ENSAYOS Nº 51/LE147

Test report No:

NIE: 51697RAN.001

Test report
REFERENCE STANDARDS:
FCC 47CFR Part 2.1093, Published RF Exposure KDB Procedures

Identification of item tested.....:	Digital Handheld Terminal
Trade .....:	PowerTrunk
Model and /or type reference .....:	HTT-500-2
Other identification of the product .....:	S/N: NYPA-17 FCC ID: WT7PTHTT500760C
Final HW version .....:	A model
Final SW version .....:	173401507367
Manufacturer.....:	TELTRONIC, S.A.U. Polígono Malpica, Calle F-Oeste (50016). Zaragoza. (SPAIN).
Test method requested, standard.....:	1. FCC 47 CFR Part 2.1093. (10-1-14 Edition) Radiofrequency radiation exposure evaluation: portable devices. 2. FCC OET KDB 447498 D01 General RF Exposure Guidance v06 (October 2015) 3. FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015). 4. FCC OET KDB 865664 D02 RF Exposure Reporting v01r02 (October 2015) 5. FCC OET KDB 648474 D04 Handset SAR v01r03 (October 2015) 6. FCC OET KDB 643646 D01 v01r03 SAR Test for PTT Radios (October 2015).

Summary .....:	Considering the results of the performed test according to FCC 47CFR Part 2.1093, the item under test is IN COMPLIANCE with the requested specifications specified in the standards. The maximum 1g volume averaged SAR found during this test has been 6.79 W/kg, into the 779 - 805 MHz frequency band, for P25 mode and head exposure condition. The maximum 1g volume averaged SAR for multiband transmission found during this test has been 7.07 W/kg, for head exposure. NOTE: The results presented in this Test Report apply only to the particular item under test established in page 1 of this document, as presented for test on the date(s) shown in section, "USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS".
Approved by (name / position & signature) .....:	Miguel Lacave Antennas Lab Manager MIGUEL LACAVE GARCÍA 2017.01.09 17:02:11 +01'00'
Date of issue .....:	2017-01-09
Report template No.....:	FDT08_18

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Competences and guarantees

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In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance program for its measurement equipment.

AT4 wireless 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 AT4 wireless at the time of performance of the test.

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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

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

1. FCC OET KDB 865664 D01 - SAR Measurement Requirements for 100 MHz to 6 GHz v01r04 (August 2015).

Usage of samples

Samples undergoing test have been selected by: the client

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
51697/19	Portable terminal	HTT-500-2	NYPA-17	2016-11-22
51697/22	Battery	300-01175	---	2016-11-22

Sample M/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
51697/19	Portable terminal	HTT-500-2	NYPA-17	2016-11-22
51697/11	Antenna	300-00498	---	2016-11-22
51697/22	Battery	300-01175	---	2016-11-22
51697/23	Battery	300-01175	---	2016-11-22
51697/24	Battery	300-01175	---	2016-11-22

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

Test sample description

The test sample consists of a Digital handheld terminal for TETRA, TI D-LMR and P25 with external antenna, keypad and display. It can also include a Bluetooth module and a GPS receiver inside.

Identification of the client

TELTRONIC, S.A.U.

Polígono Malpica, Calle F-Oeste (50016). Zaragoza. (SPAIN).

Testing period

The performed test started on 2016-11-22 and finished on 2016-12-01.

The tests have been performed at AT4 wireless.

Environmental conditions

In the laboratory for measurements, the following limits were not exceeded during the test:

Temperature	Min. = 20.02 ºC Max. = 24.00 ºC
Relative humidity	Min. = 39.53 % Max. = 66.97 %

Remarks and comments

1: Only the plots of the highest reported SAR for each test configuration and mode/band are included in appendix C.

2: Zoom scan for this position is not required according to FCC OET KDB 447498 D01 General RF Exposure Guidance v06, paragraph "4.4.2. Area scan based 1-g estimation"

3: Testing of other required channels is not required when the highest output channel has a measured SAR ≤ 3.5 W/kg, according to FCC OET KDB 613646 D01 SAR Test for PTT Radios v01r03".

Used instrumentation

1. Dosimetric E-field probe SPEAG EX3DV4
2. Data acquisition device SPEAG DAE4
3. Electro-optical converter SPEAG EOC3
4. 750 MHz dipole validation kit SPEAG D750V3
5. 900 MHz dipole validation kit SPEAG D900V2
6. Robot Stäubli RX60BL
7. Robot controller Stäubli CM7MB
8. SAR measurement software SPEAG DASY52 V52.8.8.1222
9. SAR post processing software SPEAG SEMCAD X
10. Measurement server SPEAG DASY5 SE UMS 011 BS
11. SAM head-body simulator SPEAG Twin SAM V4.0
12. Oval flat phantom SPEAG ELI 4
13. Head and Body Tissue Equivalent Liquids for 750 MHz and 900 MHz bands
14. Vector network analyzer Agilent FieldFox N9923A
15. Dielectric probe kit SPEAG DAK-3.5
16. Power sensor DC 50 MHz to 18 GHz R&S model NRP-Z81
17. Power meter Agilent E4419B
18. RF Generator R&S SMU200A
19. DC Power supply Agilent U8002A
20. Dual directional coupler HP 778D and NARDA.
21. Power amplifier MITEQ AMF-4D-00400600-50-30P
22. 6 dB attenuator Weinschel 75 A-6-11
23. 20 dB attenuator Weinschel 75 A-20-11
24. SPEAG Mounting Device for Hand-Held Transmitters.
25. Digital thermometer LKM Electronics model DTM300-Spezial
26. Temperature and humidity probe HUMIDIROBE Pico Technology.

Testing verdicts

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

FCC 47CFR Part 2.1093 Paragraph	**VERDICT**			
	NA	**P**	**F**	**NM**
(d)(1) TETRA 769-775 MHz		P		
(d)(1) TETRA 779-805 MHz		P		
(d)(1) TETRA 809-824 MHz		P		
(d)(1) TETRA 854-869 MHz		P		
(d)(1) TI D-LMR 769-775 MHz		P		
(d)(1) TI D-LMR 779-805 MHz		P		
(d)(1) TI D-LMR 809-824 MHz		P		
(d)(1) TI D-LMR 854-869 MHz		P		
(d)(1) P25 769-775 MHz		P		
(d)(1) P25 779-805 MHz		P		
(d)(1) Bluetooth 2450 MHz		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 occupational/controlled 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)(1).

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 fulfils the procedural and technical requirements described at the reference standards used.

1.4. Phantom requirements

The phantom for head worn 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:

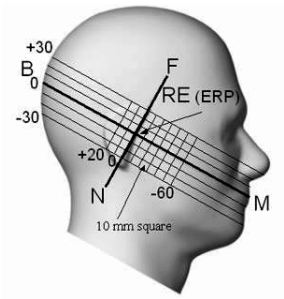

Figure 1: Proportions of Phantom

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

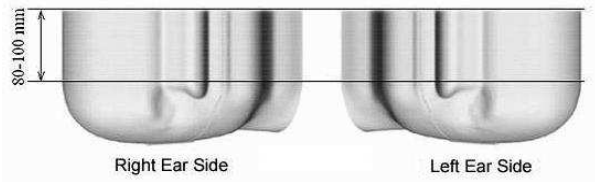

Figure 2: Proportions and shape of Phantom shell

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

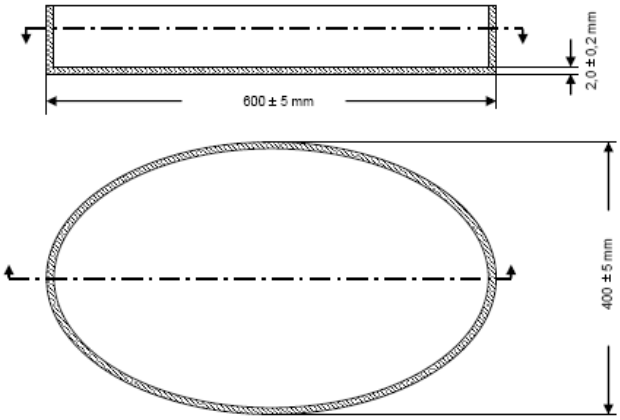

Figure 3: Proportions and shape of Phantom shell

1.5. Measurement Liquids requirements.

The liquids used to simulate the human tissues, must fulfils the requirements of the dielectric properties required. These target dielectric properties per FCC OET KDB 865664 D01 instructions come from the dipole and probe calibration data which are included in Appendix B, Section 3, of this document.

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.

2. MEASUREMENT SYSTEM

2.1. Measurement System

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

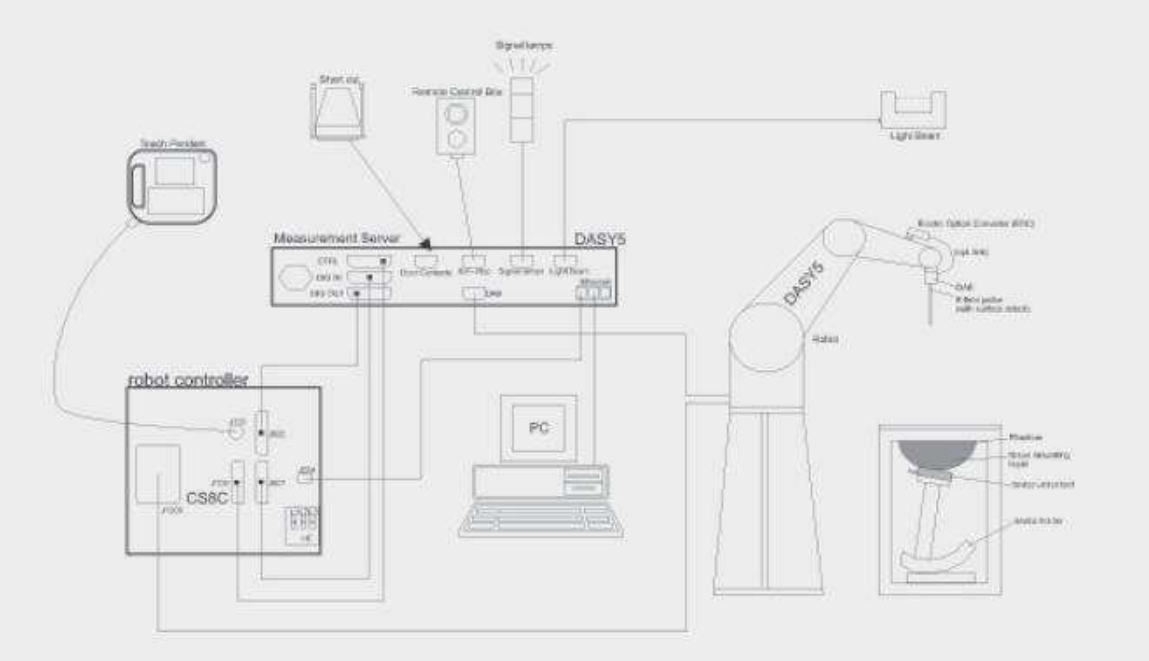

Figure 4: SAR Measurement system

- 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 Win7 professional operating system and the DASY5 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.

