In accordance with the requirements of
EN50566, EN62209 and COUNCIL RECOMMENDATION 1999/519/EC

CE SAR EVALUATION REPORT

Product Name	Tablet
Model No.	Tab 70 WiFi
Serial Model	N/A
Brand Name	Blackview
Report No.	AIT23071307CH1

Prepared for

DOKE COMMUNICATION (HK) LIMITED

RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD WANCHAI HK CHINA

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name.....................:	DOKE COMMUNICATION (HK) LIMITED
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Manufacturer's Name.............:	Shenzhen DOKE Electronic Co., Ltd
Address.......................................:	801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road, Guangming District, Shenzhen, China

Product description

Product name............................:	Tablet
Trademark ....:	Blackview
Model and/or type reference .:	Tab 70 WiFi
Serial Model...............................:	N/A
Standards..................................:	EN 50566: 2017 EN 62209-2: 2010 EN 50663: 2017; EN 62479: 2010

This device described above has been tested by Dongguan AIT. In accordance with the measurement methods and procedures specified in EN62209. Testing has shown that this device is capable of compliance with localized specific absorption rate (SAR) specified in COUNCIL 1999/519/EC. The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

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Date of Test

Date (s) of performance of tests...............:	July 20, 2023 –July 21, 2023
Date of Issue..:	July 27, 2023
Test Result..:	**Pass**

Reviewed by: Simba Huang

Simba Huang

Approved by: Seal-Chen

Seal.chen

※ ※ Revision History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	July 27, 2023	Seal.chen

TABLE OF CONTENTS

1. General Information

1.1. RF exposure limits

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

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	10.0	20.0

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

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	2.0	4.0

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

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

General Population/Uncontrolled Environments:
Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE
HEAD AND TRUNK LIMIT
2.0 W/kg
APPLIED TO THIS EUT

1.2. Statement of Compliance

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

Band	Max SAR Value Reported(W/kg)	
	10-g Body (Separation distance of 0mm)	Max SAR Summation
WLAN 2.4GHz	0.453	N/A
WLAN 5.2GHz	0.160	

NOTE: The Max SAR Summation is calculated based on the same configuration and test position.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (2.0 W/kg) specified in COUNCIL RECOMMENDATION 1999/519/EC, and had been tested in accordance with the measurement methods and procedures specified in EN 62209-1/2.

1.3. EUT Description

Product Name	Tablet		
Trademark	Blackview		
Model Name	Tab 70 WiFi		
Serial Model	N/A		
Hardware Version:	R863T-RK3562-V0.1		
Software Version:	Tab_70_WiFi_NEU_R863T_V1.0_20230713V01		
Device Phase	Identical Prototype		
Exposure Category	General population / Uncontrolled environment		
Battery Information	DC 3.8V from Battery		
WIFI 2.4G			
Supported type:	802.11b/g/n/ax		
Modulation:	802.11b: DSSS 802.11g/n/ax: OFDM		
Operation frequency:	802.11b/g/n(HT20)/ax(HE20): 2412MHz~2472MHz 802.11n(H40)/ax(HE40):2422MHz~2462MHz		
Channel number:	802.11b/g/n(HT20)/ax(HE20): 13 802.11n(H40)/ax(HE40): 9		
Channel separation:	5MHz		
Antenna Type	FPC Antenna		
Antenna gain:	-3.3dBi		
WIFI 5GHz			
Supported type:	20MHz system	40MHz system	80MHz system
	802.11a 802.11n 802.11ac 802.11ax	802.11n 802.11ac 802.11ax	802.11ac 802.11ax
Operation frequency:	5180-5240MHz 5745-5825Mhz	5190-5230MHz 5755-5795MHz	5210MHz; 5775MHz
Modulation:	OFDM	OFDM	OFDM
Channel number:	9	4	2
Channel separation:	20MHz	40MHz	80MHz
Antenna Type	FPC Antenna		
Antenna gain:	-1.7dBi		
Bluetooth BR/EDR			
Supported:	Bluetooth BR/EDR		
Modulation:	GFSK, π/4DQPSK, 8DPSK		
Operation frequency:	2402MHz~2480MHz		
Channel number:	79		
Channel separation:	1MHz		
Antenna Type	FPC Antenna		
Antenna gain:	-3.3dBi		
Bluetooth LE			
Supported type:	Bluetooth low Energy		
Modulation:	GFSK		
Operation frequency:	2402MHz to 2480MHz		
Channel number:	40		
Channel separation:	2 MHz		
Antenna Type	FPC Antenna		
Antenna gain:	-3.3dBi		

Note: For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

1.4. Test specification(s)

EN 50566: 2017	Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz: hand-held and body mounted devices in close proximity to the human body
EN 62209-2: 2010	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures –Part 2: Procedure to determine the Specific Absorption Rate (SAR) in the head and body for 30MHz to 6GHz Handheld and Body-Mounted Devices used in close proximity to the body
EN 50663: 2017	Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10MHz to 300GHz)

1.5. Ambient Condition

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

2. SAR Measurement System

2.1. SAR Measurement Set-up

The DASY4 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY4 measurement server.

The DASY4 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY4 software and SEMCAD data evaluation software.

