



SAR Test Report

For

Applicant Name: RATOC Systems, Inc.
Address: 8th floor Osaka Metro Minami-Horie Bldg. 1-18-4 Minami-horie,
Nishi-ku, Osaka, Japan 550-0015
EUT Name: Wireless Display Splitter Adapter
Model Number: HB937
Series Model Number: RS-WLSP1-TX

Issued By

Company Name: BTF Testing Lab (Shenzhen) Co., Ltd.
Address: Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial
Park, Tantou Community, Songgang Street, Bao'an District,
Shenzhen, Guangdong, China

Report Number: BTF260325R01201
MIC Notices No. 88 Annex 79(2004)
article 14-2.

Test Standards: EN 50566:2017+A1:2023
EN 62479: 2010
EN 50663: 2017
EN IEC/IEEE 62209-1528: 2021

Test Conclusion: Pass

Test Date: 2026-05-21
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Tested By: Ella. ku
Ella Ku / Tester

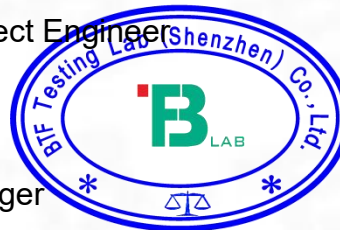
Date: 2026-05-22

Reviewed By: Amenda Zhong

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Date: 2026-05-22
Ryan.CJ / EMC Manager



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Revision History		
Version	Issue Date	Revisions Content
R_V0	2026-05-22	Original
Note:		Once the revision has been made, then previous versions reports are invalid.

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1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Description:	All measurement facilities used to collect the measurement data are located at Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China

1.3 Laboratory Condition

Ambient Temperature:	22.3℃
Ambient Relative Humidity:	48%
Ambient Pressure:	100.9 kPa

1.4 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	RATOC Systems, Inc.
Address:	8th floor Osaka Metro Minami-Horie Bldg. 1-18-4 Minami-horie, Nishi-ku, Osaka, Japan 550-0015

2.2 Manufacturer Information

Company Name:	RATOC Systems, Inc.
Address:	8th floor Osaka Metro Minami-Horie Bldg. 1-18-4 Minami-horie, Nishi-ku, Osaka, Japan 550-0015

2.3 Factory Information

Company Name:	Dongguan World Pass Industrial Co., LTD
Address:	29, Lianhuan Road, Dalingshan Town, Dongguan City, Guangdong Province

2.4 General Description of Equipment under Test (EUT)

EUT Name	Wireless Display Splitter Adapter
Under Test Model Name	HB937
Series Model Name	RS-WLSP1-TX
Description of Model name differentiation	Only the model name is different, others are the same.

2.5 Technical Information

Network and Wireless connectivity	5G WIFI 802.11a, 802.11n(HT20)
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	WLAN	
Frequency Band	802.11a /802.11n(HT20)	5150 ~ 5250 MHz
Antenna Type	WLAN: Integral Antenna	
Hotspot Function	Not Support	
Power Reduction	Not Support	
Exposure Category	General Population/Uncontrolled exposure	
EUT Stage	Portable Device	
Product	Type	
	☒ Production unit	☐ Identical prototype

3. Summary of Test Results

3.1 Test Standards

No.	Identity	Document Title
1	MIC Notices NO. 88 Annex 79(2004)	Measurement method of Specific Absorption Ratio (SAR)
2	EN 50663: 2017	Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz- 300 GHz)
3	EN 62479: 2010	Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
4	EN IEC/IEEE 62209-1528: 2021	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-worn wireless communication devices – Human models, instrumentation and procedures (Frequency range of 4 MHz to 10 GHz)
5	1999/519/EC	Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user

According to 1999/519/EC the limit for General Population/ Uncontrolled exposure should be applied for this device, it is 2.0 W/kg as averaged over any 10 gram of tissue.

Body Position	SAR Value (W/Kg)	
	General Population/ Uncontrolled Exposure	Occupational/ Controlled Exposure
Whole-Body SAR (averaged over the entire body)	0.08	0.4
Partial-Body SAR (averaged over any 1 gram of tissue)	2.0	10.0
SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue)	4.0	20.0

NOTE:

General Population/Uncontrolled Exposure: Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment- related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Occupational/Controlled Exposure: Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure. In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

3.3 Test Result Summary

<Maximum Reported Standalone SAR>

Frequency Band		Maximum Reported SAR (W/kg) 10 g
		Body SAR (Separation 0 mm)
RLAN	5.2 G Wifi	0.292
Limits (W/kg)		2.0
Test Verdict		Pass

3.4 Test Uncertainty

3.4.1 Measurement uncertainty evaluation for SAR test (450MHz to 6GHz)

Uncertainty Component	Tol (+-%)	Prob. Dist.	Div.	Unc. $u(x_i)=a(x_i)/q_i$	Ci (1g)	Ci (10g)	1g Ui (+-%)	10 g Ui (+-%)	Vi v _{eff}
Measurement System									
Probe calibration	16	N (k = 2)	2	8.00	1	1	8.00	8.00	∞
Probe calibration drift	4	R	√3	2.31	1	1	2.31	2.31	∞
Probe linearity	4.7	R	√3	2.71	1	1	2.71	2.71	∞
detection limit	1	R	√3	0.58	1	1	0.58	0.58	∞
Probe isotropy	3.5	R	√3	2.02	0.71	0.71	1.43	1.43	∞
Hemispherical Isotropy	5.9	N	1	5.90	0.71	0.71	4.19	4.19	∞
Boundary effect	1	R	1.73	0.58	1	1	0.58	0.58	∞
Integration time	1.4	R	1.73	0.81	1	1	0.81	0.81	∞
Response time	0	R	1.73	0.00	1	1	0.00	0.00	∞
Readout electronics	0.5	N	1	0.50	1	1	0.50	0.50	∞
RF ambient and noise	3	R	√3	1.73	1	1	1.73	1.73	∞
Probe positioning errors	3.28	N	1	3.28	0.33	0.33	1.08	1.08	∞
Data processing errors	2.3	R	1	1.33	1	1	1.33	1.33	∞
Conductivity measurement	4.07	N	1	2.35	0.79	0.77	1.86	1.81	∞
Permittivity measurement	5.06	N	1	2.92	0.23	0.26	0.67	0.76	∞
Liquid Conductivity - Temperature Uncertainty	2.5	R	1	1.44	0.79	0.77	1.14	1.11	∞
Liquid Permittivity - Temperature Uncertainty	2.5	R	√3	1.44	0.23	0.26	0.33	0.38	∞
Shell permittivity	2.9	R	√3	1.67	0.25	0.25	0.42	0.42	∞
Repeatability of positioning the DUT or source against the phantom	2.7	N	1	2.70	2	2	5.40	5.40	∞
Uncertainty in accepted power	3	R	1	3.00	1	1	3.00	3.00	∞
Effect of operating mode on probe sensitivity	2.3	R	√3	1.33	1	1	1.33	1.33	∞
Variation in SAR due to drift in output of DUT	2.2	N	1	2.20	1	1	2.20	2.20	∞
Phantom deviation from target (ϵ' , σ)	1.9	N	1	1.90	1	1	1.90	1.90	∞
SAR scaling	0	R	√3	0.00	1	1	0.00	0.00	∞
Combined uncertainty	/						12.56	12.55	
Expanded Uncertainty (95% Confidence interval)	/						25.11	25.11	