Manufacturer	Device	Type
Schmid & Partner Engineering AG	Dosimetric E-Field Probe	EX3DV4
Schmid & Partner Engineering AG	Data Acquisition Electronics	DAE4
Schmid & Partner Engineering AG	Electro-Optical Converter	EOC3
Stäubli	Robot	RX60BL
Stäubli	Robot controller	CS7MB
Schmid & Partner Engineering AG	Measurement Server	DASY5 SE UMS 011 BS
Schmid & Partner Engineering AG	SAM head-body simulator	TWIN SAM V4.0
Schmid & Partner Engineering AG	Oval flat phantom	SPEAG ELI 4
Schmid & Partner Engineering AG	Mounting Device for Hand-Held Transmitters	SD000 HD1HA
Schmid & Partner Engineering AG	Measurement Software	DASY52 V52.8.8.1222
Schmid & Partner Engineering AG	Postprocessing Software	SEMCAD X
Schmid & Partner Engineering AG	750 MHz System Validation Dipole	D750V3
Schmid & Partner Engineering AG	900 MHz System Validation Dipole	D900V2
Agilent	Vector Network Analyser	FieldFox N9923A
Schmid & Partner Engineering AG	Dielectric Probe Kit	DAK-3.5

Table 1: Measurement Equipment

	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 tocuh 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	ELI
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.
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 (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	Approx. 30 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
	D2450V2	52.0	290.0
	D2600V2	49.2	290.0
	D5GHzV2	20.6	300.0

2.2. Test positions of device relative to head

The 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.

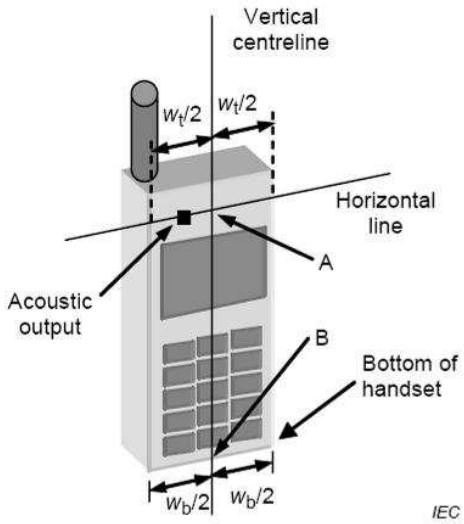

Figure 5: DUT's basic scheme

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.

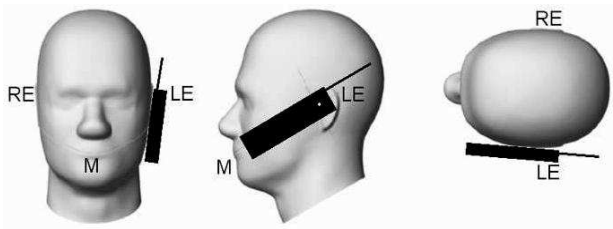

Figure 6: "Cheek" position of DUT

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.

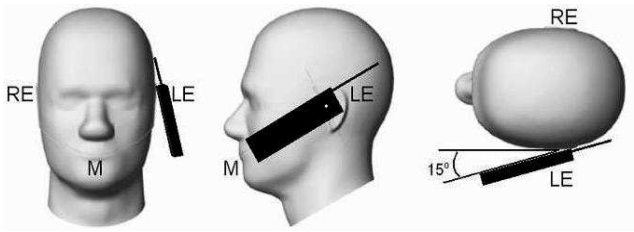

Figure 7: "Tilted" position of DUT

As the device under test is a Handheld PTT two-ways radio, Head SAR in-front-of the face exposure conditions is also required according to KDB 643646 D01.

Head SAR has been measured with the front face of the radio positioned at 2.5 cm parallel to the flat phantom.

2.3. 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.

As no body-worn accessory has been supplied for testing, SAR measurements for body exposure have been performed at 5 mm distance, with the back side of the device facing the flat phantom.

2.4. Test to be performed

For Head SAR test shall be performed at both DUT positions previously described, on each side of the SAM Head-Body Simulator Phantom using the centre frequency of each operating band.

Additionally, the configuration giving to the maximum mass averaged SAR shall be used to test the low-end and the high-end frequencies of each transmitting band. Thus, the tests to be performed are as follows:

- Measurements at Central Channel of application band:
  1. SAR measurement at the left side of Phantom and the cheek position of the DUT.
  2. SAR measurement at the left side of Phantom and the tilted 15º position of the DUT.
  3. SAR measurement at the right side of Phantom and the cheek position of the DUT.
  4. SAR measurement at the right side of Phantom and the tilted 15º position of the DUT.
  5. SAR measurement at the flat side of the Phantom with the front face DUT at 2.5cm parallel to the flat Phantom.
- Measurements at Low Channel of application band: SAR measurement at the side and position where the maximum SAR level, measured at Central channel, was found.
- Measurements at High Channel of application band: SAR measurement at the side and position where the maximum SAR level, measured at Central channel, was found.

For body SAR, test shall be performed with the radio placed in a body-worn accessory, positioned against the flat phantom, representative of the normal operating conditions expected by users, using the centre frequency of each operating band. Low and high channels for each band should be tested at this position.

2.5. 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 1 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. 10 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.

2.6. 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, and indicated in the previous points.

2.7. System Validation

Prior to the SAR measurements, system verification is done daily to verify the system accuracy. 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.

The measured one-gram 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

Uncertainty for 300 MHz – 6 GHz

ERROR SOURCES	Uncertainty value (± %)	Probability distribution	Divisor	(c_i) 1g	(c_i) 10g	Standard uncertainty (1g) (± %)	Standard uncertainty (10g) (± %)
Measurement Equipment							
Probe Calibration	6.550	N	1	1	1	6.550	6.550
Axial Isotropy	4.700	R	√3	0.7	0.7	1.899	1.899
Hemisfericall Isotropy	9.600	R	√3	0.7	0.7	3.880	3.880
Boundary effect	2.000	R	√3	1	1	1.155	1.155
Linearity	4.700	R	√3	1	1	2.714	2.714
System Detection limits	1.000	R	√3	1	1	0.577	0.577
Probe modulation response	6.100	R	√3	1	1	3.522	3.522
Readout electronics	0.300	N	1	1	1	0.300	0.300
Response time	0.800	R	√3	1	1	0.462	0.462
Integration time	2.600	R	√3	1	1	1.501	1.501
RF Ambient noise	3.000	R	√3	1	1	1.732	1.732
RF Ambient reflections	3.000	R	√3	1	1	1.732	1.732
Probe positioner mech. restrictions	0.800	R	√3	1	1	0.462	0.462
Probe positioning with respect to phantom shell	6.700	R	√3	1	1	3.868	3.868
Max. SAR Eval.	4.000	R	√3	1	1	2.309	2.309
Test Sample Related							
Device holder uncertainty	2.900	N	1	1	1	2.900	2.900
Test sample positioning	3.600	N	1	1	1	3.600	3.600
Drift of output power	5.000	R	√3	1	1	2.887	2.887
Phantom and Setup							
Phantom uncertainty (shape and thickness tolerances)	6.600	R	√3	1	1	3.811	3.811
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.900	R	√3	1	0.84	1.097	0.921
Liquid conductivity (meas.)	2.454	N	1	0.78	0.71	1.914	1.742
Liquid permittivity (meas.)	2.454	N	1	0.26	0.26	0.6.38	0.638
Liquid conductivity – temperature uncertainty	3.400	R	√3	0.78	0.71	1.531	1.394
Liquid permittivity – temperature uncertainty	0.400	R	√3	0.23	0.26	0.053	0.060
Combined standard uncertainty	$u_c = \sqrt{\sum_{1=1}^{m} c_i^2 \cdot u_i^2}$					**12.82**	**12.76**
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**25.64**	**25.53**

Table 2: Uncertainty Assessment for 300 MHz - 6 GHz

Uncertainty for Fast SAR measurement 300 MHz – 6 GHz

ERROR SOURCES	Uncertainty value (± %)	Probability distribution	Divisor	(c_i) 1g	(c_i) 10g	Standard uncertainty (1g) (± %)	Standard uncertainty (10g) (± %)
Measurement Equipment							
Probe Calibration	6,550	N	1	0	0	0,000	0,000
Axial Isotropy	4,700	R	√3	0,7	0,7	1,899	1,899
Hemisfericall Isotropy	9,600	R	√3	0,7	0,7	3,880	3,880
Boundary effect	2,000	R	√3	1	1	1,155	1,155
Linearity	4,700	R	√3	1	1	2,714	2,714
System Detection limits	1,000	R	√3	1	1	0,577	0,577
Probe modulation response	2,400	R	√3	1	1	1,386	1,386
Readout electronics	0,300	N	1	0	0	0,000	0,000
Response time	0,800	R	√3	0	0	0,000	0,000
Integration time	2,600	R	√3	1	1	1,501	1,501
RF Ambient noise	3,000	R	√3	1	1	1,732	1,732
RF Ambient reflections	3,000	R	√3	0	0	0,000	0,000
Probe positioner mech. restrictions	0,800	R	√3	1	1	0,462	0,462
Probe positioning with respect to phantom shell	6,700	R	√3	1	1	3,868	3,868
Spatial x-y-Resolution	10,000	R	√3	1	1	5,774	5,774
Fast SAR z-Approximation	14,000	R	√3	1	1	8,083	8,083
Test Sample Related							
Device holder uncertainty	2.900	N	1	1	1	2.900	2.900
Test sample positioning	3.600	N	1	1	1	3.600	3.600
Drift of output power	5.000	R	√3	1	1	2.887	2.887
Power Scaling	0,000	R	√3	0	0	0,000	0,000
Phantom and Setup							
Phantom uncertainty (shape and thickness tolerances)	7.600	R	√3	1	1	4.388	4.388
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.900	R	√3	1	0.84	1.097	0.921
Liquid conductivity (meas.)	1.500	N	√3	0.78	0.71	0.675	0.615
Liquid permittivity (meas.)	1.200	N	√3	0.26	0.26	0.180	0.180
Liquid conductivity – temperature uncertainty	3.400	N	√3	0.78	0.71	1.531	1.394
Liquid permittivity – temperature uncertainty	0.400	N	√3	0.23	0.26	0.053	0.060
Combined standard uncertainty	$u_c = \sqrt{\sum_{1=1}^{m} c_i^2 \cdot u_i^2}$					**14.34**	**14.29**
Expanded uncertainty (confidence interval of 95%)	*ue =2.00 uc*					**28.68**	**28.59**

Table 3: Fast SAR Uncertainty Assessment for 300 MHz - 6 GHz

4. SAR LIMIT

The SAR values have to be averaged over a mass of 1 gr. (SAR 1 gr.) with the shape of a cube. This level couldn't exceed the values indicated in the application Standard:

Standard	Exposure	SAR	SAR Limit (W/kg)
FCC 47 CFR Part 2.1093 Paragraph (d)(1)	Ocupational/controlled	$SAR_{1\ gr.}$	8

Table 4: SAR limit

Having a worst case measurement, the SAR limit is valid for Ocupational/controlled exposure.