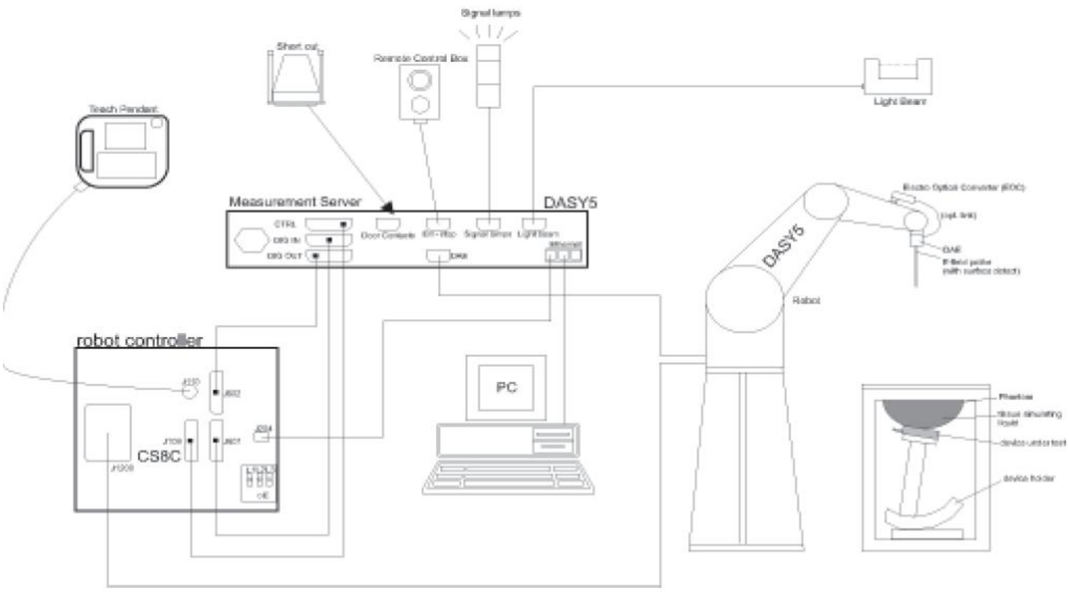
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



2.2. DASY4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

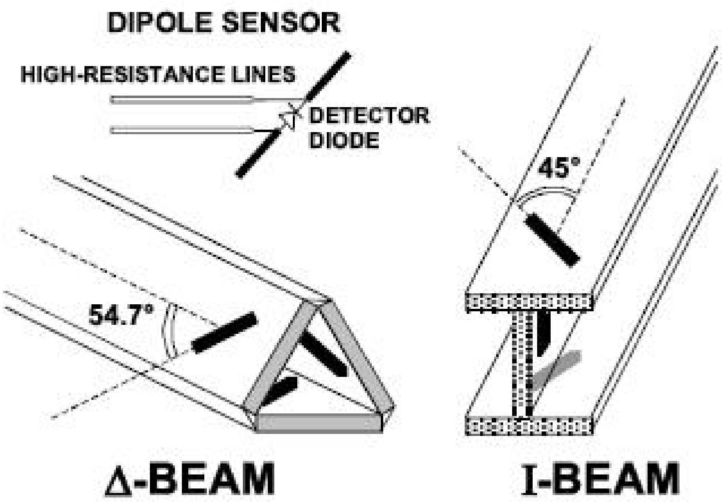
Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



2.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

2.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

Device holder supplied by SPEAG

2.5. Scanning Procedure

The DASY4 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY4 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot. Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan
Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered on the maxima found in the preceding area scan.

Spatial Peak Detection
The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses. The DASY4 system allows evaluations that combine measured data and robot positions, such as: • maximum search • extrapolation • boundary correction • peak search for averaged SAR During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard’s method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

2.6. Data Storage and Evaluation

Data Storage

The DASY4 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY4 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcpi = diode compression point (DASY parameter)

From the compensated input signals the priMayy field data for each channel can be evaluated:

$$\text{E}-\text{fieldprobes}: \quad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\text{H}-\text{fieldprobes}: \quad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The priMayy field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

2.7. Test Equipment List

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Calibration	Calibration Interval
Data Acquisition Electronics DAEx	SPEAG	DAE4	1331	2022-09-15	1
E-field Probe	SPEAG	EX3DV4	7396	2023-05-06	1
System Validation Dipole 2450V2	SPEAG	D2450V2	1009	2021-01-25	3
System Validation Dipole 5GHzV2	SPEAG	D5GHzV2	1200	2021-05-18	3
Communication Tester	R&S	CMW500	116581	2023-01-22	1
Dielectric Probe Kit	Agilent	85070E	NA#F-EP-00777	/	/
Power meter	Agilent	NRVD	835843/014	2023-01-22	1
Power meter	Agilent	NRVD	835843/018	2023-01-22	1
Power meter	Agilent	NRVD	835843/021	2023-01-22	1
Power sensor	Agilent	NRV-Z2	100211	2023-01-22	1
Power sensor	Agilent	NRV-Z2	100215	2023-01-22	1
Power sensor	Agilent	NRV-Z2	100219	2023-01-22	1
Signal generator	ROHDE & SCHWARZ	SME03	100029	2023-01-22	1
Amplifier	AR	2HL-42W-S	100206	/	/

