DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:

NIE: 77695RAN.003

Test report
IEEE Std 1528™-2013

(*) Identification of item tested	STP8X040
(*) Trademark	Sepura
(*) Model and /or type reference tested	STP8X040
(*) Other identification of the product	FCC ID: XX6STP8X040B IC: 8739A-STP8X040B HW version: PLX-11016M10-01 (mod state 9) SW version: Main: 181301302937
(*) Features	TETRA, GPS and BT (Classic)
Manufacturer	Sepura Limited 9000 Cambridge Research Park Beach Drive Waterbeach Cambridge, CB25 9TL United Kingdom
Test method requested, standard	1. IEEE Std 1528™-2013. 2. FCC 47 CFR Part 2.1093.
Summary	Considering the results of the performed test, the item under test is IN COMPLIANCE with FCC 47CFR Part 2.1093 exposure limits. The maximum 1g volume averaged SAR found during this test have been 0.805 W/kg, for TETRA mode. The maximum 10g volume averaged SAR found during this test have been 0.734 W/kg, for TETRA mode. The maximum 1g volume averaged SAR for multiband transmission found during this test has been 0.805 W/kg, for TETRA + Bluetooth mode.
Approved by (name / position & signature)	Manuel García Antennas Lab Technical Responsible 74862741H MANUEL GARCÍA (C:A29507456) 74862741H MANUEL GARCÍA (C:A29507456) 2024.07.25 13:10:36 +02'00'
Date of issue	2024-07-25
Report template No	FAN44_00 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the following documents:

1. DEKRA Testing and Certification S.A.U. internal document PODT000.
2. FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015).

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested", “Other identification of the product”, “Features” and “Test sample description”).

2. Maximum output power and testing distance information.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and ir is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: the client

Samples are composed of the following elements:

Sample	Control Nº	Description	Model	Serial Nº	Date of reception
S/01	77695B_106.1	Rechargeable BATTERY	300-00910	STP8XBB - 04	2024-05-06
S/01	77695B_13.1	TETRA Mobile Radio	STP8X040	1PR902412G9Y2AX	2024-04-30
S/01	77695B_99.1	Rechargeable BATTERY	300-00910	STP8XBB - 03	2024-05-06
S/01	77695B_17.1	TETRA Mobile Radio	STP8X040	1PR902412G9Y2BV	2024-04-30
S/02	77695B_106.1	Rechargeable BATTERY	300-00910	STP8XBB - 04	2024-05-06
S/02	77695B_47.1	Antenna	300-00884	--	2024-04-30
S/02	77695B_13.1	TETRA Mobile Radio	STP8X040	1PR902412G9Y2AX	2024-05-02
S/02	77695B_99.1	Rechargeable BATTERY	300-00910	STP8XBB - 03	2024-05-06

1. Sample S/01 has undergone the test(s) specified in subclause “Test method requested”: Conducted average output power.
2. Sample S/02 has undergone the test(s) specified in subclause “Test method requested”: SAR evaluation for TETRA and Bluetooth modes.

Test sample description

Description of product.....:	STP8X040	
Software version .....:	181301302937	
Hardware version .....:	PLX-11016M10-01 (mod state 9)	
Mounting position .....:	[ ]	Table top equipment
	[ ]	Wall/Ceiling mounted equipment
	[X]	Equipment used next to the ear
	[X]	Hand-held equipment
	[X]	Other: Body-worn device

Accessories (not part of the test item).....:

Description	Type	Manufacturer	Part number
STP8X Battery 1400mAh	Battery	SEPURA	300-00910
Antenna STP8X RF/GPS 450-470MHz (Black)	Antenna	SEPURA	300-00884
STP8X Heavy Duty 'Over The Head' Headset	Audio Accessory	SEPURA	300-00852
STP8X Heavy Duty Helmet Headset	Audio Accessory	SEPURA	300-00850
STP8X Throat Mic. Headset	Audio Accessory	SEPURA	300-00851
STP8X skull microphone	Audio Accessory	SEPURA	300-00855
STP8X lightweight boom headset	Audio Accessory	SEPURA	300-00854
STP8X lightweight boom headset with PTT	Audio Accessory	SEPURA	300-00892
STP8X in-ear headset with PTT	Audio Accessory	SEPURA	300-01051
STP8X Advanced RSM	Audio Accessory	SEPURA	300-00853
STP8X Advanced RSM (Peltor compatible) FD	Audio Accessory	SEPURA	300-00990
STP8X large-button PTT	Audio Accessory	SEPURA	300-00849
Shoulder strap	Body Worn Accessory	SEPURA	300-00900
STP8X Extended Belt Loop	Body Worn Accessory	SEPURA	300-00912
Dock Tag	Body Worn Accessory	SEPURA	300-00045
STP/SC20 Klick Fast Stud	Body Worn Accessory	SEPURA	300-00718
STP8X Klick Fast stud	Body Worn Accessory	SEPURA	300-00955
SRH Klick Fast stud kit	Body Worn Accessory	SEPURA	300-00015
STP8X Case Klick Fast stud kit	Body Worn Accessory	SEPURA	300-00911
STP8X belt clip	Body Worn Accessory	SEPURA	300-00908
STP8X hard leather case (black)	Body Worn Accessory	SEPURA	300-00959
STP8X Hard Leather Case Flap	Body Worn Accessory	SEPURA	300-00969
STP8X Holster Style Hard Leather Case (Black)	Body Worn Accessory	SEPURA	300-00898
STP8X Lightweight Leather Case	Body Worn Accessory	SEPURA	300-01590
STP8X Hard Leather Case (Red)	Body Worn Accessory	SEPURA	300-02004
STP8X heavy-duty black leather flaps	Body Worn Accessory	SEPURA	300-00969
STP8X Desktop Charger	Power and charging	SEPURA	300-00904
Plug adapter (EU)	Power and charging	SEPURA	300-02000

Identification of the client

Sepura Limited

9000 Cambridge Research Park Beach Drive Waterbeach Cambridge, CB25 9TL United Kingdom

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-05-07
Date (finish)	2024-06-10

Document history

Report number	Date	Description
77695RAN.003	2024-07-25	First release

Environmental conditions

Date	Max. Temp. ºC	Min. Temp. ºC	Max. Hum. %	Min. Hum. %	Limit
From 2024-05-07 to 2024-06-10	24.52	20.52	64.70	33.13	18-25 ºC, 30-70%

Remarks and comments

1. Zoom scan is not required according to FCC OET KDB 447498 D01 General RF Exposure Guidance 06, paragraph “4.4.2. Area scan based 1-g estimation”.
2. Zoom scan and/or power drifts measurements have not been able to be performed by the measurement system due to very low SAR values close to or under the noise level.
3. “Top edge” of the device has not been tested due to testing reduction. It is not possible to use the device on the top edge for extremity exposure conditions because of the antenna position on that side.
4. Only the plots of the highest SAR for each test position and mode/band are included in appendix C.
5. The tests have been performed by the technical personnel: Ismael Gamarro.

6. The instrumentation utilized to perform the tests covered in this test report is listed in the following table:

DEKRA Control Number	Equipment	S/N
02402	20 dB Attenuator, WEINSCHEL model 75A-20-11	902
03436	Robot controller, Stäubli model CS7MB	F04/50P5A1/C/01
03420	Robot, Stäubli model RX60BL	F04/SOP5A1/A/01
03438	Electro-optical converter, SPEAG model EOC3	391
04859	DAK software, SPEAG model DAK V1.10.325.10	-
04835	DC POWER SUPPLY 30V/5A 150W	MY58500043
05580	Dipole validation kit 450 MHz, SPEAG model D450V3	D450V3-SN:1092
03430	Data acquisition device, SPEAG model DAE4	669
04170	Digital thermometer, LKM Electronics model DTM3000-SpezialL	2989
03429	Dipole validation kit 2450 MHz, SPEAG model D2450V2	756
06125	Dosimetric E-field Probe, SPEAG model EX3DV4	7461
04393	Dual Power meter, Agilent model E4419B	MY45103349
01084	Dual directional coupler, HP model 778D	15821
03630	Dual directional coupler, NARDA model 4227-16	02953
04173	Head Tissue Equivalent Liquid for 1900-3800 MHz band, SPEAG model HBBL1900-3800V3	-
04171	Dielectric probe kit, SPEAG model DAK-3.5	1080
05581	Head Tissue Equivalent Liquid for 450 MHz band, SPEAG model HSL450V2	-
03526	Mounting Device for Laptops and Body-Worn Transmitters, SPEAG model LH1 001 AC	-
08896	Mounting Device for Hand-held devices, SPEAG model MD4HHTV5	P/N: SD 000 H01 KA
02216	Power Divider, PICOSECOND PULSE LABS model 5333-104	236310 1504
04164	Power Sensor 50 MHz-18GHz, R&S model NRP-Z81	100527
03485	Power amplifier, MITEQ model AMF-4D-00400600-50-30P	1456425
04391	Power sensor, Agilent model E9300A	SG41491203
04392	Power sensor, Agilent model E9300A	SG41491189
03847	Measurement server, SPEAG model DASY5 SE UMS 011 BS	1227
03422	SAM head-body simulator, SPEAG model TWIN SAM V4.0	-
03423	SAR measurement software, SPEAG model DASY52	-
03346	Signal RF Generator, R&S model SMU200A	102234
03453	Temperature and humidity probe, Pico Technology model HUMIDIPROBE	UAL02/077
04482	Vector Network Analyzer, Agilent Technologies model N9923A FieldFox	US49470126
03440	Bluetooth signalling unit, Anritsu model MT8852B	6K00004262

7. References

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093 and the following FCC Published RF exposure KDB procedures:

- FCC OET KDB 447498 D01 General RF Exposure Guidance v06 (October 2015).
- FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015).
- FCC OET KDB 865664 D02 RF Exposure Reporting v01r02 (October 2015).
- FCC OET KDB 643646 D01: SAR test for PTT Radios v01r03

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

FCC 47CFR Part 2.1093	VERDICT			
	N/A	P	F	N/M
TETRA 450 – 470 MHz		P		
Bluetooth		P		

Appendix A: Test configuration

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1. GENERAL INTRODUCTION

1.1. Application Standard

The Federal Communications Commission (FCC) sets the limits for General Population/Uncontrolled exposure to radio frequency electromagnetic fields for transmitting devices designed to be used within 20 centimetres of the body of the user under FCC 47 CFR Part 2.1093 - "Radiofrequency radiation exposure evaluation: portable devices", paragraph (d)(2).