* This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.4.2 Measurement uncertainty evaluation for system check

Uncertainty Component	Tol (+-%)	Prob. Dist.	Div.	Unc. $u(x_i)=a(x_i)/q_i$	Ci (1g)	Ci (10 g)	1g Ui (+-%)	10 g Ui (+-%)	Vi v _{eff}
Measurement System									
Probe calibration	16	N (k = 2)	2	8.00	1	1	8.00	8.00	∞
Probe calibration drift	4	R	1.73	2.31	1	1	2.31	2.31	∞
Probe linearity	4.7	R	1.73	2.72	1	1	2.72	2.72	∞
Detection limit	1	R	1.73	0.58	1	1	0.58	0.58	∞
Axial Isotropy	3.5	R	1.73	2.02	1	1	2.02	2.02	∞
Hemispherical Isotropy	5.9	R	1.73	3.41	0.71	0.71	2.42	2.42	∞
Boundary effect	1	R	1.73	0.58	0.71	0.71	0.41	0.41	∞
Integration time	1.4	R	1.73	0.81	1	1	0.81	0.81	∞
Response time	0	R	1.73	0.00	1	1	0.00	0.00	∞
Readout electronics	0.5	N	1	0.50	1	1	0.50	0.50	∞
Noise	3	R	1.73	1.73	1	1	1.73	1.73	∞
Reflections	3	R	1.73	1.73	1	1	1.73	1.73	∞
Positioner Mechanical Tolerance	3.28	R	1.73	1.90	0.33	0.33	0.63	0.63	∞
Positioning with respect to Phantom Shell	3.28	R	1.73	1.90	0.33	0.33	0.63	0.63	∞
Data processing errors	2.3	R	1.73	1.33	1	1	1.33	1.33	∞
Conductivity measurement	4.07	N	1	4.07	0.79	0.77	3.22	3.13	∞
Permittivity measurement	5.06	N	1	5.06	0.23	0.26	1.16	1.32	∞
Liquid Conductivity - Temperature Uncertainty	2.5	R	1.73	1.45	0.79	0.77	1.14	1.11	∞
Liquid Permittivity - Temperature Uncertainty	2.5	R	1.73	1.45	0.23	0.26	0.33	0.38	∞
Shell permittivity	2.9	R	1.73	1.68	0.25	0.25	0.42	0.42	∞
Distance between the radiating element of the DUT and the phantom medium	2.7	N	1	2.70	2	2	5.40	5.40	∞
Deviation of experimental antennas	4.5	N	1.73	2.60	1	1	2.60	2.60	∞
Other uncertainty contributions	2	R	1	2.00	1	1	2.00	2.00	∞
Uncertainty in accepted power	3	R	1.73	1.73	1	1	1.73	1.73	∞
Phantom deviation from target (ϵ', σ)	1.9	N	1	1.90	1	0.87	1.90	1.65	∞
$u(\Delta SAR)$	\						12.51	12.47	
Expanded uncertainty (95% confidence interval)	\						25.02	24.93	

4.2.2 Robot



A standard high precision 6-axis robot (Denso) with teaches pendant with Scanning System

- It must be able to scan all the volume of the phantom to evaluate the tridimensional distribution of SAR.
- Must be able to set the probe orthogonal of the surface of the phantom ($\pm 30^\circ$).
- Detects stresses on the probe and stop itself if necessary to keep the integrity of the probe.

4.2.3 E-Field Probe

For the measurements the Specific Dosimetric E-Field Probe 0125-EPGO-445 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%
- Calibration range: 150 to 6000 MHz for head & body simulating liquid
- Axial Isotropy: <0.10 dB
- Spherical Isotropy: <0.10 dB
- Angle between probe axis (evaluation axis) and surface normal line: less than 30° .

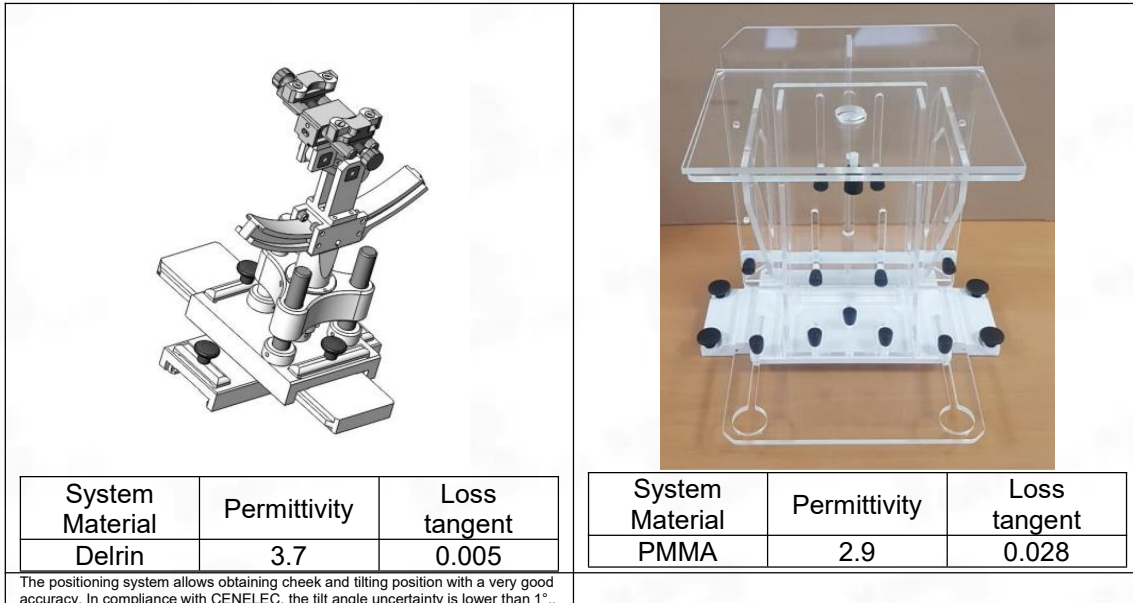


4.2.4 Phantoms

SAM Phantom			
For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The probe scanning of the E-Field is done in the 2 halves of the normalized head. The normalized shape of the phantom corresponds to the dimensions of 90% of an adult head size. It enables the dosimetric evaluation of left and right-hand phone usage and includes an additional flat phantom part for the simplified body performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.			
		The thickness of the phantom amounts to 2 mm±0.2 mm. The materials for the phantom do not affect the radiation of the device under test (DUT) : $\epsilon_r' < 5$ The head is filled with tissue simulating liquid. The hand do not have to be modeled.	
SAM Phantom			
TWIN SAM phantom			
Mechanical		Electrical	
Overall thickness	2±0.2 mm(except ear area)	Relative permittivity	3.4
Dimensions	1000 mm(L) x 500 mm(W) x 200 mm(H)	Loss tangent	0.02
Maximum volume	27 L		
Material	Fiberglass based		