3. SAR Measurement Procedures

Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in Picture 5

Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom),

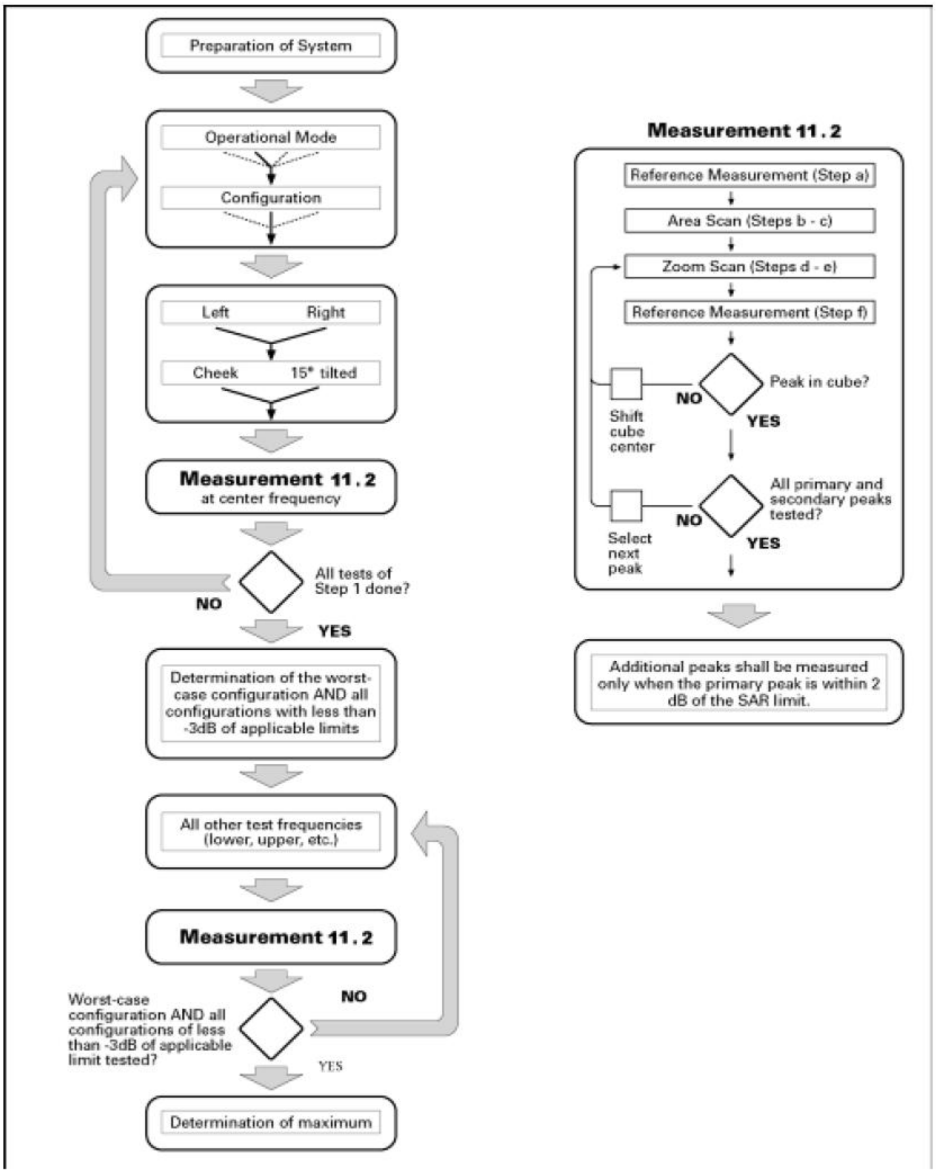
b) all configurations for each device position in a), e.g., antenna extended and retracted, and

c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

d) If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 11.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 5 Block diagram of the tests to be performed

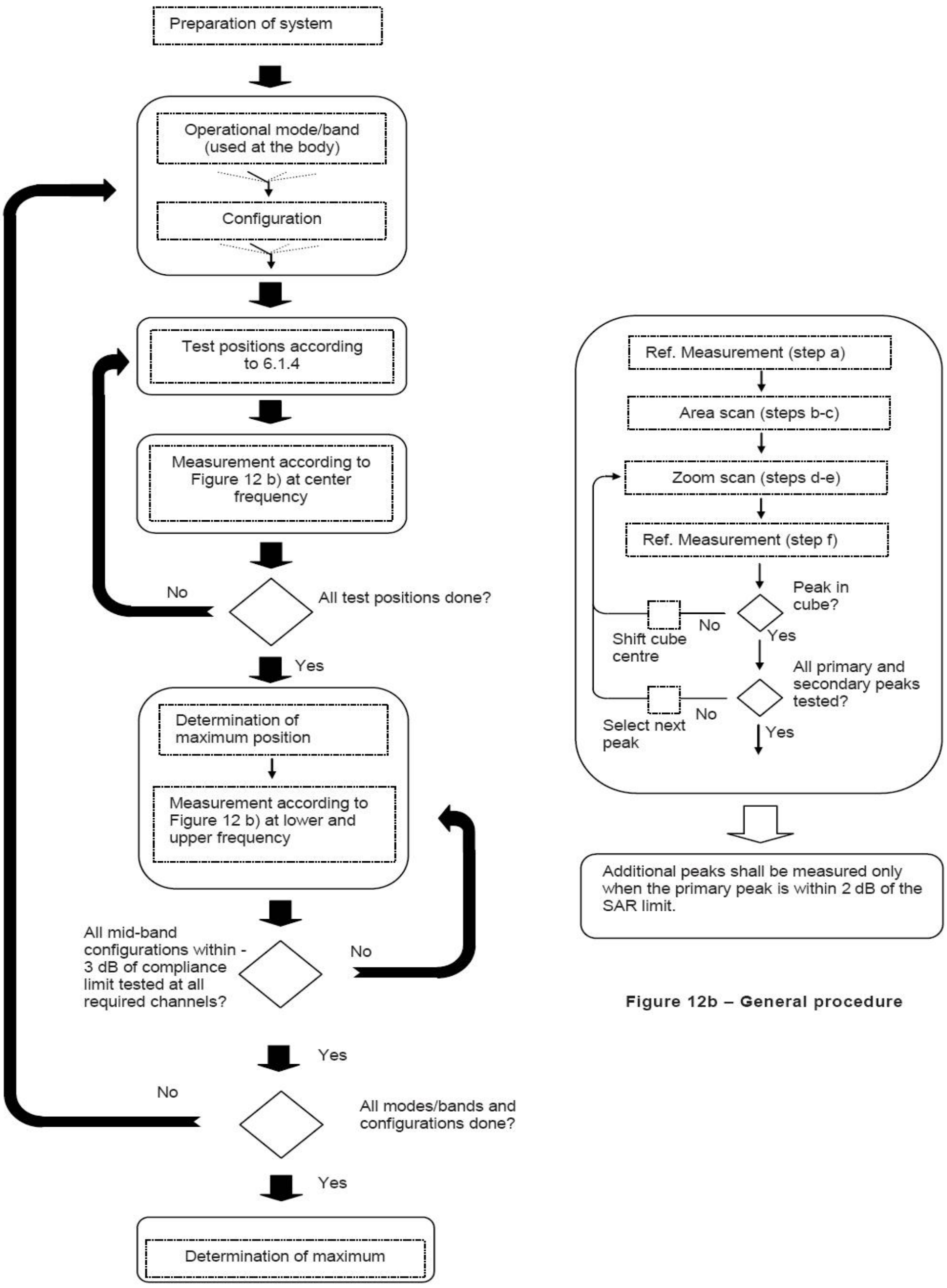


Figure 12a – Tests to be performed

Figure 12b – General procedure

Picture 6 Block diagram of the tests to be performed

Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 5).