1.2. General requirements

The SAR measurement has been performed continuing the following considerations and environment conditions:

The ambient temperature shall be in the range of 18ºC to 25ºC and the variation shall not exceed +/-2ºC during the test.

The ambient humidity shall be in the range of and 30% - 70%.

The device battery shall be fully charged before each measurement.

1.3. Measurement system requirements

The measurement system used for SAR tests fulfills the procedural and technical requirements described at the reference standards used.

1.4. Phantom requirements

The phantom model for head measurements is a simplified representation of the human anatomy and comprised of material with electrical properties similar to the corresponding tissues in human body. The human model has the following proportions:

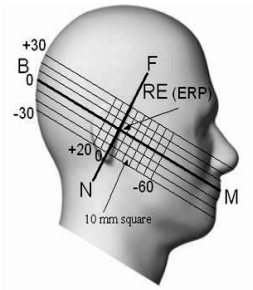


Figure 1: Proportions of Phantom

The shell model is a shaped container and it has the representation shown in the following figure:

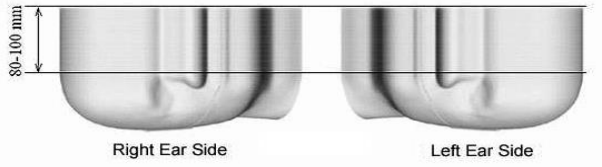


Figure 2: Proportions and shape of Phantom shell

The phantom model for body measurements is an elliptical open-top container with a flat bottom, with the following shape and dimensions:

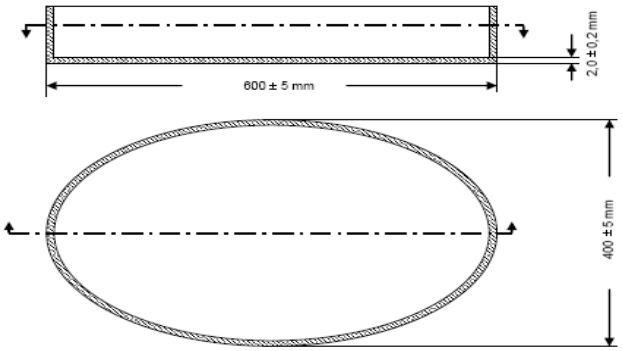


Figure 3: Proportions and shape of Phantom shell

1.5. Measurement Liquids requirements

The liquids used to simulate the human tissues, must fulfill the requirements of the dielectric properties required. These target dielectric properties are indicated into FCC OET KDB 865664 D01 Appendix A.

Frequency (MHz)	ε_r	σ (S/m)
450	43.5	0.87
750	41.94	0.89
835	41.5	0.90
900	41.5	0.97
1750	40.07	1.37
1800	40.0	1.40
2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
5200	36.0	4.66
5500	35.65	4.97
5800	35.3	5.27

Table 1: Liquid material requirements

To minimize the effect of reflections on peak spatial-average SAR values, from the upper surface of the tissue equivalent liquid, the depth of the liquid should be at least 15 cm.

Dielectric porperties values of the Tissue Simulant Liquids used for SAR measurements are included in Appendix B, Section 3, of this document.

2. MEASUREMENT SYSTEM

2.1. Measurement System

The DASY5 system for performing compliance tests consists of the following items:

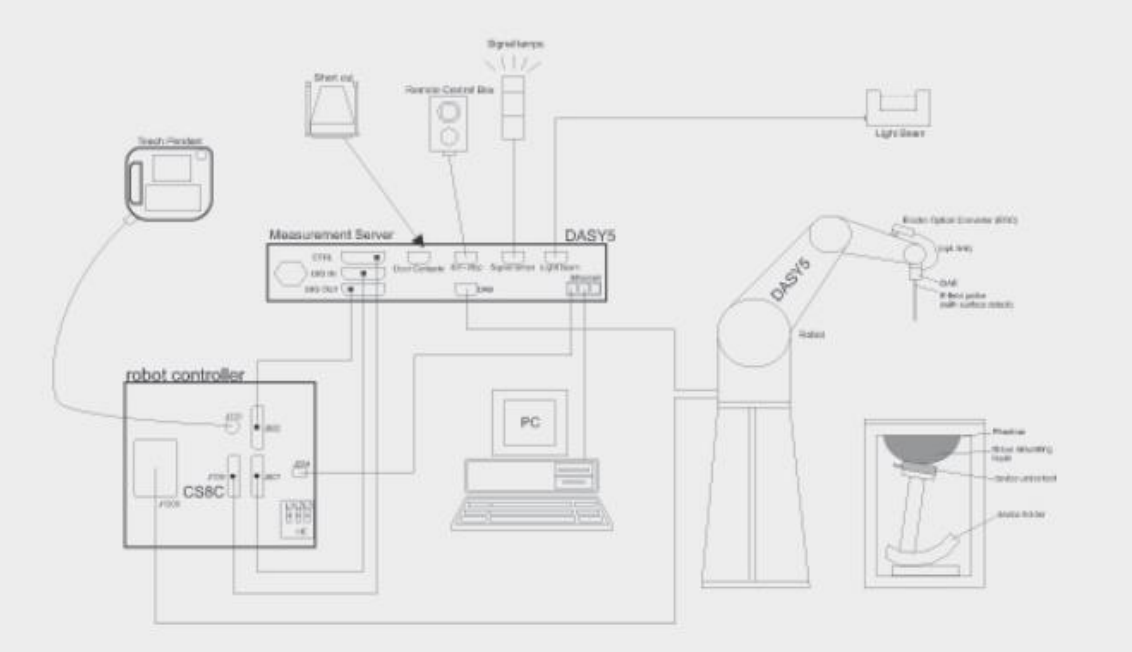
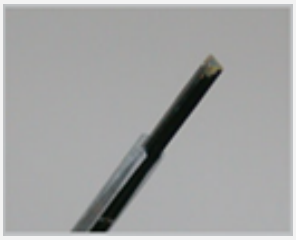


Figure 4: SAR Measurement system

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (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.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running the DASY software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.



Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1.0 mm

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter, and control logic. Serial optical link communication with DASY4/5 embedded system (fully remote controlled). Two-step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset Voltage	< 5 µV (with auto zero)
Input Resistance	200 MOhm
Input Bias Current	< 50 fA

Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	Approx. 25 liters
Wooden Support	SPEAG standard phantom table

	**Model**	**Mounting Device for Hand-Held Transmitters**
	Construction	In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).
	Material	Polyoxymethylene (POM)

	**Model**	**Mounting Device for Laptop and Body-Worn Transmitters**
	Construction	In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device (Body-worn) enables testing of transmitters devices according to IEC 62209-2 specifications. The device holder can be locked for positioning at flat phantom section.
	Material	Polyoxymethylene (POM), PET-G, Foam

	**Model**	**System Validations Kits 450 MHz – 6 GHz**
	Construction	Symmetrical dipole with I/4 balun. Enables measurement of feedpoint impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.
	Frequency	450 MHz to 5800 MHz
	Return Loss	20 dB at specified validation position
	Dimensions (length and overall height in mm)	

Product	Dipole length	Overall height
D450V3	290.0	330.0
D750V3	179.0	330.0
D900V2	148.5	340.0
D1800V2	72.5	300.0
D2000V2	65.0	300.0
D2300V2	56.3	290.0
D2450V2	52.0	290.0
D2600V2	49.2	290.0
D3300V2	38.0	285.0
D3500V2	37.0	285.0
D3700V2	34.7	285.0
D3900V2	32.0	280.0
D4200V2	30.1	280.0
D4600V2	27.0	280.0
D4900V2	25.0	280.0
D5GHzV2	20.6	300.0

2.2. 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 in 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. An 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.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centre for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

The DASY Laptop Holder extension is lightweight and made of POM, PET-G acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

2.3. Test Positions of device relative to head

The reference standard requires two test positions for the handset in the head. These positions are the "cheek" position and the “tilted” position. The tests positions used are described below. The handset should be tested in both positions (left and right sides) in the SAM phantom.

The DUT shall be placed in the Phantom in such way that the main point of the mobile terminal (acoustic output) coincides with the reference point located at the Phantom’s ear.

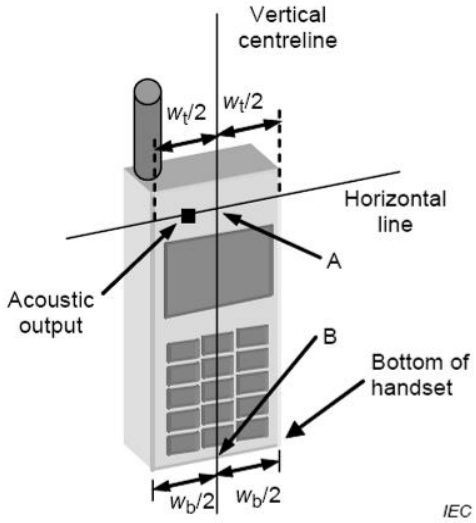


Figure 5: DUT’s basic scheme

SAR measurements will be performed for the following configurations as indicated in the reference standard:

- Right side of Phantom, Cheek position.
- Right side of Phantom, 15º Tilted position.
- Left side of Phantom, Cheek position.
- Left side of Phantom, 15º Tilted position.

