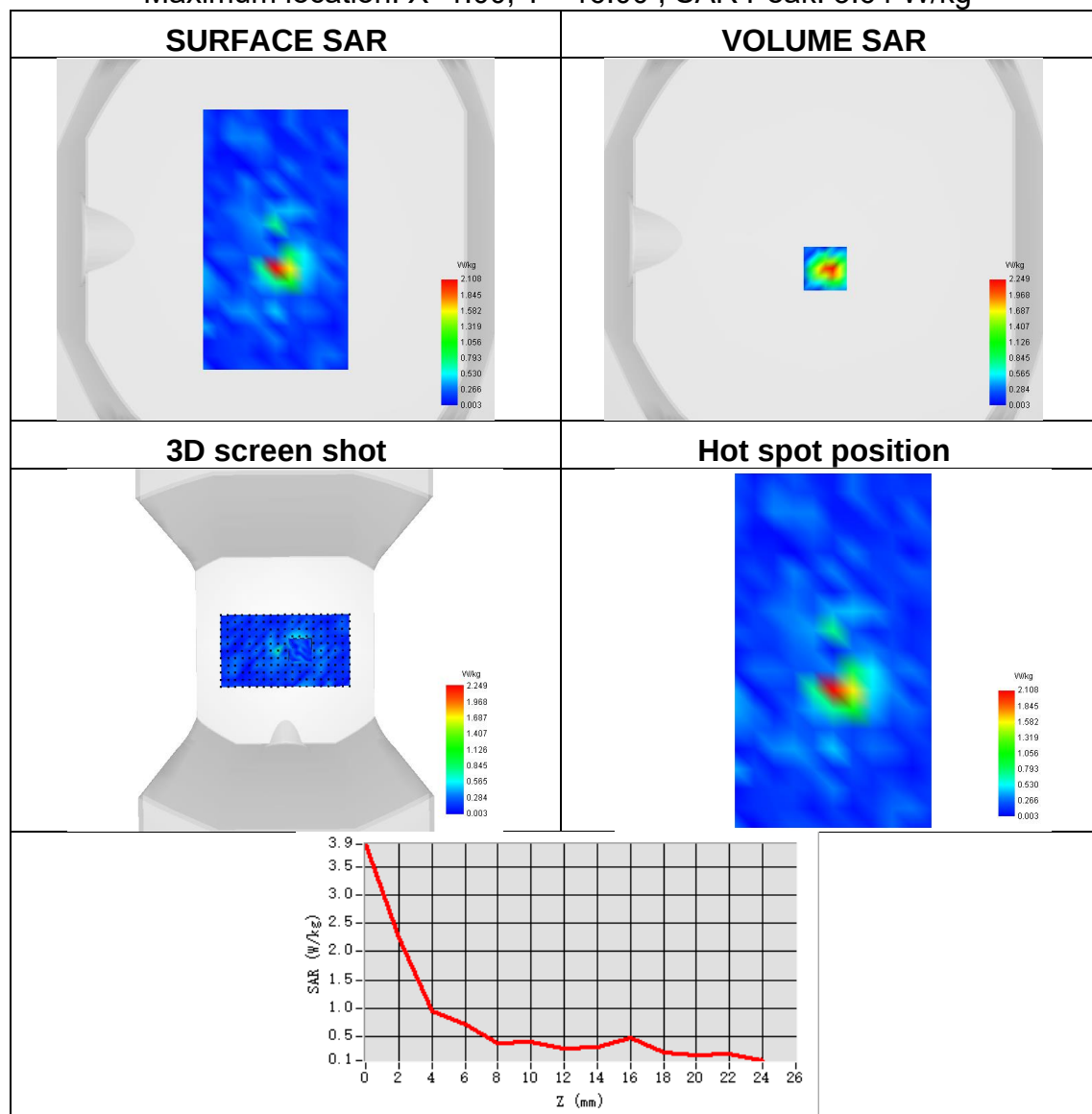




Plot 9:

Test Date	2024-12-08
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2c
Signal	IEEE 802.11a
Frequency	5700
SAR 10g (W/Kg)	0.396
SAR 1g (W/Kg)	1.050
ConvF	1.76
Relative permittivity	36.68
Conductivity (S/m)	5.08