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and In(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional measurement distance to the phantom inner surface shorter than the probe diameter, additional

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the priMayy peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step

e) The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and δIn(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and In(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5. If this cannot be achieved an additional uncertainty evaluation is needed.

f) Use post processing (e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 2 to Table 6 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

4. System Verification Procedure

4.1. Tissue Verification

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

Ingredients (% of weight)	Head Tissue								
Frequency Band (MHz)	750	835	900	1800	1900	2000	2450	2600	5200
Water	34.40	34.40	34.40	55.36	55.36	71.88	71.88	71.88	65.53
NaCl	0.79	0.79	0.79	0.35	0.35	0.16	0.16	0.16	0.00
1,2-Propanediol	64.81	64.81	64.81	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	30.45	30.45	19.97	19.97	19.97	17.24
DGBE	0.00	0.00	0.00	13.84	13.84	7.99	7.99	7.99	0.00

4.1.1. Tissue Dielectric Parameter Check Results

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

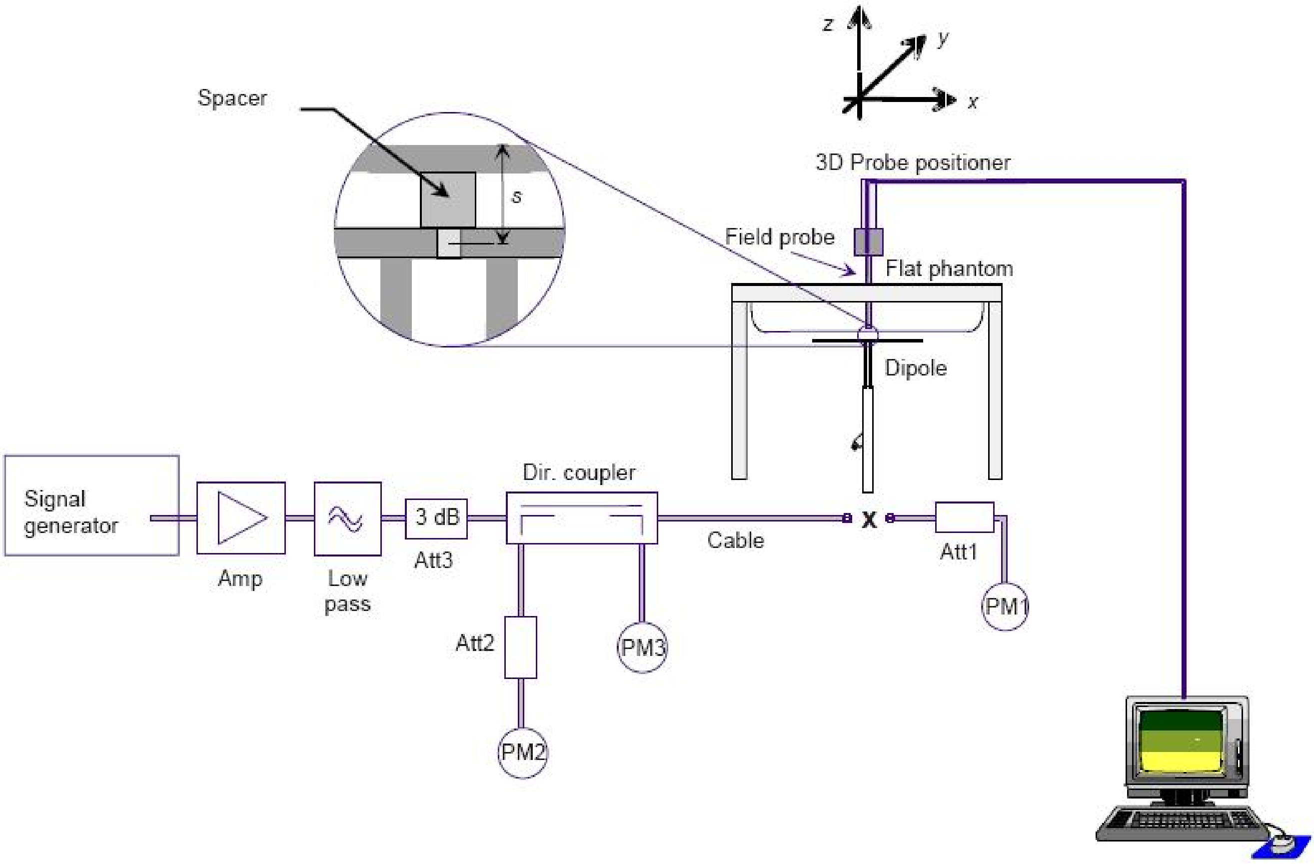
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue				Liquid Temp.	Test Data
		ε_r	σ	ε_r	Dev. (%)	σ	Dev. (%)		
2450B	2450	52.7	1.95	51.936	-1.45%	1.922	2.08%	22.4	07/20/2023
5250B	5250	48.9	5.36	49.511	1.25%	5.427	2.23%	22.3	07/21/2023

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

4.2. System Verification Procedure

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

The system verification is shown as below picture:



4.2.1. System Verification Results

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

Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Targeted SAR (W/kg)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)	Date
2450	Body	250	23.90	6.03	24.12	0.92%	07/20/2023
5250	Body	100	20.50	2.11	21.10	2.93%	07/21/2023