Definition of the “cheek” position

The "cheek" position relative to Phantom is described as follows:

1. - Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagital plane of the Phantom. While

maintaining the device in this plane, align the centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE).

2. - Translate the mobile phone box towards the Phantom until the ear-piece touches the ear reference point (RE or LE). While maintaining the device in the reference plane, move the bottom of the box until any point of the front side is in contact with the cheek of the Phantom.

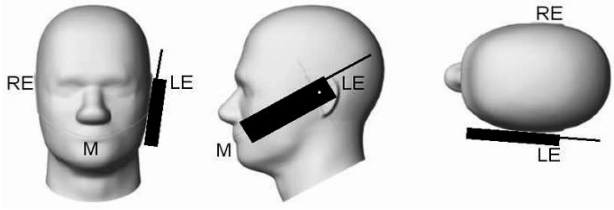


Figure 6: “Cheek” position of DUT

Definition of the tilted position:

The "15º tilted" position relative to Phantom is described as follows:

1. - 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, move it outward away from the mouth by an angle of 15 degrees.

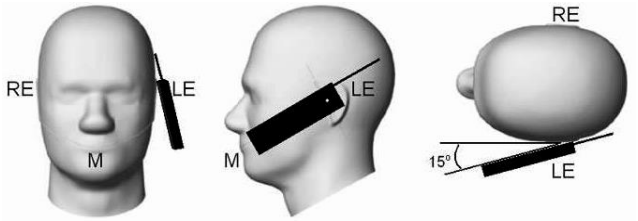


Figure 7: “Tilted” position of DUT

If the mobile phone is also designed to transmit with other configurations (antenna fully extended/retracted, keypad cover opened/closed…), all tests described above shall be performed for each configuration. When considering multi-mode and multi-band mobile phones, all of the above tests shall be performed at each transmitting mode/band with the corresponding maximum peak power level

If the device under test is a two-way radio the device 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 between the phantom surface and the device shall be used for SAR measurements.

2.4. Test Positions of device relative to body

Handheld PTT two-ways radios shall be tested for body-worn accessory exposure conditions according to KDB 643646 D01.

The device has been tested in the following test positions to be in compliance with this possible body-worn device operation at a minimum test distance of 5 mm:

- Back Face: DUT placed at the centre of flat phantom with its back side against the flat phantom surface.
- Front Face: DUT placed at the centre of flat phantom with its front side against the flat phantom surface.

As the device under test may be use with several types of accessories, antennas, audio Accessory and carrying accessories, Body-worn exposure conditions has been tested for each worst combination of accessories at 0mm distance to the flat phantom.

Beside the common use as a handset, the device under test could be used as a mobile hotspot, so hotspot mode exposure shall be tested according to the hotspot mode SAR procedures in KDB 941225, all faces and edges with a transmitting antenna located within 25 mm from that surface or edge have been measured facing the flat phantom surface at 0 mm distance for hotspot mode.

2.5. Test to be performed

Test shall be performed at the device positions previously described, on each side of the head (left and right side) and the flat phantom, using the channel frequency producing the highest rated output power of each operating band.

Additionally, the configuration giving to the maximum mass averaged SAR shall be used to test the rest of the applicable test frequency channels of each transmitting band. Thus, the tests to be performed are as follows:

- Measurements at the channel frequency producing the highest rated output power of the application band for head exposure condition:
  - SAR measurement at the left side of the Phantom in cheek and tilted 15º positions of the DUT.
  - SAR measurement at the right side of the Phantom in cheek and tilted 15º positions of the DUT.
  - SAR measurement at the center side of the Phantom at 25 mm for the front-of-face use.

- Measurements at the channel frequency producing the highest rated output power of the application band for body exposure condition:
  - SAR measurement with back and front faces of the DUT against the phantom.
  - SAR measurement in a body-worn accessory, positioned against the flat phantom, representative of the normal operating conditions expected by users.

- Measurements at the channel frequency producing the highest rated output power of the application band for extremity exposure condition:
  - SAR measurement with each face/edge of the DUT against the phantom at 0 mm.

- Measurements at the rest of the applicable test frequency channels of the application band: SAR measurement at the side and position where the maximum SAR level, measured at the channel frequency producing the highest rated output power, was found.

- All body-worn accessories containing metallic components, positioned against the flat phantom, using the frequency channel where the maximum SAR was found.

If the device under test is also designed to transmit with other configurations (antenna fully extended/retracted, keypad cover opened/closed…), all tests described above shall be performed for each configuration. When considering multi-mode and multi-band mobile phones, all of the above tests shall be performed at each transmitting mode/band with the corresponding maximum peak power level.

2.6. Description of interpolation/extrapolation scheme

The local SAR inside the Phantom is measured using small dipole sensing elements inside a probe element. The probe tip must not be in contact with the Phantoms surface in order to minimise measurement errors, but the highest local SAR is obtained from measurements at a certain distances from the shell trough extrapolation. The accurate assessment of the maximum SAR averaged over 10 gr. requires a very fine resolution in the three dimensional scanned data array. Since the measurements have to be performed over a limited time, the measured data have to be interpolated to provide an array of sufficient resolution.

The interpolation of 2D area scan is used after the initial area scan, at a fixed distance from the Phantom shell wall. The initial scan data is collected with approx. 15 mm spatial resolution and this interpolation is used to find the location of the local maximum for positioning the subsequent 3D scanning within a 1mm resolution.

For the 3D scan, data is collected on a spatially regular 3D grid having 5 mm steps in both directions. After the data collection by the SAR probe, the data are extrapolated in the depth direction to assign values to points in the 3D array closer to the shell wall. A notional extrapolation value is also assigned to the first point outside the shell wall so that subsequent interpolation schemes will be applicable right up to the shell wall boundary.

2.7. Determination of the largest peak spatial-average SAR

To determine the maximum value of the peak spatial-average SAR of a DUT, all device positions, configurations and operational modes should be tested for each frequency band.

The averaging volume shall be chosen as 1gr. of contiguous tissue. The cubic volumes, over which the SAR measurements are averaged after extrapolation and interpolation, are chosen in order to include the highest values of local SAR.

The maximum SAR level for the DUT will be the maximum level obtained of the performed measurements indicated in the previous points.

2.8. System Check

Prior to the SAR measurements, system verification is done to verify the system accuracy. As IEEE 1528-2013, Annex paragraph 8.2.1 “System Check - Purpose” specifies, a complete SAR evaluation is done using a half-wavelength dipole as source with the frequency of the mid-band channel of the operating band, or within 10% of this channel, whichever is greater.

The measured 1 gr. and 10 gr. SAR should be within 10% of the expected target values specified in the calibration certificate of the dipole, for the specific tissue and frequency used.

3. UNCERTAINTY

According to FCC OET KDB 865664 D01, if the highest measured 1-g SAR is < 1.5 W/kg, SAR measurement uncertainty analysis is not required to be included into SAR report, but it has been included for ISO 17025 accreditation.

Uncertainty for 300 MHz – 3 GHz

ERROR SOURCES (source of uncertainty)	Uncertainty value (%)	Prob. Dist.	Div.	*ci (1g)*	*ci (10g)*	*Standard uncertainty (1g) (%)*	*Standard uncertainty (10g) (%)*
Measurement Equipment							
Probe Calibration	13.30%	N	2	1	1	6.65%	6.65%
Probe calibration drift	1.70%	R	√3	1	1	0.98%	0.98%
Axial Isotropy	4.70%	R	√3	0.7	0.7	1.90%	1.90%
Hemisfericall Isotropy	9.60%	R	√3	0.7	0.7	3.88%	3.88%
Boundary effect	1.00%	R	√3	1	1	0.58%	0.58%
Linearity	4.70%	R	√3	1	1	2.71%	2.71%
System Detection limits	0.25%	R	√3	1	1	0.14%	0.14%
Probe modulation response	4.80%	N	1	1	1	4.80%	4.80%
Readout electronics	0.30%	N	1	1	1	0.30%	0.30%
Response time	1.01%	R	√3	1	1	0.58%	0.58%
Integration time	2.60%	R	√3	1	1	1.50%	1.50%
RF Ambient noise	3.00%	R	√3	1	1	1.73%	1.73%
RF Ambient reflections	3.00%	R	√3	1	1	1.73%	1.73%
Probe positioner mech. restrictions	0.40%	R	√3	1	1	0.23%	0.23%
Probe positioning with respect to phantom shell	2.90%	R	√3	1	1	1.67%	1.67%
Max. SAR Eval.	2.00%	R	√3	1	1	1.15%	1.15%
Test Sample Related							
Device holder uncertainty	3.60%	N	1	1	1	3.60%	3.60%
Test sample positioning	2.90%	N	1	1	1	2.90%	2.90%
Drift of output power	2.50%	N	1	1	1	2.50%	2.50%
System Validation source (dipole)							
Deviation of experimental dipole from numerical dipole	0.00%	N	1	0	0	0.00%	0.00%
Input power and SAR drift measurement	2.00%	R	√3	1	1	1.15%	1.15%
Dipole axis to liquid distance	3.40%	R	√3	1	1	1.96%	1.96%
Phantom and Setup							
Phantom uncertainty (shape and thickness tolerances)	6.10%	R	√3	1	1	3.52%	3.52%
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.90%	N	1	1	0.84	1.90%	1.60%
Liquid conductivity (meas.)	3.57%	N	1	0.78	0.71	2.79%	2.54%
Liquid permittivity (meas.)	3.57%	N	1	0.26	0.26	0.93%	0.93%
Liquid conductivity – temperature uncertainty	2.30%	R	√3	0.78	0.71	1.04%	0.94%
Liquid permittivity – temperature uncertainty	0.36%	R	√3	0.23	0.26	0.05%	0.05%
Combined standard uncertainty (Validation antenna)	$u_c = \sqrt{\sum_{i=1}^{m} c_i^2 \cdot u_i^2}$					9.88%	9.75%
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**19.77%**	**19.51%**
Combined standard uncertainty (DUT)	$u_c = \sqrt{\sum_{i=1}^{m} c_i^2 \cdot u_i^2}$					12.68%	12.58%
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**25.36%**	**25.16%**

Table 2: Uncertainty Assessment for 300 MHz - 3 GHz.