Maximum location: X=1.00, Y=-16.00 ; SAR Peak: 3.64 W/kg

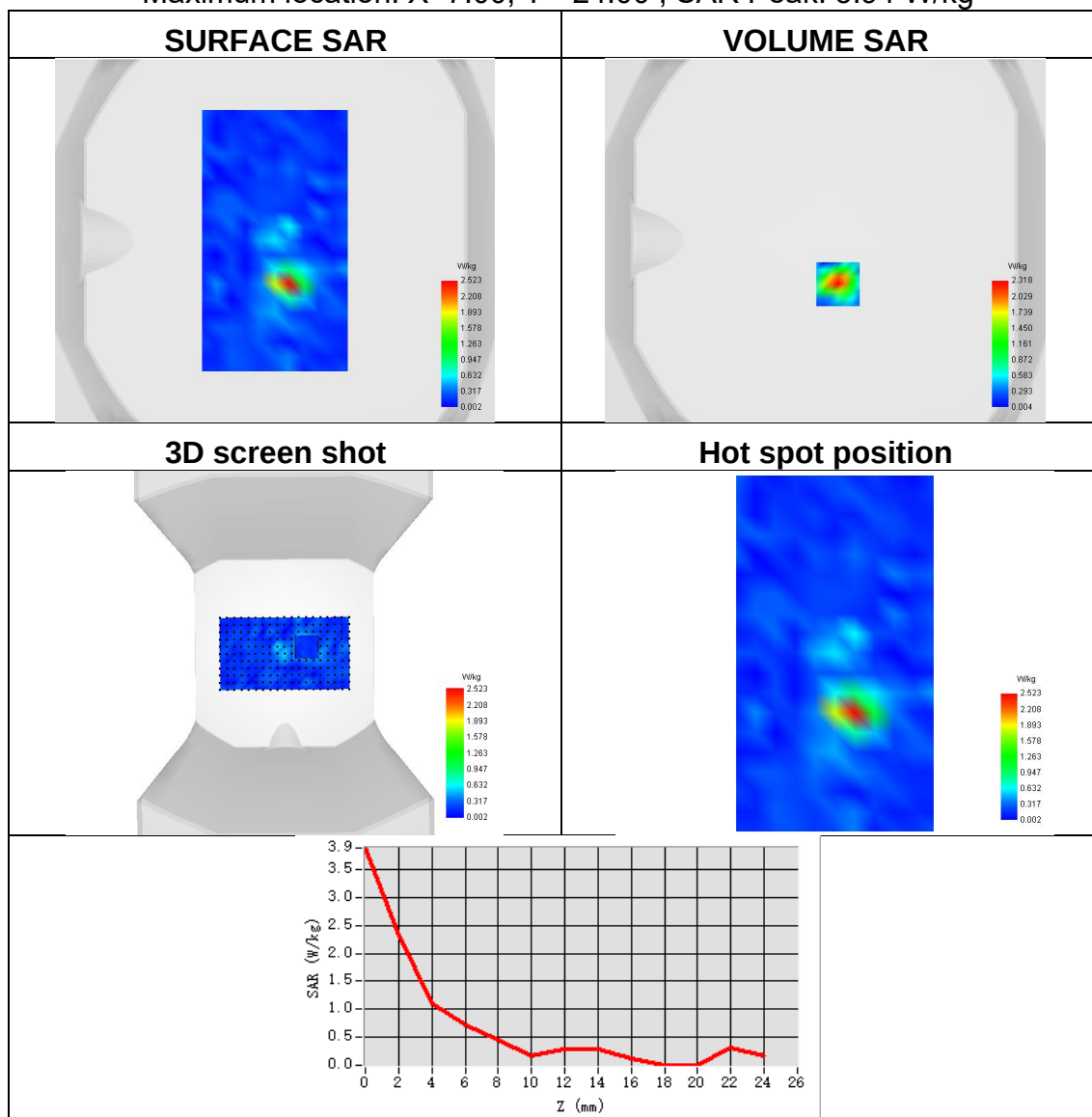




Plot 10:

Test Date	2024-12-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-3
Signal	IEEE 802.11a
Frequency	5745
SAR 10g (W/Kg)	0.415
SAR 1g (W/Kg)	1.223
ConvF	1.70
Relative permittivity	35.97
Conductivity (S/m)	5.25

Maximum location: X=7.00, Y=-24.00 ; SAR Peak: 3.94 W/kg

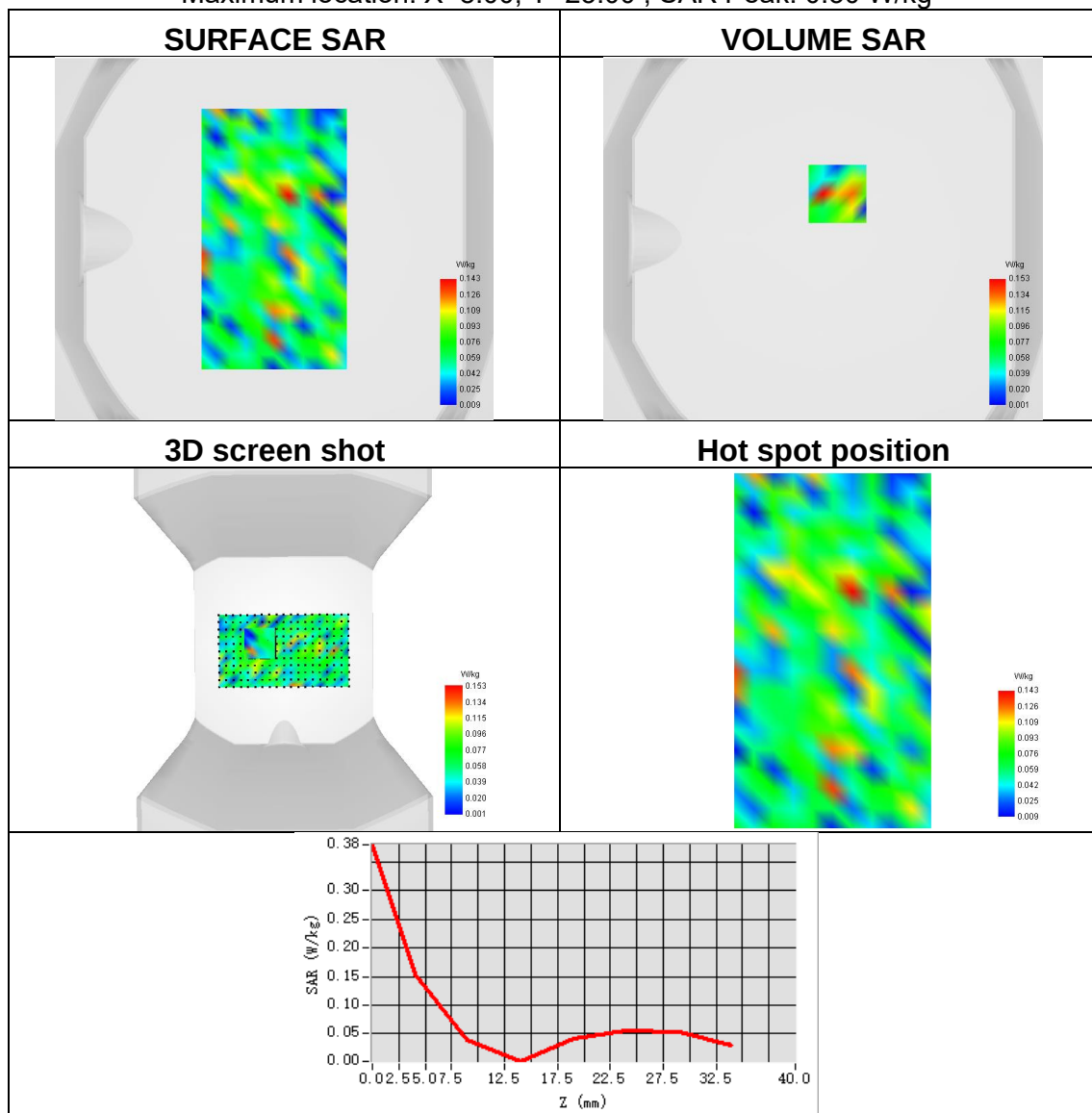




Plot 11:

Test Date	2024-12-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Right Side
Band	ISM
Signal	IEEE 802.11b
Frequency	2412
SAR 10g (W/Kg)	0.068
SAR 1g (W/Kg)	0.135
ConvF	2.24
Relative permittivity	39.44
Conductivity (S/m)	1.83