5. SAR Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2003. 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 (1 g)	Ci (10 g)	1 g Ui (±%)	10 g Ui (±%)	Vi
Measurement System								
Probe Calibration	5.8	N	1	1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	√3	0.7	0.7	1.43	1.43	∞
Hemispherical Isotropy	5.9	R	√3	0.7	0.7	2.41	2.41	∞
Boundary Effect	1	R	√3	1	1	0.58	0.58	∞
Linearity	4.7	R	√3	1	1	2.71	2.71	∞
System Detection Limits	1	R	√3	1	1	0.58	0.58	∞
Modulation response	3	N	1	1	1	3.00	3.00	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0	R	√3	1	1	0.00	0.00	∞
Integration Time	1.4	R	√3	1	1	0.81	0.81	∞
RF Ambient Conditions - Noise	3	R	√3	1	1	1.73	1.73	∞
RF Ambient Conditions - Reflections	3	R	√3	1	1	1.73	1.73	∞
Probe Positioner Mechanical Tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe Positioning with respect to Phantom Shell	1.4	R	√3	1	1	0.81	0.81	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	2.3	R	√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	√3	1	1	2.89	2.89	∞
SAR scaling	2	R	√3	1	1	1.15	1.15	∞
Phantom and Tissue Parameters								
Phantom Uncertainty (shape and thickness tolerances)	4	R	√3	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviation (in permittivity and conductivity)	2	N	1	1	0.84	2.00	1.68	∞
Liquid Conductivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	5
Liquid conductivity - measurement uncertainty	4	N	1	0.23	0.26	0.92	1.04	5
Liquid permittivity (temperature uncertainty)	2.5	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity - measurement uncertainty	5	N	1	0.23	0.26	1.15	1.30	∞
Combined Standard Uncertainty		RSS				10.63	10.54	
Expanded Uncertainty (95% Confidence interval)		k				21.26	21.08	

6. RF Exposure Positions

6.1. Body-supported device

The example in Figure 6.1) shows a Tablet PC form factor portable computer for which SAR should be separately assessed with

a) each surface and

b) the separation distances

Positioned against the flat phantom that correspond to the intended use as specified by the manufacturer. If the intended use is not specified in the user instructions, the device shall be tested directly against the flat phantom in all usable orientations.

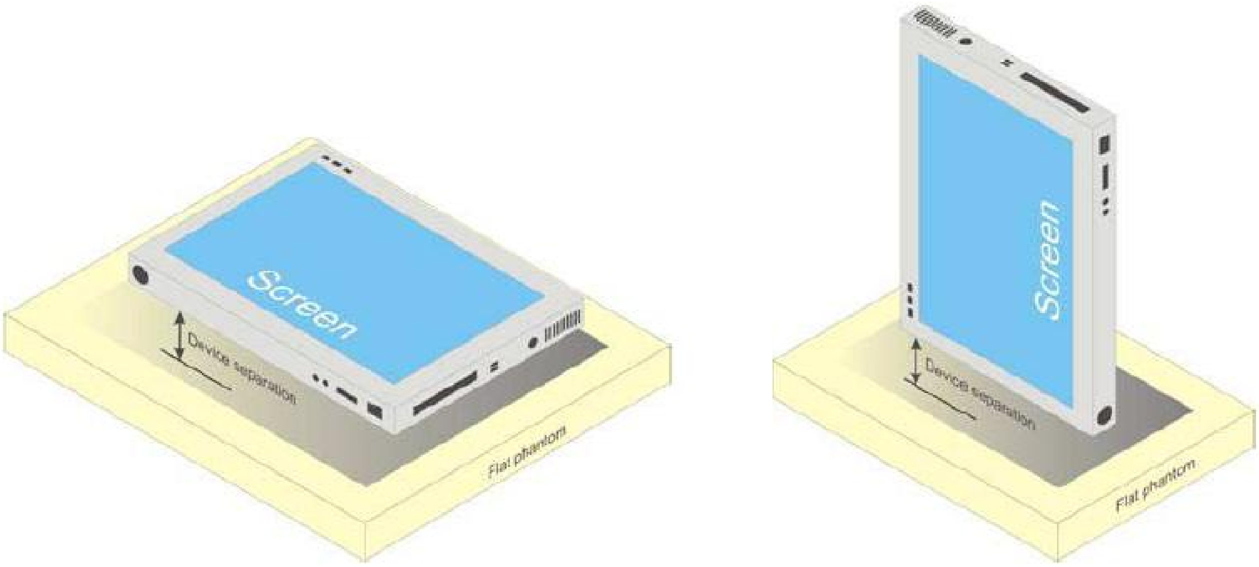
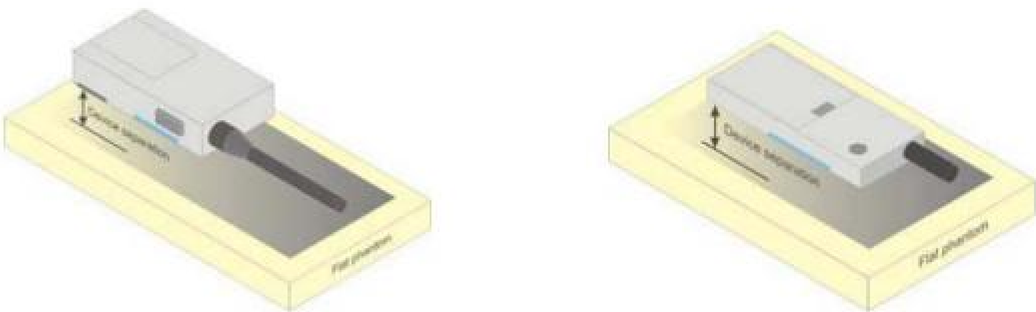


Figure 6.1 – Test positions for Body-supported device

6.2. Test Positions for front-of-face configurations

Test Positions for front-of-face configurations A typical example of a front-of-face device is a two-way radio that is held at a distance from the face of the user when transmitting. In these cases the device under test shall be positioned at the distance to the phantom surface that corresponds to the intended use as specified by the manufacturer in the user instructions. If the intended use is not specified, a separation distance of 25 mm – 0mm between the phantom surface and the device shall be used.