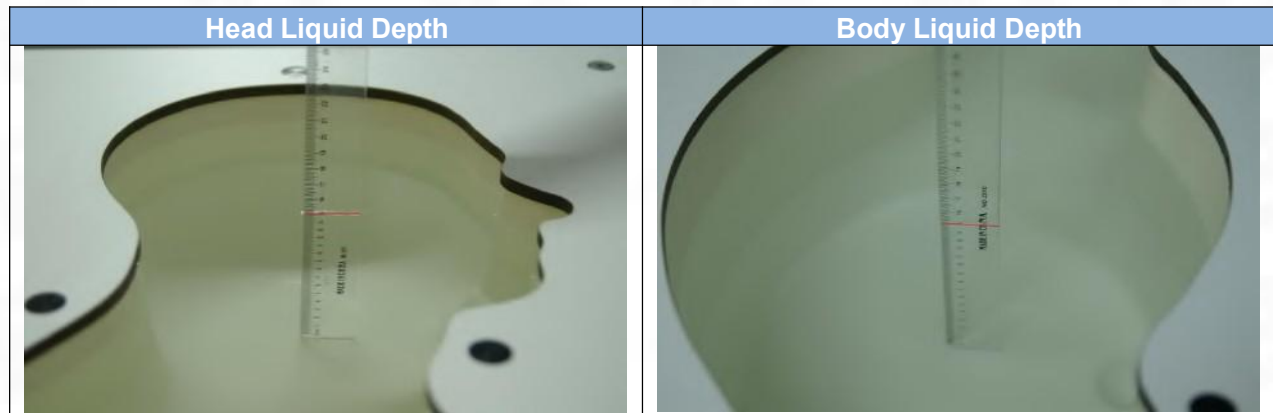
ELLIPTICAL Phantom	
The phantom is for Body performance check filled with tissue-equivalent liquid to a depth of at least 150 mm, whose shell material is resistant to damage or reaction with tissue-equivalent liquid chemicals.	
	The shape of the phantom is an ellipse with length 600mm±5mm and width 400mm±5mm. The phantom shell is made of low-loss and low-permittivity material, having loss tangent $\tan\delta \leq 0.05$ and relative permittivity: $\epsilon_r' \leq 5$ for $f \leq 3$ GHz $3 \leq \epsilon_r' \leq 5$ for $f > 3$ GHz The thickness of the bottom-wall of the flat phantom is 2.0 mm with a tolerance of ± 0.2 mm.
ELLI Phantom	
Technical & mechanical characteristics	
Shell thickness	2 mm ± 0.2 mm
Filling volume	25 L
Dimensions	600 mm x 400 mm x 200mm
Permittivity	4.4
Loss tangent	0.017

4.2.5 Device Holder



4.2.6 Simulating Liquid

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.



The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

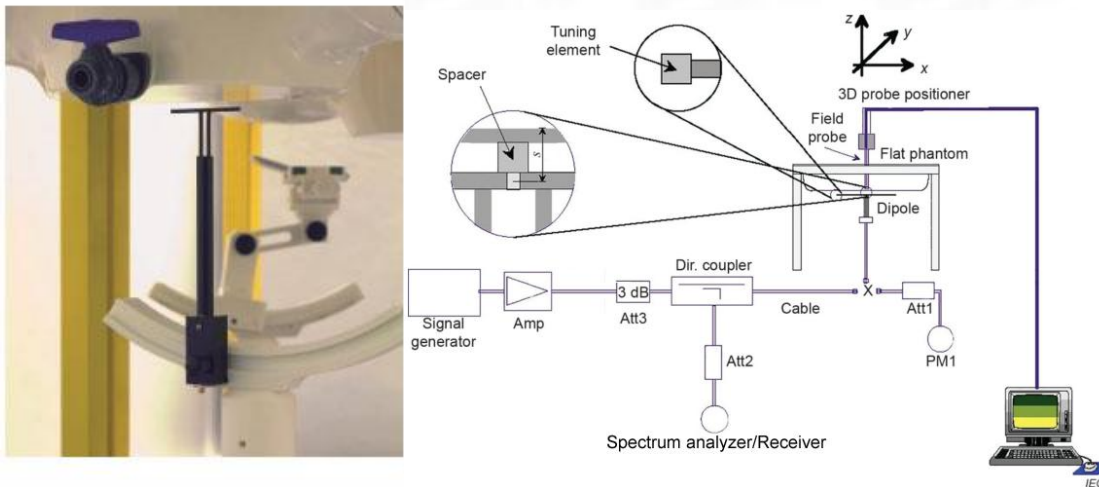
Head (Reference IEEE1528)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.4	40.0
2450	55.0	0	0	0.1	0	44.9	1.80	39.2
2600	54.9	0	0	0.1	0	45.0	1.96	39.0
Frequency (MHz)	Water (%)	Hexyl Carbitol (%)			Triton X-100 (%)		Conductivity σ (S/m)	Permittivity ε
5200	62.52	17.24			17.24		4.66	36.0
5800	62.52	17.24			17.24		5.27	35.3
Body (From instrument manufacturer)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0.1	0	31.3	1.95	52.7
2600	68.2	0	0	0.1	0	31.7	2.16	52.5
Frequency(MHz)	Water	DGBE (%)			Salt (%)		Conductivity σ (S/m)	Permittivity ε
5200	78.60	21.40			/		5.30	49.00
5800	78.50	21.40			0.1		6.00	48.20

5. System Verification

5.1 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. The setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

5.2 System Check Setup



6. Test Position Configurations

According to EN IEC/IEEE 62209-1528: 2021, body-supported devices are tested for SAR compliance described in the following subsections.

6.1 Generic Device Position Conditions

A device that cannot be categorized as any of the device types in 7.2.4.1.5 through 7.2.4.1.12 is considered a generic device; i.e. it is represented by a closed box incorporating at least one internal RF transmitter and antenna. The generic device principle may be applied to any device. In situations when a transmitter is added to the host device so that the host and transmitter operate as a single device, the generic category may be considered only if the provisions of 7.2.4.1.5 to 7.2.4.1.12 are not applicable. When the antenna or the attached RF transmitter is external to the host and the positioning of the antenna or attached RF transmitter is independent of positioning of the host (e.g. transmitter or antenna is attached by a cable and 7.2.4.1.6 does not apply), it shall be assessed using the generic device procedures.

