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: 73396RAN.001A2

Test report
IEEE Std 1528™-2013

(*) Identification of item tested	TETRA portable radio
(*) Trademark	Sepura
(*) Model and /or type reference tested	SC2028
(*) Other identification of the product	FCC ID: XX6SC2028M IC: 8739A-SC2028M HW version: PLX-2516515-01 H/w mod state 11 SW version: 1810 002 07367
(*) Features	TETRA (806-870MHz) , BT, BLE, GNSS, 802.11 b,g,n (20 MHz, 2.4 GHz)
Manufacturer	Sepura Limited 9000 Cambridge Research Park, Beach Drive, Waterbeach, Cambridge CB25 9TL, UK
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 3.336 W/kg, for TETRA mode.
Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager 2024.02.27 16:48:53 +01'00'
Date of issue	2024-02-27
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.

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

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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, normal use conditions and testing distance information.

3. SC2028 is identical to SC2021 except for the external TETRA antennas.

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.

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	74230B_16.1	Communicator Telephone	TP01SXN0W0	1PR002244GK93A3	2022-12-23
S/01	74230B_26.1	Battery Communicator Telephone	300-01853	34000000D3DBE93D	2022-12-23
S/02	73291_14.1	Stud	300-00718	N/A	2022-09-28
S/02	73291_16.1	Belt clip	300-00323	N/A	2022-09-28
S/02	73291_48.1	Heavy Duty Case with Klick Fast Stud	300-01386	261445	2022-09-30
S/02	73291_49.1	Extended Belt Loop	300-00912	262246	2022-09-30
S/02	73291_50.1	Lightweight Leather Case with Belt Clip	300-01385	262240	2022-09-30
S/02	73291_51.1	Nylon Holster	300-01387	165542	2022-09-30
S/02	74230B_18.1	Communicator Telephone	TP01SXN0W0	1PR002244GK93A7	2022-12-23
S/02	74230B_22.1	Battery Communicator Telephone	300-01175	99000000A2A9B43D	2022-12-23
S/02	74230B_24.1	Battery Communicator Telephone	300-01852	15000000BFFF9D3D	2022-12-23
S/02	74230B_25.1	Battery Communicator Telephone	300-01852	BB000000C098993D	2022-12-23
S/02	74230B_26.1	Battery Communicator Telephone	300-01853	34000000D3DBE93D	2022-12-23
S/02	74230B_9.1	Antenna	300-00498	--	2022-12-23

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 mode.

Test sample description

Description of product ...:	TETRA portable radio	
Software version.....:	.....	
Hardware version.....:	.....	
Mounting position.....:	[ ]	Table top equipment
	[ ]	Wall/Ceiling mounted equipment
	[X]	Equipment used next to the ear
	[X]	Hand-held equipment
	[X]	Other: Vehicle

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

Description	Type	Model
14 Wh Battery	Battery	300-01853
8.6 Wh Battery	Battery	300-01852
UHF ¼ wave Antenna	Antenna	--
Extended Belt Loop	Carrying accessory	300-00912
Lightweight Leather Case with Belt Clip	Carrying accessory	300-01385
Heavy Duty Case with Klick Fast Stud	Carrying accessory	300-01386
Nylon Holster	Carrying accessory	300-01387
Belt Clip	Carrying accessory	300-01589
Klickfast Stud	Carrying accessory	300-00718
Klickfast Belt Dock (50 cm)	Carrying accessory	300-00322
Klickfast Belt Dock (60 cm)	Carrying accessory	300-00323
Standard Remote Speaker Microphone (RSM)	Audio Accessory	300-00389
Advanced Remote Speaker Microphone (RSM) (37 cm Lead)	Audio Accessory	300-00734
Advanced Remote Speaker Microphone (RSM) (60 cm Lead)	Audio Accessory	300-00733
IP67 sRSM Speaker Microphone (Standard Lead Length)	Audio Accessory	300-01169
IP67 sRSM Speaker Microphone (Short Lead Length)	Audio Accessory	300-01982
IP67 Ultra CSM (with Heavy Duty Large Clip)	Audio Accessory	300-01123
IP67 Ultra CSM Peltor Interface (with Heavy Duty Large Clip)	Audio Accessory	300-01152
IP67 Ultra RSM (with Heavy Duty Large Clip)	Audio Accessory	300-01124
IP67 Ultra RSM Peltor Interface (with Heavy Duty Large Clip)	Audio Accessory	300-01153
m-RSM – Mini Remote Speaker Microphone	Audio Accessory	300-01979
EM2 Ear Hanger, RAC (50 cm)	Audio Accessory	300-00579
EM2 Ear Hanger, RAC (90 cm)	Audio Accessory	300-00580
EM2 Ear Hanger, RSM (50 cm)	Audio Accessory	300-00581
EH6 Ear Hanger, RAC (50 cm)	Audio Accessory	300-00562
EH6 Ear Hanger, RAC (90 cm)	Audio Accessory	300-00563
EH6 Ear Hanger, RSM	Audio Accessory	300-00564
STP In-Ear Tactical Headset (RAC)	Audio Accessory	300-00746
STP Genesis II Headset (RAC)	Audio Accessory	300-00747
RAC Two-Wire Kit: G-Type Ear Hanger	Audio Accessory	300-01626
RAC Two-Wire Kit: Acoustic Tube Ear Hanger	Audio Accessory	300-01628
STP/SC2 RAC One-Wire Kit, Acoustic Tube Ear Hanger	Audio Accessory	300-02017
Heavy-Duty Headset	Audio Accessory	300-00852
Heavy-Duty Helmut Headset	Audio Accessory	300-00850

	GSM-Style In-Line Hands-Free Kit (RAC)	Audio Accessory	300-00428
	Two-Wire Kit (RAC)	Audio Accessory	300-00755

Identification of the client

Sepura Limited

9000 Cambridge Research Park, Beach Drive, Waterbeach, Cambridge CB25 9TL, UK

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-01-18
Date (finish)	2023-01-25

Document history

Report number	Date	Description
73396RAN.001	2023-02-16	First release
73396RAN.001A1	2023-03-03	Second Release. Bluetooth, Wifi measurements and simultaneous transmission have been included.
73396RAN.001A2	2024-02-27	Third release. Maximum declared output power for TETRA has been updated. This modification test report cancels and replaces the test report 73396RAN.001A1.

Environmental conditions

Date	Max. Temp. ºC	Min. Temp. ºC	Max. Hum. %	Min. Hum. %	Limit
From 2023-01-18 to 2023-01-25	23.48	20.11	48.21	30.10	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. Only the plots of the highest SAR for each test position and mode/band are included in appendix C.
3. The SC2021 is identical to the SC2028 except the external TETRA antennas. The SAR values for 802.11b/g/n 2400 MHz band have been reused from the SAR test report number 73291RAN.002.
4. The tests have been performed by the technical personnel: Francisco J. Sánchez and Ismael Gamarro.
5. The instrumentation utilized to perform the tests covered in this test report is listed in the following table:

DEKRA Control Number	Equipment	S/N
1084	Dual directional coupler, HP model 778D	15821
3485	Power amplifier, MITEQ model AMF-4D-00400600-50-30P	1456425
4482	Vector Network Analyzer, Agilent Technologies model N9923A FieldFox	US49470126
3436	Robot controller, Stäubli model CS7MB	F04/50P5A1/C/01
2402	20 dB Attenuator, WEINSCHEL model 75A-20-11	902
3420	Robot, Stäubli model RX60BL	F04/SOP5A1/A/01
3438	Electro-optical converter, SPEAG model EOC3	391
3426	Dipole validation kit 900 MHz, SPEAG model D900V2	1D007
3430	Data acquisition device, SPEAG model DAE4	669
4393	Dual Power meter, Agilent model E4419B	MY45103349
9513	Dosimetric E-field Probe, SPEAG model EX3DV4	7766
4171	Dielectric probe kit, SPEAG model DAK-3.5	1080
9449	Head Tissue Equivalent Liquid for 0.6-10 GHz, SPEAG model HBBL600-10000V6	-
3424	Mounting Device for Hand-held devices, SPEAG model SD000 HD1 HA	-
4164	Power Sensor 50 MHz-18GHz, R&S model NRP-Z81	100527
4392	Power sensor, Agilent model E9300A	SG41491189
4391	Power sensor, Agilent model E9300A	SG41491203
3847	Measurement server, SPEAG model DASY5 SE UMS 011 BS	1227
3346	Signal RF Generator, R&S model SMU200A	102234
3422	SAM head-body simulator, SPEAG model TWIN SAM V4.0	-
3423	SAR measurement software, SPEAG model DASY52	-
4859	DAK software, SPEAG model DAK V1.10.325.10	-
3453	Temperature and humidity probe, Pico Technology model HUMIDIPROBE	UAL02/077
4170	Digital thermometer, LKM Electronics model DTM3000-Spezial	2989

6. 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 806-870 MHz		P		
802.11b/g/n		P[1]		
Bluetooth		P[2]		
1: See Remarks and comments 3. 2: Technology not subject to testing. Verdict has been determined through RF Exposure assessment (see Appendix B, 2.2 of this document for more details).				

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:

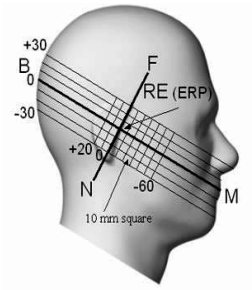


Figure 1: Proportions of Phantom

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

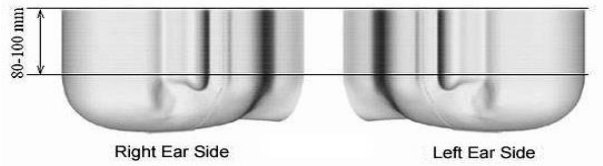


Figure 2: Proportions and shape of Phantom shell

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

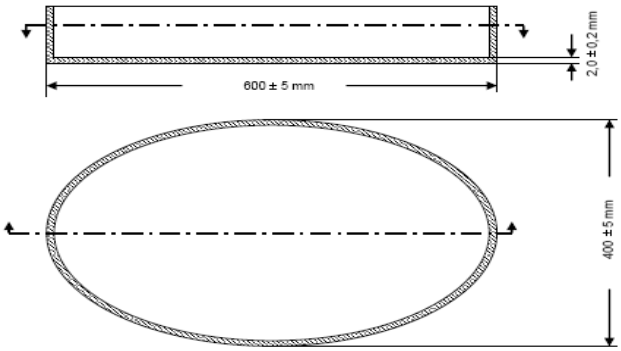


Figure 3: Proportions and shape of Phantom shell

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)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

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:

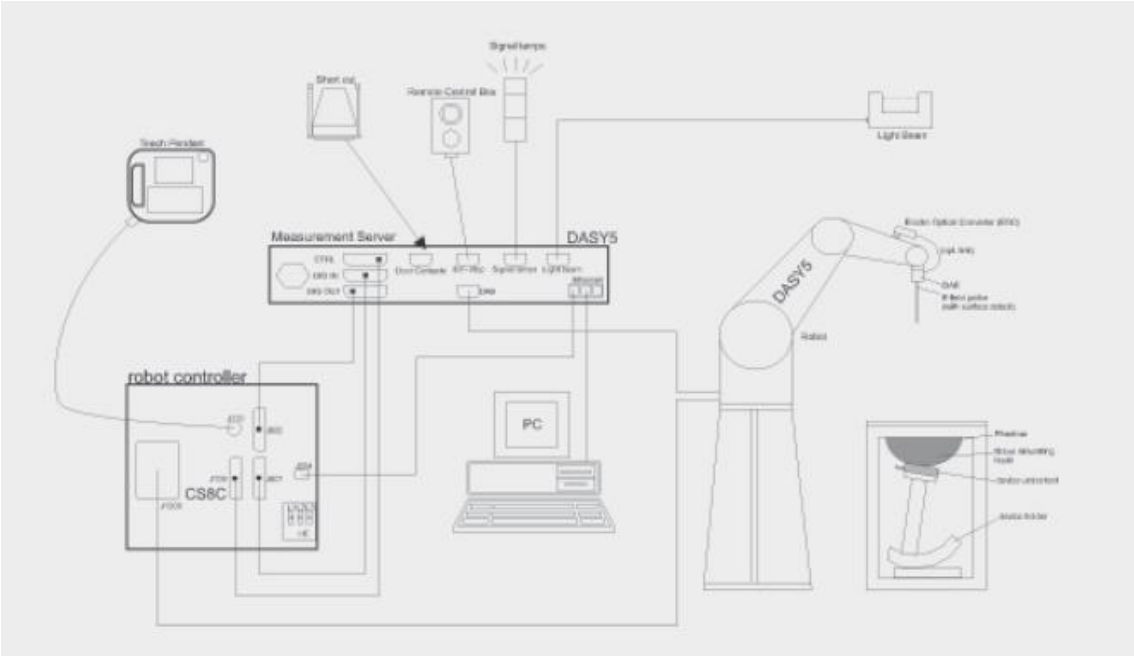
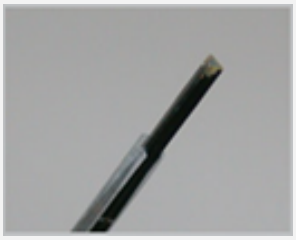


Figure 4: SAR Measurement system

- 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 Blas 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	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.

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.

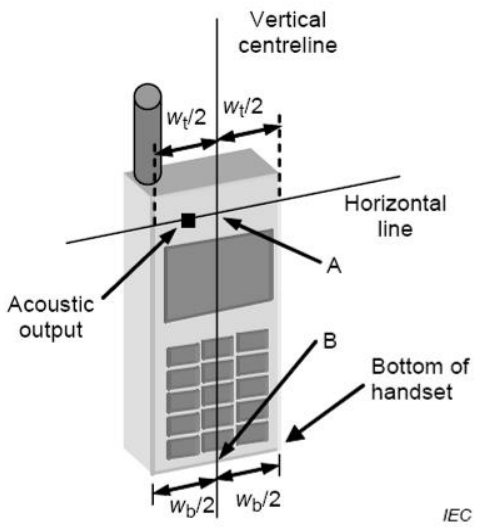


Figure 5: DUT’s basic scheme

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.