Maximum location: X=8.00, Y=25.00 ; SAR Peak: 0.30 W/kg

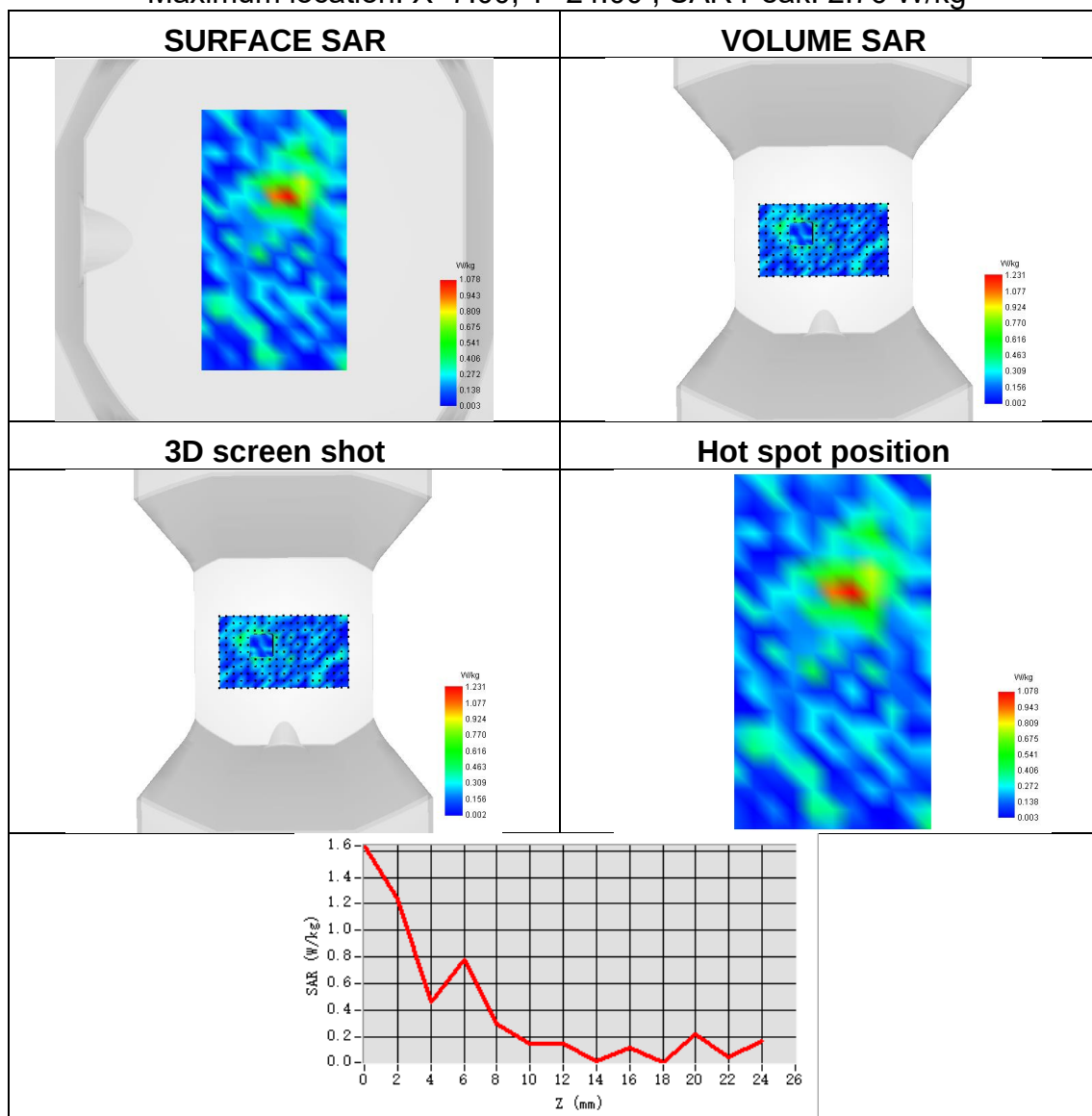




Plot 12:

Test Date	2024-12-06
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-1
Signal	IEEE 802.11a
Frequency	5240
SAR 10g (W/Kg)	0.307
SAR 1g (W/Kg)	0.775
ConvF	1.91
Relative permittivity	36.48
Conductivity (S/m)	4.65