5. DEVICE UNDER TEST

5.1. Dimensions

Dimensions	Millimetres
Height x Width x Depth	130.0 x 60.0 x 35.0
Overall Diagonal:	150.0
Display Diagonal:	65.0
Antenna:	85.0 x 10.0

Table 5: Dimensions

5.2. Wireless Technology

Wireless Technology	SAR Testing	Frequency Bands
TETRA	Required	769 – 775 MHz, 779 – 805 MHz 809 – 824 MHz, 854 – 869 MHz
TI D-LMR	Required	769 – 775 MHz, 779 – 805 MHz 809 – 824 MHz, 854 – 869 MHz
P25	Required	769 – 775 MHz, 779 – 805 MHz
Bluetooth	Not required	2402-2480 MHz

Table 6: Supported modes

5.3. Antenna Location

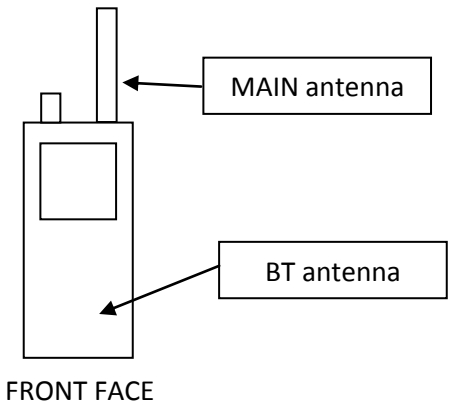

Figure 8: Antenna location sketch

Appendix B – Test results

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1. TEST CONDITIONS

1.1. Power supply (V):

V_n = 7.4 Li-polymer rechargeable battery

Type of power supply = DC Voltage from rechargeable Li-Ion 7.4 V battery.

1.2. Temperature (ºC):

T_n = +20.00 to +25.00

The subscript n indicates normal test conditions.

1.3. Test signal, Output Power and Frequencies

The actual DUT supports TETRA, TI D-LMR, P25 and Bluetooth transmitting modes. To perform testing in all supported bands, the sample **(S/N: NYPA-17)** was put into operation by using a software provided by the manufacturer.

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

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

The maximum output power declared by the manufacturer for each supported technology is:

Protocol	Max. Output Power (dBm)	Max. Average Output Power (dBm)
TETRA	32.5	26.48
TI D-LMR	32.5	26.48
P25	35.0	35.00
Bluetooth	6.55	6.55

1.4. DUT and test-site configurations

The DUT was tested over head and body exposure conditions:

- For head tests, the DUT was placed in 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, with its back face at 5 mm distance of the flat phantom surface (25 mm between the antenna and the phantom).

2. CONDUCTED AVERAGE POWER MEASUREMENTS

2.1. TETRA Bands

Mode	Band	Frequency (MHz)	Burst mode Avg. Output Power (dBm)
TETRA	769-775 MHz	769.0125	25.72
TETRA	769-775 MHz	772.0125	25.69
TETRA	769-775 MHz	774.9875	25.68
TETRA	779-805 MHz	799.0125	25.72
TETRA	779-805 MHz	802.0125	25.68
TETRA	779-805 MHz	804.9875	25.69
TETRA	809-824 MHz	809.0125	25.74
TETRA	809-824 MHz	816.5	25.76
TETRA	809-824 MHz	823.9875	25.75
TETRA	854-869 MHz	854.0125	25.75
TETRA	854-869 MHz	861.5	25.75
TETRA	854-869 MHz	868.9875	25.74

2.2. TI D-LMR Bands

Mode	Band	Frequency (MHz)	Burst mode Avg. Output Power (dBm)
TI D-LMR	769-775 MHz	769.0125	25.72
TI D-LMR	769-775 MHz	772.0125	25.68
TI D-LMR	769-775 MHz	774.9875	25.67
TI D-LMR	779-805 MHz	799.0125	25.66
TI D-LMR	779-805 MHz	802.0125	25.68
TI D-LMR	779-805 MHz	804.9875	25.71
TI D-LMR	809-824 MHz	809.0125	25.75
TI D-LMR	809-824 MHz	816.5	25.79
TI D-LMR	809-824 MHz	823.9875	25.77
TI D-LMR	854-869 MHz	854.0125	25.74
TI D-LMR	854-869 MHz	861.5	25.76
TI D-LMR	854-869 MHz	868.9875	25.76

2.3. P25 Bands

Mode	Band	Frequency (MHz)	Standard Tx mode Avg. Output Power (dBm)
P25	769-775 MHz	769.0125	34.53
P25	769-775 MHz	772.0125	34.52
P25	769-775 MHz	774.9875	34.53
P25	779-805 MHz	799.0125	34.58
P25	779-805 MHz	802.0125	34.57
P25	779-805 MHz	804.9875	34.56

2.4. Bluetooth

The manufacturer declares a maximum conducted output power of 8.16 dBm, which corresponds to 6.55 mW, for the 2402-2480MHz frequency range.

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

[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)]

≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

Protocol	Max. Conducted Output Power		Min. Test Distance (mm)	Freq. (GHz)	Result	Test Exclusion
	(dBm)	(mW)				
Proximity	8.16	6.55	5	2.480	2.06	√

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, including tune-up tolerance, 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,.

When the min. test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Estimated SAR						
Protocol	Max. Output Power		Min. Test separation distance (mm)	Frequency (GHz)	Estimated 1-g SAR	Estimated 10-g SAR
	(dBm)	(mW)				
Bluetooth	8.16	6.55	5	2.480	0.28	0.11

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]	
750	41.94	0.87	43.24	0.88	3.10	-1.28	2016-11-24
750	41.94	0.87	43.13	0.88	2.84	-1.38	2016-11-28

Frequency (MHz)	Target Body Tissue		Measured Body Tissue		Deviation %		Measured Date
	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	
750	55.53	0.96	54.15	0.98	-2.48	2.01	2016-11-30

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	41.50	0.90	42.12	0.92	1.49	2.72	2016-11-22
900	41.50	0.97	41.18	1.00	-0.78	3.03	

Frequency (MHz)	Target Body Tissue		Measured Body Tissue		Deviation %		Measured Date
	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	Permittivity ε	Conductivity σ [S/m]	
835	55.20	0.97	54.38	0.98	-1.49	0.82	2016-12-01
900	55.00	1.05	53.57	1.06	-2.60	0.70	

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

- Composition / Information on ingredients

Head and Muscle Tissue Simulation Liquids HSL750V2/MSL750V2

H2O	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 HSL900/MSL900

H2O	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%

4. SYSTEM CHECK MEASUREMENTS

4.1. Validation results for Head TSL

Date	Frequency (MHz)	SAR over	Fast SAR (W/kg)	SAR (W/kg)	Δ SAR - Fast SAR	1 W Target SAR (W/kg)	1 W Norm. SAR (W/kg)	Drift (%)
2016-11-24	750	1 gr.	2.14	2.10	< ±3%	8.07	8.39	3.97
		10 gr.	1.45	1.37	< ±7%	5.29	5.47	3.47
2016-11-28	750	1 gr.	2.14	2.08	< ±3%	8.07	8.32	3.10
		10 gr.	1.44	1.35	< ±7%	5.29	5.40	2.08
2016-11-22	900	1 gr.	2.86	2.78	< ±3%	10.6	11.09	4.58
		10 gr.	1.83	1.80	< ±7%	6.82	7.18	5.24

4.2. Validation results for Body TSL

Date	Frequency (MHz)	SAR over	Fast SAR (W/kg)	SAR (W/kg)	Δ SAR - Fast SAR	1 W Target SAR (W/kg)	1 W Norm. SAR (W/kg)	Drift (%)
2016-11-30	750	1 gr.	2.30	2.27	< ±3%	8.45	9.01	6.63
		10 gr	1.57	1.51	< ±7%	5.60	5.99	7.03
2016-12-01	900	1 gr.	2.62	2.57	< ±3%	10.5	10.44	-0.62
		10 gr.	1.74	1.68	< ±7%	6.79	6.82	0.46

5. MEASUREMENT RESULTS FOR SAR (SPECIFIC ABSORPTION RATE)

SAR measurements have been performed using software provided by the manufacturer, using TETRA Burst mode and TI D-LMR Burst mode for transmission, with a duty factor of 25%, adjusted to the maximum output power rate, and the normal P25 mode, with a duty factor of 100%, adjusted to the maximum output rate.

All measured results have been scaled to a duty factor of 50% as indicated in KDB 447498 D01.

SAR 1g values in the tables of section 5 have been calculated from the measured 1g SAR value, using the following formula:

$$SAR_1\text{-}g = Measured\,SAR\,1\text{-}g \cdot 10^{\frac{-Drift}{10}} \cdot T_{duty-factor}$$

Where:
Measured SAR 1-g = Measured 1g Averaged SAR (W/kg)
Drift = DASY drift results (dB)
$T_{duty\text{-}factor}$ = Duty cycle scale factor of 50% is applied to the transmission mode.