4. SAR LIMIT

Having a worst-case measurement, the SAR limit is valid for general population/uncontrolled exposure.

The SAR values have to be averaged over a mass of 1 gr. (SAR 1 gr.) with the shape of a cube and averaged over a mass of 10 gr (Extremity SAR 10 gr). These levels could not exceed the values indicated in the application Standard:

Standard	Exposure	SAR	SAR Limit (W/kg)
FCC 47 CFR Part 1.1310, Paragraph (c)	General population/Uncontrolled	SAR 1-g.	1.6
FCC 47 CFR Part 1.1310, Paragraph (c)	General population/Uncontrolled Extremity	SAR 10-g.	4.0

Table 3: SAR limit

5. DEVICE UNDER TEST

5.1. Dimensions

Dimensions	Millimetres
Width x Height x Depth	60 mm x 140 mm (excluding antenna and rotary) x 40 mm
Overall Diagonal:	145.0
Display Diagonal:	60.0

Table 4: DUT dimensions

5.2. Wireless Technology

Wireless Technology	Frequency Bands	Modes	Duty Cycle used for SAR testing
TETRA	450 – 470 MHz	TETRA	22.32 %
Bluetooth	2.4 GHz	Bluetooth	100.00 %

Table 5: Supported modes

5.3. Simultaneous Transmission

Simultaneous transmission evaluation was performed according to FCC OET KDB 447498 D01 General RF Exposure Guidance v06 (October 2015). The detailed simultaneous transmission combination is:

RF Exposure Condition	Capable Transmit Configurations
Head	TETRA 450 – 470 MHz + Bluetooth
Front of Face	TETRA 450 – 470 MHz + Bluetooth
Body-worn	TETRA 450 – 470 MHz + Bluetooth
Extremity	TETRA 450 – 470 MHz + Bluetooth

Table 6: DUT simultaneous transmission

5.4. Antenna Location

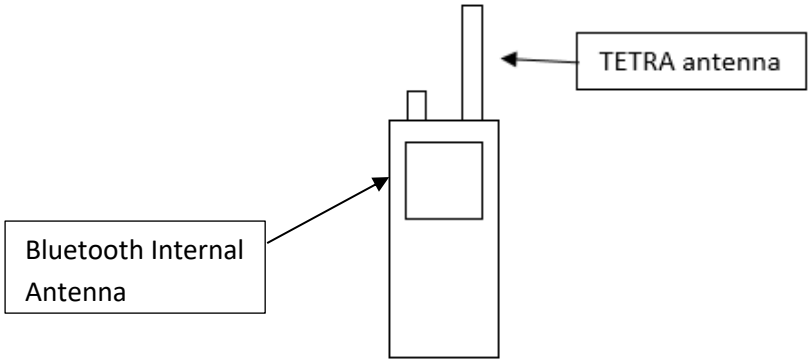


Figure 8: Antenna location sketch.

5.5. Accessories

- **Carrying Accessories**

In order to reduce SAR testing for the carrying accessories available for the device, into the following table there are stated the worst-cases accessories which have been selected considering similar operating and exposure characteristics and being representative of groups of similar ones:

Carrying Accessory	Control Nº	Part number	Type	Metallic parts	Test Distance	Comments
1	77695/071	300-02004	STP8X Hard Leather Case (Red)	Yes	0 mm	None
2	77695/058	300-00908	STP8X belt clip	Yes	0 mm	None
3	77695/067	300-00898	STP8X Holster Style Hard Leather Case (Black)	Yes	0 mm	None
4	77695/068	300-01590	STP8X Lightweight Leather Case	Yes	0 mm	None
5	77695/061	300-00045	Dock Tag	Yes	0 mm	+ Acc 7
6	77695/062	300-00912	STP8X Extended Belt Loop	Yes	0 mm	+ Acc 7
7	77695/060	300-00015	SRH Klick Fast stud kit	No	0 mm	None

Table 7: DUT carrying accessories

- **RSM (Remote Speaker Microphones)**

All supported RSM accessories do not contian any radiating antennas.

- **Antennas**

The device can use one TETRA external antennas with the following dimension and frequency transmission band:

Antenna	Frequency band (MHz)	Length (mm)
300-00884	450 – 470	69

Table 8: DUT carrying accessories

See “Appendix F – Photographs” of this document for further information.

Appendix B: Test results

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1. TEST CONDITIONS

1.1. Power supply (V):

Vn = 7.6 V rechargeable battery
Type of power supply = DC Voltage from rechargeable 7.6 V battery.

1.2. Temperature (ºC):

Tn = +20.00 to +25.00
The subscript n indicates normal test conditions.

1.3. DUT information and test-site configurations

The DUT was tested over head, front of face, body and extremity exposure conditions:

- For head tests, the DUT was placed into cheek and tilt position on the right/left side of the SAM phantom.
- For in-front-of face test, the DUT was placed with the front face against the flat side of the SAM phantom, with a testing distance of 25 mm.
- For body tests, the DUT was placed at 5 mm for body-worn measurements, and with each carry accessory, with its back face in direct contact with the flat phantom surface, as its intended use.
- For extremity tests, the DUT was placed at 0 mm from the flat side of the SAM phantom on each face/edge, except for the top edge, because it is not possible to use the device on this edge due to the antenna's position.

1.4. Test signal, Output Power and Frequencies

The sample (S/01) was put into operation by using an Anritsu model MT8852B as base station simulator for Bluetooth Classic transmitting technology.

For the TETRA mode, the device was put into operation by using a proprietary test mode supplied by the manufacturer, setting the maximum output power for each mode.

In all operating bands and test positions, the measurements were performed using the channel producing the highest rated output power.

In each band, for those positions where the maximum averaged SAR was found, measurements were performed on the other applicable test frequency channels except those with applicable test reductions.

A fully charged battery was used for every test sequence. In all operating bands and test positions, the measurements were performed on the middle channel. In each band, for those positions where the maximum averaged SAR was found, measurements were performed on the remaining required channels except those with applicable test reductions.

The maximum conducted time-averaged power of the device for each mode was measured with a power sensor R&S NRP-Z81.

The target power alignments, including tune-up tolerance, for RF components declared by the manufacturer for each supported technology are:

Band	TETRA	
	Maximum Burst Output Power (dBm)	Maximum Average Output Power (dBm)
450 – 470 MHz	30	23.5

The maximum conducted peak output power declared by the manufacturer, including tune-up tolerance, for the device is 30.0 dBm, which corresponds to a maximum average output power of 23.5 dBm, according to its 22.32 % transmitting duty cycle value.

Maximum Output Power (dBm)	
Band	Bluetooth Classic
2.4 GHz	2.5

2. CONDUCTED AVERAGE POWER MEASUREMENTS

2.1. BLUETOOTH

Module port	Bluetooth Mode	Channel	Frequency (MHz)	Modulation	Average Output Power (dBm)
1	BR/DH5	0	2402.00	GFSK	0.02
1	BR/DH5	39.0	2441.00	GFSK	-0.01
1	BR/DH5	78.0	2480.00	GFSK	0.00

2.2. PROPRIETARY

Mode	Band	Frequency (MHz)	Modulation	Average Output Power (dBm)
TETRA	450 – 470 MHz	450.00	TETRA	21.52
		460.00	TETRA	21.59
		470.00	TETRA	21.68

3. TISSUE PARAMETERS MEASUREMENTS

Frequency (MHz)	Target Head Tissue		Measured Head Tissue		Deviation %		Measured Date
	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	
450	43.50	0.87	46.55	0.91	7.00	4.13	2024-05-23
450	43.50	0.87	45.48	0.88	4.55	0.63	2024-05-27
2300	39.47	1.67	41.34	1.77	4.74	6.25	2024-05-29
2450	39.20	1.80	40.79	1.90	4.06	5.30	2024-05-29
2600	39.00	1.96	40.54	2.08	3.92	5.88	2024-05-29

Note: The dielectric properties have been measured by the contact probe method at 22° C.

DASY5 and DASY6 measurement systems have a SAR error compensation algorithm to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, so the tolerance for εr and σ may be relaxed to ± 10%.