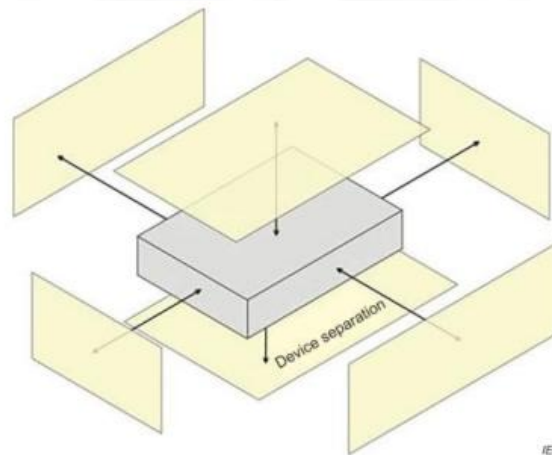
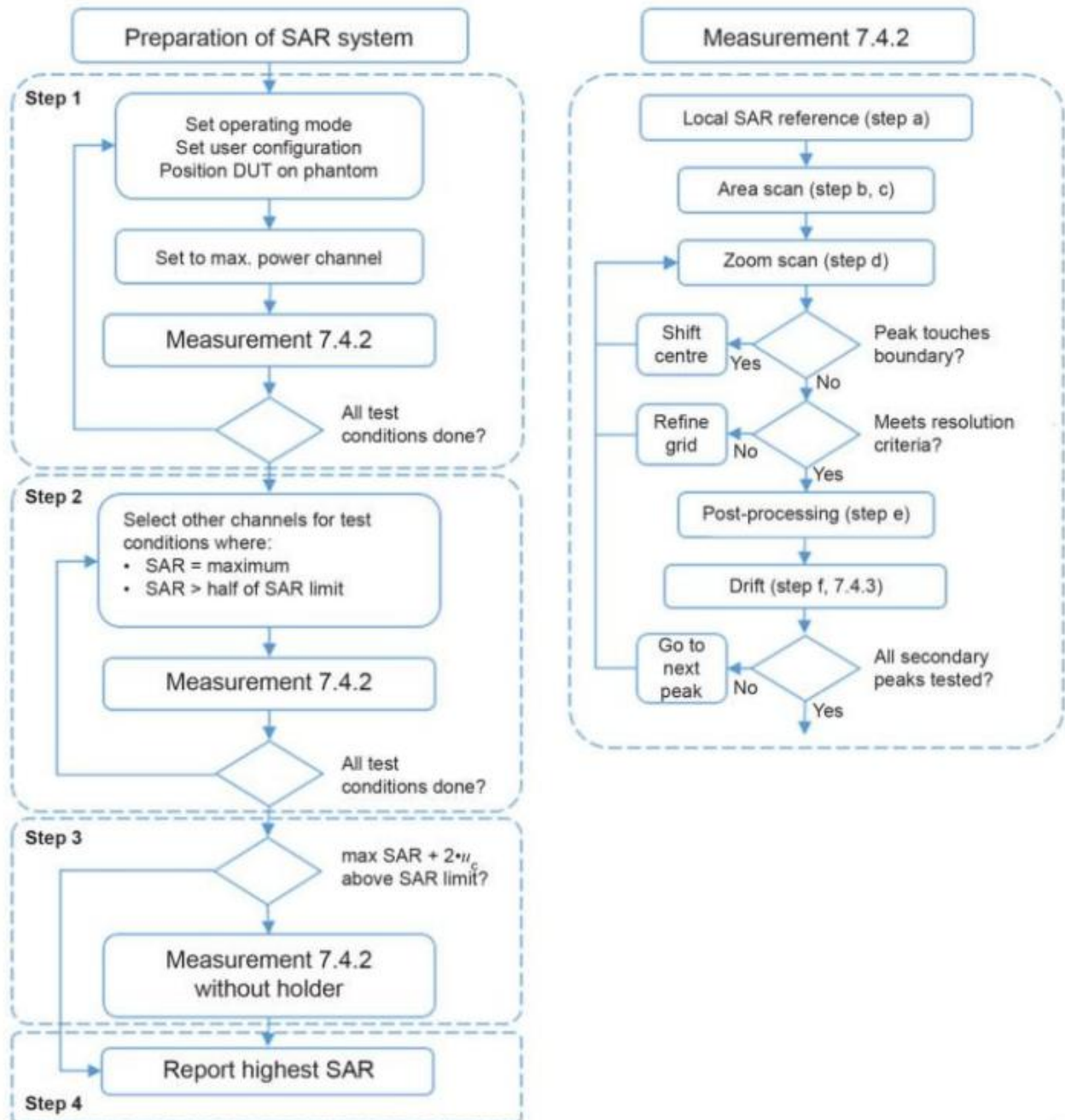


Figure 14 – Possible test positions for a generic device

7. Measurement Procedure

7.1 Measurement Process Diagram

Body SAR



IEC

7.2 Measurement Procedure

The following procedure shall be performed for each of the test conditions:

- a. Measure the local SAR at a test point within 8 mm of the phantom inner surface that is closest to the DUT. The test point can be close to the ear;
- b. Measure the SAR distribution within the phantom (area scan procedure). The SAR distribution is scanned along the inside surface of one side of the phantom head, at least for an area larger than the projection of the handset and antenna. The spatial grid step shall be less than 20 mm. The resolution accuracy can also be tested using the reference functions of 7.2.4. If surface scanning is used, then the distance between the geometrical centre of the probe dipoles and the inner surface of the phantom shall be 8,0 mm or less ($\pm 1,0$ mm). At all measurement points, the angle of the probe with respect to the line normal to the surface is recommended but not required to be less than 30° ;
- c. From the scanned SAR distribution, identify the position of the maximum SAR value, as well as the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; Additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit (i.e., 1 W/kg for a 1,6 W/kg 1 g limit, or 1,26 W/kg for a 2 W/kg 10 g limit). This is consistent with the 2 dB threshold already stated;
- d. Measure SAR with a grid step of 8 mm or less in a volume with a minimum size of 30 mm by 30 mm and 30 mm in depth (zoom scan procedure). The grid step in the vertical direction shall be 5 mm or less (see C.3.3). Separate grids shall be centred on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric cover/case of the probe should also be minimized, which is achieved if the distance between the phantom surface and physical tip of the probe is larger than half of the probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. At all measurement points, the angle of the probe with respect to the line normal to the surface is recommended but not required to be less than 30° ;
- e. Use interpolation and extrapolation procedures defined described in IEC/IEEE 62209-1528, Annex C to determine the local SAR values at the spatial resolution needed for mass averaging;
- f. The local SAR should be measured at exactly the same location as used in a). The absolute value of the measurement drift, i.e., the difference between the SAR measured in f) and a), shall be recorded in the uncertainty budget. It is recommended that the drift be kept within $\pm 5\%$. If this is not possible, even with repeat testing, additional information, e.g., data for local SAR versus time, should be used to demonstrate that the output power applied during the test is appropriate for testing the device. Power reference measurements can be taken after each zoom scan, if more than one zoom scan is needed. However, the drift should always be recorded as the difference between the device initial state with fully charged battery and all subsequent measurements using that battery.