Only the highest SAR 1-g values have been adjusted for tune-up tolerance according to KDB 643646 D01, section "A5. General Reporting Procedures". Reported SAR 1-g values in the maximum result tables of this section have been calculated using the following formula:

$$Reported_SAR_1\text{-}g = SAR_1\text{-}g \cdot \left(\frac{P_{OUT-MAX}}{P_{conducted}}\right)^{*}$$

* Note: Only positive power scale is applied, if $P_{conducted} > P_{OUT\text{-}MAX} \rightarrow (P_{OUT\text{-}MAX} / P_{conducted}) = 1$

Where:
SAR $_{1\text{-}g}$= SAR value calculated as previously described.
$P_{OUT\text{-}MAX}$ = Declared Target Power including tuning tolerance (W)
$P_{conducted}$ = Measured Conducted Output Power (W)

5.1. Summary maximum results for head measurements.

Band	Mode	Side/Position	Frequency (MHz)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
769 – 775 MHz	TETRA	Left /Tilted	769.0125	2.74	8
779 – 805 MHz	TETRA	Left /Tilted	799.0125	3.57	8
809– 824 MHz	TETRA	Left /Tilted	816.5	3.46	8
854 – 869 MHz	TETRA	Left /Tilted	868.9875	4.35	8
769 – 775 MHz	TI D-LMR	Left /Tilted	769.0125	3.20	8
779 – 805 MHz	TI D-LMR	Left /Tilted	804.9875	3.96	8
809 – 824 MHz	TI D-LMR	Left /Tilted	816.5	3.70	8
854 – 869 MHz	TI D-LMR	Left /Tilted	861.5	4.75	8
769 – 775 MHz	P25	Left /Tilted	774.9875	5.36	8
779 – 805 MHz	P25	Left /Tilted	802.0125	6.79	8

5.2. Summary maximum results for body measurements

Band	Mode	Position/Distance	Frequency (MHz)	Reported SAR 1-g (W/kg)	Limit SAR 1-g (W/kg)
769 – 775 MHz	TETRA	Back Face/5mm	769.0125	0.64	8
779 – 805 MHz	TETRA	Back Face/5mm	799.0125	0.74	8
809 – 824 MHz	TETRA	Back Face/5mm	816.5	1.81	8
854 – 869 MHz	TETRA	Back Face/5mm	861.5	2.21	8
769 – 775 MHz	TI D-LMR	Back Face/5mm	769.0125	0.70	8
779 – 805 MHz	TI D-LMR	Back Face/5mm	804.9875	0.77	8
809 – 824 MHz	TI D-LMR	Back Face/5mm	816.5	1.92	8
854 – 869 MHz	TI D-LMR	Back Face/5mm	861.5	2.54	8
769 – 775 MHz	P25	Back Face/5mm	769.0125	2.41	8
779 – 805 MHz	P25	Back Face/5mm	799.0125	3.24	8

5.3. Result for head simultaneous multi-band transmission

Transmission Mode	Band	Max Reported SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 1-g (W/kg)	Verdict
TETRA	854– 869 MHz	4.35	4.63	8	Pass
Bluetooth	2.45GHz	0.28			
TI D-LMR	854– 869 MHz	4.75	5.03	8	Pass
Bluetooth	2.45GHz	0.28			
P25	779 – 805 MHz	6.79	7.07	8	Pass
Bluetooth	2.45GHz	0.28			

5.4. Result for body simultaneous multi-band transmission

Transmission Mode	Band	Max Reported SAR 1-g (W/kg)	Σ SARi (W/kg)	Limit SAR 1-g (W/kg)	Verdict
TETRA	854– 869 MHz	2.21	2.49	8	Pass
Bluetooth	2.45GHz	0.28			
TI D-LMR	854– 869 MHz	2.54	2.82	8	Pass
Bluetooth	2.45GHz	0.28			
P25	779 – 805 MHz	3.24	3.52	8	Pass
Bluetooth	2.45GHz	0.28			

5.5. Results for TETRA 769 – 775 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	769.0125	0.955	NM[2]	1.910	1.27	
Left / 15º Tilted	0	769.0125	1.10	1.13	2.297	-0.80	1
Right / Cheek	0	769.0125	0.848	NM[2]	1.696	0.69	
Right / 15º Tilted	0	769.0125	0.962	NM[2]	1.924	0.23	
Left / 15º Tilted	0	772.0125	NM[3]				
Left / 15º Tilted	0	774.9875	NM[3]				
Front of Face	25	769.0125	0.264	0.26	0.540	-1.83	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	769.0125	0.595	0.606	1.212	0.03	2
Back face	5	25	772.0125	NM[3]				
Back face	5	25	774.9875	NM[3]				

3: See remarks and comments.

5.6. Results for TETRA 779 – 805 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	799.0125	1.1	NM[2]	2.304	-2.28	
Left / 15º Tilted	0	799.0125	1.42	1.48	2.994	-0.57	3
Right / Cheek	0	799.0125	0.934	NM[2]	1.868	1.86	
Right / 15º Tilted	0	799.0125	1.31	NM[2]	2.726	-0.12	
Left / 15º Tilted	0	802.0125	NM[3]				
Left / 15º Tilted	0	804.9875	NM[3]				
Front of Face	25	799.0125	0.303	0.304	0.618	-0.80	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	799.0125	0.674	0.69	1.380	0.58	4
Back face	5	25	802.0125	NM[3]				
Back face	5	25	804.9875	NM[3]				

3: See remarks and comments.

5.7. Results for TETRA 809 – 824 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	816.5	1.22	NM[2]	2.463	-0.46	
Left / 15º Tilted	0	816.5	1.39	1.46	2.933	-0.23	5
Right / Cheek	0	816.5	0.837	NM[2]	1.674	0.35	
Right / 15º Tilted	0	816.5	1.23	NM[2]	2.512	-0.23	
Left / 15º Tilted	0	809.0125	NM[3]				
Left / 15º Tilted	0	823.9875	NM[3]				
Front of Face	25	816.5	0.344	0.344	0.701	-0.92	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	816.5	0.718	0.73	1.532	-2.39	6
Back face	5	25	809.0125	NM[3]				
Back face	5	25	823.9875	NM[3]				

3: See remarks and comments.

5.8. Results for TETRA 854 – 869 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	861.5	1.08	NM[2]	2.160	0.93	
Left / 15º Tilted	0	861.5	1.71	1.77	3.540	1.04	
Right / Cheek	0	861.5	0.86	NM[2]	1.720	1.51	
Right / 15º Tilted	0	861.5	1.32	1.35	2.712	-0.23	
Left / 15º Tilted	0	854.0125	1.69	1.72	3.440	0.35	
Left / 15º Tilted	0	868.9875	1.79	1.8	3.667	-0.92	7
Front of Face	25	861.5	0.443	0.457	0.914	0.93	

2: See remarks and comments

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	861.5	0.929	0.922	1.865	-0.57	8
Back face	5	25	854.0125	NM[3]				
Back face	5	25	868.9875	NM[3]				

3: See remarks and comments.

5.9. Results for TI D-LMR 769 – 775 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	769.0125	0.828	NM[2]	1.800	0.46	
Left / 15º Tilted	0	769.0125	1.15	1.2	2.682	-1.37	9
Right / Cheek	0	769.0125	0.812	NM[2]	1.765	2.21	
Right / 15º Tilted	0	769.0125	1.06	NM[2]	2.304	1.62	
Left / 15º Tilted	0	772.0125	NM[3]				
Left / 15º Tilted	0	774.9875	NM[3]				
Front of Face	25	769.0125	0.282	0.282	0.587	-1.94	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	769.0125	0.574	0.615	1.390	-1.94	10
Back face	5	25	772.0125	NM[3]				
Back face	5	25	774.9875	NM[3]				

3: See remarks and comments.

5.10. Results for TI D-LMR 779 – 805 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	804.9875	1.14	NM[2]	2.530	-1.03	
Left / 15º Tilted	0	804.9875	1.48	1.53	3.326	0.69	11
Right / Cheek	0	804.9875	0.802	NM[2]	1.743	0.00	
Right / 15º Tilted	0	804.9875	1.31	NM[2]	2.640	0.23	
Left / 15º Tilted	0	799.0125	NM[3]				
Left / 15º Tilted	0	802.0125	NM[3]				
Front of Face	25	804.9875	0.318	0.325	0.650	0.81	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	804.9875	0.683	0.7	1.529	-0.23	12
Back face	5	25	799.0125	NM[3]				
Back face	5	25	802.0125	NM[3]				

3: See remarks and comments.

5.11. Results for TI D-LMR 809 – 824 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	816.5	1.03	NM[2]	2.239	0.35	
Left / 15º Tilted	0	816.5	1.37	1.45	3.152	1.04	13
Right / Cheek	0	816.5	0.918	NM[2]	2.014	-0.46	
Right / 15º Tilted	0	816.5	1.32	NM[2]	2.876	-0.12	
Left / 15º Tilted	0	809.0125	NM[3]				
Left / 15º Tilted	0	823.9875	NM[3]				
Front of Face	25	816.5	0.325	0.34	0.739	0.58	

2 and 3: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	816.5	0.728	0.745	1.638	-0.57	14
Back face	5	25	809.0125	NM[3]				
Back face	5	25	823.9875	NM[3]				

3: See remarks and comments.

5.12. Results for TI D-LMR 854 – 869 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	861.5	1.1	NM[2]	2.391	0.58	
Left / 15º Tilted	0	861.5	1.78	1.85	4.022	0.00	15
Right / Cheek	0	861.5	0.953	NM[2]	2.072	0.00	
Right / 15º Tilted	0	861.5	1.42	1.43	3.123	-0.23	
Left / 15º Tilted	0	854.0125	1.66	1.73	3.813	-0.69	
Left / 15º Tilted	0	868.9875	1.67	1.77	3.848	1.04	
Front of Face	25	861.5	0.446	0.449	0.992	-0.80	

2: See remarks and comments.

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	861.5	0.941	0.929	2.154	-3.17	16
Back face	5	25	854.0125	NM[3]				
Back face	5	25	868.9875	NM[3]				

3: See remarks and comments.

5.13. Results for P25 769 – 775 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	769.0125	8.1	8.1	4.202	-1.83	
Left / 15º Tilted	0	769.0125	8.65	8.73	4.539	-1.94	
Right / Cheek	0	769.0125	6.14	6.14	3.149	-1.26	
Right / 15º Tilted	0	769.0125	7.36	7.36	3.774	-1.26	
Left / 15º Tilted	0	772.0125	9.09	9.19	4.595	0.00	
Left / 15º Tilted	0	774.9875	9.56	9.62	4.810	0.12	17
Front of Face	25	769.0125	1.97	1.97	0.985	0.23	

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	769.0125	4.34	4.32	2.16	0.12	18
Back face	5	25	772.0125	NM[3]				
Back face	5	25	774.9875	NM[3]				

3: See remarks and comments.