- Composition / Information on ingredients

Head and Muscle Tissue Simulation Liquids HSL450V2/MSL450V2

Water	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7%

Head and Muscle Tissue Simulation Liquids HBBL1900-3800V3/MBBL1900-3800V3

Water	50 – 73 %
Non-ionic detergents	27 – 50 % polyoxyethylenesorbitan monolaurate
NaCl	0 – 2 %
Preservative	0.05 – 0.1% Preventol-D7
Safety relevant ingredients:	
CAS-No. 55965-84-9	< 0.1 % aqueous preparation, containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone
CAS-No. 9005-64-5	<50 % polyoxyethylenesorbitan monolaurate

4. SYSTEM CHECK MEASUREMENTS

Execution Date	Frequency (MHz)	Exposure Conditions	SAR over	Fast SAR (W/Kg)	SAR (W/Kg)	1 W Target SAR (W/Kg)	1 W Nor. SAR (W/Kg)	Drift (%)
2024-05-23	450	Head	1-g	0.50	0.50	4.65	4.88	4.90
2024-05-23	450	Head	10-g	0.35	0.34	3.09	3.32	7.46
2024-05-27	450	Head	1-g	0.47	0.46	4.65	4.57	-1.68
2024-05-27	450	Head	10-g	0.33	0.31	3.09	3.10	0.34
2024-05-29	2450	Head	1-g	5.61	5.49	50.50	54.90	8.71
2024-05-29	2450	Head	10-g	2.61	2.49	23.50	24.90	5.96

5. MEASUREMENT RESULTS FOR SAR (SPECIFIC ABSORPTION RATE)

5.1. Summary maximum results for head measurements.

Mode	Antenna	Side / Position	Channel (Frequency)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
Bluetooth Classic	Internal	--	--	0.000*	1.6
Bluetooth Classic	Internal	Front of Face	--	0.000*	1.6
TETRA 450 – 470 MHz	300-00884	Left Cheek	450.0 MHz	0.805	1.6
TETRA 450 – 470 MHz	300-00884	Front of Face	450.0 MHz	0.256	1.6

5.2. Summary maximum results for body measurements.

Mode	Antenna	Side / Position	Channel (Frequency)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
Bluetooth Classic	Internal	--	--	0.000*	1.6
Bluetooth Classic	Internal	Back Face - acc 300-00015	--	0.000*	1.6
TETRA 450 – 470 MHz	300-00884	Front face 5 mm	450.0 MHz	0.683	1.6
TETRA 450 – 470 MHz	300-00884	Back Face - acc 300-00015	450.0 MHz	0.446	1.6

5.3. Summary maximum results for 10-g Extremity SAR measurements

According to KDB 648474 D04, Handset SAR v01r03, for smart phones, with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

Mode	Antenna	Side / Position	Frequency	Reported SAR 10-g (W/kg)	Limit SAR 10-g (W/kg)
Bluetooth Classic	Internal	Right Edge 0 mm	2402.0 MHz	0.000	4.0
TETRA 450 – 470 MHz	300-00884	Right Edge 0 mm	450.0 MHz	0.734	4.0

5.4. Summary maximum simultaneous multi-band transmission

Exposure Condition	Position	Transmission Mode	Band	Reported SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 1-g (W/kg)	Verdict
Head	Left / Cheek	TETRA 450 – 470 MHz	450 MHz	0.805	0.805	1.6	Pass
		Bluetooth Classic	2.4 GHz	0.000			
Head	Front of Face	TETRA 450 – 470 MHz	450 MHz	0.256	0.256	1.6	Pass
		Bluetooth Classic	2.4 GHz	0.000			
Body	Front Face	TETRA 450 – 470 MHz	450 MHz	0.683	0.683	1.6	Pass
		Bluetooth Classic	2.4 GHz	0.000			
Extremity	Right Edge	TETRA 450 – 470 MHz	450 MHz	0.734	0.735	4.0	Pass
		Bluetooth Classic	2.4 GHz	0.001			

5.5. Bluetooth

BT Mode	Ant.	Expos. Cond.	Pos.	Dist (mm)	Ch.	Freq. (MHz)	Duty Cycle (%)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Estimated SAR 10-g (W/kg)	SAR 10-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)	Reported SAR 10-g (W/kg)	Limit SAR 10-g (W/kg)	Verdict	Plot No.
BR/DH5	Internal	Head	Left Cheek	0	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Head	Left Tilt	0	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Head	Right Cheek	0	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Head	Right Tilt	0	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Head	Front of Face	25	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Body	Front Face	5	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Body	Back Face	5	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Body	Back Face - acc 300-00015	0	0	2402.00	100.00	0.000*	N/M	N/M	N/M	0.000*	1.770	N/A	1.600	N/A	N/A	P	
BR/DH5	Internal	Extremity	Front Face	0	0	2402.00	100.00	N/A	N/A	0.000*	N/M	0.000*	1.770	N/A	N/A	N/A	4.000	P	
BR/DH5	Internal	Extremity	Back Face	0	0	2402.00	100.00	N/A	N/A	0.000*	N/M	0.000*	1.770	N/A	N/A	N/A	4.000	P	
BR/DH5	Internal	Extremity	Left Edge	0	0	2402.00	100.00	N/A	N/A	0.000*	N/M	0.000*	1.770	N/A	N/A	N/A	4.000	P	
BR/DH5	Internal	Extremity	Right Edge	0	0	2402.00	100.00	N/A	N/A	0.001*	N/M	0.000*	1.770	N/A	N/A	N/A	4.000	P	1
BR/DH5	Internal	Extremity	Bottom Edge	0	0	2402.00	100.00	N/A	N/A	0.000*	N/M	0.000*	1.770	N/A	N/A	N/A	4.000	P	

N/M: Not Measured (See Remarks and comments1.)
N/A: Not Applicable
*: See Remarks and comments 2

5.6. Proprietary

Mode	Ant.	Expos. Cond.	Pos.	Dist (mm)	Freq. (MHz)	Duty Cycle (%)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Estimated SAR 10-g (W/kg)	SAR 10-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)	Reported SAR 10-g (W/kg)	Limit SAR 10-g (W/kg)	Verdict	Plot No.
TETRA	300-00884	Head	Left Cheek	0	470.00	100.00	0.472	0.473	N/M	N/M	0.231	1.521	0.719	1.600	N/A	N/A	P	
TETRA	300-00884	Head	Left Tilt	0	470.00	100.00	0.467	N/M	N/M	N/M	2.212	1.521	0.710	1.600	N/A	N/A	P	
TETRA	300-00884	Head	Right Cheek	0	470.00	100.00	0.370	N/M	N/M	N/M	-0.917	1.521	0.563	1.600	N/A	N/A	P	
TETRA	300-00884	Head	Right Tilt	0	470.00	100.00	0.455	N/M	N/M	N/M	3.633	1.521	0.692	1.600	N/A	N/A	P	
TETRA	300-00884	Head	Left Cheek	0	450.00	100.00	0.509	0.510	N/M	N/M	-0.574	1.578	0.805	1.600	N/A	N/A	P	2
TETRA	300-00884	Head	Left Cheek	0	460.00	100.00	0.497	0.506	N/M	N/M	-0.574	1.552	0.785	1.600	N/A	N/A	P	
TETRA	300-00884	Head	Front of Face	25	450.00	100.00	0.164	0.168	N/M	N/M	2.565	1.521	0.256	1.600	N/A	N/A	P	3
TETRA	300-00884	Body	Front Face	5	470.00	100.00	0.337	0.339	N/M	N/M	2.447	1.521	0.516	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face	5	470.00	100.00	0.217	0.220	N/M	N/M	2.920	1.521	0.335	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Front Face	5	450.00	100.00	0.422	0.433	N/M	N/M	-1.031	1.578	0.683	1.600	N/A	N/A	P	4
TETRA	300-00884	Body	Front Face	5	460.00	100.00	0.346	0.346	N/M	N/M	2.683	1.552	0.537	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-02004	0	450.00	100.00	0.208	0.207	N/M	N/M	-0.345	1.521	0.315	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-00908	0	450.00	100.00	0.218	0.220	N/M	N/M	0.115	1.521	0.335	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-00898	0	450.00	100.00	0.160	0.162	N/M	N/M	0.809	1.521	0.246	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-01590	0	450.00	100.00	0.200	0.213	N/M	N/M	2.920	1.521	0.324	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-0045	0	450.00	100.00	0.235	0.211	N/M	N/M	-0.574	1.521	0.321	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-00912	0	450.00	100.00	0.123	0.122	N/M	N/M	1.976	1.521	0.186	1.600	N/A	N/A	P	
TETRA	300-00884	Body	Back Face - acc 300-00015	0	450.00	100.00	0.294	0.293	N/M	N/M	-2.051	1.521	0.446	1.600	N/A	N/A	P	5
TETRA	300-00884	Extremity	Front Face	0	470.00	100.00	N/M	N/M	0.274	N/M	-2.837	1.521	N/A	N/A	0.417	4.000	P	
TETRA	300-00884	Extremity	Back Face	0	470.00	100.00	N/M	N/M	0.203	N/M	-1.372	1.521	N/A	N/A	0.309	4.000	P	
TETRA	300-00884	Extremity	Left Edge	0	470.00	100.00	N/M	N/M	0.229	N/M	0.115	1.521	N/A	N/A	0.348	4.000	P	
TETRA	300-00884	Extremity	Right Edge	0	470.00	100.00	N/M	N/M	0.464	0.414	0.693	1.521	N/A	N/A	0.630	4.000	P	

Mode	Ant.	Expos. Cond.	Pos.	Dist (mm)	Freq. (MHz)	Duty Cycle (%)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Estimated SAR 10-g (W/kg)	SAR 10-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)	Reported SAR 10-g (W/kg)	Limit SAR 10-g (W/kg)	Verdict	Plot No.
TETRA	300-00884	Extremity	Bottom Edge	0	470.00	100.00	N/M	N/M	0.030	N/M	3.992	1.521	N/A	N/A	0.046	4.000	P	
TETRA	300-00884	Extremity	Right Edge	0	450.00	100.00	N/M	N/M	0.481	0.465	1.042	1.578	N/A	N/A	0.734	4.000	P	6
TETRA	300-00884	Extremity	Right Edge	0	460.00	100.00	N/M	N/M	0.435	0.394	3.039	1.552	N/A	N/A	0.611	4.000	P	