7.3 Area & Zoom Scan Procedure

Measure the two-dimensional SAR distribution within the phantom (i.e. the area scan) Table 3 provides the measurement parameters required for the area scan.

1) The area over which the SAR measurement is performed shall cover at least an area larger than the projection of the DUT, including its antenna. For some DUTs, the area projected onto the phantom can be relatively large, such that the probe might not reach all points. In this case, rotated phantoms may be used, and the area may be assessed by multiple overlapping area scans. The measurement resolution and spatial resolution for interpolation shall be selected to allow identification of the local peak locations to within one-half of the linear dimension of the corresponding side of the zoom-scan volume.

2) For the flat phantom, the boundary of the measurement area shall not be closer than 20 mm from the phantom side walls.

Table 3 – Area scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5^a$
Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.		
^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.		

Table 4 – Zoom scan parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2^a$
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x- and y-directions (Δx and Δy , in mm)	8	$24/f^b$
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f-1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_n in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b This is the maximum spacing allowed, which might not work for all circumstances.		

7.4 Test Reduction Procedure

IEC/IEEE 62209-1528 provides a reproducible and conservative measurement methodology to measure the SAR of handheld and body-mounted wireless communication devices, which can be used to determine compliance of such equipment with the human exposure basic restrictions. Clearly, there is a point where the power generated by wireless devices is at such a level that it is incapable of exceeding the basic restriction. Measurements following the procedure of IEC/IEEE 62209-1528 might then not be necessary.

There may be DUTs that generate power at such a level that it is incapable of exceeding the basic restriction of the respective exposure guideline. That level can be determined by a variety of techniques which do not require the actual exposure level measurements. Determining this level would speed up the process without compromising technical accuracy. EN 62479 proposes techniques for such purposes and may be applied.

7.4.1 Example 1

The maximum power level, $P_{max, m}$, that can be transmitted by a device before the SAR averaged over a mass, m , exceeds a given limit, SAR_{lim} , can be defined. Any device transmitting at power levels below $P_{max, m}$ can then be excluded from SAR testing. The lowest possible value for $P_{max, m}$ is:

$$P_{max, m} = SAR_{lim} \times m$$

For example, an exposure limit of $SAR_{lim} = 2 \text{ W/kg}$ and an averaging mass of $m = 10 \text{ g}$ give a total transmitting power of $P_{max, m} = 20 \text{ mW}$ that would conservatively meet this exposure limit. For an exposure limit of $SAR_{lim} = 1,6 \text{ W/kg}$ and an averaging mass of $m = 1 \text{ g}$, a total transmitting power of $P_{max, m} = 1,6 \text{ mW}$ would conservatively meet the exposure limit. This assessment is based on the unrealistic assumption that all of the conducted power is radiated by the antenna and then absorbed in the body (i.e. none of the power is transmitted for communication) and all of the absorbed power is concentrated in the averaging mass. EN 62479 gives less restrictive power thresholds that may be applied in certain cases.

7.4.2 Example 2

Simultaneous multi-band transmission means that the device can transmit multiple transmission modes at the same time, e.g., a WCDMA transmission at 2GHz and a WLAN transmission at 2.45GHz. The time-averaged output power of a secondary transmitter (i.e. the lower power transmitter, e.g. Bluetooth, WLAN) may be much lower than that of the primary transmitter can be excluded from SAR testing when used alone. However, when the primary and secondary transmitter are used together, the SAR limit may still be exceeded. A means of determining the threshold power for the secondary transmitter that allows it to be excluded from SAR testing is needed. One way of determining the threshold power level available to the secondary transmitter ($P_{available}$) is to calculate it from the measured peak spatial-average SAR of the primary transmitter (SAR_1) according to the equation:

$$P_{available} = P_{th, m} \times (SAR_{lim} - SAR_1) / SAR_{lim}$$

Where:

$P_{th, m}$ is the threshold exclusion power level taken from EN 62479 Annex B for the frequency of the secondary transmitter at the separation distance used in the testing.

If the output power of the secondary transmitter is less than $P_{available}$, SAR measurement for the secondary transmitter is not necessary.

The above formula can be easily generalized to the case where more than two transmitters are communicating simultaneously. If there are N simultaneous transmitters and the peak spatial-average SAR of the first N-1 transmitter are known (SAR_i), then the threshold power level available to the Nth transmitter can be found from

$$P_{\text{available}} = P_{\text{max},m} \times (SAR_{\text{lim}} - \sum_{i=1}^{N-1} SAR_i) / SAR_{\text{lim}}$$

Alternatively, $P_{\text{th},m}$ can be replaced by $P_{\text{max},m}$, which is an easier approach but leads to more restrictive power threshold.

8. Conducted RF Output Power

8.1 Wifi

5G

Band (GHz)	Mode	Channel	Freq. (MHz)	EIRP(dBm)	Maximum Tune-up(dBm)	SAR Test Require.
U-NII-1 (5.150~5.250)	802.11a	36	5180	16.34	16.50	Yes
		40	5200	15.72	16.00	No
		48	5240	15.44	15.50	No
	802.11n(HT20)	36	5180	15.77	16.00	No
		40	5200	15.66	16.00	No
		48	5240	15.39	15.50	No

Note:

1) For WiFi 5G 802.11a/n SAR tests, a communication link is set up with the test mode software for WiFi mode test. The EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate.

2) When multiple channel bandwidth configurations in a frequency band have the same maximum tune-up output power, the test configuration is determined by applying the following steps sequentially.

a. The largest channel bandwidth configuration is selected among the multiple configurations in a frequency band with the same maximum tune-up output power.

b. When multiple transmission modes (802.11a/g/n/ac) have the same maximum tune-up output power, largest channel bandwidth, lowest order modulation, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac.

9. Test Result

RLAN-5.2g(gap 0mm)													
Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	10g Meas. SAR (W/kg)	Duty cycle (%)	Duty cycle Factor	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	10g Scaled SAR (W/kg)	Meas. No.
U-NII-1 (5.150~5.250) 802.11a	Horizontal- Up side	0	36	5180	2.670	0.250	100.00	1.000	16.34	16.50	1.038	0.260	/
	Horizontal- Down side	0	36	5180	-1.140	0.281	100.00	1.000	16.34	16.50	1.038	0.292	1#
	Vertical- Front	0	36	5180	1.220	0.213	100.00	1.000	16.34	16.50	1.038	0.221	/
	Vertical- Back	0	36	5180	-4.020	0.204	100.00	1.000	16.34	16.50	1.038	0.212	/
	Top edge	0	36	5180	1.600	0.188	100.00	1.000	16.34	16.50	1.038	0.195	/

Notes: Refer to ANNEX C for the detailed test data for each test configuration.