5.14. Results for P25 779 – 805 MHz band.

- **Head measurements**

Side / Position	Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Left / Cheek	0	799.0125	9.27	9.27	4.887	-2.61	
Left / 15º Tilted	0	799.0125	11.6	11.7	5.850	0.00	
Right / Cheek	0	799.0125	7.89	7.89	4.074	-1.60	
Right / 15º Tilted	0	799.0125	9.43	9.43	4.814	-1.03	
Left / 15º Tilted	0	802.0125	11.7	11.8	5.941	-0.34	19
Left / 15º Tilted	0	804.9875	11.5	11.6	5.881	-0.69	
Front of Face	25	799.0125	2.3	2.3	1.177	-1.14	

- **Body measurements**

Position	Dist (mm)	Antenna Dist (mm)	Frequency (MHz)	FAST SAR 1-g (W/kg)	Measured SAR 1-g (W/kg)	SAR 1-g (W/kg)	Power Drift (%)	Plot No.
Back face	5	25	799.0125	5.77	5.88	2.940	1.04	20
Back face	5	25	802.0125	NM[3]				
Back face	5	25	804.9875	NM[3]				

3: See remarks and comments.

5.15. Variability results.

According to KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, paragraph "2.8.1. SAR measurement variability", repeated measurements are required only when the measured SAR, without been scaled to the maximum tune-up tolerance, is > 4 W/kg for occupational/controlled exposure.

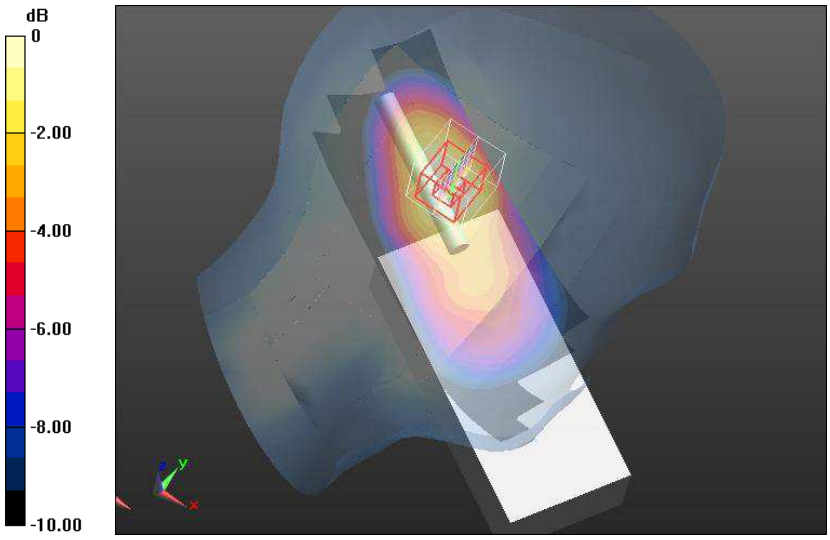
Band	Mode	RF Exposure	Side / Position	Frequency (MHz)	SAR 1-g (W/kg)	Power Drift (%)	Variation < 20 %	Plot No
779 – 805 MHz	P25	Head	Left / Tilted	802.0125	6.15	-0.18	√	21
854 – 869 MHz	TI D-LMR	Head	Left / Tilted	861.5	3.78	0.14	√	22

Appendix C – Measurement report

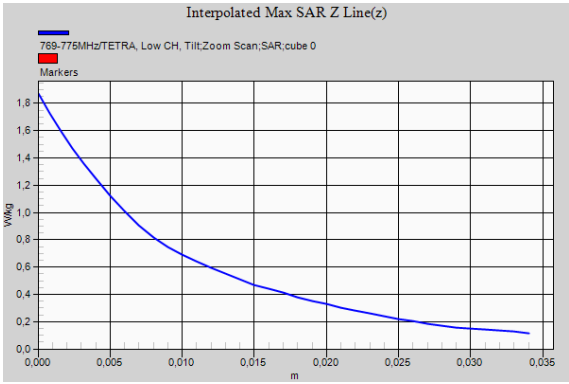
TETRA 769-775 MHz – Left hand side – Tilted position – Plot Nº 1

Test Laboratory: AT4 Wireless; Date: 24/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TETRA (0); Frequency: 769.013 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 770 MHz; σ = 0.9 S/m; ε_r = 42.91; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/769-775MHz/TETRA, Low CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.28 W/kg
Left Hand Side/769-775MHz/TETRA, Low CH, Tilt/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.91 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.711 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.25 W/kg



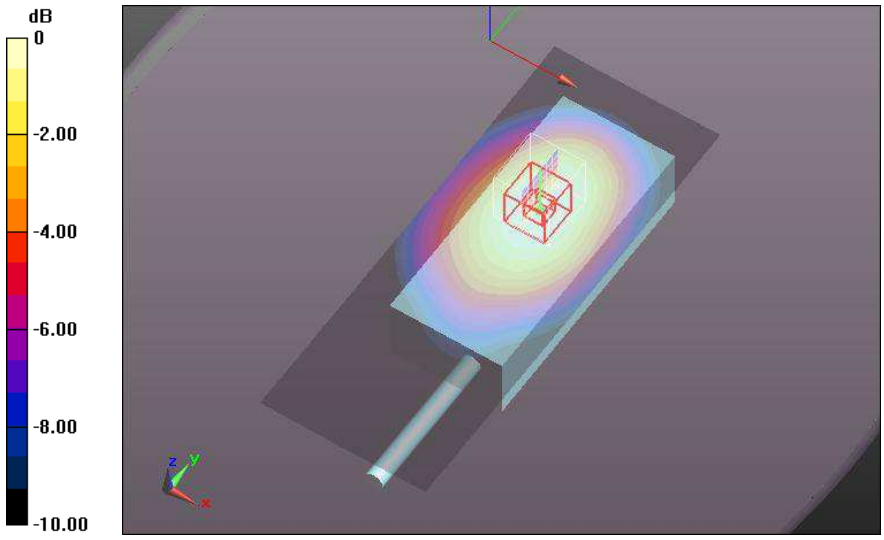
0 dB = 1.25 W/kg = 0.97 dBW/kg



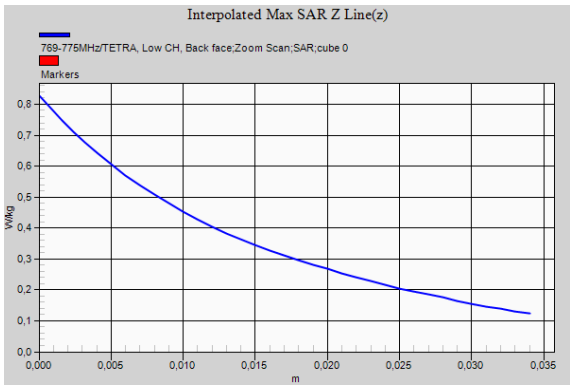
TETRA 769-775 MHz – Body – Back Face 5 mm – Plot Nº 2

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TETRA (0); Frequency: 769.013 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 770 MHz; σ = 0.99 S/m; ε_r = 54.25; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/769-775MHz/TETRA, Low CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.675 W/kg
Flat Phantom, Body, d=5mm/769-775MHz/TETRA, Low CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.74 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.828 W/kg
SAR(1 g) = 0.606 W/kg; SAR(10 g) = 0.438 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.646 W/kg



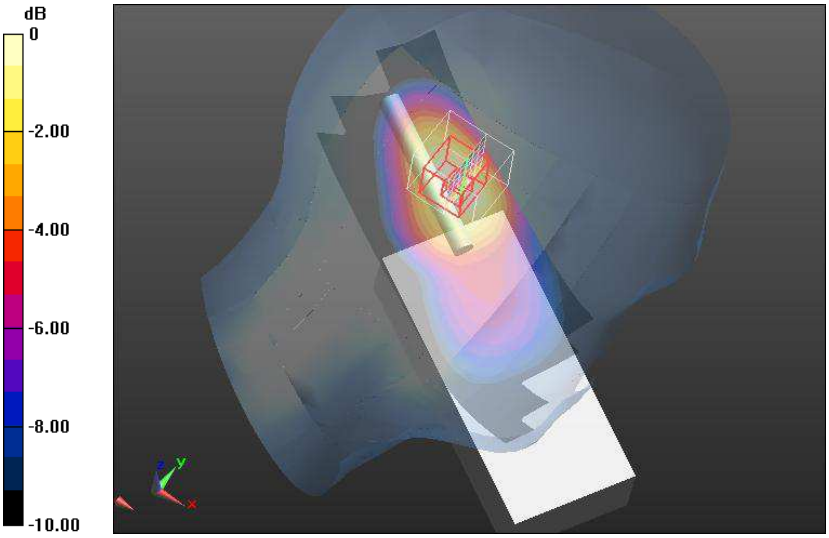
0 dB = 0.646 W/kg = -1.90 dBW/kg



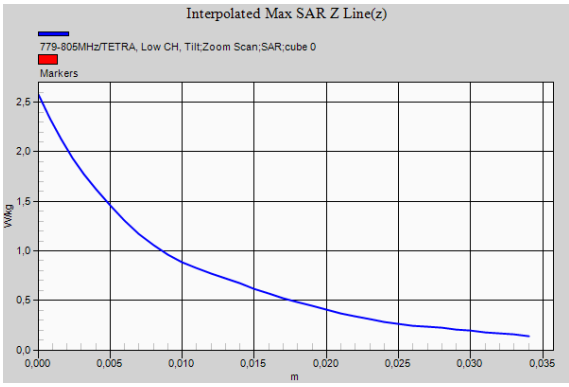
TETRA 779-805 MHz – Left hand side – Tilted position – Plot Nº 3

Test Laboratory: AT4 Wireless; Date: 24/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TETRA (0); Frequency: 799.013 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 800 MHz; σ = 0.93 S/m; ε_r = 42.44; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/779-805MHz/TETRA, Low CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.67 W/kg
Left Hand Side/779-805MHz/TETRA, Low CH, Tilt/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.14 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 2.58 W/kg
SAR(1 g) = 1.48 W/kg; SAR(10 g) = 0.909 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.61 W/kg