N/M: Not Measured (See Remarks and comments1.)
N/A: Not Applicable

DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

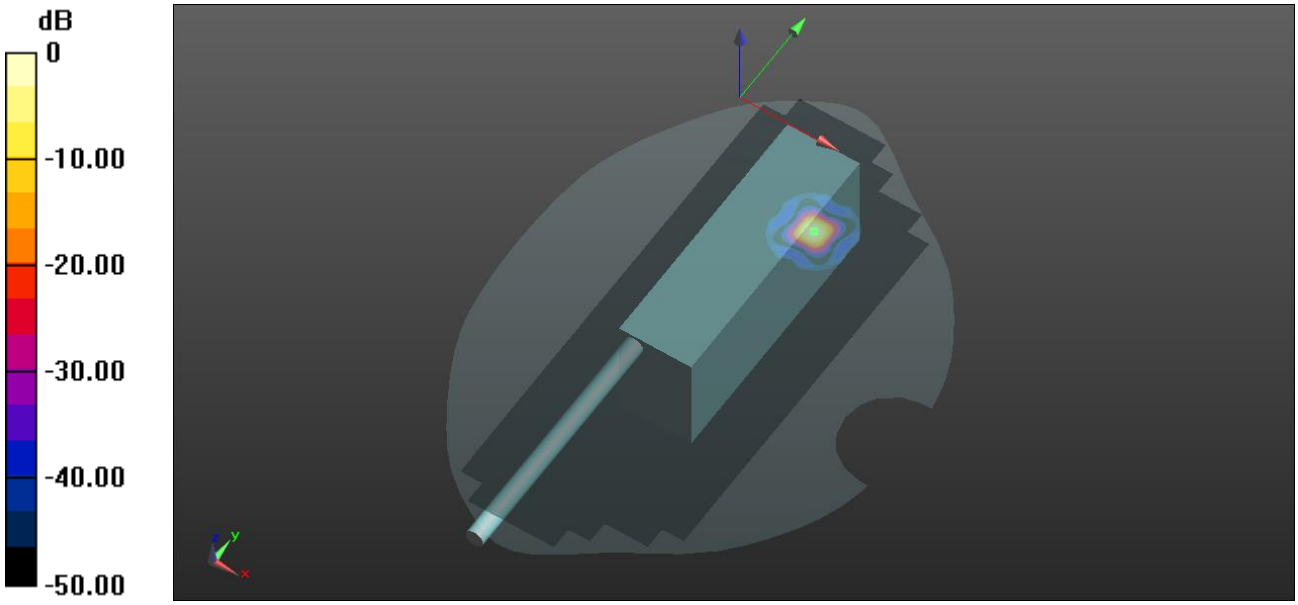
Appendix C: Measurement report

Plot Nº1

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 30/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 10032 - CAA, IEEE 802.15.1 Bluetooth (GFSK, DH5); Frequency: 2402 MHz; Duty Cycle: 1:1.30557
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.86 S/m; ε_r = 40.924; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(7.65, 7.65, 7.65) @ 2402 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Flat Phantom, Extremity, Edges, d=0mm_ant 310-00884_EU_FCC_ISED/Right Edge, BT_BR-DH5 - 2402MHz/Area Scan (91x231x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.000511 W/kg



0 dB = 0.000511 W/kg = -32.91 dBW/kg

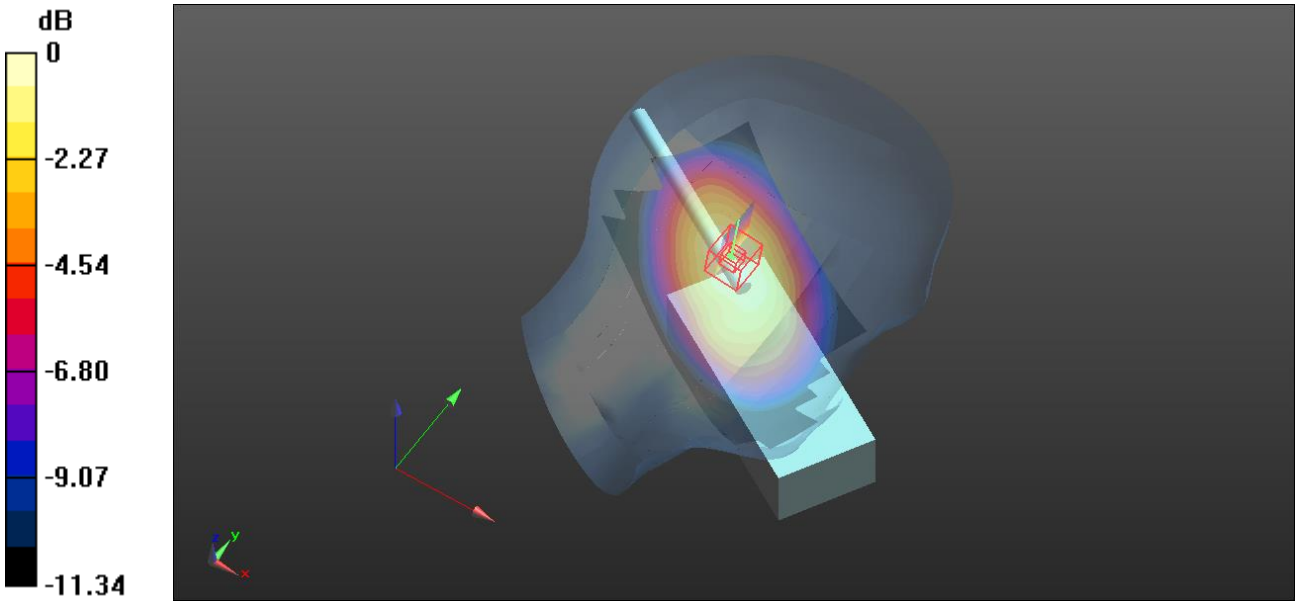
Plot Nº2

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 0, TETRA (0) (0); Frequency: 450 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 450 MHz; σ = 0.87 S/m; ε_r = 46.04; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Left Hand Side_ant 300-00884/450 MHz, Cheek/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.615 W/kg

Left Hand Side_ant 300-00884/450 MHz, Cheek/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.27 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.709 W/kg
SAR(1 g) = 0.510 W/kg; SAR(10 g) = 0.362 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 22.7 mm
Ratio of SAR at M2 to SAR at M1 = 71.2%
Maximum value of SAR (measured) = 0.620 W/kg



0 dB = 0.620 W/kg = -2.08 dBW/kg

Plot Nº3

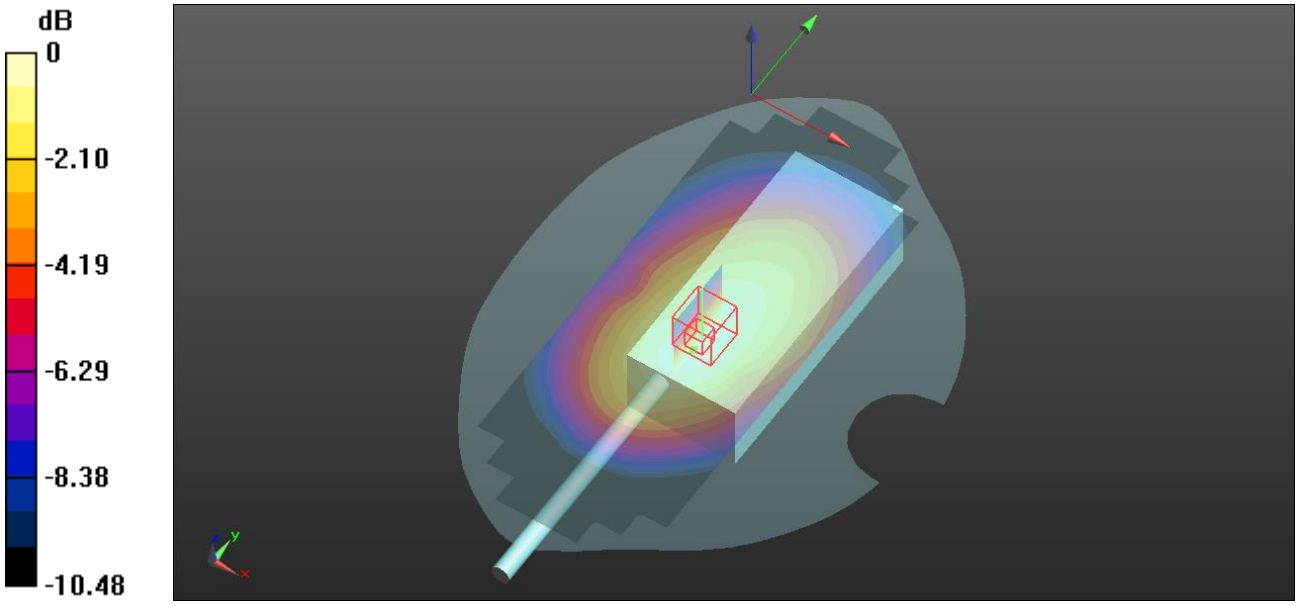
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 0, TETRA (0) (0); Frequency: 450 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 450 MHz; σ = 0.87 S/m; ε_r = 46.04; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Flat Phantom, Front of Face, d=25mm_ant 300-00884/Front of Face, 450 MHz/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.182 W/kg

Flat Phantom, Front of Face, d=25mm_ant 300-00884/Front of Face, 450 MHz/Zoom Scan (5x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.69 V/m; Power Drift = 0.22 dB
Peak SAR (extrapolated) = 0.222 W/kg
SAR(1 g) = 0.168 W/kg; SAR(10 g) = 0.125 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 16 mm)
Ratio of SAR at M2 to SAR at M1 = 75.6%
Maximum value of SAR (measured) = 0.195 W/kg