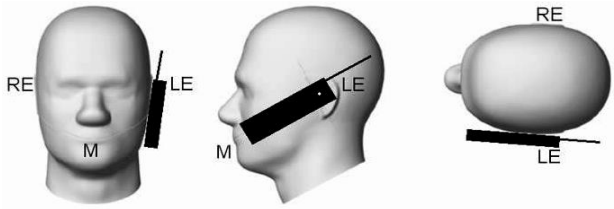


Figure 6: “Cheek” position of DUT

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.

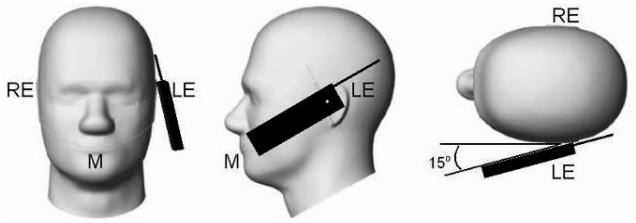


Figure 7: “Tilted” position of DUT

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.

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 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)	$u_c = \sqrt{\sum_{1=1}^{m} c_i^2 \cdot u_i^2}$					9.88%	9.75%
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**19.77%**	**19.51%**
Combined standard uncertainty (DUT)	$u_c = \sqrt{\sum_{1=1}^{m} c_i^2 \cdot u_i^2}$					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

Standard	Exposure	SAR	SAR Limit (W/kg)
FCC 47 CFR Part 1.1310, Paragraph (c)	Ocupational/Controlled	SAR 1-g.	8.0
FCC 47 CFR Part 1.1310, Paragraph (c)	Ocupational/Controlled Extremity	SAR 10-g.	20.0

Table 3: SAR limit for occupational exposure

5. DEVICE UNDER TEST

5.1. Dimensions

Dimensions	Millimetres
Width x Height x Depth	Width: 61mm, Height: 139mm (excluding antenna and rotary) and Depth: 75mm (standard battery)
Overall Diagonal:	145.0
Display Diagonal:	75.0

Table 4: DUT dimensions

5.2. Wireless Technology

Wireless Technology	Frequency Bands	Modes	Duty Cycle used for SAR testing
TETRA	806-870 MHz	TETRA	25 %
Wi-Fi	2.4 GHz	802.11b/g/n (20MHz)	*See Remarks and comments note 3.
Bluetooth	2.4 GHz	Bluetooth	SAR Low-Power Exclusion compliant

Table 5: Supported modes

5.3. Antenna Location

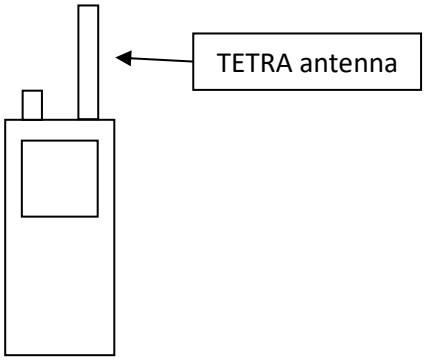


Figure 8: Antenna location sketch.

5.4. Accessories

- **Battery**

There are two different battery models with different capacities. The battery with the maximum capacity has been used to perform head and in front of face exposure conditions measurements and the other one, the thinnest one, has been use to perform body worn exposure condition measurements.

In order to perform a battery check, a measurement with the thinnest battery has been performed in head exposure condition, and with the maximum capacity battery in body-worn exposure condition.

- **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 taking into account similar operating and exposure characteristics and being representative of groups of similar ones:

Carrying Accessory	Control Nº	Type	Metallic parts	Test Distance	Comments
1	73291/014	Belt Clip	Yes	0mm	None
2	73291/051	Nylon Holster	Yes	0mm	None
3	73291/016/048	Heavy Duty Case with Klick Fast Stud	Yes	0mm	+ Acc.6
4	73291/049	Extended Belt Loop	Yes	0mm	None
5	73291/050	Lightweight Leather Case with Belt Clip	Yes	0mm	None
6	73291/016	Klickfast Dock (60 cm)	No	0mm	None

Table 6: DUT carrying accessories

All body-worn accessories containing metallic components were tested individually.

For the body-worn accessories that do not contain metallic or conductive components the one which provided the smallest test separation distance was also tested.

- **RSM (Remote Speaker Microphones)**

All supported RSM accessories do not contian any radiating antennas.

- **Antennas**

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

Antenna	Frequency band (MHz)	Length (mm)
Orange pointed	806-870	87.0

Table 7: Antenna information.

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):

V_n = 7.4 V rechargeable battery
Type of power supply = DC Voltage from rechargeable 7.4 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 and body 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.

1.4. Test signal, Output Power and Frequencies

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, for RF components declared by the manufacturer for each supported technology are:

Band	TETRA	
	Maximum Burst Output Power (dBm)	Maximum Average Output Power (dBm)
806 – 870 MHz	35.18	28.6

The maximum conducted peak output power declared by the manufacturer, for the device is 35.18 dBm, which corresponds to a maximum average output power of 28.6 dBm, according to its 21.75 % transmitting duty cycle value.

2. CONDUCTED AVERAGE POWER MEASUREMENTS

2.1. TETRA

Mode	Channel	Frequency (MHz)	Modulation	Average Output Power (dBm)
TETRA 809 -824 MHz	Low	806.02	TETRA	28.03
	Mid	815.00	TETRA	28.06
	High	823.98	TETRA	28.01
TETRA 851 -869 MHz	Low	851.02	TETRA	27.96
	Mid	860.00	TETRA	27.86
	High	868.98	TETRA	27.76

2.2. BLUETOOTH

Based on paragraph “4.3.1 Standalone SAR test exclusion considerations” of the KDB 447498 D01 - General RF Exposure Guidance:

[(max. power of channel, mW)/(min. test separation distance, mm)] · [√f(GHz)]≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

Protocol	Max. Declared Output Power		Min. Test separation distance (mm)	Frequency (GHz)	Result	Test Exclusion
	(dBm)	(mW)				
Bluetooth LE	9.0	7.94	5.0	2.402 - 2.480	0.16	√

The computed value for Bluetooth is < 3.0, so Bluetooth mode qualifies for Standalone SAR test exclusion for 1-g SAR and 10-g SAR.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm; where x = 7.5 for 1-g SAR and x= 18,75 for 10-g extremity SAR

Estimated SAR					
Protocol	Max. Output Power		Min. Test separation distance (mm)	Frequency (GHz)	Estimated 1-g SAR
	(dBm)	(mW)			
Bluetooth LE	9.0	7.94	5.0	2.48	0.34

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]	
835	41.55	0.91	39.21	0.95	-5.64	4.54	2023-01-20
900	41.50	0.97	39.46	0.96	-4.91	-0.98	2023-01-20
835	41.55	0.91	39.20	0.94	-5.66	2.88	2023-01-23
900	41.50	0.97	39.11	0.96	-5.75	-0.82	2023-01-23
835	41.55	0.91	39.21	0.94	-5.65	3.54	2023-01-25
900	41.50	0.97	39.17	0.97	-5.62	-0.07	2023-01-25

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

DASY5 measurement system has 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 Tissue Simulation Liquids HBBL600-6000V6

Aqueos solution with surfactants and inhibitors, exact percentage concentration of components is withheld as a trade secret by the manufacturer. Contains:

Ehtanediol	<5.2 %
Sodium petroleum sulfonate	<2.9 %
Hexylene Glycol / 2 – Methyl-pentane-2,4-diol	<2.9 %
Alkoxylated alcohol, > C_{16}	<2.0 %

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 (%)
2023-01-20	900	Head	1-g	2.57	2.55	11.10	10.26	-7.58
2023-01-20	900	Head	10-g	1.73	1.64	7.07	6.60	-6.68
2023-01-23	900	Head	1-g	2.63	2.60	11.10	10.46	-5.77
2023-01-23	900	Head	10-g	1.77	1.68	7.07	6.76	-4.40
2023-01-25	900	Head	1-g	2.56	2.55	11.10	10.27	-7.47
2023-01-25	900	Head	10-g	1.73	1.64	7.07	6.61	-6.57

5. MEASUREMENT RESULTS FOR SAR (SPECIFIC ABSORPTION RATE)

5.1. Summary maximum results for head measurements.

Mode	Side / Position	Channel (Frequency)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
TETRA 809 -824 MHz	Left / Tilt	Mid CH (815.0 MHz)	3.170	8
TETRA 851 -869 MHz	Left / Tilt	High CH (868.98 MHz)	3.336	8
TETRA 809 -824 MHz	Front of Face	Mid CH (815.0 MHz)	0.453	8
TETRA 851 -869 MHz	Front of Face	High CH (868.98 MHz)	0.753	8

5.2. Summary maximum results for body measurements.

Mode	Side / Position	Channel (Frequency)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
TETRA 809 -824 MHz	Front face/5 mm	Mid CH (815.0 MHz)	2.026	8
TETRA 851 -869 MHz	Back face/5 mm	Mid CH (860.0 MHz)	2.230	8

5.3. Result for head simultaneous multi-band transmission

Transmission Mode	Band	Max. SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 10-g (W/kg)	Verdict
TETRA	851-869MHz	3.336	3.459	10.0	Pass
802.11 b/g/n	2.4GHz	0.123[3]			
TETRA	851-869MHz	3.336	3.676	10.0	Pass
Bluetooth (Estimated)	2.4GHz	0.34			

3: See Remarks and comments.

5.4. Result for front of face simultaneous multi-band transmission

Transmission Mode	Band	Max. SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 10-g (W/kg)	Verdict
TETRA	851-869MHz	0.753	0.767	10.0	Pass
802.11 b/g/n	2.4GHz	0.014[3]			
TETRA	851-869MHz	0.753	1.093	10.0	Pass
Bluetooth (Estimated)	2.4GHz	0.34			

3: See Remarks and comments.

5.5. Result for body simultaneous multi-band transmission

Transmission Mode	Band	Max. SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 10-g (W/kg)	Verdict
TETRA	851-869MHz	2.230	3.066	10.0	Pass
802.11 b/g/n	2.4GHz	0.836[3]			
TETRA	851-869MHz	2.230	2.570	10.0	Pass
Bluetooth (Estimated)	2.4GHz	0.34			

3: See Remarks and comments.

5.6. Results for 802.11 2400 MHz Band.

See Remarks and comments 3.

5.7. Results for TETRA

Exposure Conditions	Position	Dist (mm)	Channel	Frequency (MHz)	Duty Cycle (%)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)	Verdict	Plot No.
Head	Left Cheek	0	Mid	815.00	100.00	2.230	N/M	-1.712	1.13	N/A	8.000	P	
	Left Tilt	0	Mid	815.00	100.00	2.780	2.800	3.039	1.13	3.170	8.000	P	1
	Right Cheek	0	Mid	815.00	100.00	1.910	N/M	-2.051	1.13	N/A	8.000	P	
	Right Tilt	0	Mid	815.00	100.00	2.560	N/M	-1.031	1.13	N/A	8.000	P	
	Left Tilt	0	Low	806.02	100.00	2.650	2.770	-2.613	1.14	3.158	8.000	P	
	Left Tilt	0	High	823.98	100.00	2.600	2.650	2.094	1.15	3.037	8.000	P	
	EAR - battery check	0	Mid	815.00	100.00	2.780	2.760	3.157	1.13	3.124	8.000	P	2
	Front of face	25	Mid	815.00	100.00	0.390	0.397	0.115	1.13	0.453	8.000	P	3
Body	Front Face	5	Mid	815.00	100.00	1.840	1.730	0.693	1.13	1.958	8.000	P	4
	Back Face	5	Mid	815.00	100.00	1.700	N/M	-0.574	1.13	N/A	8.000	P	
	Front Face	5	Low	806.02	100.00	1.470	1.480	1.158	1.14	1.687	8.000	P	
	Front Face	5	High	823.98	100.00	1.540	1.520	1.158	1.15	1.742	8.000	P	
	Acc1	0	Mid	815.00	100.00	1.030	1.030	1.508	1.13	1.166	8.000	P	5
	Acc2 - Front face	0	Mid	815.00	100.00	1.290	1.080	-4.060	1.13	1.223	8.000	P	
	Acc2 - Back face	0	Mid	815.00	100.00	1.620	1.640	2.802	1.13	1.856	8.000	P	6
	Acc3	0	Mid	815.00	100.00	0.667	0.654	0.000	1.13	0.740	8.000	P	7
	Body - Acc4	0	Mid	815.00	100.00	1.300	1.280	1.274	1.13	1.449	8.000	P	8
	Body - Acc5	0	Mid	815.00	100.00	0.546	0.550	2.683	1.13	0.623	8.000	P	9
	Body - Acc6	0	Mid	815.00	100.00	0.808	0.790	1.976	1.13	0.894	8.000	P	10
	Front face-Battery check	5	Mid	815.00	100.00	1.780	1.790	-1.031	1.13	2.026	8.000	P	11