10. Simultaneous Transmission

The device contains one transmitters (only for Wifi) can not transmit multiple transmission modes at the same time, determining the threshold power level available to the secondary transmitter ($P_{\text{available}}$) is to calculate it from the measured peak spatial-average SAR of the primary transmitter (SAR_1) according to the equation:

$$P_{\text{available}} = P_{\text{th},m} \cdot (SAR_{\text{lim}} - SAR_1) / SAR_{\text{lim}}$$

where $P_{\text{th},m}$ is the threshold exclusion power level taken from Annex B of IEC 62479 for the frequency of the secondary transmitter at the separation distance used in the testing.

f GHz	BW %	Exemple d'interface air	P_{max} mW			
			$s = 5 \text{ mm}$		$s = 25 \text{ mm}$	
			$m = 1 \text{ g}$	$m = 10 \text{ g}$	$m = 1 \text{ g}$	$m = 10 \text{ g}$
2,442	3,4	802.11b	7,3	32	130	328
5,250	3,8	WIMAX	6,8	53	258	845

11. Test Equipment List

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
E-Field Probe	MVG	SSE2	0125-EPGO-445	2026/03/03	2027/03/02
6 1/2 Digital Multimeter	Keithley	DMM6500	4527164	2025/10/17	2026/10/16
Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	161997	2025/10/17	2026/10/16
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	2025/10/17	2026/10/16
E-Series Avg. Power Sensor	KEYSIGHT	E9300A	MY55050017	2026/04/02	2027/04/01
EPM Series Power Meter	KEYSIGHT	E4418B	MY41293435	2026/04/02	2027/04/01
10dB Attenuator	MIDWEST MICROWAVE	263-10dB	N/A	2026/04/02	2027/04/01
Coupler	MERRIMAC	CWM-10R-10.8G	LOT-83391	2026/04/02	2027/04/01
5200MHz-5800MHz Validation Dipole	MVG	SID5000	07/22 DIP5G000-670	2025/05/26	2028/05/25
LIMESAR Dielectric Probe	MVG	SCLMP	06/22 OCPG88	2026/04/07	2027/04/06
ENA Series Network Analyzer	Agilent	E5071B	MY42301221	2025/10/17	2026/10/16
Thermometer	Riters	DT-232	21A11	2026/04/02	2027/04/01
Antenna network emulator	MVG	ANTA 74	07/22 ANTA 74	N/A	N/A
SAM Phantom	MVG	SAM	07/22 SAM149	N/A	N/A
Mobile Phone Positioning System	MVG	MSH 118	07/22 MSH 118	N/A	N/A
Mechanical Calibration Kit	PNA	N/A	N/A	2025/10/17	2026/10/16
Open SAR test software	MVG	N/A	V5.3.5	N/A	N/A
Note: For dipole antennas, BTF has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria: 1. There is no physical damage on the dipole; 2. System validation with specific dipole is within 10% of calibrated value; 3. Return-loss in within 20% of calibrated measurement. 4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement. 5. Only one 3db attenuator is shown in the equipment list, but three are actually used.					

ANNEX A Simulating Liquid Verification Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SCLMP Dielectric Probe Kit.

Dielectric performance of tissue simulating liquid									
Frequency (MHz)	ϵ_r		σ (s/m)		Delta (ϵ_r)	Delta (σ)	Limit	Temp ($^{\circ}\text{C}$)	Date
	Target	Measured	Target	Measured					
5200	36.00	35.88	4.66	4.69	-0.33%	0.64%	$\pm 5\%$	22.3	21/5/2026
NOTE: The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 $^{\circ}\text{C}$ of the conditions expected during the SAR evaluation to satisfy protocol requirements.									

ANNEX B System Check Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of 10 % (for 10 g).

Frequency (MHz)	Input Power (mW)	10g SAR (W/Kg)	1g SAR (W/Kg)	10g SAR 1W input power normalized (W/Kg)	1g SAR 1W input power normalized (W/Kg)	10g SAR Standard target (1W) (W/Kg)	1g SAR Standard target (1W) (W/Kg)	10g SAR Deviation	1g SAR Deviation
5200	100	2.319	7.715	23.19	77.15	22.78	78.16	1.80%	-1.29%

System Performance Check Data (5200 MHz)

System check at 5200 MHz

Date of measurement: 21/5/2026

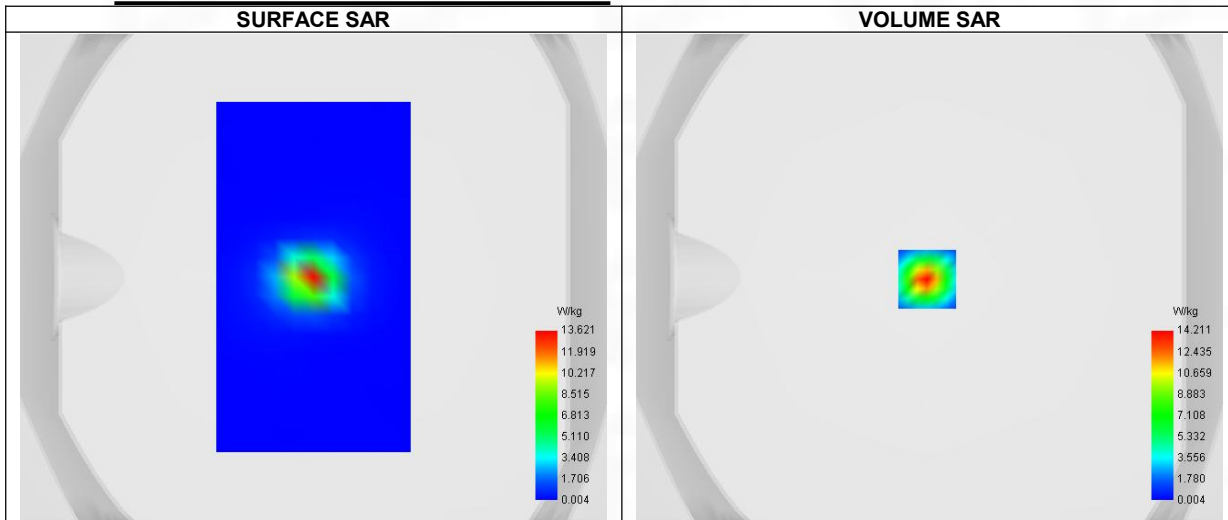
A. Experimental conditions.