0 dB = 0.195 W/kg = -7.10 dBW/kg

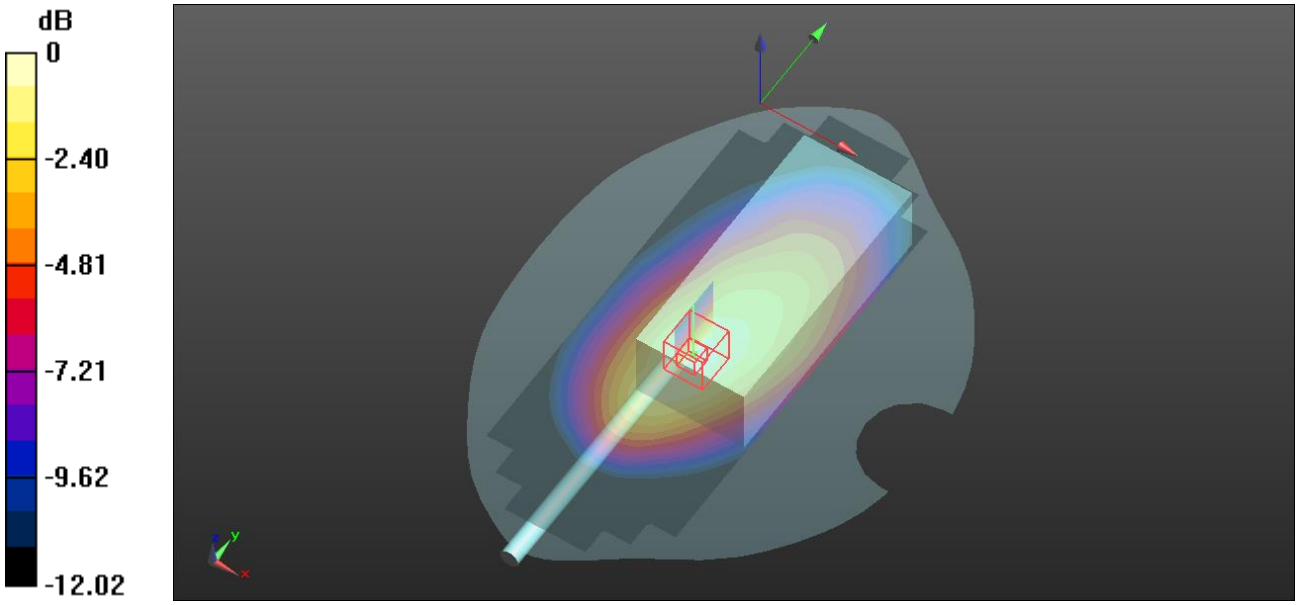
Plot Nº4

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 0, TETRA (0) (0); Frequency: 450 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 450 MHz; σ = 0.87 S/m; ε_r = 46.04; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Flat Phantom, Body, d=5mm_ant 300-00884/Front Face, 450 MHz/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.469 W/kg

Flat Phantom, Body, d=5mm_ant 300-00884/Front Face, 450 MHz/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.76 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.610 W/kg
SAR(1 g) = 0.433 W/kg; SAR(10 g) = 0.307 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 16 mm)
Ratio of SAR at M2 to SAR at M1 = 70.2%
Maximum value of SAR (measured) = 0.525 W/kg



0 dB = 0.525 W/kg = -2.79 dBW/kg

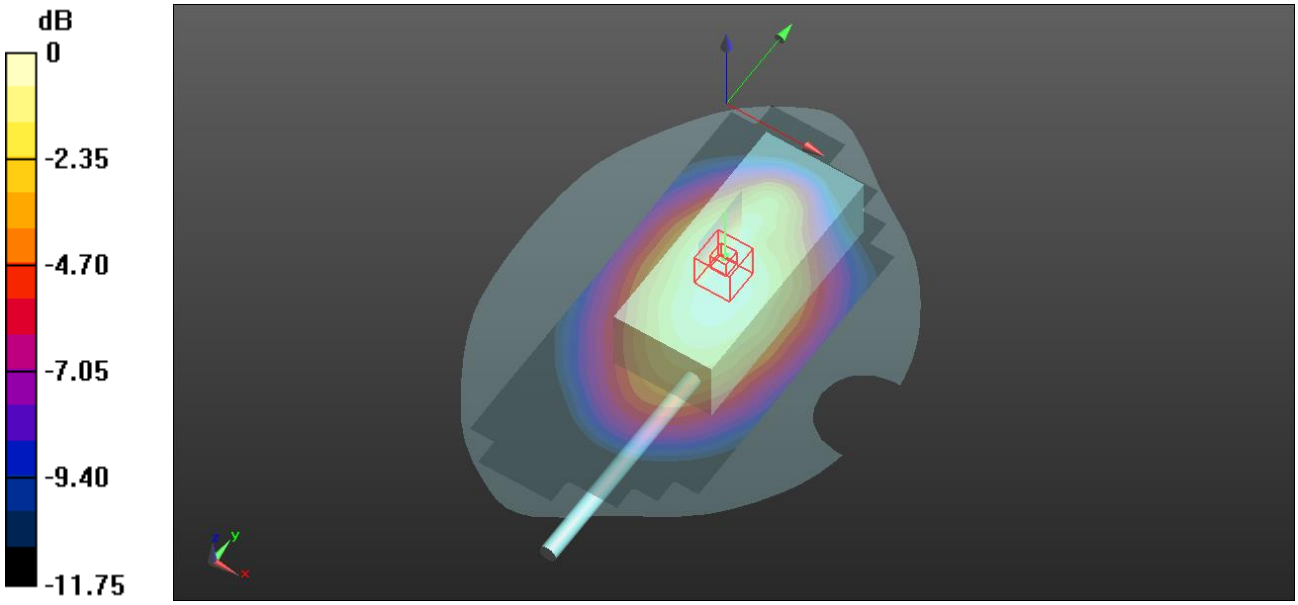
Plot Nº5

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 27/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 0, TETRA (0) (0); Frequency: 450 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 450 MHz; σ = 0.88 S/m; ε_r = 45.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Flat Phantom, Body, d=0mm_ant 300-00884_accesories - 27-05-2024/Back Face, 450 MHz acc 300-00015/Area Scan (81x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.336 W/kg

Flat Phantom, Body, d=0mm_ant 300-00884_accesories - 27-05-2024/Back Face, 450 MHz acc 300-00015/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.31 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.293 W/kg; SAR(10 g) = 0.219 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 20 mm)
Ratio of SAR at M2 to SAR at M1 = 72.4%
Maximum value of SAR (measured) = 0.353 W/kg



0 dB = 0.336 W/kg = -4.74 dBW/kg

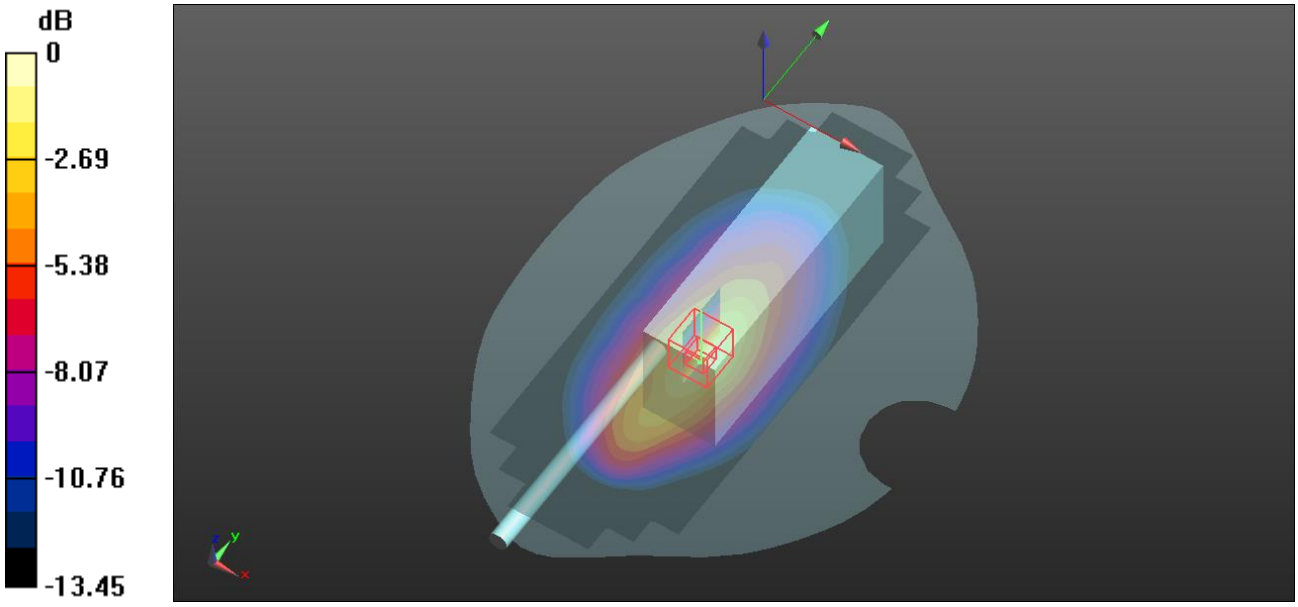
Plot Nº6

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/05/2024

DUT: STP8X040; Type: PTT Radio; Serial: 1PR902412G9Y2AX
Communication System: UID 0, TETRA (0) (0); Frequency: 450 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 450 MHz; σ = 0.87 S/m; ε_r = 46.04; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Flat Phantom, Extremity, Edges, d=0mm_ant 300-00884/Right Edge, 450 MHz/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.846 W/kg

Flat Phantom, Extremity, Edges, d=0mm_ant 300-00884/Right Edge, 450 MHz/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.21 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.763 W/kg; SAR(10 g) = 0.465 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 14.5 mm
Ratio of SAR at M2 to SAR at M1 = 59.4%
Maximum value of SAR (measured) = 1.04 W/kg