N/M: Not Measured (See Remarks and comments 1.)
N/A: Not Applicable

Exposure Conditions	Position	Dist (mm)	Channel	Frequency (MHz)	Duty Cycle (%)	Estimated SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Scale factor	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)	Verdict	Plot No.
Head	Left Cheek	0	Low	851.02	100.00	1.780	N/M	-0.115	1.160	N/A	8.000	P	
	Left Tilt	0	Low	851.02	100.00	2.660	2.630	-1.486	1.160	3.048	8.000	P	
	Right Cheek	0	Low	851.02	100.00	1.450	N/M	-0.917	1.160	N/A	8.000	P	
	Right Tilt	0	Low	851.02	100.00	2.190	N/M	0.000	1.160	N/A	8.000	P	
	Left Tilt	0	Mid	860.00	100.00	2.670	2.700	0.000	1.190	3.202	8.000	P	
	Left Tilt	0	High	868.98	100.00	2.680	2.750	-1.372	1.210	3.336	8.000	P	12
	EAR - battery check	0	High	868.98	100.00	2.680	2.840	1.976	1.160	3.292	8.000	P	13
	Front of face	25	High	868.98	100.00	0.640	0.645	-3.284	1.160	0.753	8.000	P	14
Body	Front Face	5	Low	851.02	100.00	1.730	N/M	0.115	1.160	N/A	8.000	P	
	Back Face	5	Low	851.02	100.00	1.790	1.830	-0.115	1.160	2.121	8.000	P	
	Back Face	5	Mid	860.00	100.00	1.730	1.880	0.462	1.190	2.230	8.000	P	15
	Back Face	5	High	868.98	100.00	1.770	1.750	0.231	1.210	2.123	8.000	P	
	Acc1	0	Mid	860.00	100.00	1.170	1.190	-0.345	1.160	1.379	8.000	P	16
	Acc2 - Front face	0	Mid	860.00	100.00	1.510	1.540	0.000	1.160	1.785	8.000	P	
	Acc2 - Back face	0	Mid	860.00	100.00	1.800	1.800	-0.803	1.160	2.086	8.000	P	17
	Acc3	0	Mid	860.00	100.00	0.859	0.857	-0.459	1.160	0.993	8.000	P	18
	Body - Acc4	0	Mid	860.00	100.00	1.500	1.290	-0.803	1.160	1.495	8.000	P	19
	Body - Acc5	0	Mid	860.00	100.00	0.660	0.653	1.042	1.160	0.757	8.000	P	20
	Body - Acc6	0	Mid	860.00	100.00	0.932	0.935	-1.258	1.160	1.084	8.000	P	21
	Front face-Battery check	5	Low	851.02	100.00	1.490	1.490	0.346	1.160	1.727	8.000	P	22

N/M: Not Measured (See Remarks and comments 1.)
N/A: Not Applicable

Appendix C: Measurement report

Plot Nº1

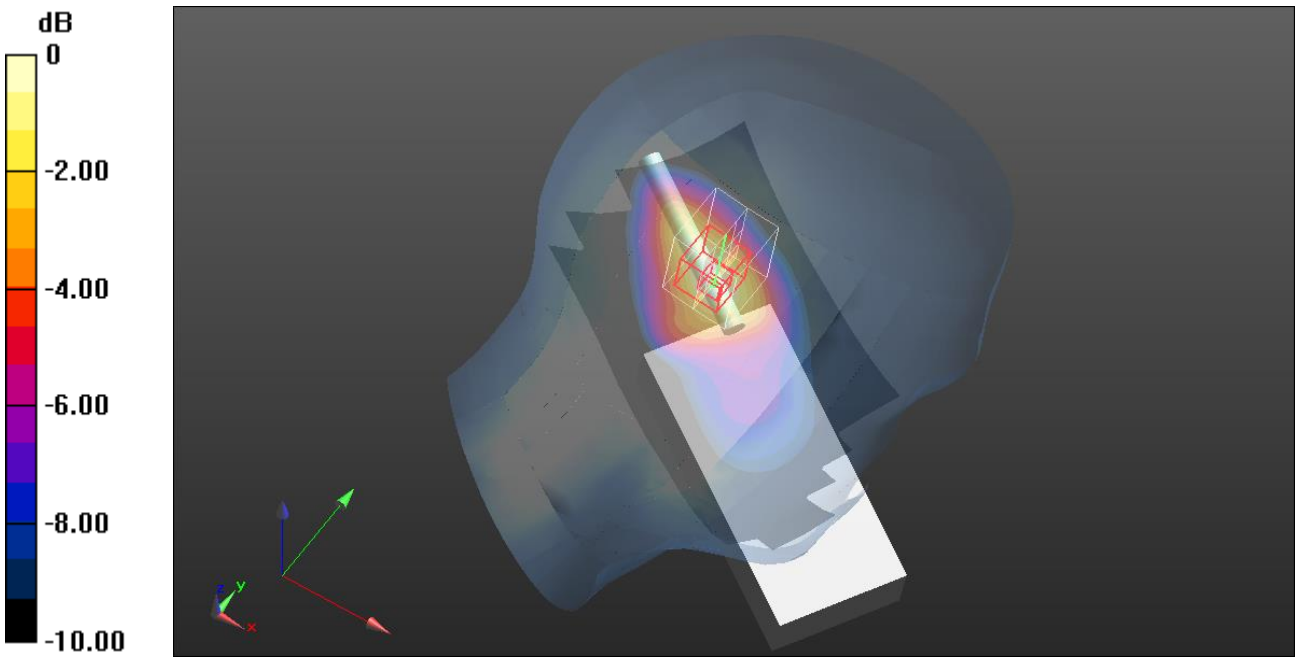
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Hand Side_23-01-2023/TETRA, 815 MHz, Tilt/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.62 W/kg

Left Hand Side_23-01-2023/TETRA, 815 MHz, Tilt/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 39.61 V/m; Power Drift = 0.26 dB
Peak SAR (extrapolated) = 4.66 W/kg
SAR(1 g) = 2.8 W/kg; SAR(10 g) = 1.76 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 15.2 mm
Ratio of SAR at M2 to SAR at M1 = 60.5%
Maximum value of SAR (measured) = 3.76 W/kg



0 dB = 3.76 W/kg = 5.75 dBW/kg

Plot Nº2

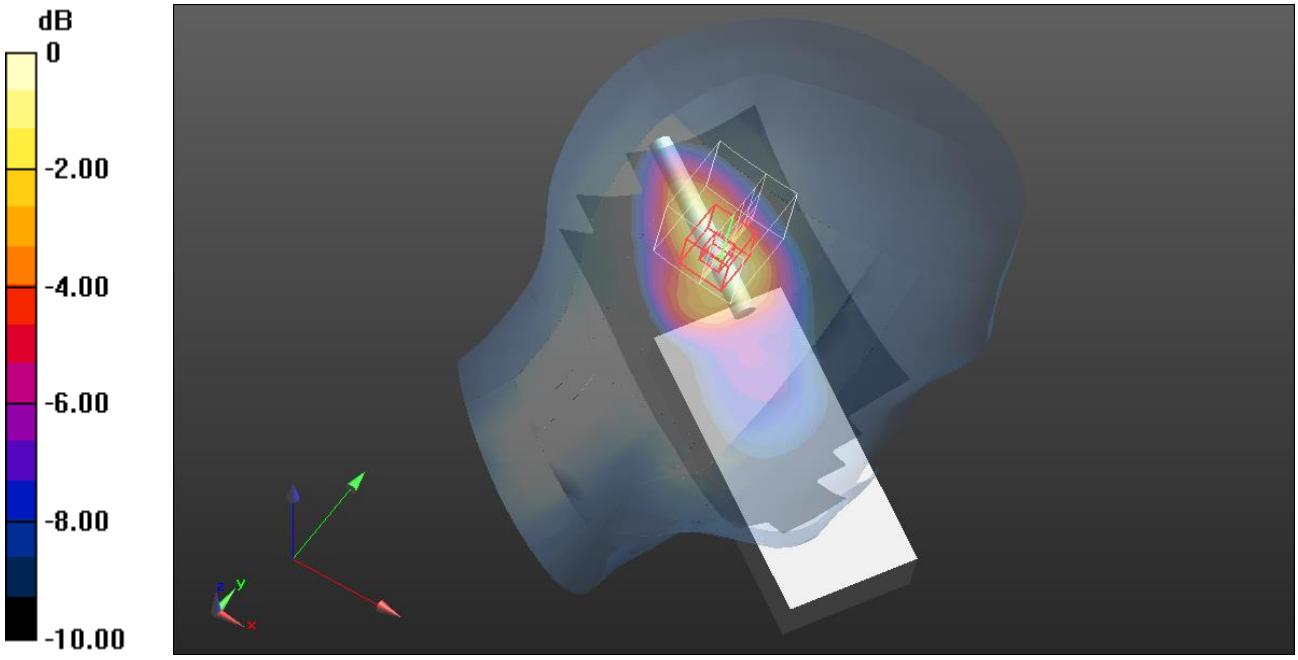
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Hand Side_23-01-2023/TETRA, 815 MHz, Tilt - Battery check/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.65 W/kg

Left Hand Side_23-01-2023/TETRA, 815 MHz, Tilt - Battery check/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.73 V/m; Power Drift = 0.27 dB
Peak SAR (extrapolated) = 4.43 W/kg
SAR(1 g) = 2.76 W/kg; SAR(10 g) = 1.77 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 15.8 mm
Ratio of SAR at M2 to SAR at M1 = 63.1%
Maximum value of SAR (measured) = 3.59 W/kg



0 dB = 3.59 W/kg = 5.55 dBW/kg

Plot Nº3

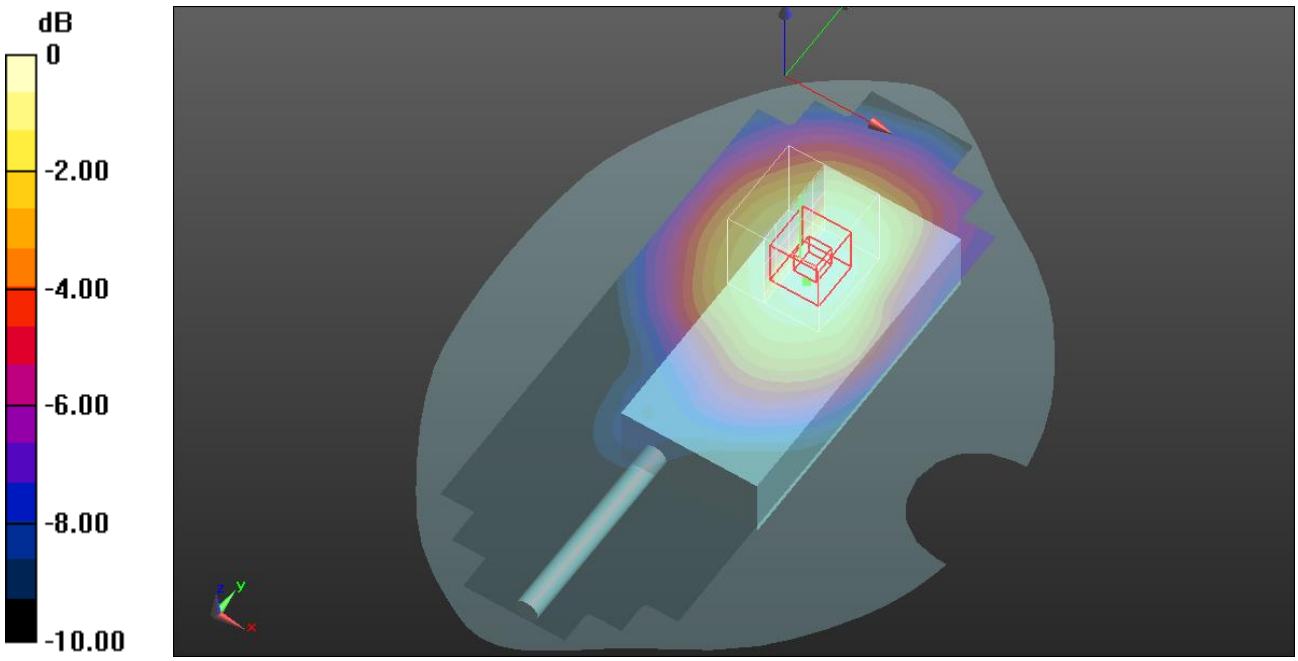
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Front of Face, d=25mm/TETRA, 815 MHz, Front of face/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.441 W/kg

Flat Phantom, Front of Face, d=25mm/TETRA, 815 MHz, Front of face/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.40 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.541 W/kg
SAR(1 g) = 0.397 W/kg; SAR(10 g) = 0.295 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 72.4%
Maximum value of SAR (measured) = 0.470 W/kg



0 dB = 0.470 W/kg = -3.28 dBW/kg

Plot Nº4

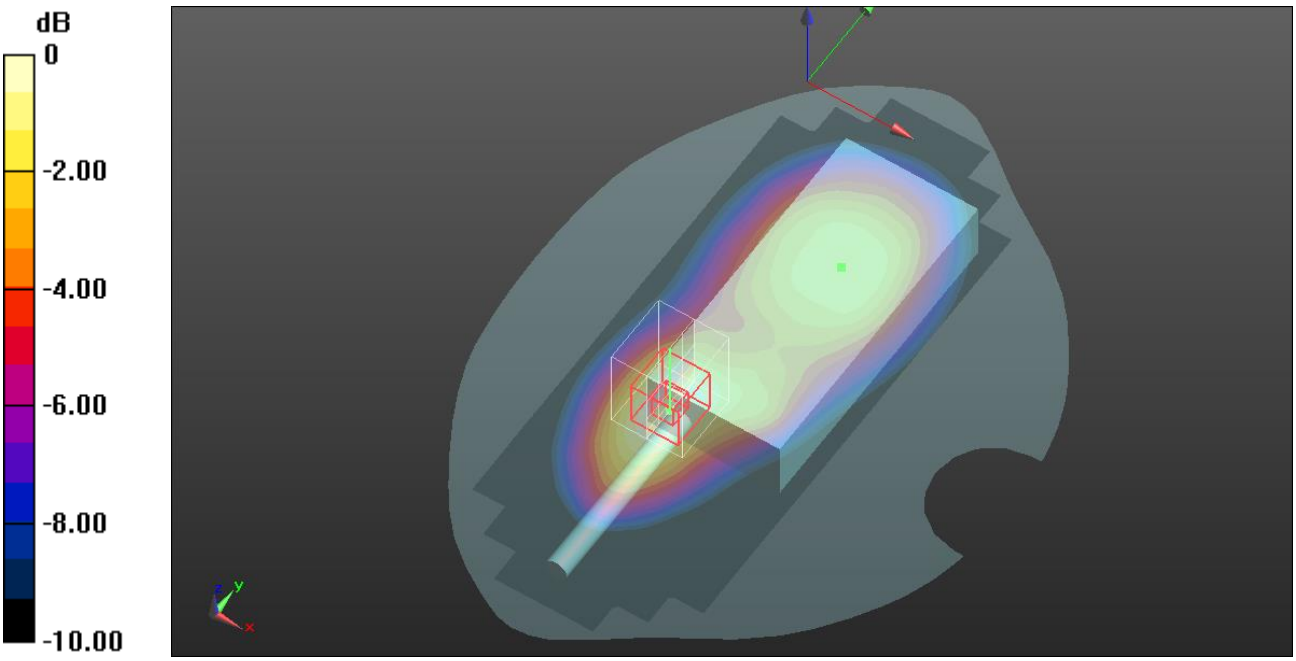
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 815 MHz, Front face, d=5 mm/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.30 W/kg