Probe	0125-EPGO-445
ConvF	1.16
Area Scan	dx=8mm dy=8mm, Complete
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2.0mm,Complete
Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels/Frequency	Middle
Signal	CW

B. Permittivity

Middle TX Frequency (MHz)	5200.000
Relative permittivity (real part)	35.876
Relative permittivity (imaginary part)	16.441
Conductivity (S/m)	4.693

C. SAR Surface and Volume



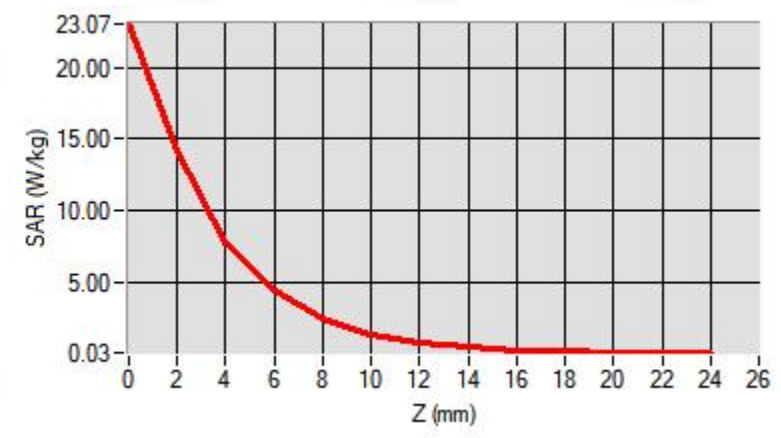
Maximum location: X=-1.00, Y=-1.00 ; SAR Peak: 24.33 W/kg

D. SAR 1g & 10g

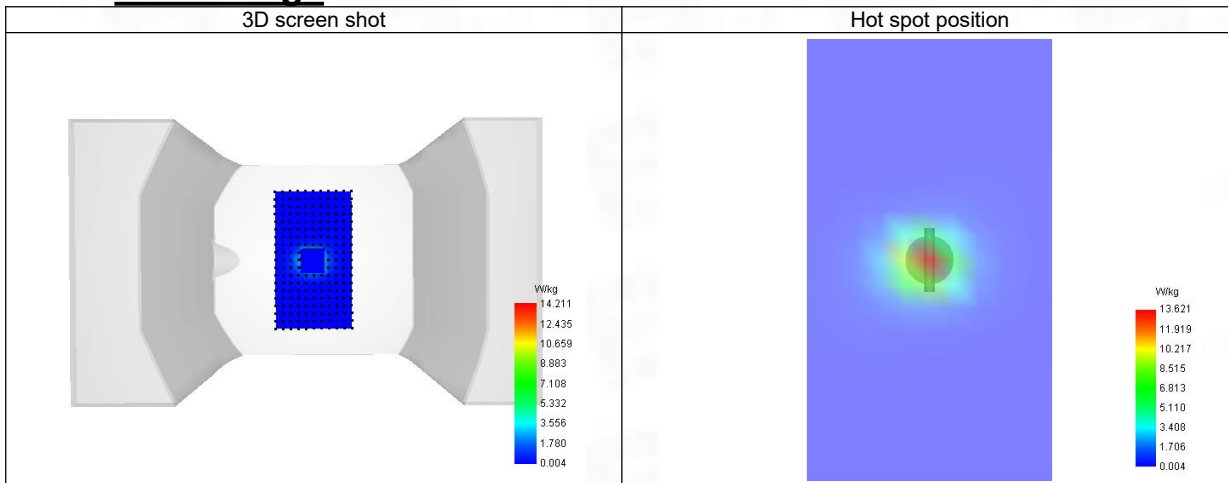
SAR 10g (W/Kg)	2.319
SAR 1g (W/Kg)	7.715
Variation (%)	-1.210
Horizontal validation criteria: minimum distance (mm)	8.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	54.390552

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	23.071	14.211	7.730	4.391	2.423	1.355	0.754	0.420	0.233	0.129	0.071	0.041



F. 3D Image



ANNEX C Test Data

1-Body with back position in dist. 0mm on Channel 36 in IEEE 802.11a U-NII

SAR Measurement at U-NII-1 (Body, Validation Plane)

Date of measurement: 21/5/2026

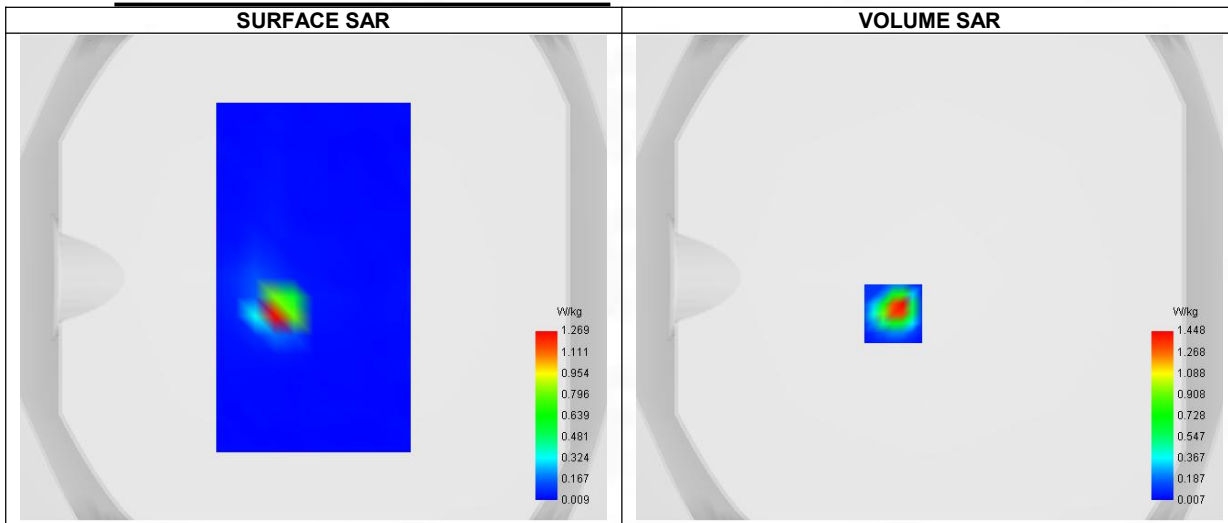
A. Experimental conditions.