0 dB = 1.04 W/kg = 0.17 dBW/kg

Appendix D: System Validation Report

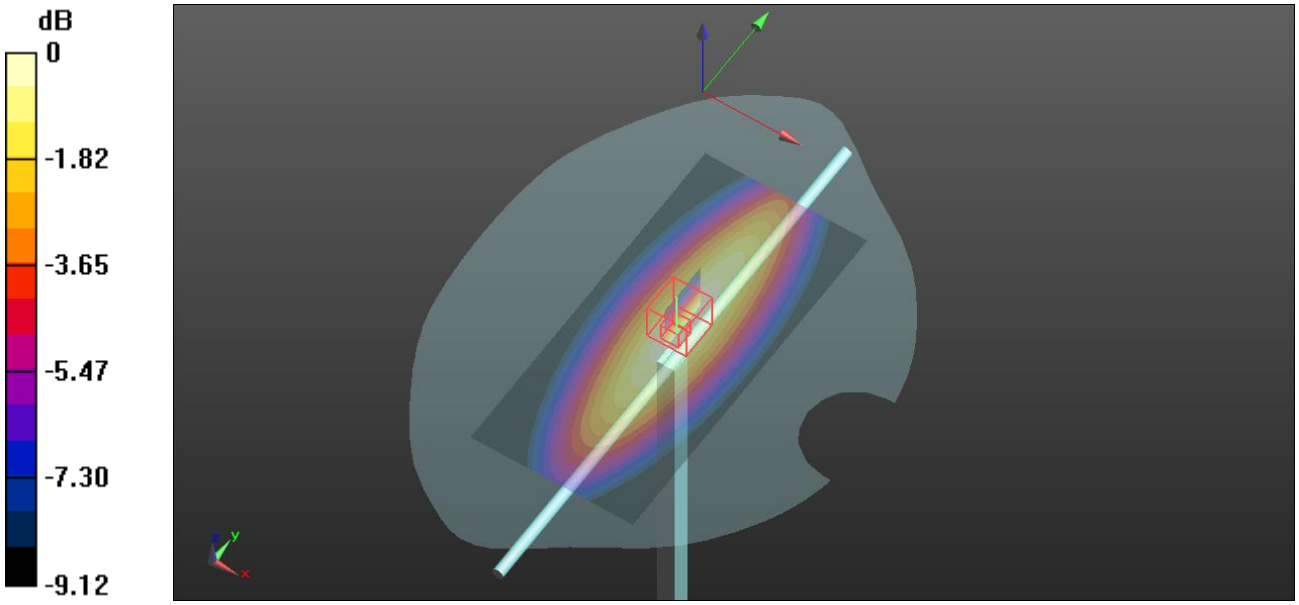
Validation results in 450 MHz Band for Head TSL

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/05/2024

DUT: D450V3 - SN1092; Type: D450V3; Serial: SN1092
Communication System: UID 0, CW (0); Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; σ = 0.91 S/m; ε_r = 46.55; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Configuration 450MHz, 2024-05-23/d=15mm, Pin=100 mW/Area Scan (61x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.565 W/kg

Configuration 450MHz, 2024-05-23/d=15mm, Pin=100 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.94 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.696 W/kg
SAR(1 g) = 0.468 W/kg; SAR(10 g) = 0.321 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 15 mm)
Ratio of SAR at M2 to SAR at M1 = 67.6%
Maximum value of SAR (measured) = 0.588 W/kg



0 dB = 0.588 W/kg = -2.30 dBW/kg

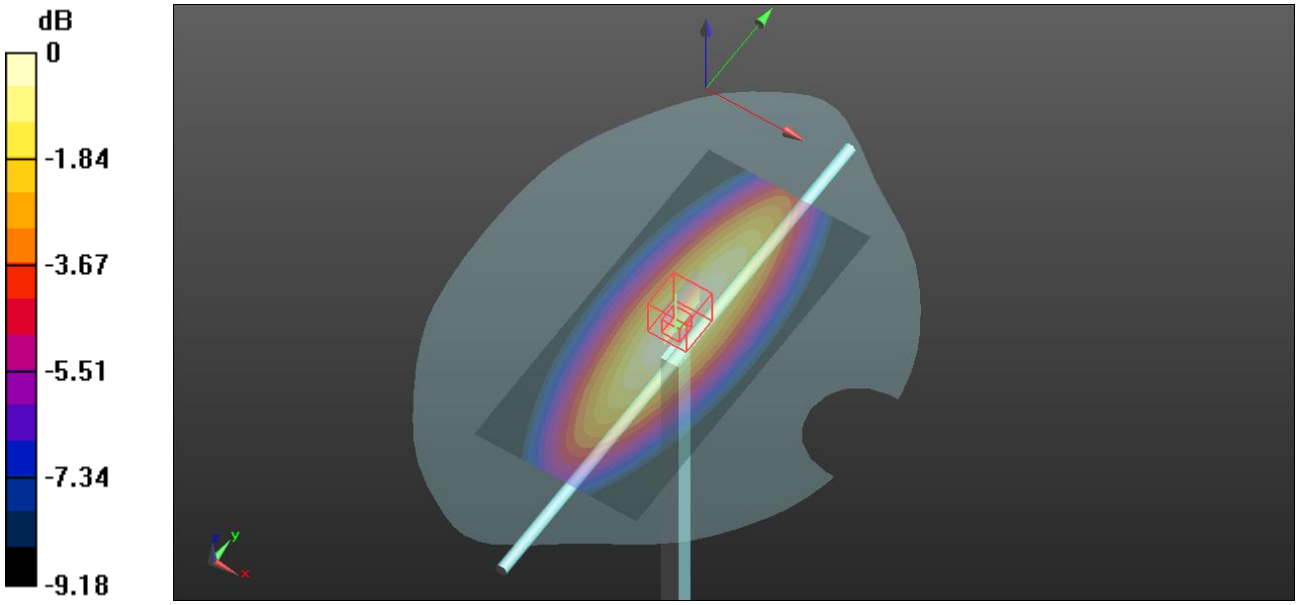
Validation results in 450 MHz Band for Head TSL

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 27/05/2024

DUT: D450V3 - SN1092; Type: D450V3; Serial: SN1092
Communication System: UID 0, CW (0); Frequency: 450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; σ = 0.88 S/m; ε_r = 45.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(11.07, 11.07, 11.07) @ 450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Configuration 450MHz, 2024-05-27/d=15mm, Pin=100 mW/Area Scan (61x131x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.554 W/kg

Configuration 450MHz, 2024-05-27/d=15mm, Pin=100 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.86 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.676 W/kg
SAR(1 g) = 0.456 W/kg; SAR(10 g) = 0.311 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 15 mm)
Ratio of SAR at M2 to SAR at M1 = 67.6%
Maximum value of SAR (measured) = 0.571 W/kg



0 dB = 0.554 W/kg = -2.56 dBW/kg

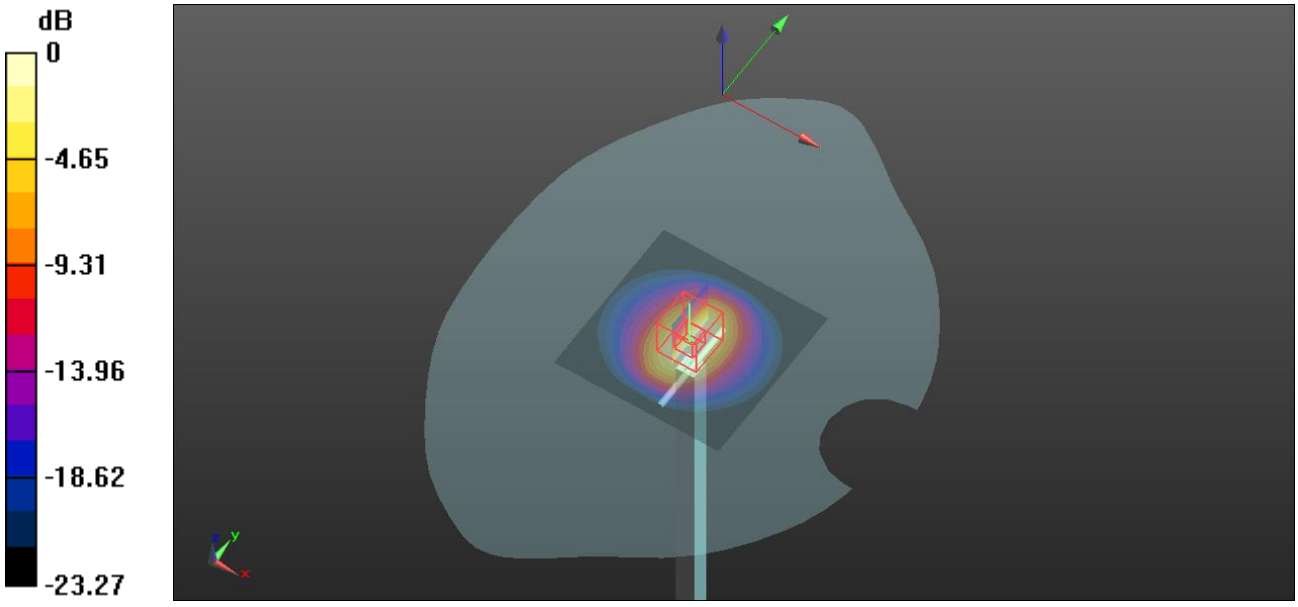
Validation results in 2450 MHz Band for Head TSL

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 29/05/2024

DUT: D2450V2 - SN756; Type: D2450V2; Serial: SN756
Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.9 S/m; ε_r = 40.79; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN7461; ConvF(7.65, 7.65, 7.65) @ 2450 MHz; Calibrated: 17/08/2023
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/08/2023
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Configuration 2450MHz, 2024-05-28/d=10mm, Pin=100 mW/Area Scan (91x91x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 7.33 W/kg

Configuration 2450MHz, 2024-05-28/d=10mm, Pin=100 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.31 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 12.0 W/kg
SAR(1 g) = 5.49 W/kg; SAR(10 g) = 2.49 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 9.8 mm
Ratio of SAR at M2 to SAR at M1 = 46.7%
Maximum value of SAR (measured) = 7.37 W/kg



0 dB = 7.37 W/kg = 8.67 dBW/kg