7. RF Output Power

7.1. Wi-Fi & BT Output Power

[2.4GHz WLAN]

Mode	Channel	Frequency (MHz)	Output Power EIRP (dBm)	Tune-Up
802.11b	1	2412	15.11	15±1
	7	2442	14.40	14±1
	13	2472	13.43	14±1
802.11g	1	2412	14.67	14±1
	7	2442	14.37	14±1
	13	2472	14.09	14±1
802.11n (HT20)	1	2412	13.87	13±1
	7	2442	13.99	13±1
	13	2472	13.43	13±1
802.11n (HT40)	3	2422	13.20	13±1
	7	2442	13.19	13±1
	11	2462	13.05	13±1
802.11ax (HE20)	1	2412	13.88	13±1
	7	2442	13.70	13±1
	13	2472	13.28	13±1
802.11ax (HE40)	3	2422	13.03	13±1
	7	2442	13.14	13±1
	11	2462	12.95	13±1

[5GHz WLAN Band 1]

Mode	Frequency (MHz)	Output Power EIRP (dBm)	Tune-up
802.11A	5180	16.66	16±1
	5200	16.46	16±1
	5240	16.33	16±1
802.11n (HT20)	5180	16.05	15.5±1
	5200	15.87	15.5±1
	5240	15.44	15.5±1
802.11n(HT40)	5190	15.79	15.5±1
	5230	15.49	15.5±1
802.11ac(VHT20)	5180	16.06	15.5±1
	5200	16.05	15.5±1
	5240	15.57	15.5±1
802.11ac(VHT40)	5190	15.60	15.5±1
	5230	15.54	15.5±1
802.11ac(VHT80)	5210	14.88	15.5±1
802.11ax(HE20)	5180	16.23	15.5±1
	5200	15.93	15.5±1
	5240	15.64	15.5±1
802.11ac(HE40)	5190	15.54	15.5±1
	5230	15.64	15.5±1
802.11ac(HE80)	5210	14.53	15.5±1

[5GHz WLAN Band 3]

Mode	Frequency (MHz)	Output Power EIRP (dBm)	Tune-up
802.11A	5745	11.01	11±1
	5785	11.35	11±1
	5825	11.60	11±1
802.11n (HT20)	5745	10.45	11±1
	5785	11.12	11±1
	5825	11.38	11±1
802.11n(HT40)	5755	10.53	11±1
	5795	10.65	11±1
802.11ac(VHT20)	5745	10.50	11±1
	5785	10.92	11±1
	5825	11.34	11±1
802.11ac(VHT40)	5755	10.87	11±1
	5795	10.62	11±1
802.11ac(VHT80)	5775	10.42	11±1
802.11ax(HE20)	5745	10.69	11±1
	5785	11.07	11±1
	5825	11.45	11±1
802.11ac(HE40)	5755	10.73	11±1
	5795	10.43	11±1
802.11ac(HE80)	5775	10.27	11±1

Note: According to the table above, the maximum E.I.R.P. power with tune-up of WLAN5.8G is 12dBm which is lower than 13dBm, so SAR test for WLAN5.8G is not required. It satisfied the requirements of standard EN 62479:2010.

[2.4GHz BT]

Mode	Channel	Output Power EIRP (dBm)	Tune-up
GFSK	Hopping	4.63	4±1
π/4-DQPSK	Hopping	2.78	3±1
8DPSK	Hopping	3.62	3±1
BLE 1Mbps	CH00	4.38	4±1
	CH19	4.38	4±1
	CH39	4.14	4±1
BLE 2Mbps	CH00	4.23	4±1
	CH19	4.27	4±1
	CH39	4.05	4±1

Note: According to the table above, the maximum E.I.R.P. power with tune-up of BT is 5dBm which is lower than 13dBm, so SAR test for BT is not required. It satisfied the requirements of standard EN 62479:2010.

8. SAR Measurement Results

< WIFI 2.4G >

Band	Mode	Test Position	Ch.	*Conducted Power (dBm)*	*Tune-up (dBm)*	*Scale*	*SAR10g (W/kg*	*Reported SAR10g (W/kg)*	Plot
WIFI2.4	DSSS	Front	01	15.11	16.0	1.227	0.334	0.410	
WIFI2.4	DSSS	Rear	01	15.11	16.0	1.227	**0.369**	**0.453**	**#1**
WIFI2.4	DSSS	Right	01	15.11	16.0	1.227	0.105	0.129	
WIFI2.4	DSSS	Left	01	15.11	16.0	1.227	0.114	0.140	
WIFI2.4	DSSS	Top	01	15.11	16.0	1.227	0.357	0.438	
WIFI2.4	DSSS	Bottom	01	15.11	16.0	1.227	0.034	0.042	

< WIFI 5G >

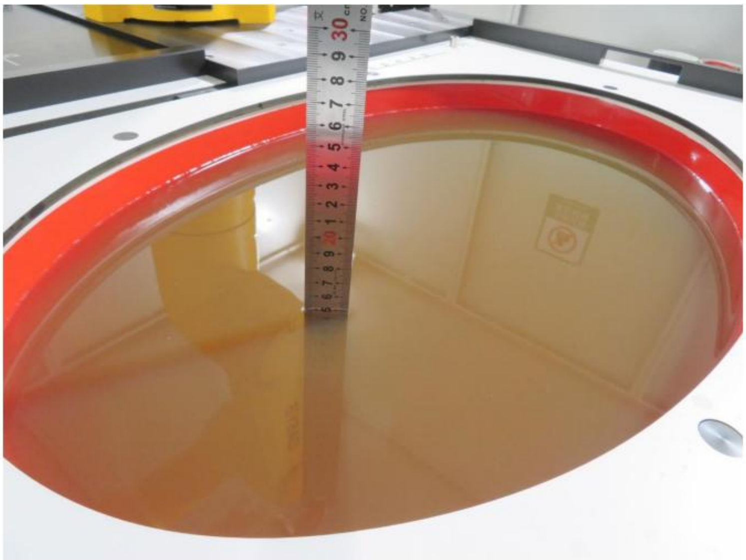
Band	Mode	Test Position	Ch.	*Conducted Power (dBm)*	*Tune-up (dBm)*	*Scale*	*SAR10g (W/kg*	*Reported SAR10g (W/kg)*	Plot
WIFI5.2	802.11a20	Front	36	16.66	17.00	1.081	0.137	0.148	
WIFI5.2	802.11a20	Rear	36	16.66	17.00	1.081	**0.148**	**0.160**	**#2**
WIFI5.2	802.11a20	Right	36	16.66	17.00	1.081	0.011	0.012	
WIFI5.2	802.11a20	Left	36	16.66	17.00	1.081	0.015	0.016	
WIFI5.2	802.11a20	Top	36	16.66	17.00	1.081	0.144	0.156	
WIFI5.2	802.11a20	Bottom	36	16.66	17.00	1.081	0.008	0.009	

< Simultaneous Transmission Analysis >

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.