Maximum location: X=7.00, Y=24.00 ; SAR Peak: 2.76 W/kg

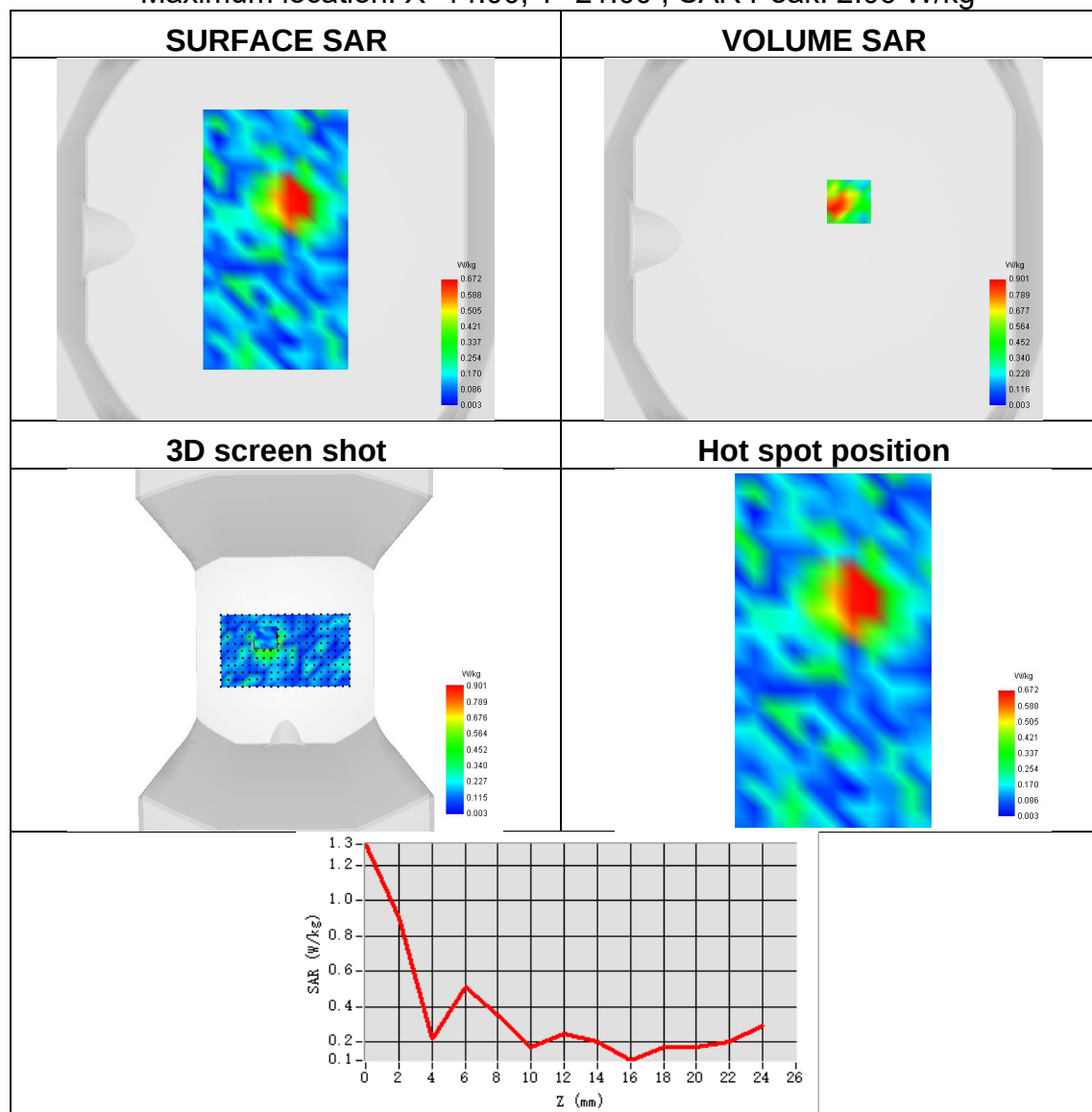




Plot 13:

Test Date	2024-12-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2a
Signal	IEEE 802.11a
Frequency	5260
SAR 10g (W/Kg)	0.224
SAR 1g (W/Kg)	0.568
ConvF	1.91
Relative permittivity	36.58
Conductivity (S/m)	4.83

Maximum location: X=14.00, Y=21.00 ; SAR Peak: 2.06 W/kg

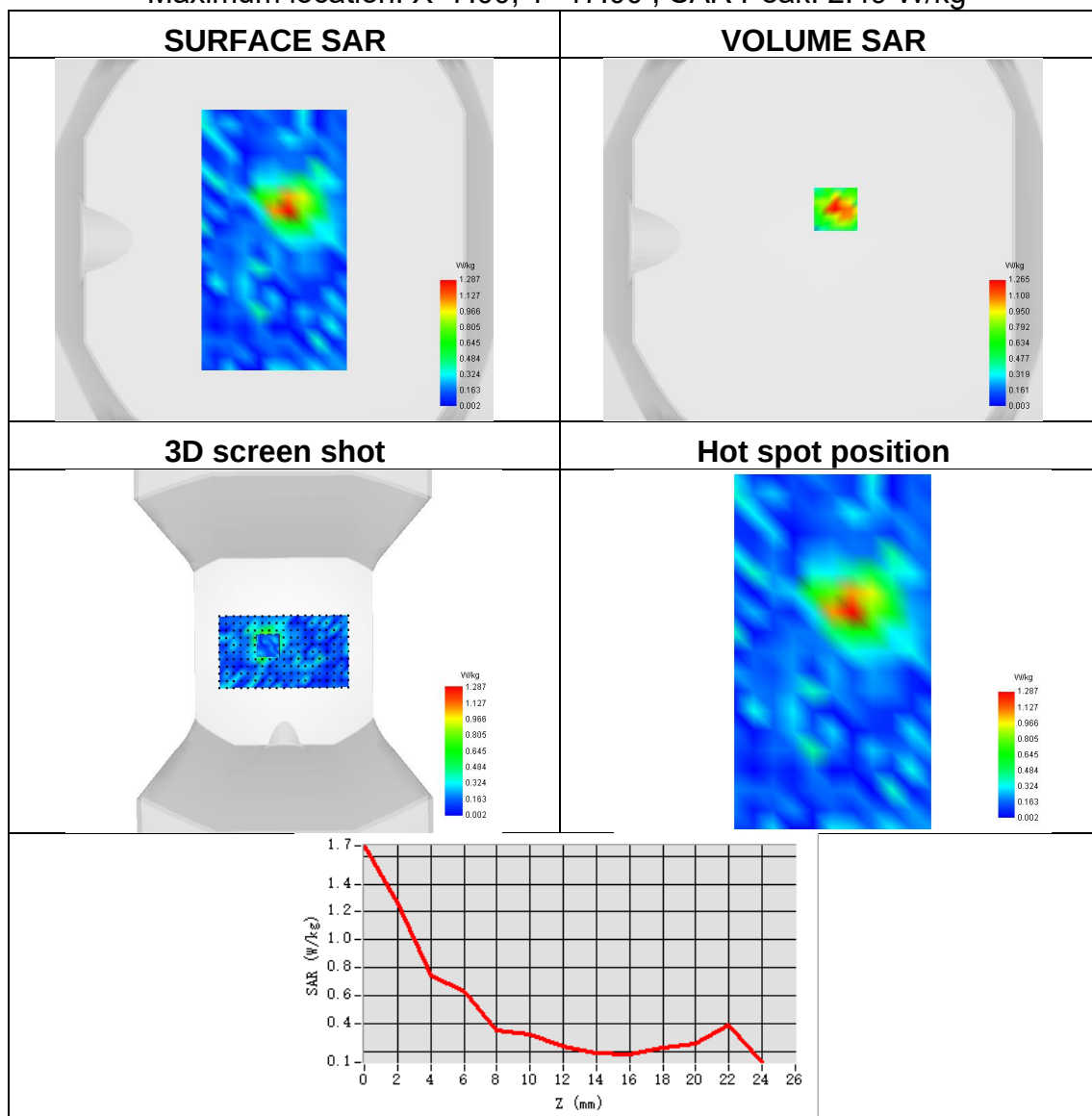




Plot 14:

Test Date	2024-12-08
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2c
Signal	IEEE 802.11a
Frequency	5700
SAR 10g (W/Kg)	0.313
SAR 1g (W/Kg)	0.708
ConvF	1.76
Relative permittivity	36.68
Conductivity (S/m)	5.08