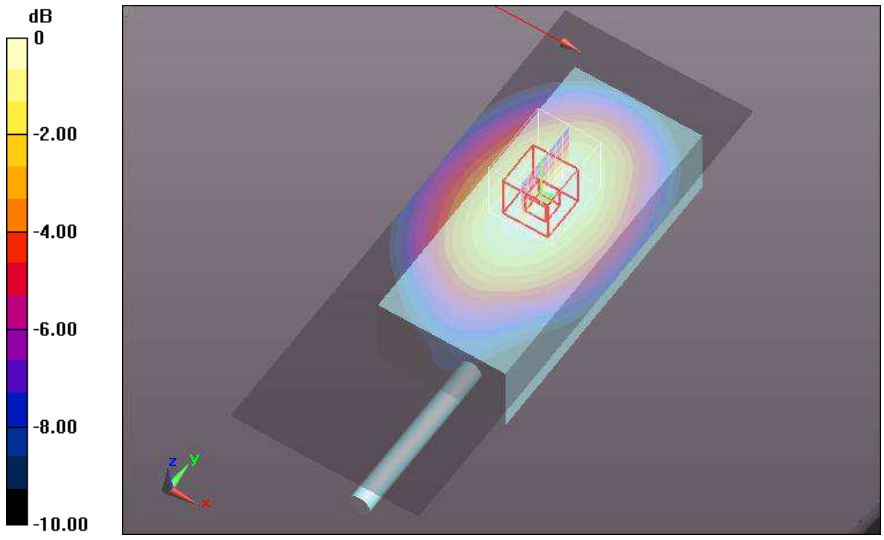
0 dB = 1.61 W/kg = 2.07 dBW/kg



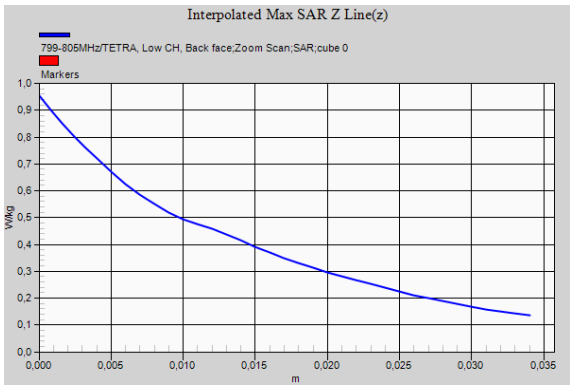
TETRA 779-805 MHz – Body – Back Face 5 mm – Plot Nº 4

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TETRA (0); Frequency: 799.013 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 800 MHz; σ = 0.99 S/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/799-805MHz/TETRA, Low CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.771 W/kg
Flat Phantom, Body, d=5mm/799-805MHz/TETRA, Low CH, Back face/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.77 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.954 W/kg
SAR(1 g) = 0.690 W/kg; SAR(10 g) = 0.500 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.732 W/kg



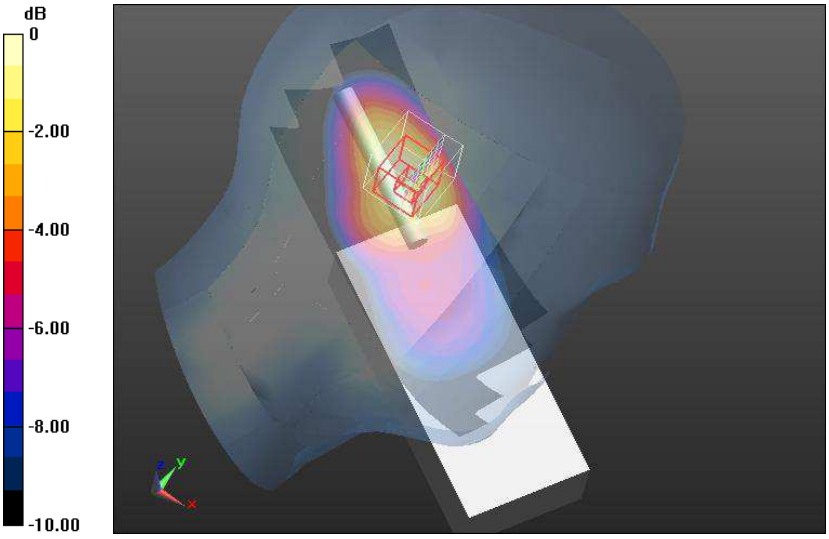
0 dB = 0.732 W/kg = -1.35 dBW/kg



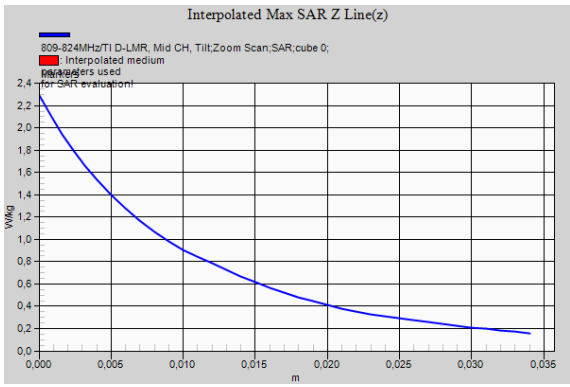
TETRA 809-824 MHz – Left hand side – Tilted position – Plot Nº 5

Test Laboratory: AT4 Wireless; Date: 22/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 816.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 816.5 MHz; σ = 0.91 S/m; ε_r = 42.396; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side, area scan 15mm/809-824MHz/TI D-LMR, Mid CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.60 W/kg
Left Hand Side, area scan 15mm/809-824MHz/TI D-LMR, Mid CH, Tilt/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.11 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 1.45 W/kg; SAR(10 g) = 0.933 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.56 W/kg



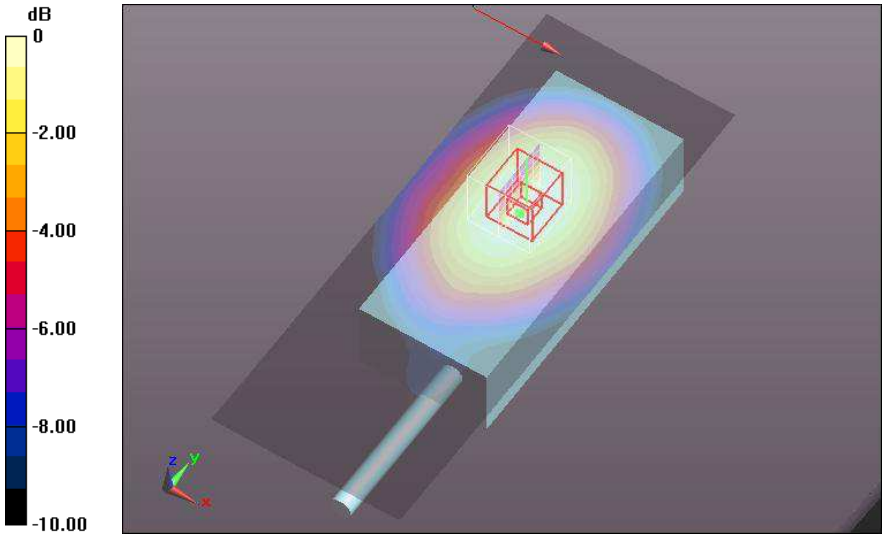
0 dB = 1.56 W/kg = 1.93 dBW/kg



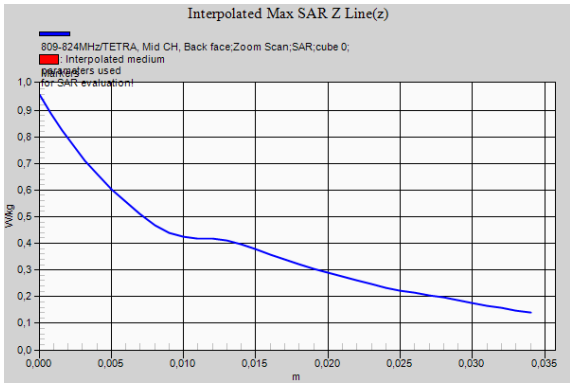
TETRA 809-824 MHz – Body – Back Face 5 mm – Plot Nº 6

Test Laboratory: AT4 Wireless; Date: 01/12/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-15
Communication System: UID 0, TETRA (0); Frequency: 816.5 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 816.5 MHz; σ = 0.953 S/m; ε_r = 54.493; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.59, 8.59, 8.59); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/809-824MHz/TETRA, Mid CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.814 W/kg
Flat Phantom, Body, d=5mm/809-824MHz/TETRA, Mid CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.61 V/m; Power Drift = -0.21 dB
Peak SAR (extrapolated) = 0.959 W/kg
SAR(1 g) = 0.730 W/kg; SAR(10 g) = 0.541 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.784 W/kg



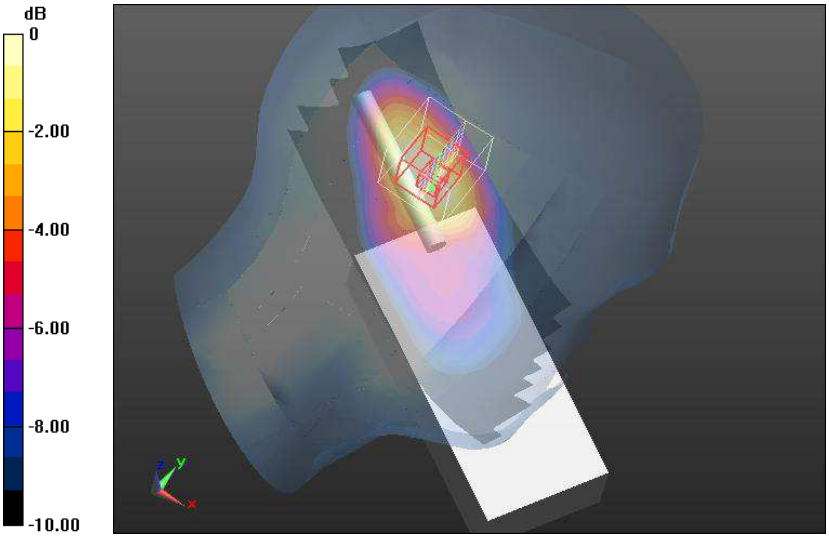
0 dB = 0.784 W/kg = -1.06 dBW/kg



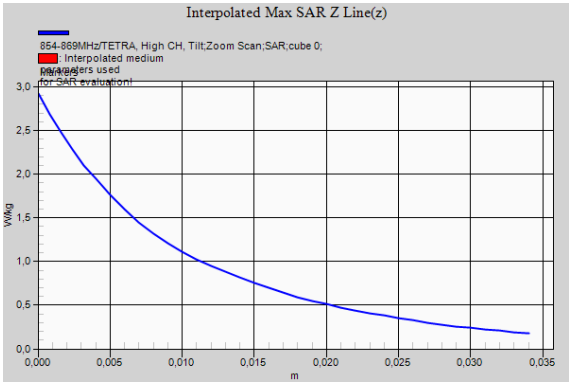
TETRA 854-869 MHz – Left hand side – Tilted position – Plot Nº 7