Liquid depth



Body Position liquid depth (15.2cm)

Appendix B. System Check Plots

System Performance Check- 2450MHz

DUT: D2450V2; Type: D2540V2; Serial: 1009

Date: 07/20/2023

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.922 S/m; ε_r = 51.936; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6℃;Liquid Temperature:22.4℃;

DASY Configuration:

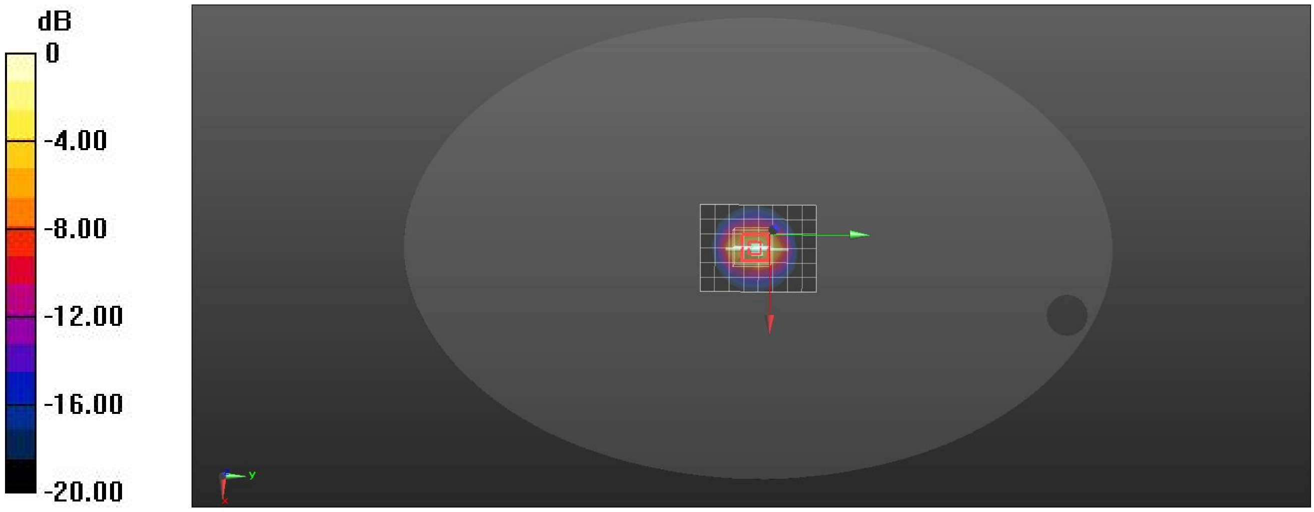
- Probe: EX3DV4 - SN7396; ConvF(7.53, 7.53, 7.53) @ 2450 MHz; Calibrated: 5/6/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 9/15/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY5, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Area Scan (7x9x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 26.2 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 6.03 W/kg

Maximum value of SAR (measured) = 21.0 W/kg



0 dB = 21.0 W/kg = 13.22 dBW/kg

System Performance Check 2450MHz 250mW

SystemPerformanceCheck-Head 5250MHz

DUT: D5GHzV2; Type: D5GHzV2; Serial: 1200

Date: 07/21/2023

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5250 MHz; σ = 5.427 S/m; ε_r = 49.551; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6℃;Liquid Temperature:22.4℃;

DASY Configuration:

- Probe: EX3DV4 - SN7396; ConvF(4.93, 4.93, 4.93) @ 5250 MHz; Calibrated: 5/6/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 9/15/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY5, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Area Scan (7x7x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.0 W/kg

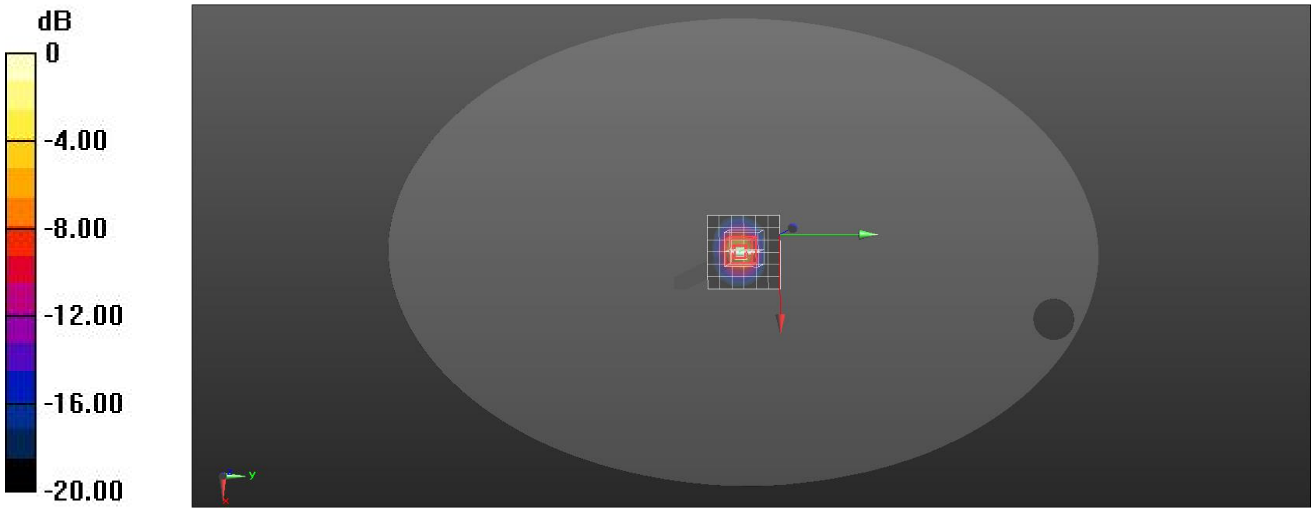
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 59.18 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 30.6 W/kg

SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.11 W/kg

Maximum value of SAR (measured) =19.9 W/kg



0 dB = 19.9 W/kg = 12.99 dBW/kg

System Performance Check 5150MHz 100mW

Appendix C. SAR Test Plots

WLAN2.4G_802.11b_Rear side_0mm_CH01

Date: 07/20/2023

Communication System: WLAN2.4G; Frequency: 2412 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2412 MHz; σ = 1.725 S/m; ε_r = 50.354; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7396; ConvF(7.53, 7.53, 7.53); Calibrated: 5/6/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 9/15/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY5, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Area Scan (9x10x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 1.35 W/g

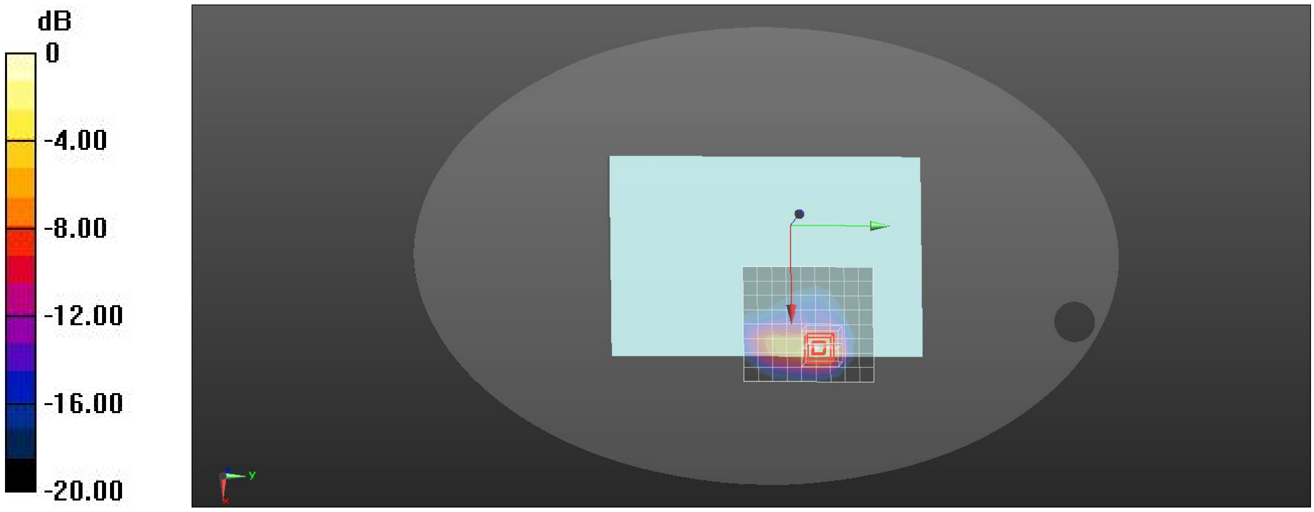
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.241 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 2.28 W/kg

SAR(1 g) = 0.951 W/g; SAR(10 g) = 0.369 W/g

Maximum value of SAR (measured) =1.76 W/g



0 dB = 1.76 W/kg = 2.46 dBW/kg

Plot #1: WLAN2.4G_802.11b_Rear side_0mm_CH01

WLAN 5.2GHz_Rear side_0mm_802.11a CH36

Date: 07/21/2023

Communication System: WLAN 5.2G; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f =5180 MHz; σ = 5.325 S/m; ε_r = 49.425; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7396; ConvF(4.93, 4.93, 4.93); Calibrated: 5/6/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 9/15/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY5, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Area Scan (11x12x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.10 W/g

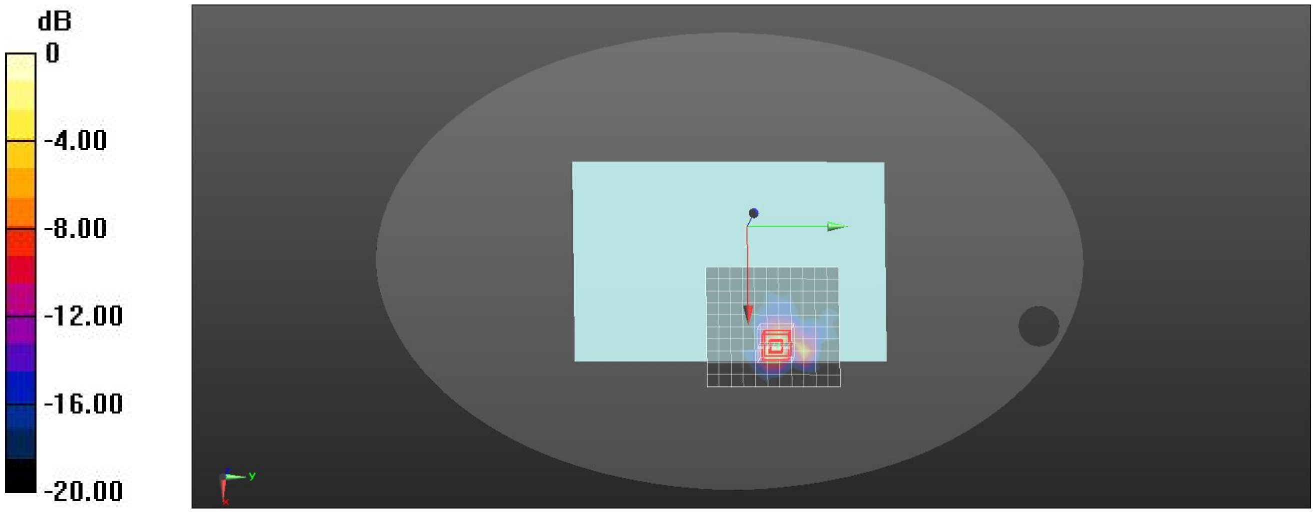
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 3.911 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 2.13 W/kg

SAR(1 g) = 0.554 W/g; SAR(10 g) = 0.148 W/g

Maximum value of SAR (measured) = 1.36 W/g



0 dB = 1.36 W/kg = 1.34 dBW/kg

Plot #2: WLAN 5.2GHz_Rear side_0mm_802.11a CH36

※※※※※END OF THE REPORT※※※※※