Maximum location: X=7.00, Y=17.00 ; SAR Peak: 2.49 W/kg

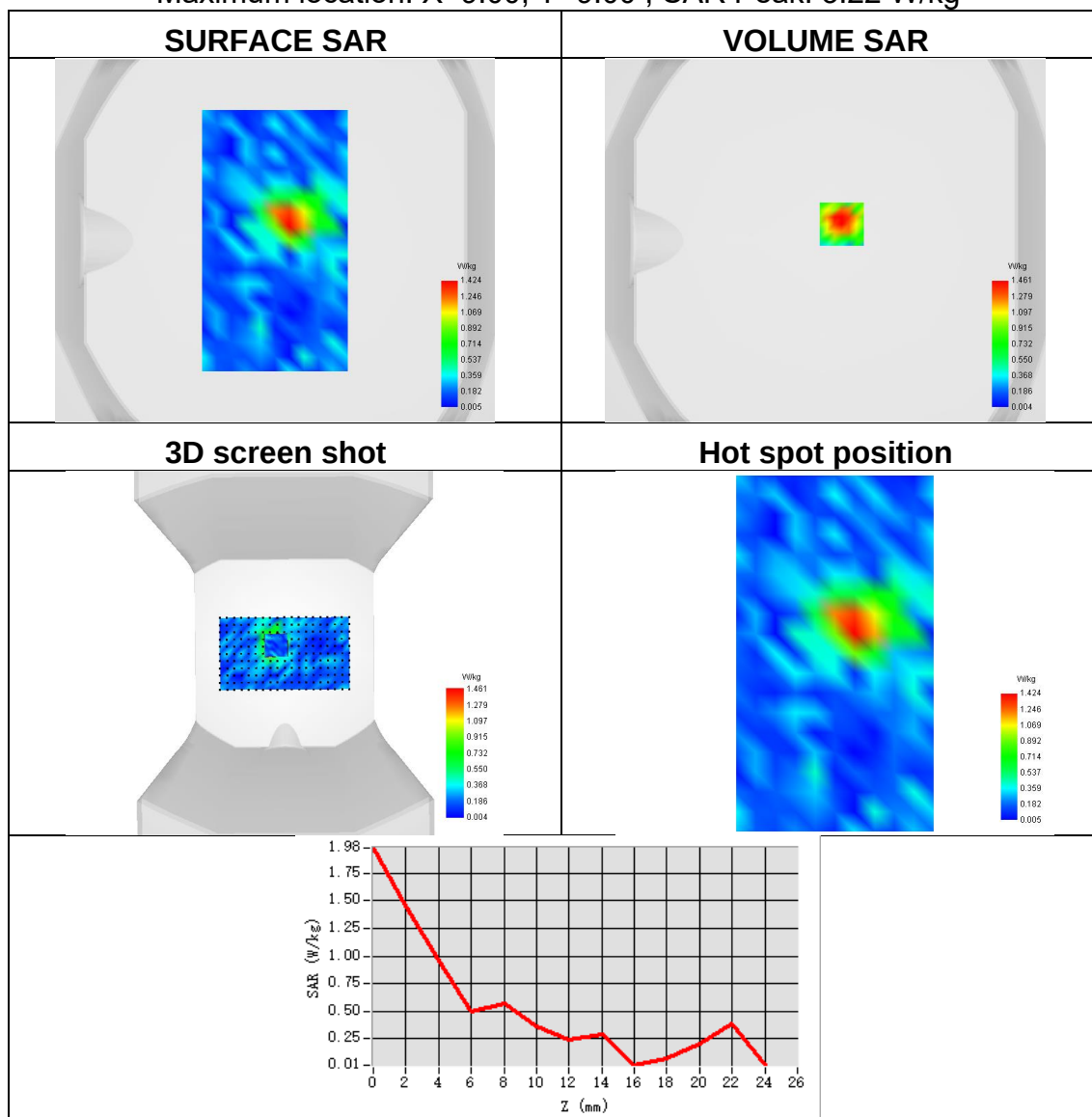




Plot 15:

Test Date	2024-12-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-3
Signal	IEEE 802.11a
Frequency	5745
SAR 10g (W/Kg)	0.321
SAR 1g (W/Kg)	0.801
ConvF	1.70
Relative permittivity	35.97
Conductivity (S/m)	5.25