Flat Phantom, Body worn/TETRA, 815 MHz, Front face, d=5 mm/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.01 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.53 W/kg
SAR(1 g) = 1.73 W/kg; SAR(10 g) = 1.14 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 70.3%
Maximum value of SAR (measured) = 2.12 W/kg



0 dB = 2.12 W/kg = 3.26 dBW/kg

Plot Nº5

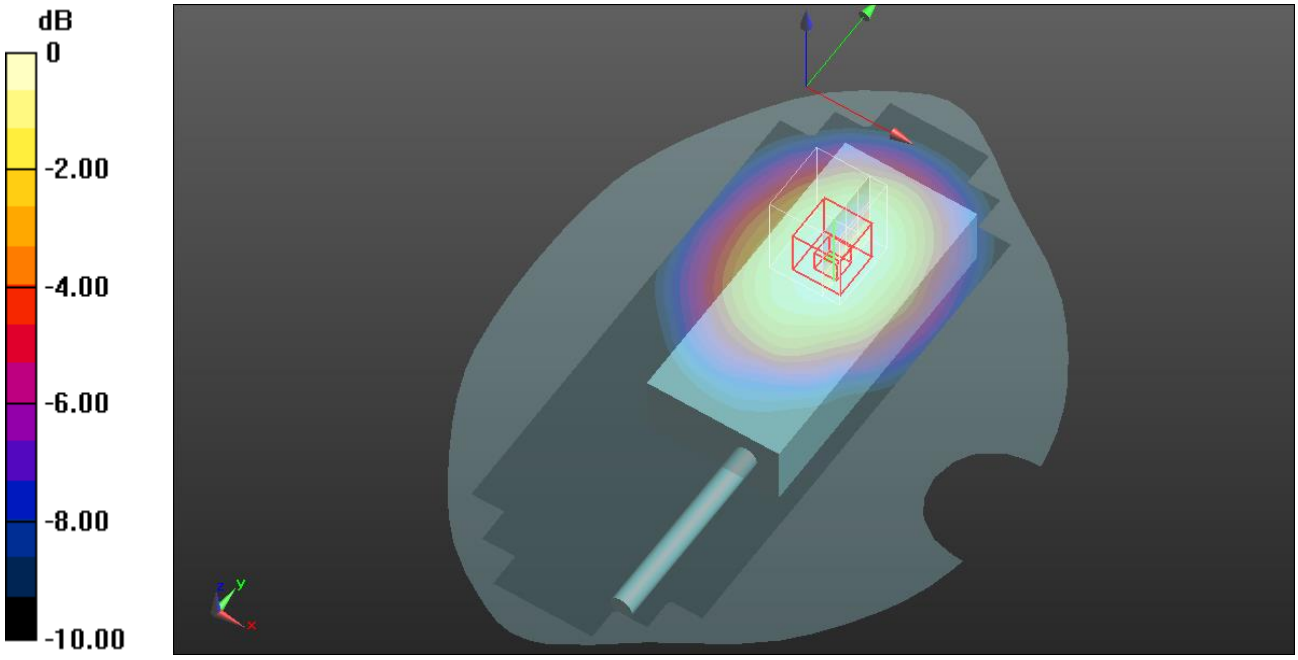
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 815 MHz, Back face, d=0 mm ACC1/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.26 W/kg

Flat Phantom, Body worn/TETRA, 815 MHz, Back face, d=0 mm ACC1/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.89 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.753 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 73.6%
Maximum value of SAR (measured) = 1.21 W/kg



0 dB = 1.21 W/kg = 0.83 dBW/kg

Plot Nº6

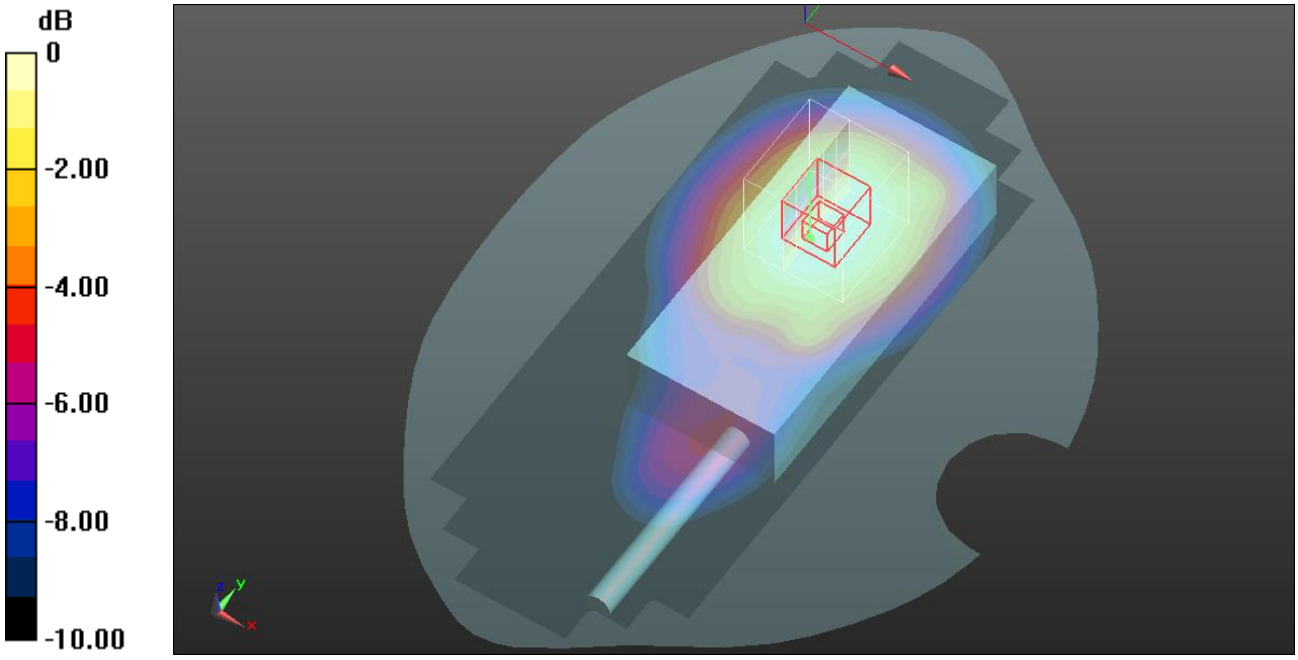
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 815 MHz, Back face, d=0 mm ACC2/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.98 W/kg

Flat Phantom, Body worn/TETRA, 815 MHz, Back face, d=0 mm ACC2/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.26 V/m; Power Drift = 0.23 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 1.64 W/kg; SAR(10 g) = 1.19 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 76.4%
Maximum value of SAR (measured) = 1.92 W/kg



0 dB = 1.92 W/kg = 2.83 dBW/kg

Plot Nº7

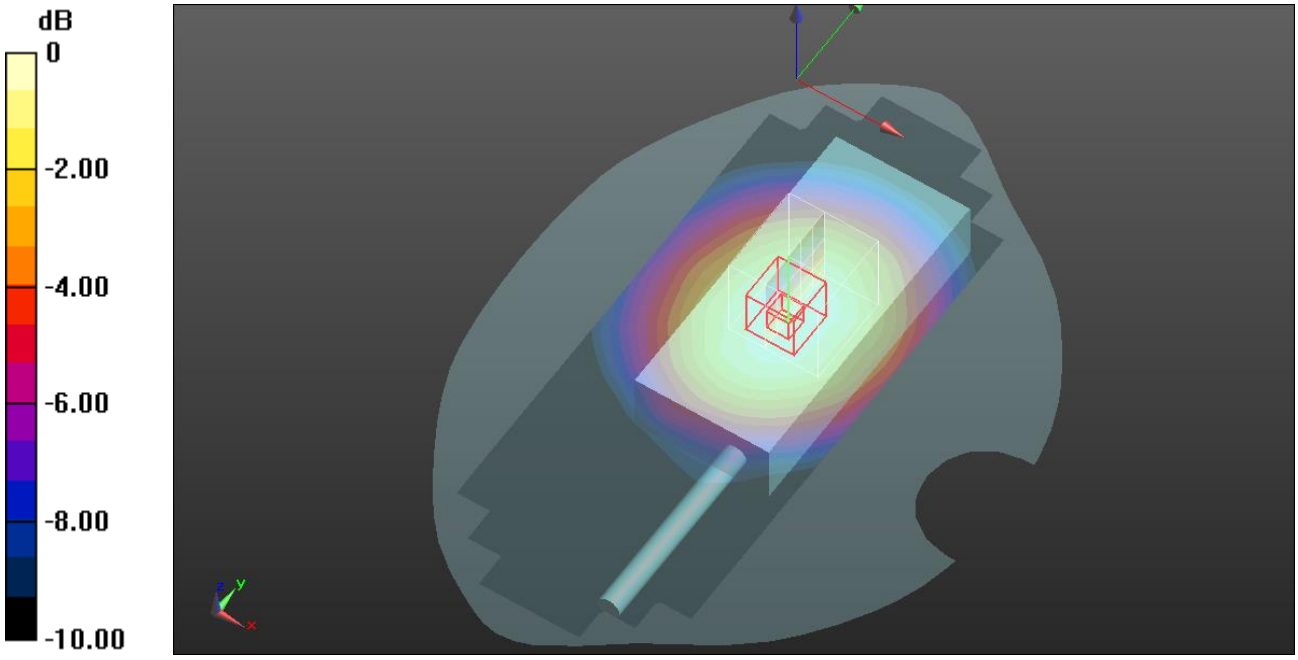
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.25; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC3/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.814 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC3/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.50 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.895 W/kg
SAR(1 g) = 0.654 W/kg; SAR(10 g) = 0.472 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 75.1%
Maximum value of SAR (measured) = 0.783 W/kg



0 dB = 0.783 W/kg = -1.06 dBW/kg

Plot Nº8

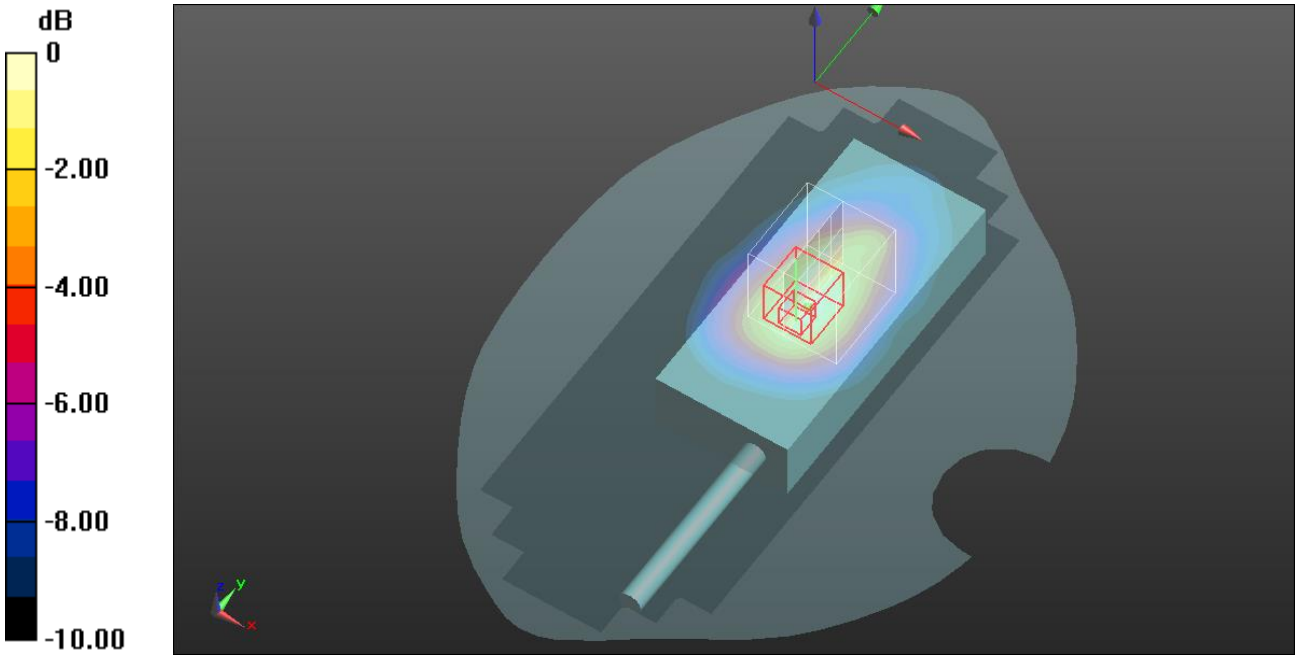
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.25; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC4/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.62 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC4/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.50 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.797 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 15.8 mm
Ratio of SAR at M2 to SAR at M1 = 58.1%
Maximum value of SAR (measured) = 1.77 W/kg