Probe	0125-EPGO-445
ConvF	1.16
Area Scan	dx=8mm dy=8mm, Complete
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2.0mm,Complete
Phantom	Validation plane
Device Position	Body
Band	U-NII-1
Channels/Frequency	Lower (36)/ frequency 5180.000 Mhz
Signal	IEEE 802.11 ac

B. Permittivity

Middle TX Frequency (MHz)	5180.000
Relative permittivity (real part)	35.902
Relative permittivity (imaginary part)	16.411
Conductivity (S/m)	4.672

C. SAR Surface and Volume



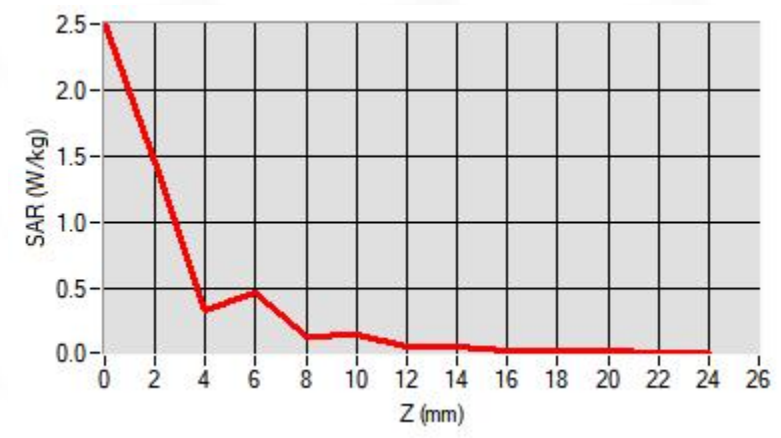
Maximum location: X=-15.00, Y=-15.00 ; SAR Peak: 2.68 W/kg

D. SAR 1g & 10g

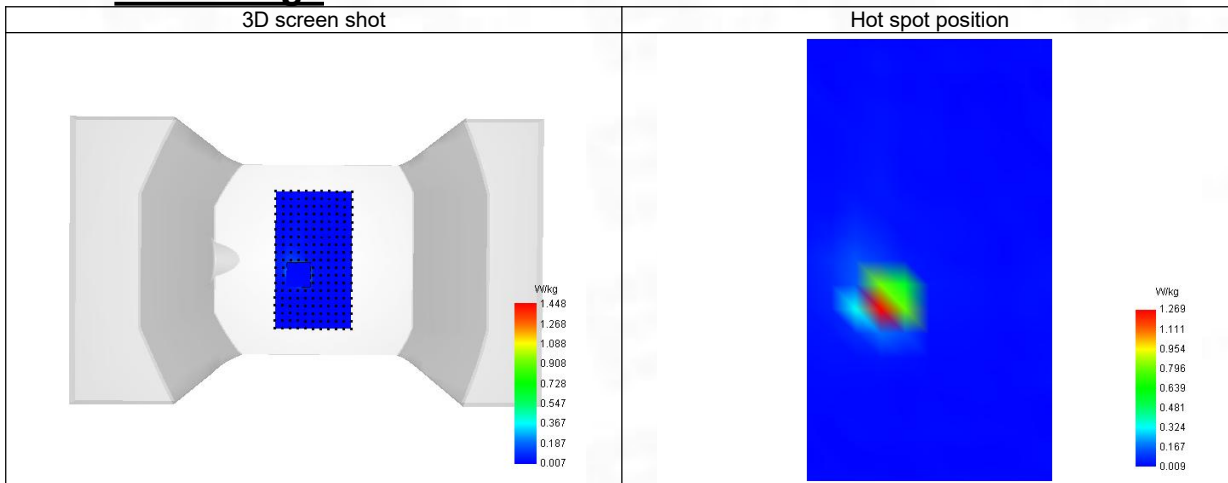
SAR 10g (W/Kg)	0.281
SAR 1g (W/Kg)	0.744
Variation (%)	-1.140
Horizontal validation criteria: minimum distance (mm)	4.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	55.686750

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
SAR (W/Kg)	2.491	1.448	0.329	0.464	0.133	0.158	0.054	0.061	0.031	0.038	0.026	0.020



F. 3D Image

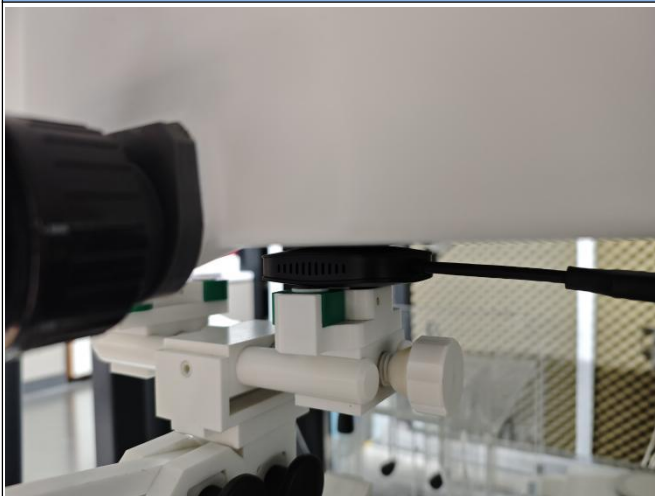


ANNEX D SAR Test Setup Photos

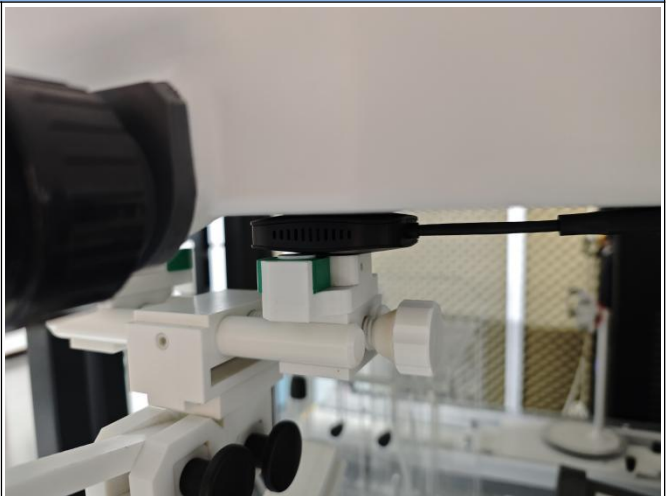
Reference Photo: simulation liquid depth 15.9cm



Reference Photos



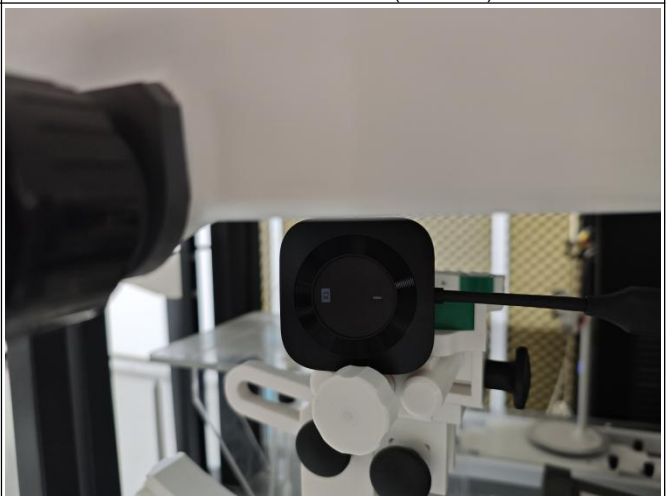
Horizontal- Up side (dist. 0mm)



Horizontal- Down side (dist. 0mm)



Vertical- Front (dist. 0mm)



Vertical- Back (dist. 0mm)



Top edge (dist. 0mm)

ANNEX E EUT External and Internal Photos

Please refer to RF Report.

ANNEX F Calibration Report

Please refer to the document "Calibration Report.pdf".



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--END OF REPORT--