Maximum location: X=9.00, Y=9.00 ; SAR Peak: 3.22 W/kg

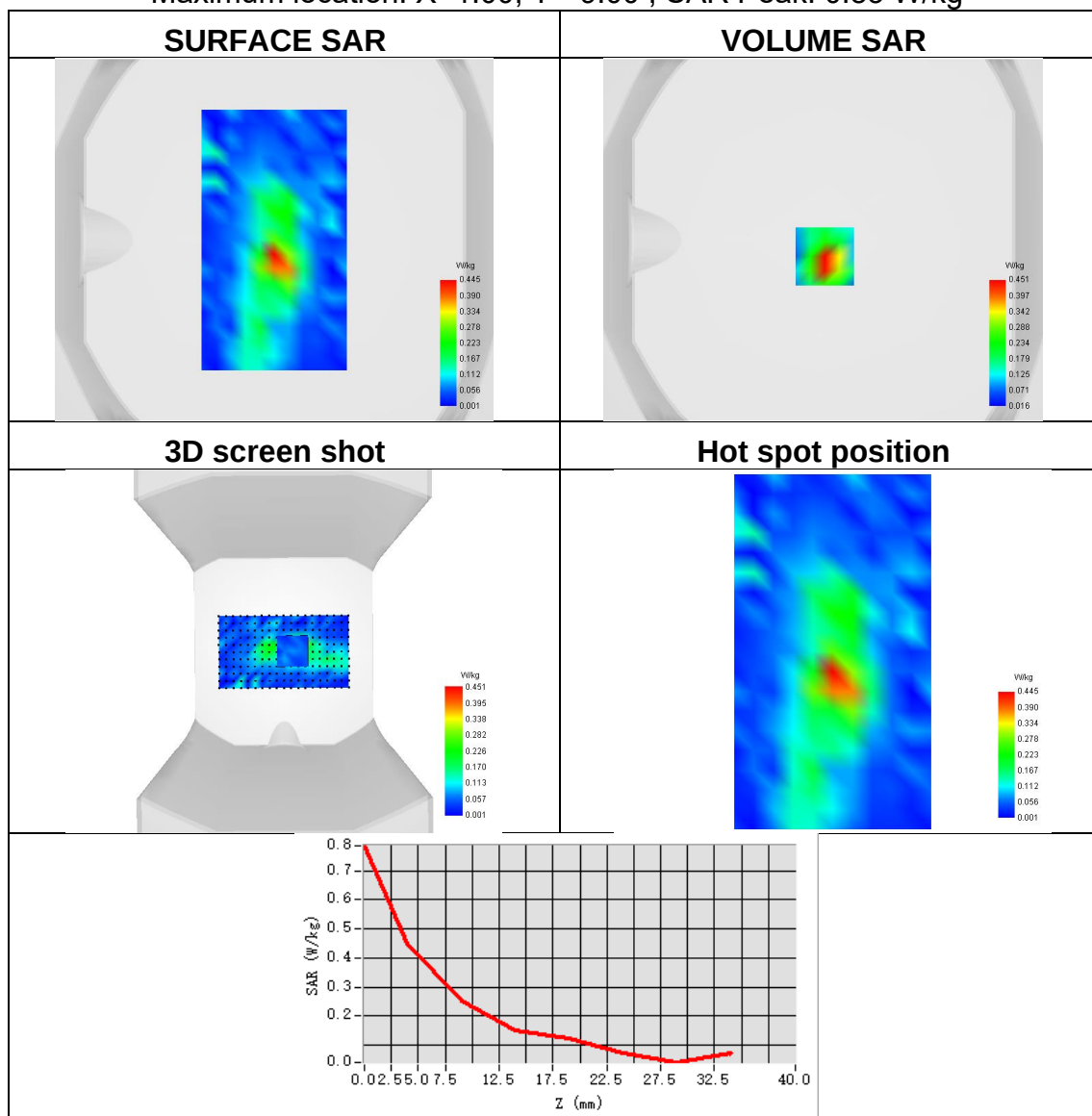




Plot 16:

Test Date	2024-12-07
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Right Side
Band	ISM
Signal	IEEE 802.11b
Frequency	2412
SAR 10g (W/Kg)	0.204
SAR 1g (W/Kg)	0.446
ConvF	2.24
Relative permittivity	39.44
Conductivity (S/m)	1.83

Maximum location: X=1.00, Y=-9.00 ; SAR Peak: 0.83 W/kg

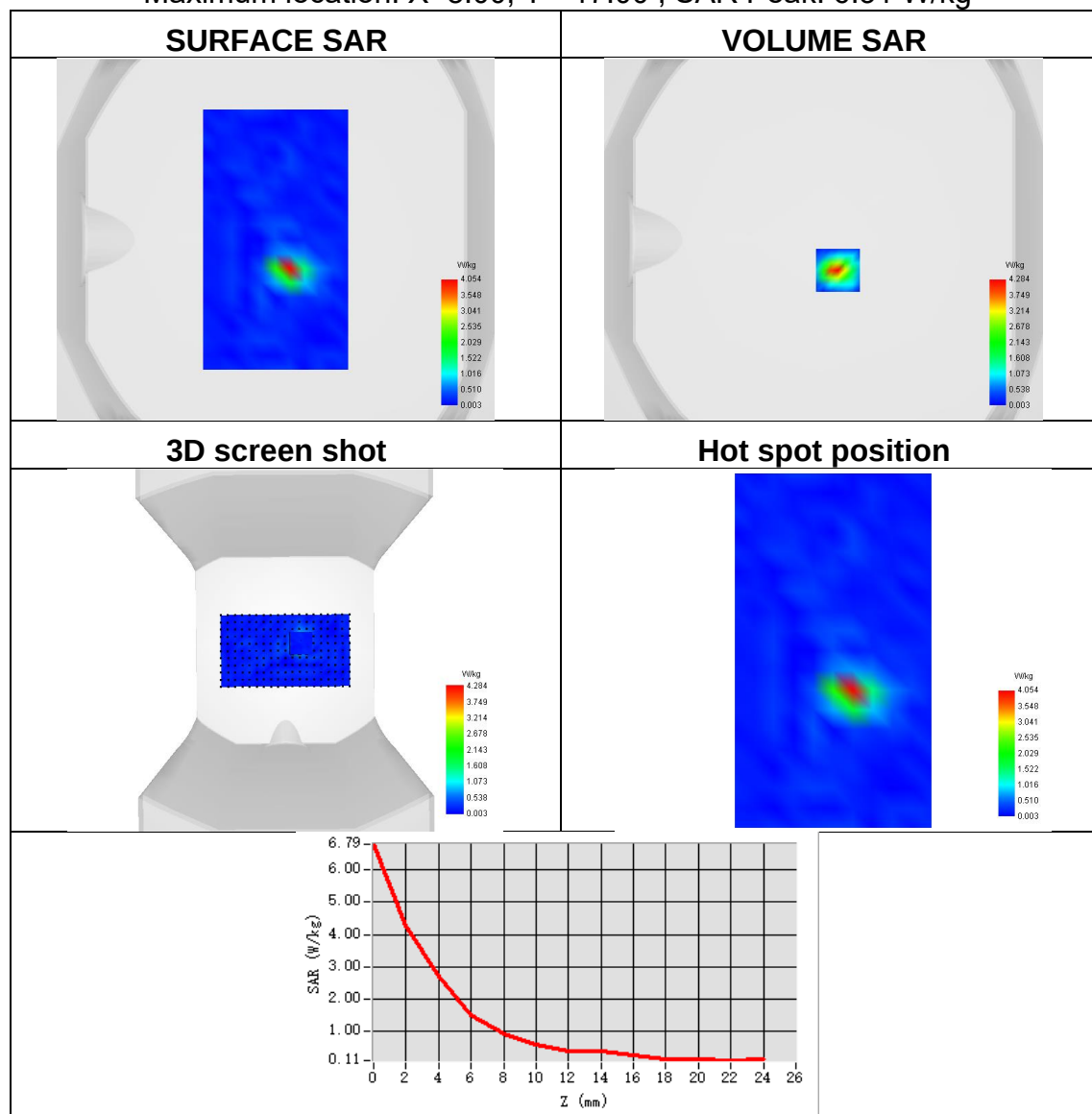




Plot 17:

Test Date	2024-12-06
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-1
Signal	IEEE 802.11a
Frequency	5240
SAR 10g (W/Kg)	0.613
SAR 1g (W/Kg)	2.160
ConvF	1.91
Relative permittivity	36.48
Conductivity (S/m)	4.65