0 dB = 1.77 W/kg = 2.48 dBW/kg

Plot Nº9

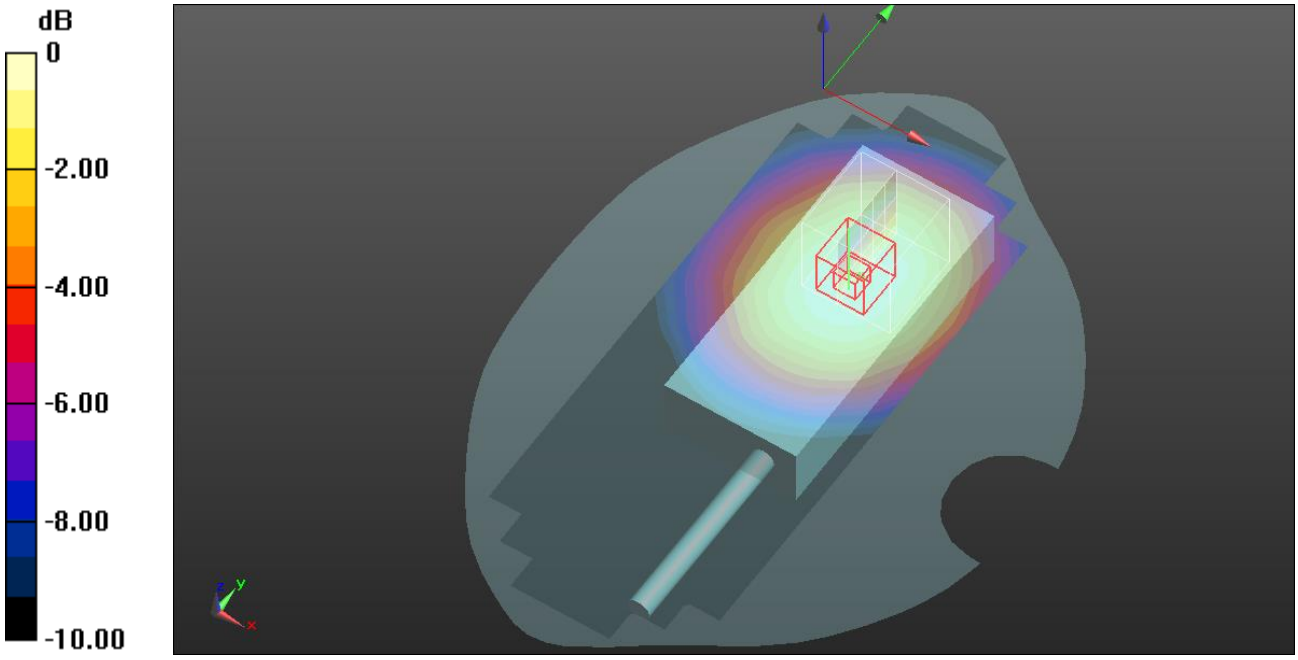
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.25; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC5/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.673 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC5/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.39 V/m; Power Drift = 0.23 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.550 W/kg; SAR(10 g) = 0.402 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 76.8%
Maximum value of SAR (measured) = 0.643 W/kg



0 dB = 0.643 W/kg = -1.92 dBW/kg

Plot Nº10

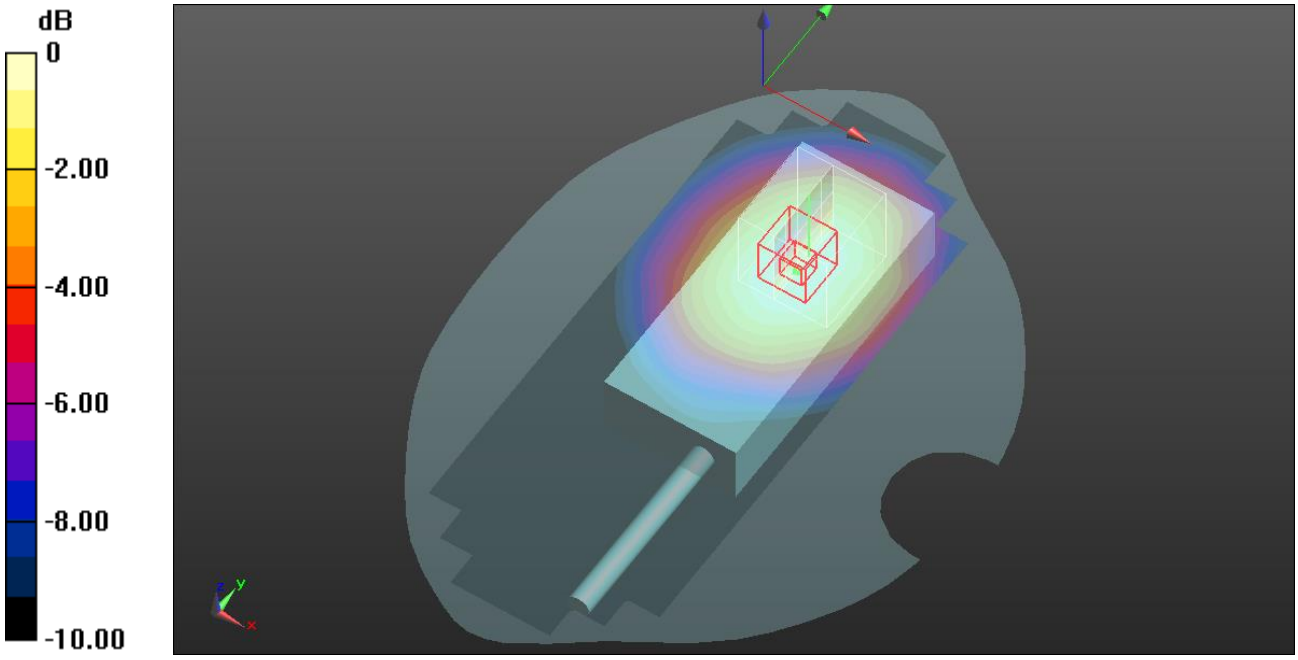
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.25; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC6/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.989 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 815 MHz, Back face, d=0 mm ACC6/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.38 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.790 W/kg; SAR(10 g) = 0.581 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 69.8%
Maximum value of SAR (measured) = 0.939 W/kg



0 dB = 0.939 W/kg = -0.27 dBW/kg

Plot Nº11

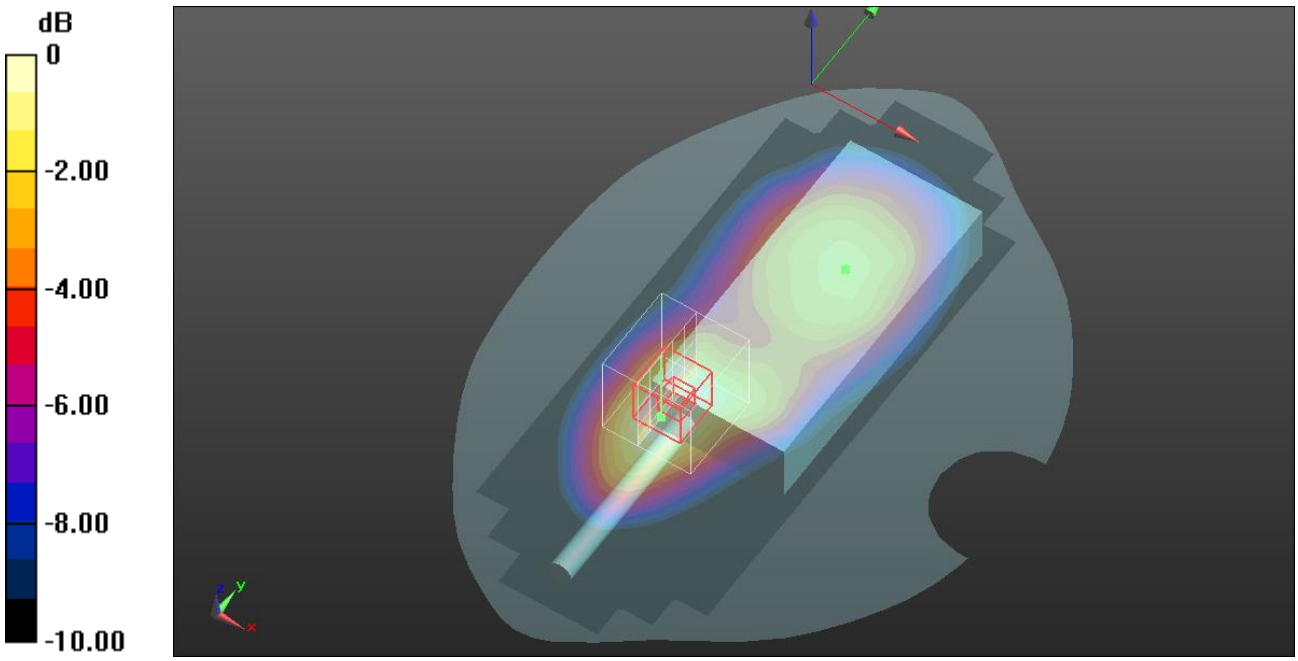
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 815 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 815 MHz; σ = 0.93 S/m; ε_r = 39.22; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 815 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 815 MHz, Front face, d=5 mm - Battery check/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.19 W/kg

Flat Phantom, Body worn/TETRA, 815 MHz, Front face, d=5 mm - Battery check/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.19 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.72 W/kg
SAR(1 g) = 1.79 W/kg; SAR(10 g) = 1.16 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 17.2 mm
Ratio of SAR at M2 to SAR at M1 = 66.5%
Maximum value of SAR (measured) = 2.25 W/kg



0 dB = 2.25 W/kg = 3.52 dBW/kg

Plot Nº12

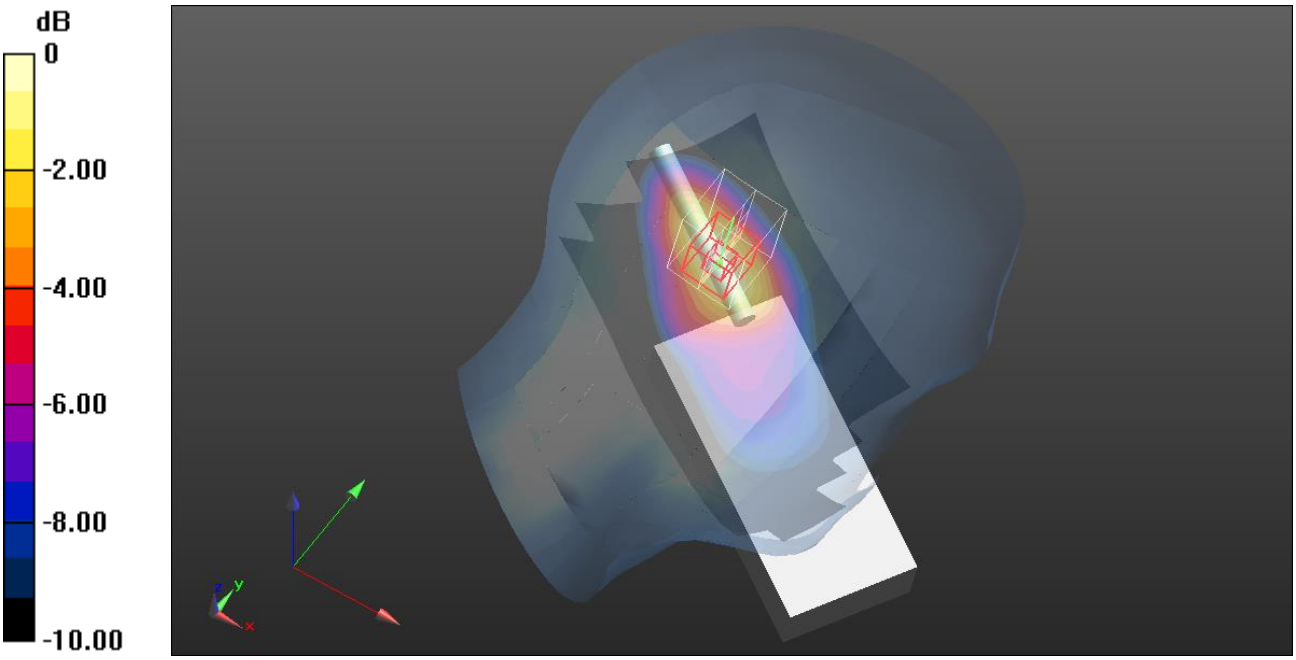
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 868.975 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 868.975 MHz; σ = 0.95 S/m; ε_r = 39.162; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 868.975 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Hand Side_23-01-2023/TETRA, 868.975 MHz, Tilt/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 3.54 W/kg

Left Hand Side_23-01-2023/TETRA, 868.975 MHz, Tilt/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.42 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 4.28 W/kg
SAR(1 g) = 2.75 W/kg; SAR(10 g) = 1.73 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 14.8 mm
Ratio of SAR at M2 to SAR at M1 = 65.6%
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.58 W/kg



0 dB = 3.58 W/kg = 5.54 dBW/kg

Plot Nº13

Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 868.975 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 868.975 MHz; σ = 0.95 S/m; ε_r = 39.162; ρ = 1000 kg/m^3
Phantom section: Left Section