Test Laboratory: AT4 Wireless; Date: 23/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TETRA (0); Frequency: 868.987 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 868.987 MHz; σ = 0.958 S/m; ε_r = 41.596; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.25, 8.25, 8.25); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/854-869MHz/TETRA, High CH, Tilt/Area Scan (81x241x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 2.11 W/kg
Left Hand Side/854-869MHz/TETRA, High CH, Tilt/Zoom Scan (8x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.61 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.93 W/kg
SAR(1 g) = 1.8 W/kg; SAR(10 g) = 1.13 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.97 W/kg



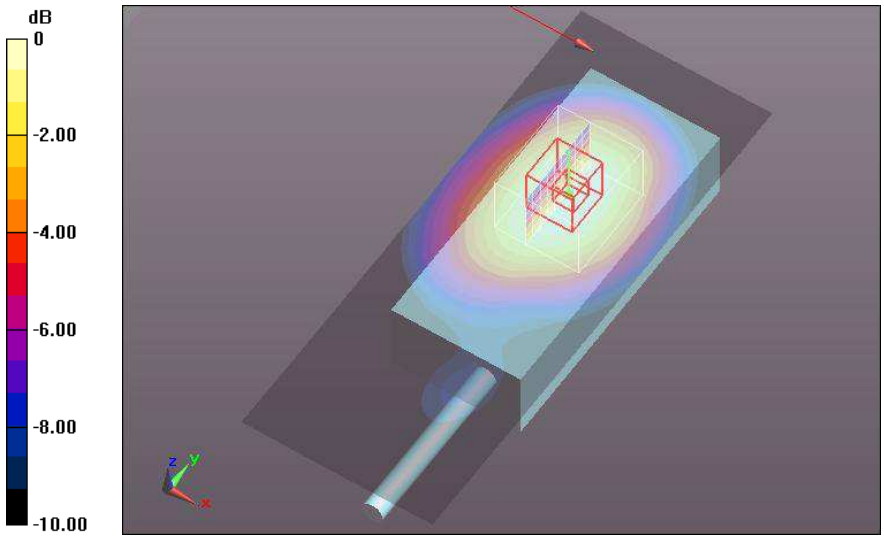
0 dB = 1.97 W/kg = 2.94 dBW/kg



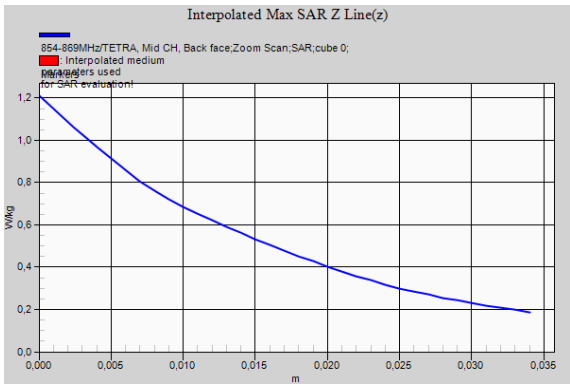
TETRA 854-869 MHz – Body – Back Face 5 mm – Plot Nº 8

Test Laboratory: AT4 Wireless; Date: 01/12/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-15
Communication System: UID 0, TETRA (0); Frequency: 861.5 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 861.5 MHz; σ = 1.003 S/m; εr = 54.029; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.49, 8.49, 8.49); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/854-869MHz/TETRA, Mid CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.06 W/kg
Flat Phantom, Body, d=5mm/854-869MHz/TETRA, Mid CH, Back face/Zoom Scan (9x10x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.81 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.922 W/kg; SAR(10 g) = 0.678 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.00 W/kg



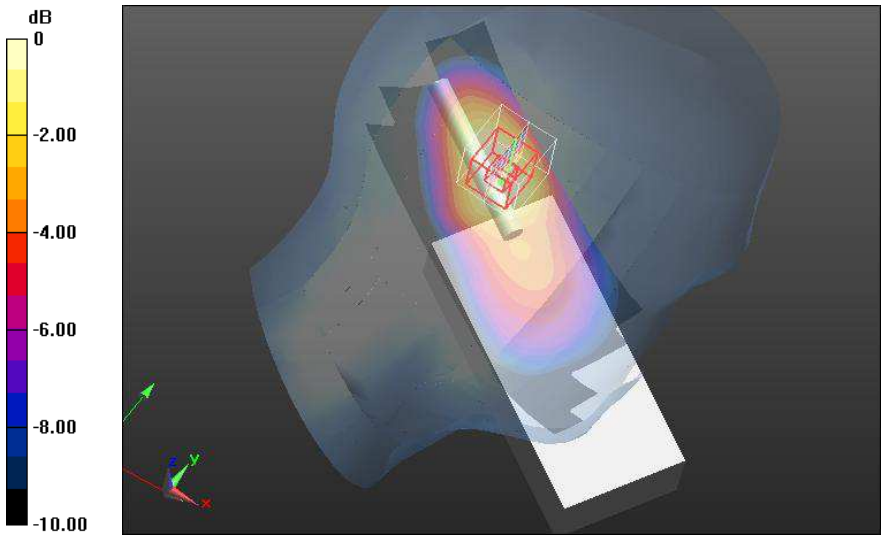
0 dB = 1.00 W/kg = 0.00 dBW/kg



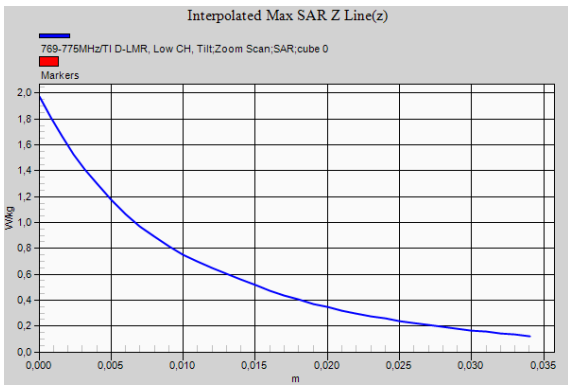
TI D-LMR 769-775 MHz – Left hand side – Tilted position – Plot Nº 9

Test Laboratory: AT4 Wireless; Date: 25/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 769.013 MHz; Duty Cycle: 1:4.30031
Medium parameters used: f = 770 MHz; σ = 0.9 S/m; εr = 42.91; ρ = 1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/769-775MHz/TI D-LMR, Low CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.32 W/kg
Left Hand Side/769-775MHz/TI D-LMR, Low CH, Tilt/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.66 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.97 W/kg
SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.750 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.29 W/kg



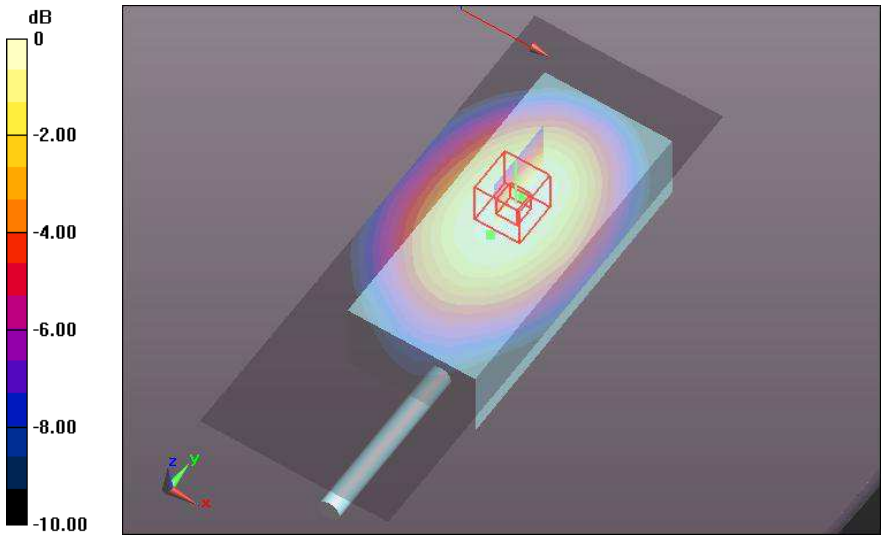
0 dB = 1.29 W/kg = 1.11 dBW/kg



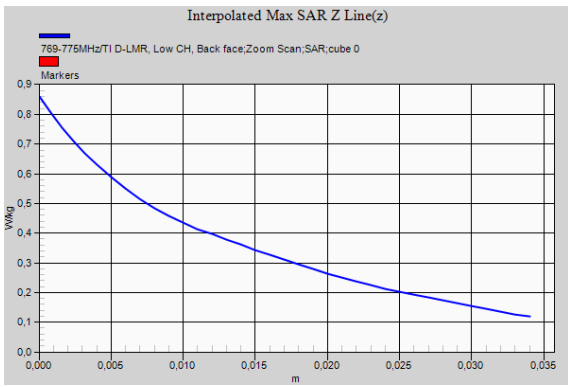
TI D-LMR 769-775 MHz – Body – Back Face 5 mm – Plot Nº 10

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 769.013 MHz; Duty Cycle: 1:4.30031
Medium parameters used: f = 770 MHz; σ = 0.99 S/m; εr = 54.25; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/769-775MHz/TI D-LMR, Low CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.659 W/kg
Flat Phantom, Body, d=5mm/769-775MHz/TI D-LMR, Low CH, Back face/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.74 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.861 W/kg
SAR(1 g) = 0.615 W/kg; SAR(10 g) = 0.447 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.646 W/kg