Maximum location: X=8.00, Y=-17.00 ; SAR Peak: 6.31 W/kg

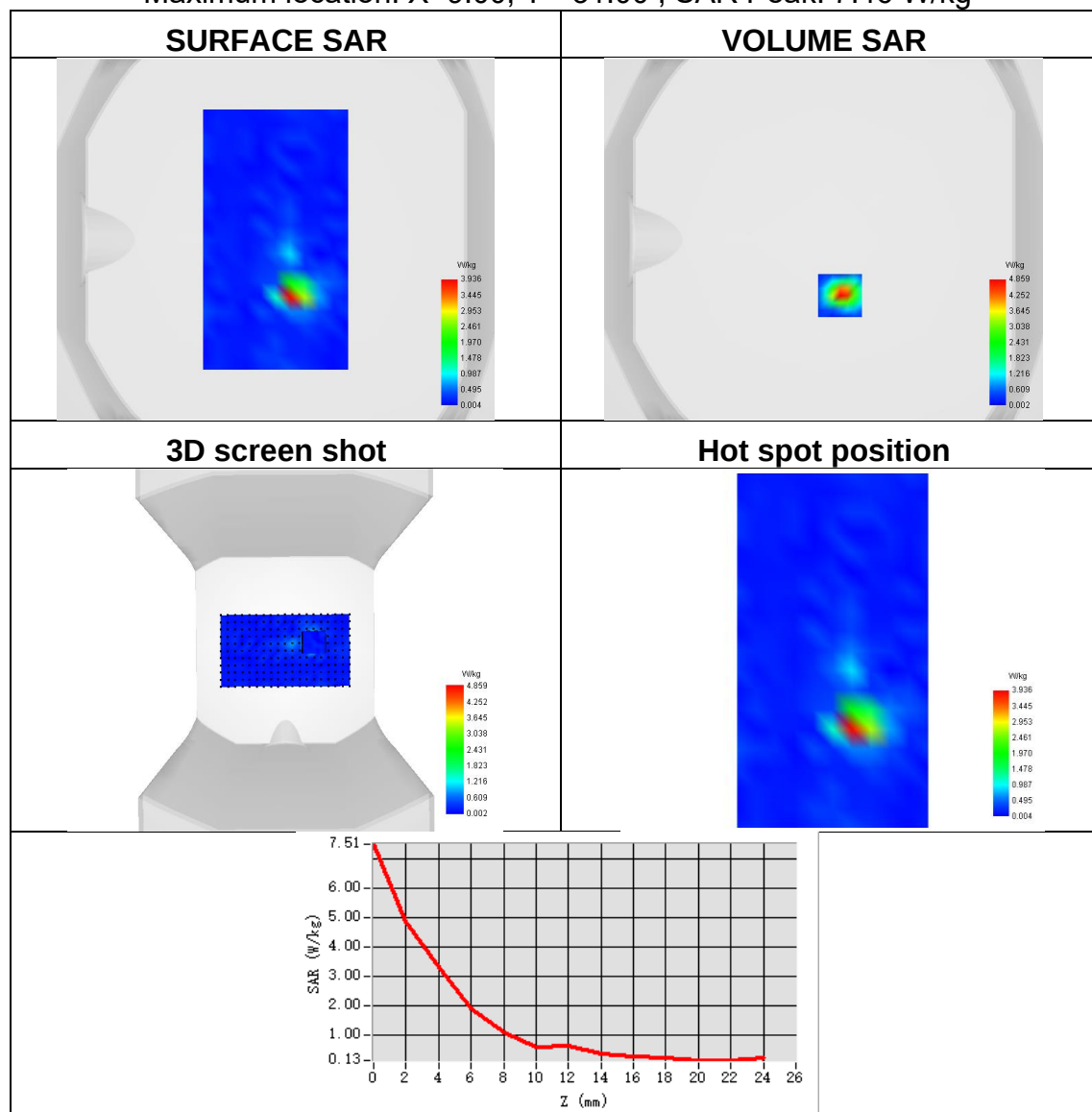




Plot 18:

Test Date	2024-12-10
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2a
Signal	IEEE 802.11a
Frequency	5260
SAR 10g (W/Kg)	0.711
SAR 1g (W/Kg)	2.519
ConvF	1.91
Relative permittivity	36.58
Conductivity (S/m)	4.83