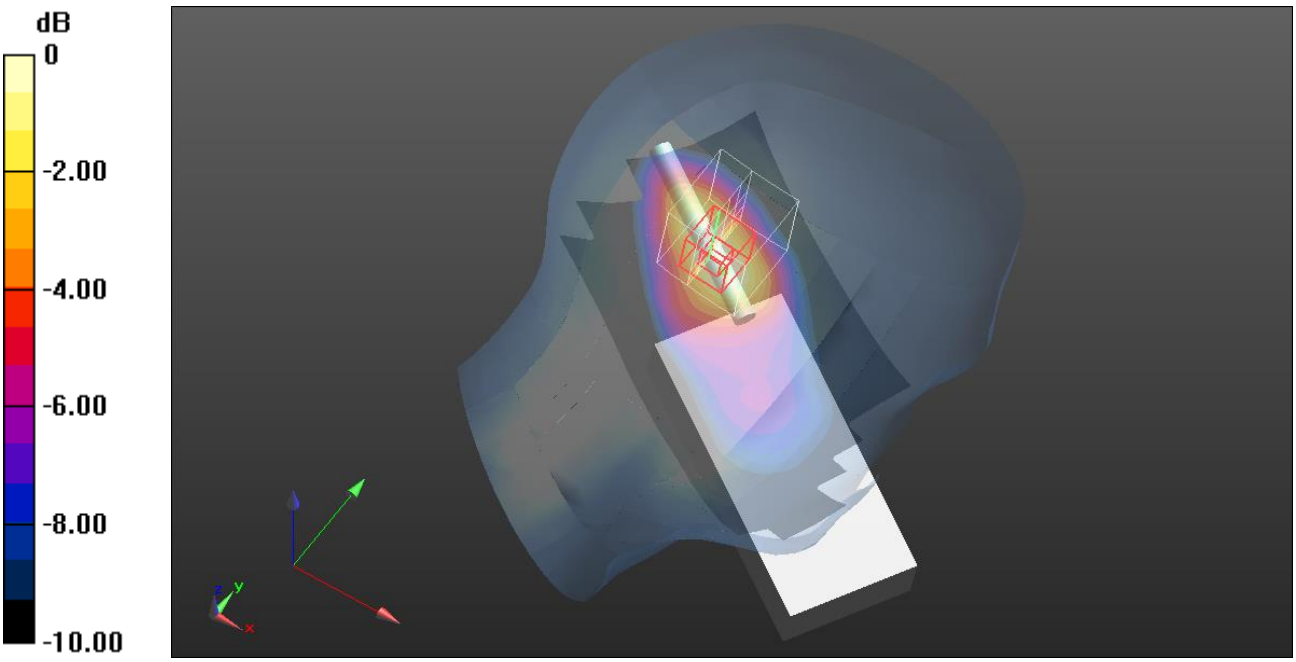
DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 868.975 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Hand Side_23-01-2023/TETRA, 868.975 MHz, Tilt - Battery check/Area Scan (71x181x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 3.56 W/kg

Left Hand Side_23-01-2023/TETRA, 868.975 MHz, Tilt - Battery check/Zoom Scan (6x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.27 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 4.34 W/kg
SAR(1 g) = 2.84 W/kg; SAR(10 g) = 1.78 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 14.3 mm
Ratio of SAR at M2 to SAR at M1 = 66.5%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.54 W/kg



0 dB = 3.54 W/kg = 5.49 dBW/kg

Plot Nº14

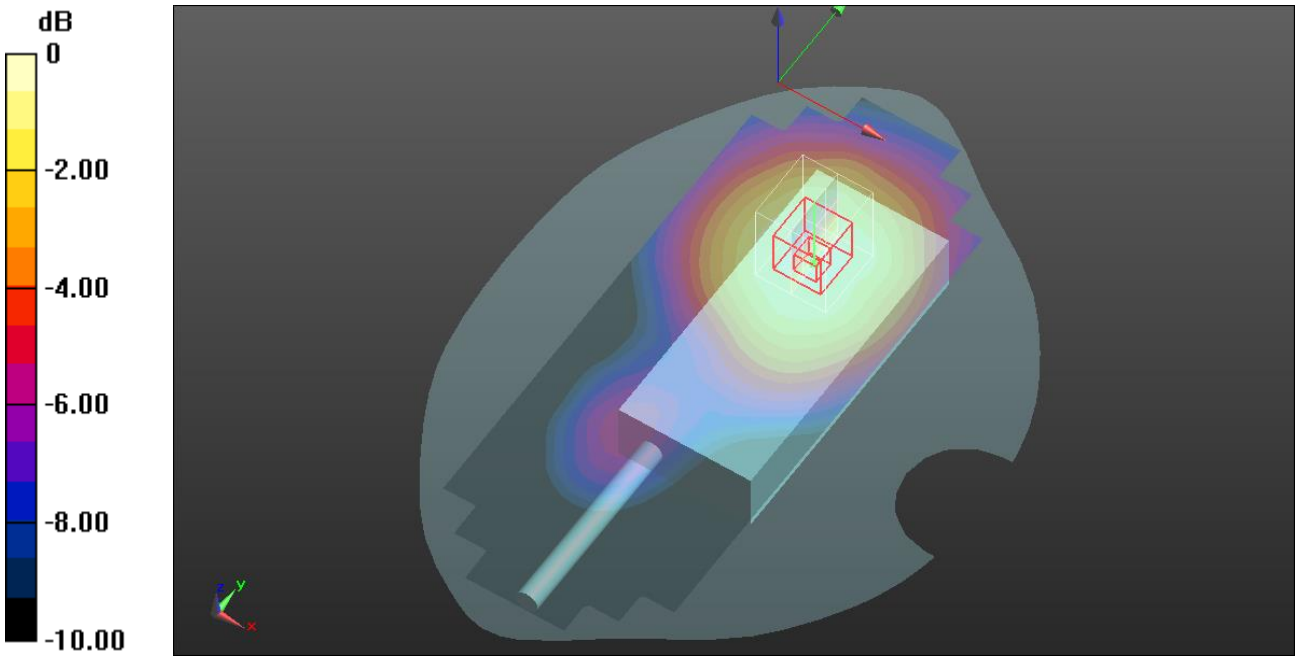
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 868.975 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 868.975 MHz; σ = 0.95 S/m; ε_r = 39.162; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 868.975 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Front of Face, d=25mm/TETRA, 868.975 MHz, Front of face/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.734 W/kg

Flat Phantom, Front of Face, d=25mm/TETRA, 868.975 MHz, Front of face/Zoom Scan (5x5x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.41 V/m; Power Drift = -0.29 dB
Peak SAR (extrapolated) = 0.868 W/kg
SAR(1 g) = 0.645 W/kg; SAR(10 g) = 0.476 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 76.2%
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.763 W/kg



0 dB = 0.763 W/kg = -1.17 dBW/kg

Plot Nº15

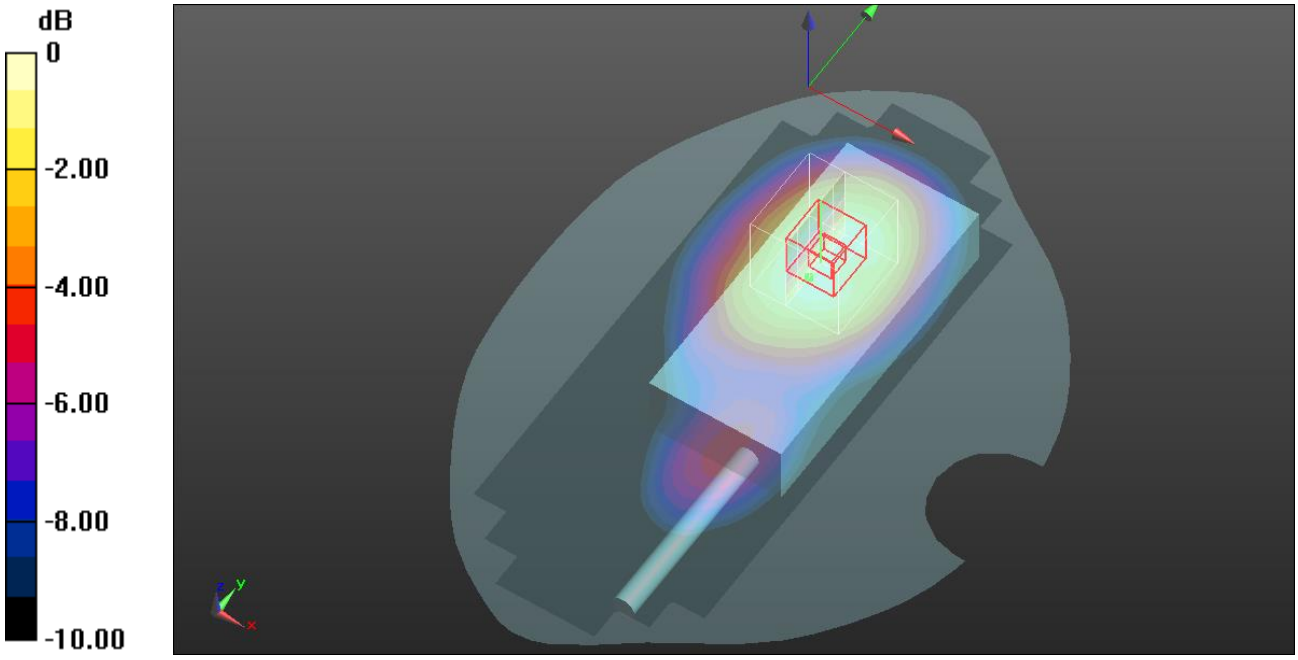
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=5 mm/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.14 W/kg

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=5 mm/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.52 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.51 W/kg
SAR(1 g) = 1.88 W/kg; SAR(10 g) = 1.34 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 25.8 mm
Ratio of SAR at M2 to SAR at M1 = 75.7%
Maximum value of SAR (measured) = 2.22 W/kg



0 dB = 2.22 W/kg = 3.46 dBW/kg

Plot Nº16

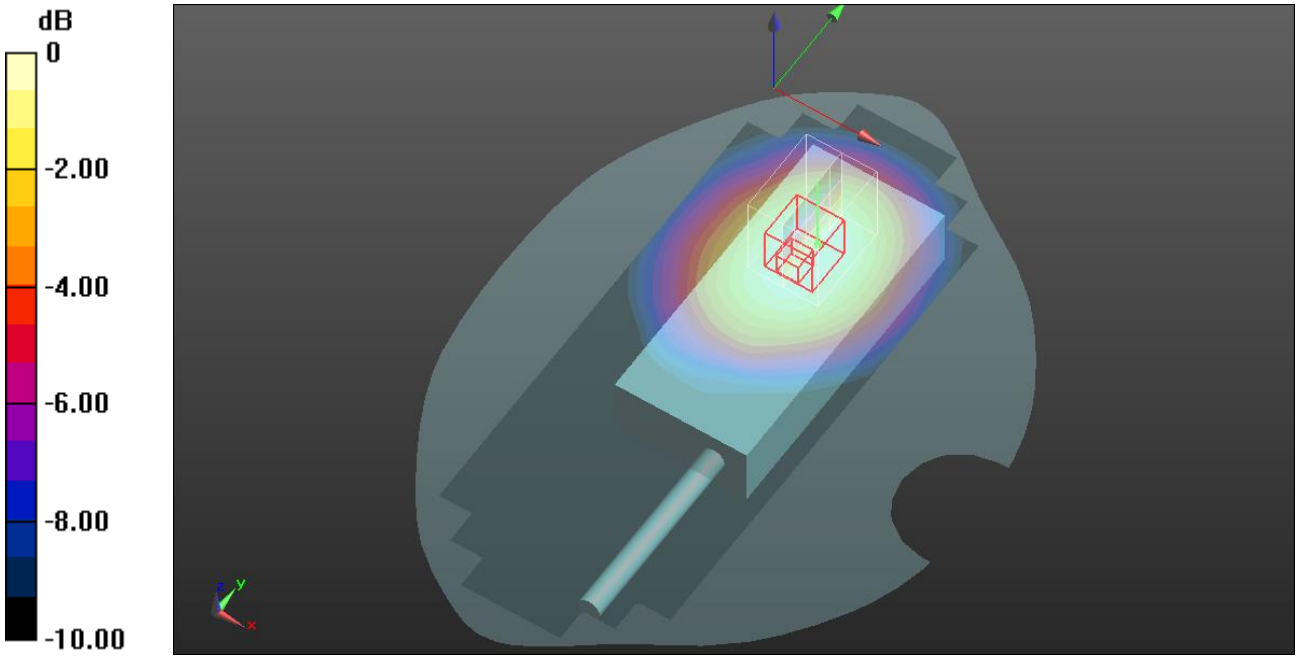
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=0 mm ACC1/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=0 mm ACC1/Zoom Scan (5x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.59 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.19 W/kg; SAR(10 g) = 0.863 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 74.7%
Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.42 W/kg = 1.52 dBW/kg

Plot Nº17

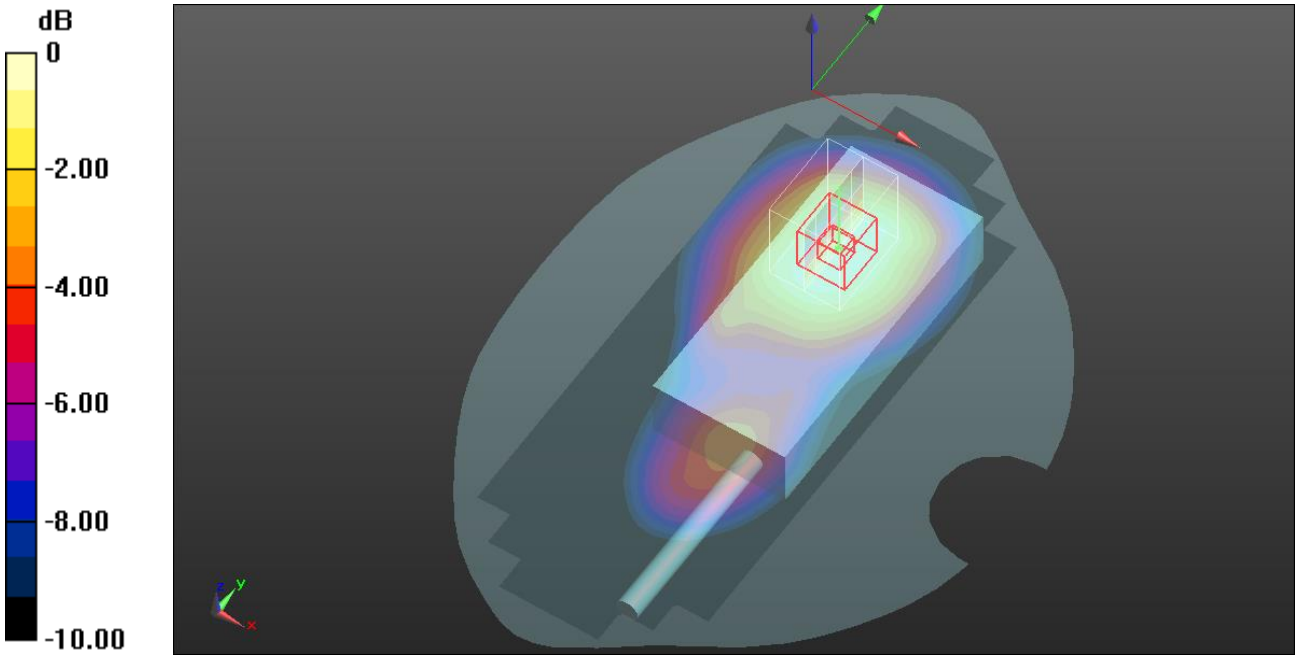
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=0 mm ACC2/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.19 W/kg

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=0 mm ACC2/Zoom Scan (5x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.42 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.36 W/kg
SAR(1 g) = 1.8 W/kg; SAR(10 g) = 1.29 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 76.1%
Maximum value of SAR (measured) = 2.14 W/kg



0 dB = 2.14 W/kg = 3.30 dBW/kg

Plot Nº18

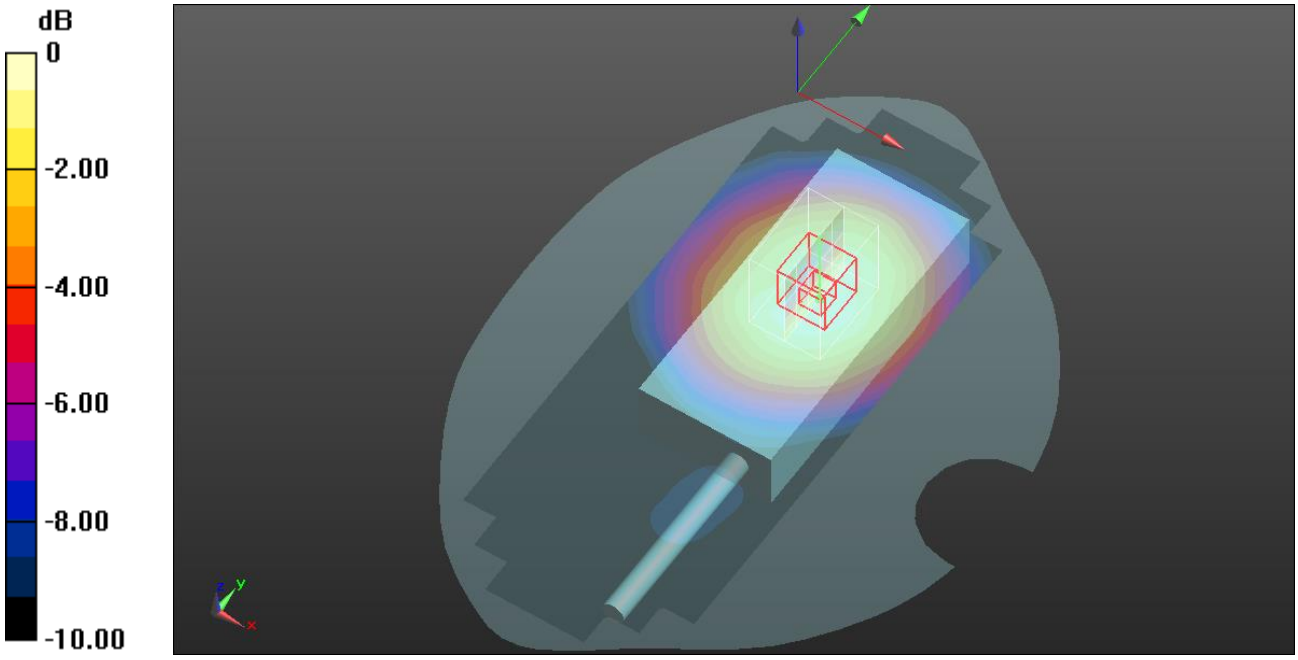
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.21; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC3/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.05 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC3/Zoom Scan (5x6x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.05 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.857 W/kg; SAR(10 g) = 0.614 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 73.7%
Maximum value of SAR (measured) = 1.03 W/kg



0 dB = 1.03 W/kg = 0.13 dBW/kg

Plot Nº19

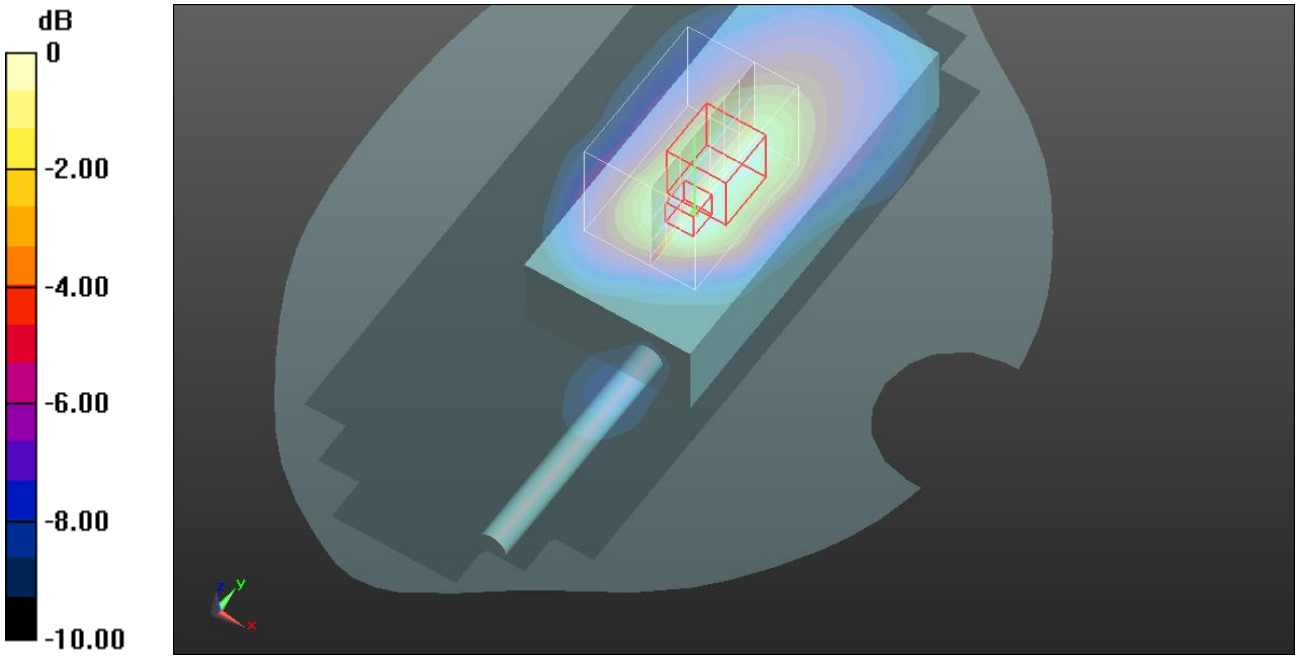
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.21; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC4/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.01 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC4/Zoom Scan (6x8x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.88 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.11 W/kg
SAR(1 g) = 1.29 W/kg; SAR(10 g) = 0.859 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 11.6 mm
Ratio of SAR at M2 to SAR at M1 = 65.6%
Maximum value of SAR (measured) = 1.64 W/kg



0 dB = 1.64 W/kg = 2.15 dBW/kg

Plot Nº20

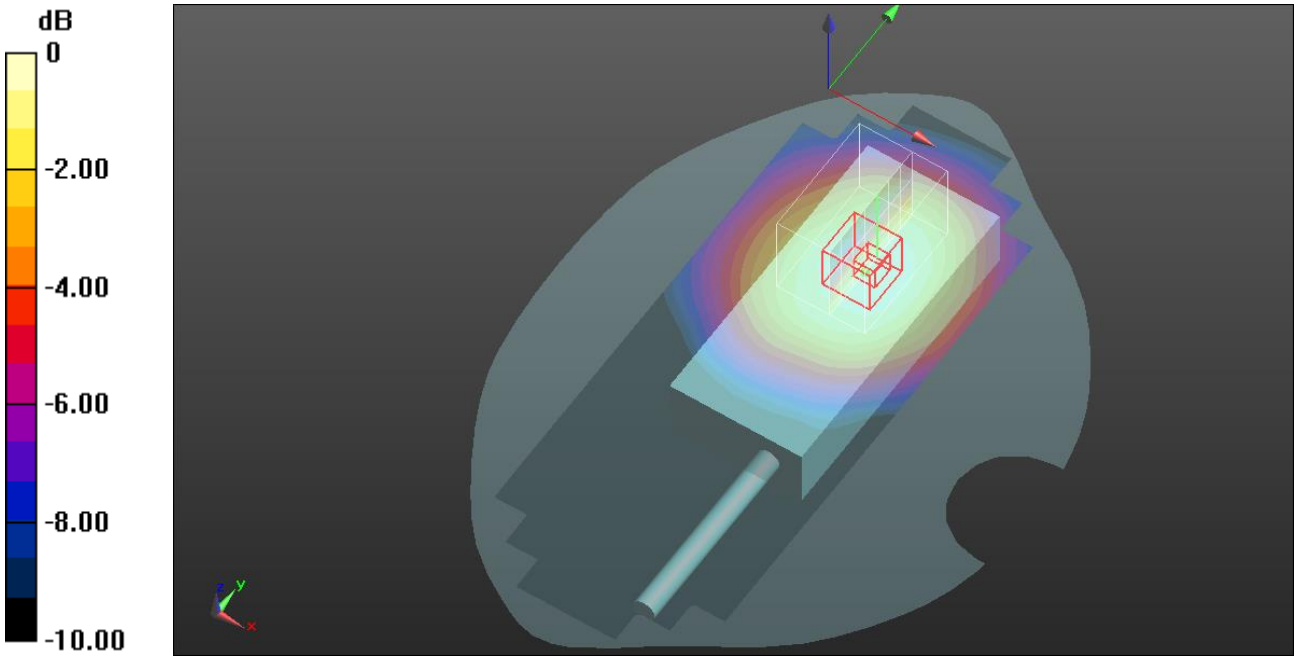
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.21; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC5/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.808 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC5/Zoom Scan (6x8x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.12 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.653 W/kg; SAR(10 g) = 0.477 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 37.4 mm
Ratio of SAR at M2 to SAR at M1 = 74.8%
Maximum value of SAR (measured) = 0.766 W/kg



0 dB = 0.766 W/kg = -1.16 dBW/kg

Plot Nº21

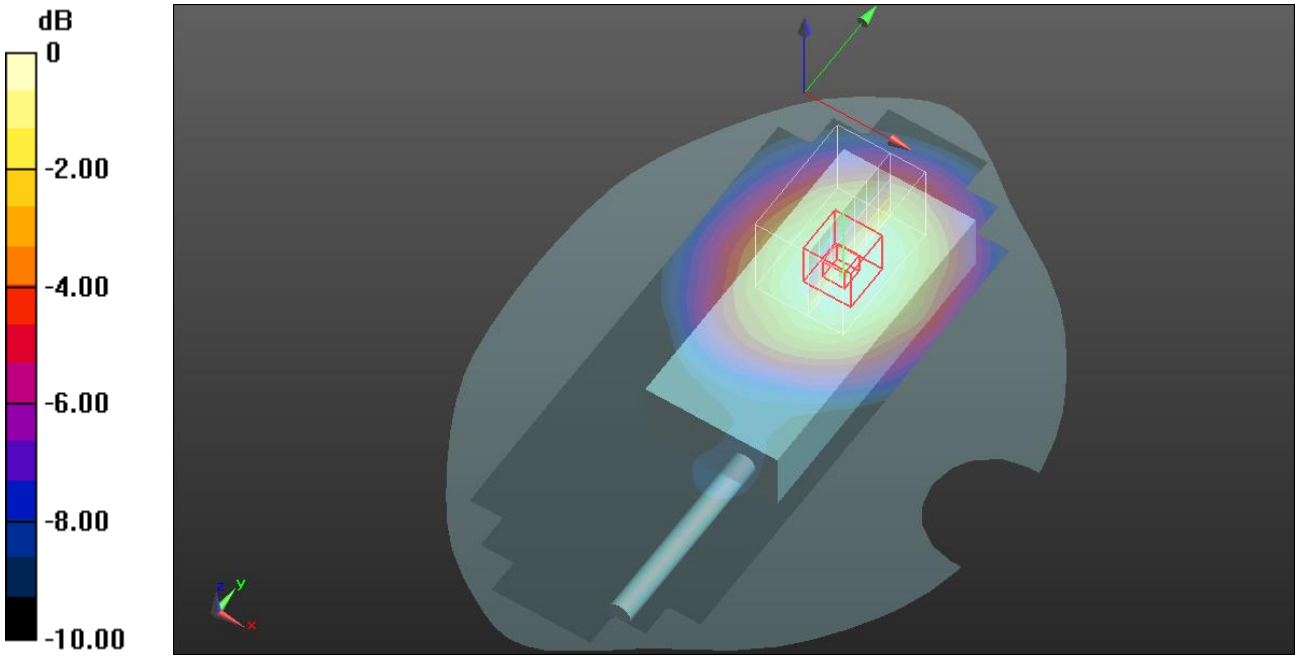
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.21; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC6/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.14 W/kg