Maximum location: X=9.00, Y=-31.00 ; SAR Peak: 7.46 W/kg

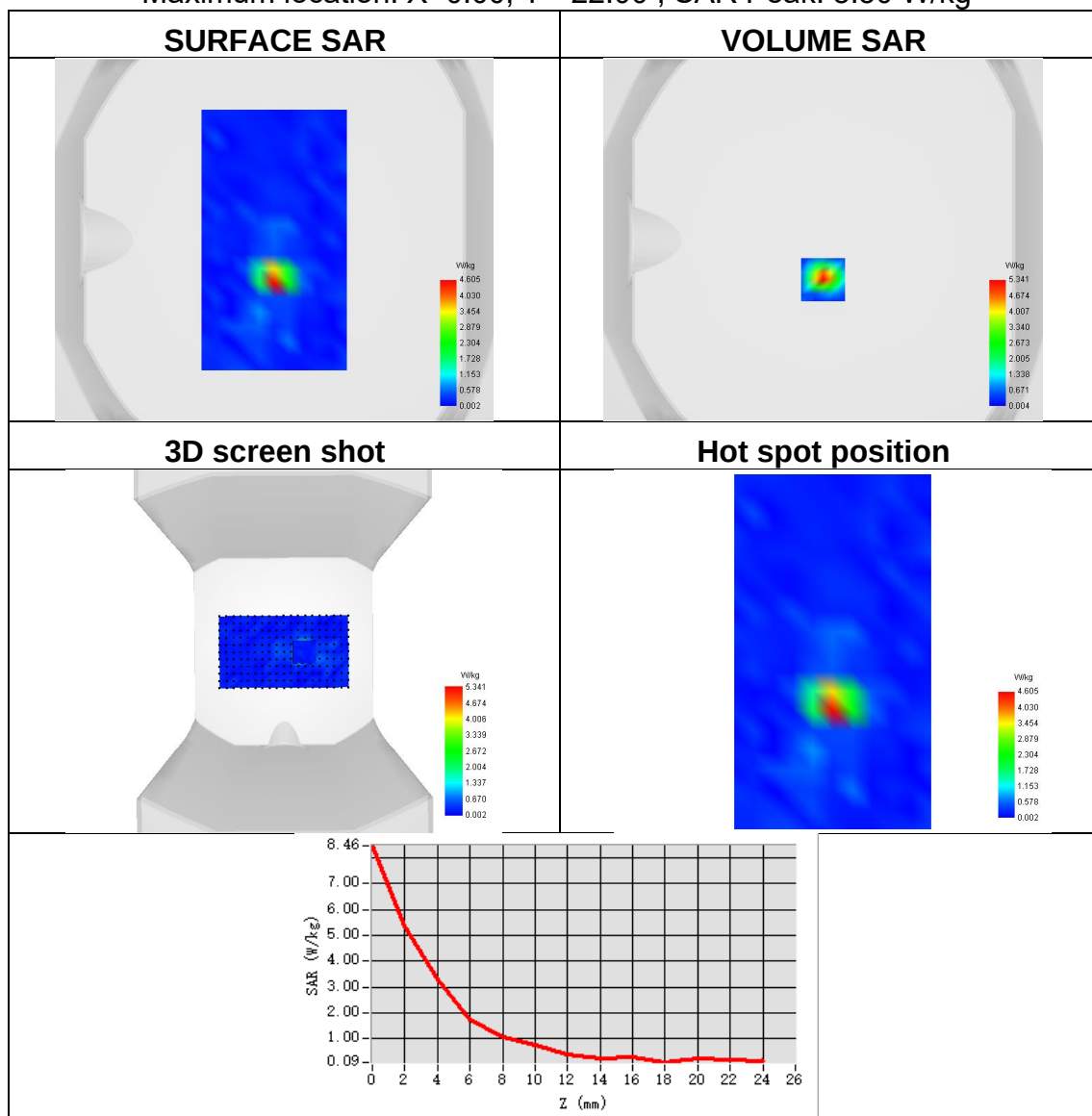




Plot 19:

Test Date	2024-12-08
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-2c
Signal	IEEE 802.11a
Frequency	5700
SAR 10g (W/Kg)	0.763
SAR 1g (W/Kg)	2.772
ConvF	1.76
Relative permittivity	36.68
Conductivity (S/m)	5.08

Maximum location: X=0.00, Y=-22.00 ; SAR Peak: 8.50 W/kg

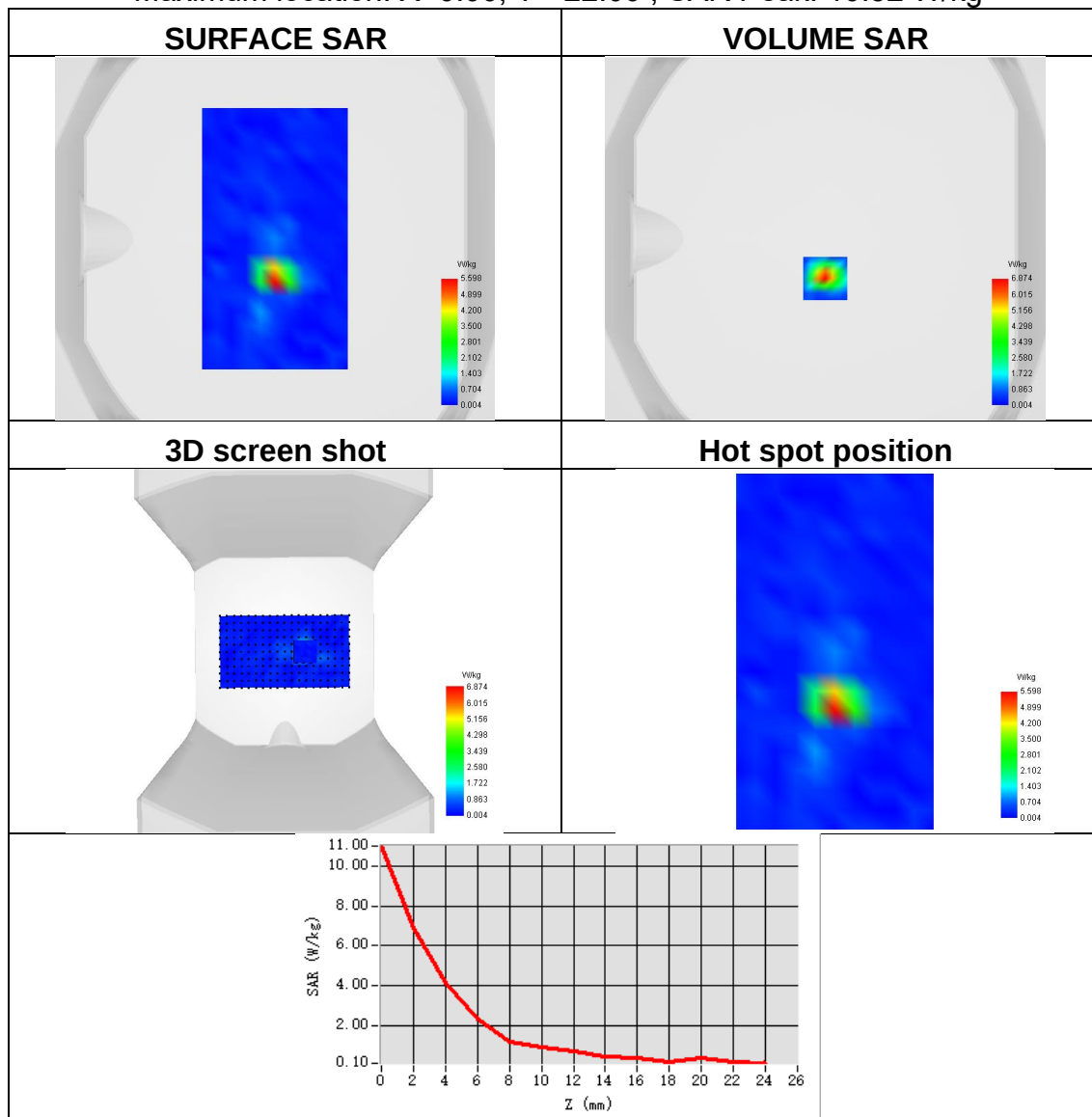




Plot 20:

Test Date	2024-12-09
Area Scan	dx=8mm dy=8mm
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Right Side
Band	U-NII-3
Signal	IEEE 802.11a
Frequency	5745
SAR 10g (W/Kg)	0.957
SAR 1g (W/Kg)	3.443
ConvF	1.70
Relative permittivity	35.97
Conductivity (S/m)	5.25

Maximum location: X=0.00, Y=-22.00 ; SAR Peak: 10.52 W/kg





Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※