Flat Phantom, Body worn_Acc3-Acc6/TETRA, 860 MHz, Back face, d=0 mm ACC6/Zoom Scan (6x8x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.22 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.935 W/kg; SAR(10 g) = 0.672 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 32.8 mm
Ratio of SAR at M2 to SAR at M1 = 73.2%
Maximum value of SAR (measured) = 1.12 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

Plot Nº22

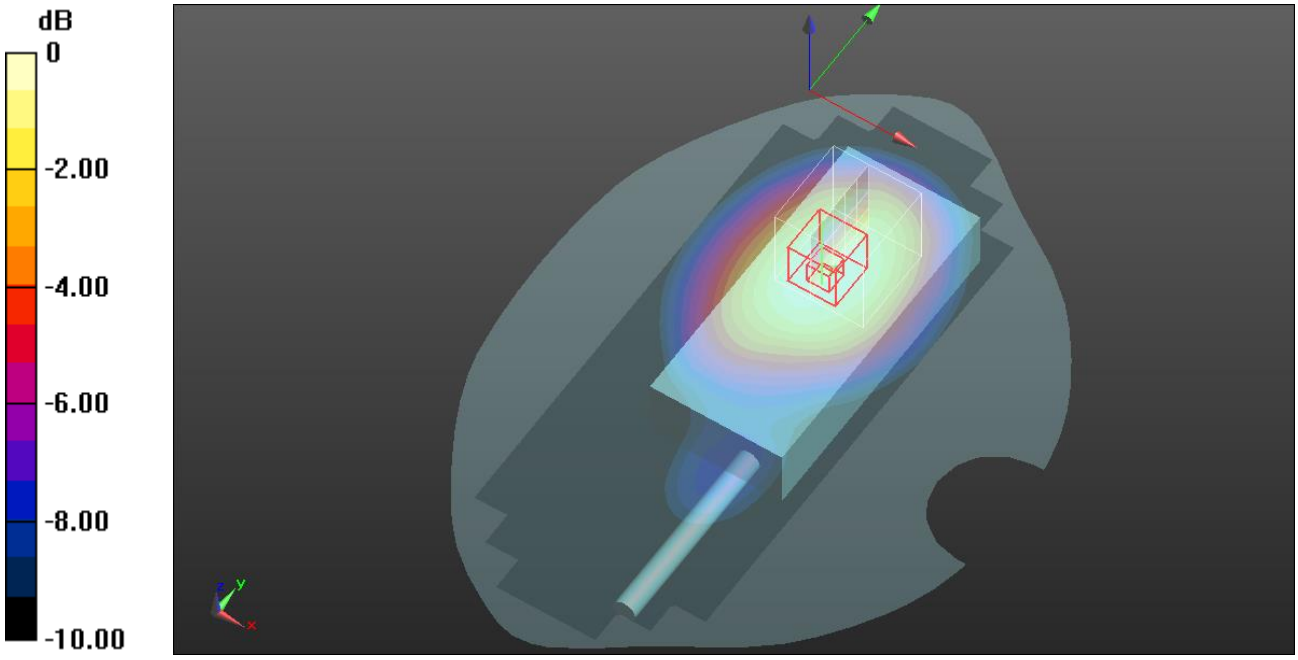
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 24/01/2023

DUT: SC2028; Type: PTT Radio; Serial: 1PR002244GK93A7
Communication System: UID 0, TETRA (0); Frequency: 860 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 860 MHz; σ = 0.95 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 860 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=5 mm - Battery check/Area Scan (71x181x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.82 W/kg

Flat Phantom, Body worn/TETRA, 860 MHz, Back face, d=5 mm - Battery check/Zoom Scan (6x6x5)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.30 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.01 W/kg
SAR(1 g) = 1.49 W/kg; SAR(10 g) = 1.08 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 25.3 mm
Ratio of SAR at M2 to SAR at M1 = 74.6%
Maximum value of SAR (measured) = 1.78 W/kg



0 dB = 1.78 W/kg = 2.50 dBW/kg

Appendix D: System Validation Report

Validation results in 900 MHz Band for Head TSL

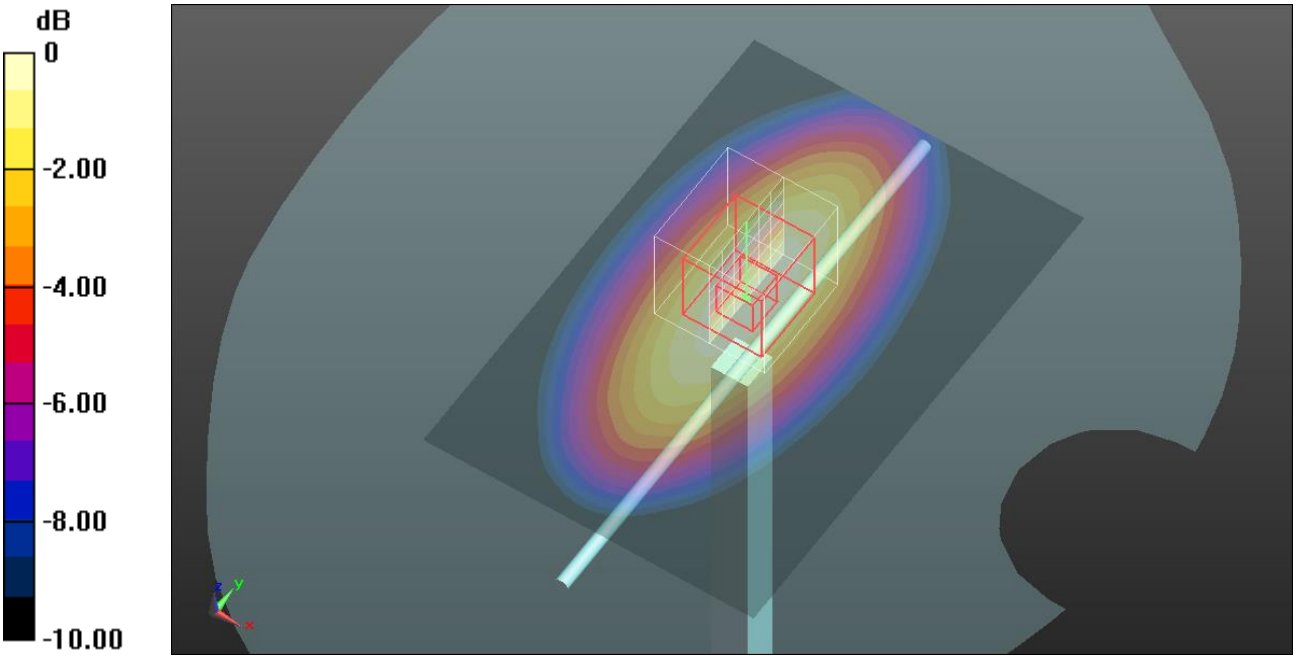
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 20/01/2023

DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007
Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 0.96 S/m; ε_r = 39.46; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 900 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Configuration 900MHz, 2023-01-20/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.96 W/kg

Configuration 900MHz, 2023-01-20/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.76 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.89 W/kg
SAR(1 g) = 2.55 W/kg; SAR(10 g) = 1.64 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 65.6%
Maximum value of SAR (measured) = 3.01 W/kg



0 dB = 3.01 W/kg = 4.79 dBW/kg

Validation results in 900 MHz Band for Head TSL

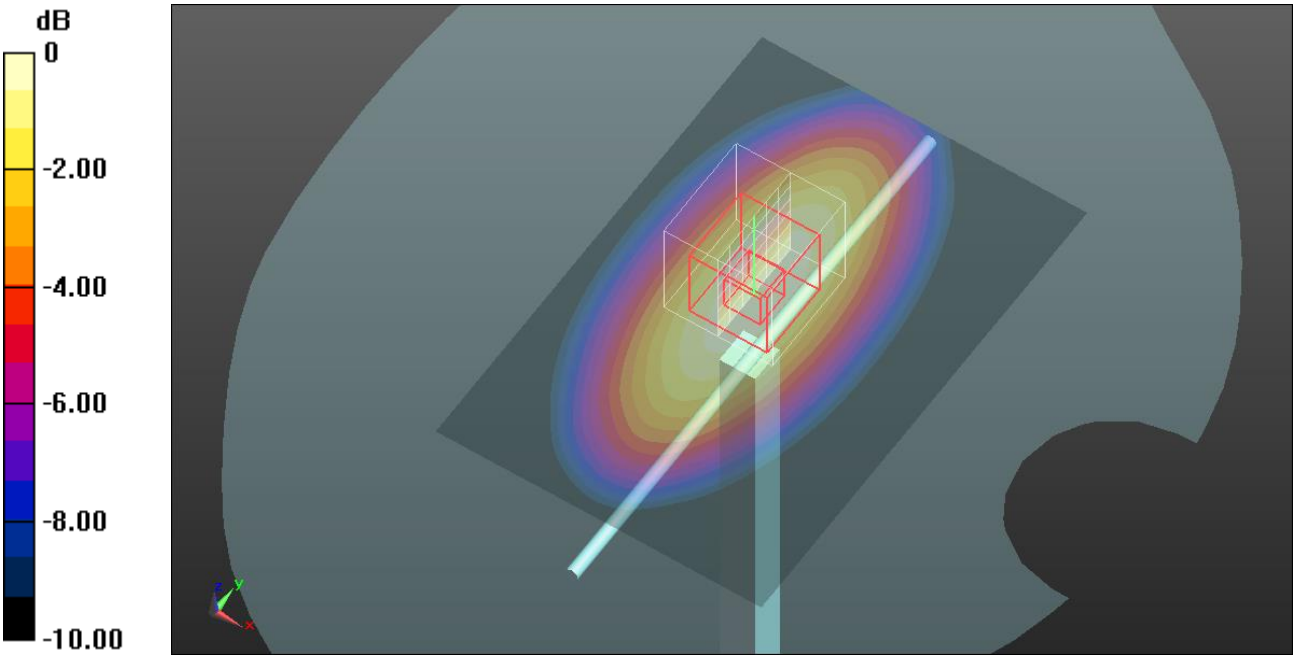
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 23/01/2023

DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007
Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 0.96 S/m; ε_r = 39.11; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 900 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Configuration 900MHz, 2023-01-23/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.03 W/kg

Configuration 900MHz, 2023-01-23/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.40 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.94 W/kg
SAR(1 g) = 2.6 W/kg; SAR(10 g) = 1.68 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 66.1%
Maximum value of SAR (measured) = 3.06 W/kg



0 dB = 3.06 W/kg = 4.86 dBW/kg

Validation results in 900 MHz Band for Head TSL

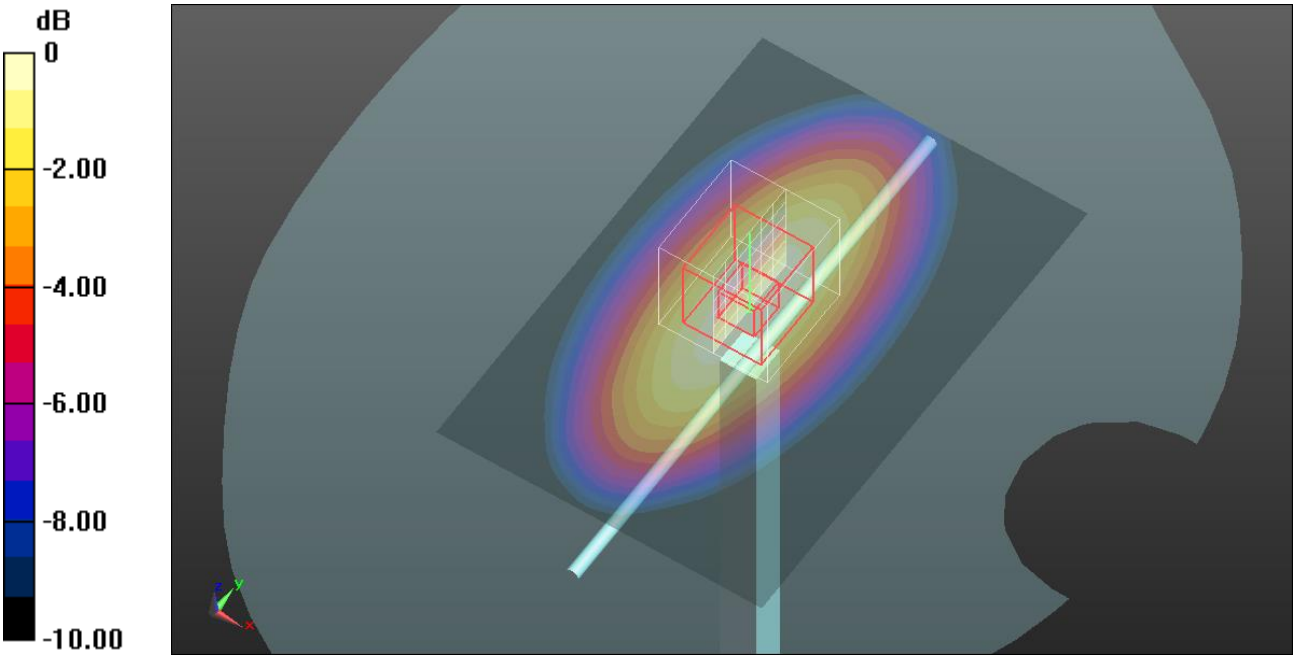
Test Laboratory: DEKRA Testing and Certification, S.A.U; Date: 25/01/2023

DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007
Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 0.97 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN7766; ConvF(9.66, 9.66, 9.66) @ 900 MHz; Calibrated: 18/10/2022
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1690; Calibrated: 13/10/2022
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Configuration 900MHz, 2023-01-25/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.96 W/kg

Configuration 900MHz, 2023-01-25/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.24 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.90 W/kg
SAR(1 g) = 2.55 W/kg; SAR(10 g) = 1.64 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 21.3 mm
Ratio of SAR at M2 to SAR at M1 = 65.5%
Maximum value of SAR (measured) = 3.00 W/kg



0 dB = 3.00 W/kg = 4.77 dBW/kg