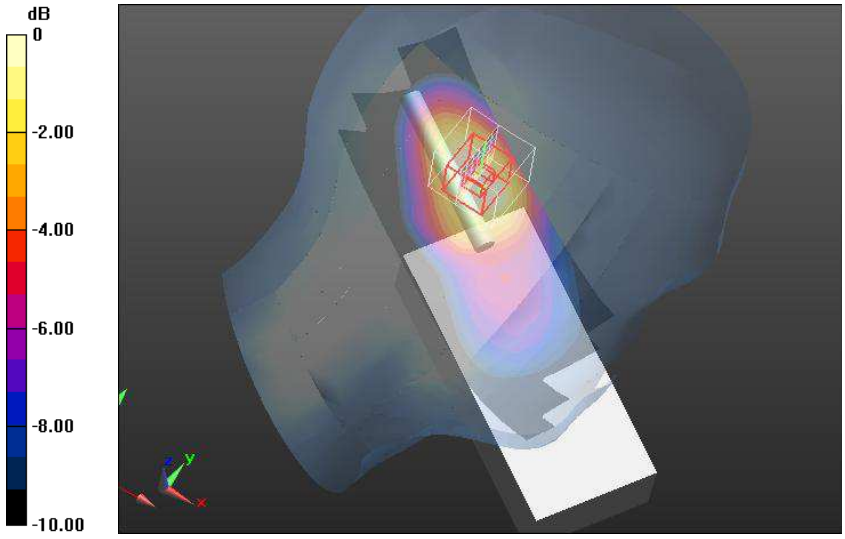
0 dB = 0.646 W/kg = -1.90 dBW/kg



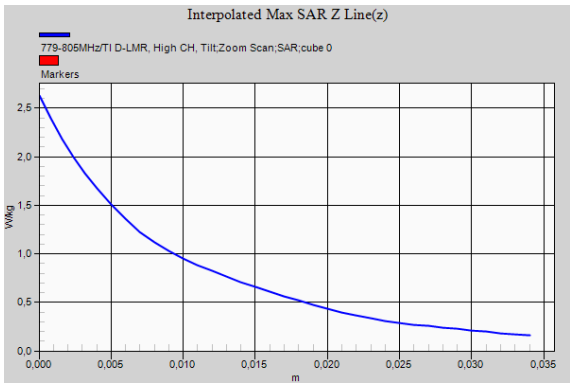
TI D-LMR 779-805 MHz – Left hand side – Tilted position – Plot Nº 11

Test Laboratory: AT4 Wireless; Date: 25/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 804.987 MHz; Duty Cycle: 1:4.30031
Medium parameters used: f = 805 MHz; σ = 0.94 S/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/779-805MHz/TI D-LMR, High CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.75 W/kg
Left Hand Side/779-805MHz/TI D-LMR, High CH, Tilt/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.73 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.63 W/kg
SAR(1 g) = 1.53 W/kg; SAR(10 g) = 0.954 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 1.66 W/kg



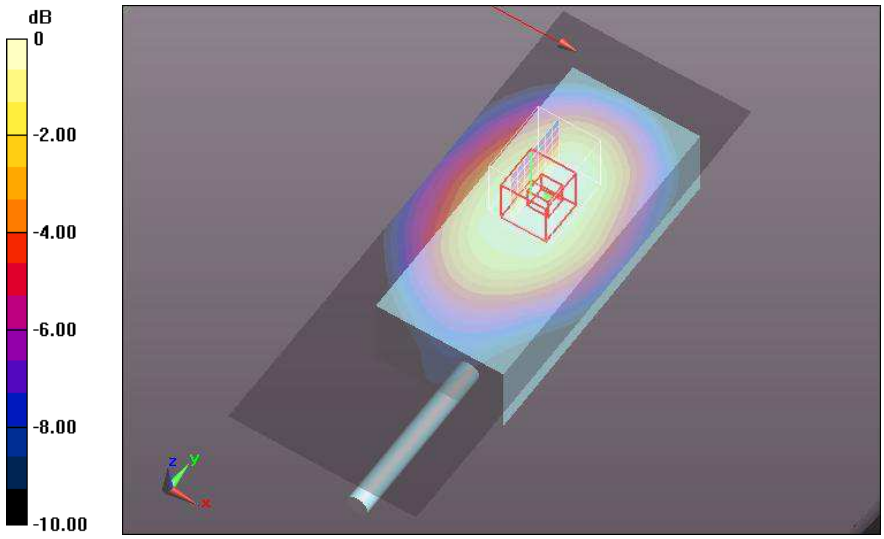
0 dB = 1.66 W/kg = 2.20 dBW/kg



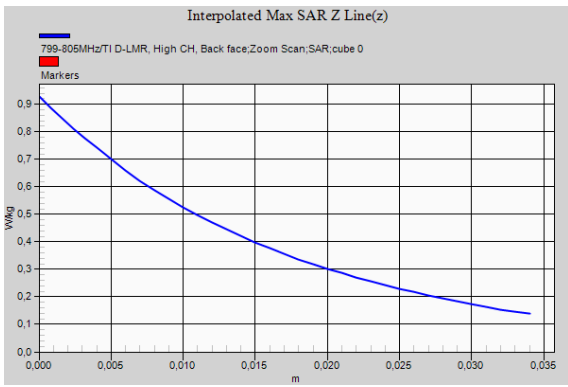
TI D-LMR 779-805 MHz – Body – Back Face 5 mm – Plot Nº 12

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 804.987 MHz; Duty Cycle: 1:4.30031
Medium parameters used: f = 805 MHz; σ = 1 S/m; ε_r = 53.75; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/799-805MHz/TI D-LMR, High CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.785 W/kg
Flat Phantom, Body, d=5mm/799-805MHz/TI D-LMR, High CH, Back face/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.17 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.700 W/kg; SAR(10 g) = 0.512 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.740 W/kg



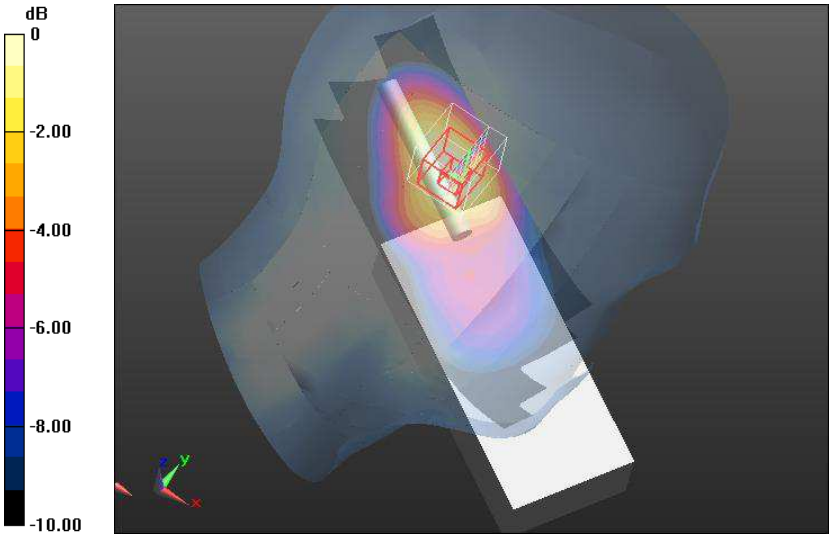
0 dB = 0.740 W/kg = -1.31 dBW/kg



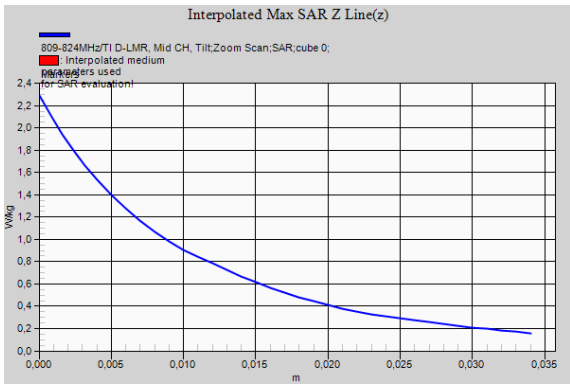
TI D-LMR 809-824 MHz – Left hand side – Tilted position – Plot Nº 13

Test Laboratory: AT4 Wireless; Date: 22/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 816.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 816.5 MHz; σ = 0.91 S/m; ε_r = 42.396; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side,/809-824MHz/TI D-LMR, Mid CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.60 W/kg
Left Hand Side,/809-824MHz/TI D-LMR, Mid CH, Tilt/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.11 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 1.45 W/kg; SAR(10 g) = 0.933 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.56 W/kg



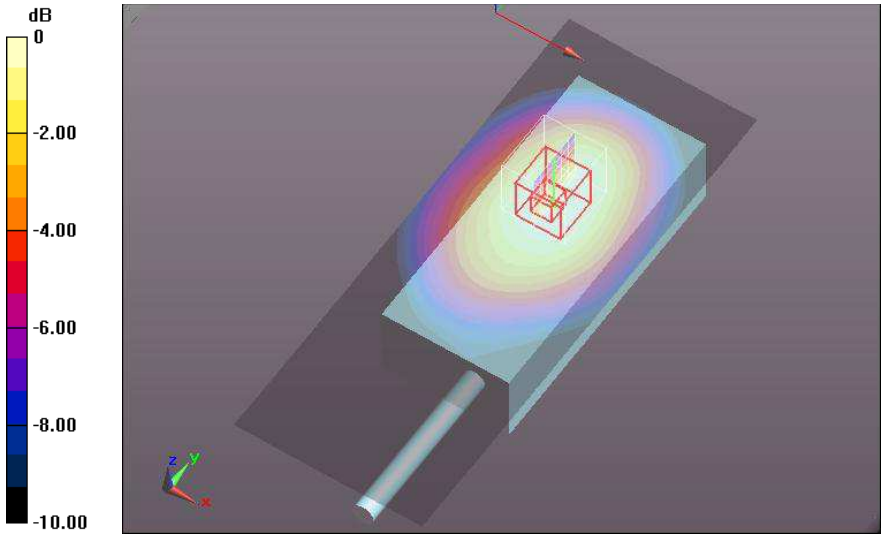
0 dB = 1.56 W/kg = 1.93 dBW/kg



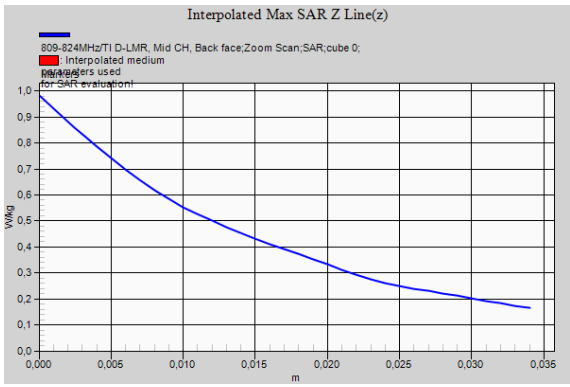
TI D-LMR 809-824 MHz – Body – Back Face 5 mm – Plot Nº 14

Test Laboratory: AT4 Wireless; Date: 01/12/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-15
Communication System: UID 0, TI D-LMR (0); Frequency: 816.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 816.5 MHz; σ = 0.953 S/m; ε_r = 54.493; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.59, 8.59, 8.59); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/809-824MHz/TI D-LMR, Mid CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.819 W/kg
Flat Phantom, Body, d=5mm/809-824MHz/TI D-LMR, Mid CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.37 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.983 W/kg
SAR(1 g) = 0.745 W/kg; SAR(10 g) = 0.544 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.793 W/kg



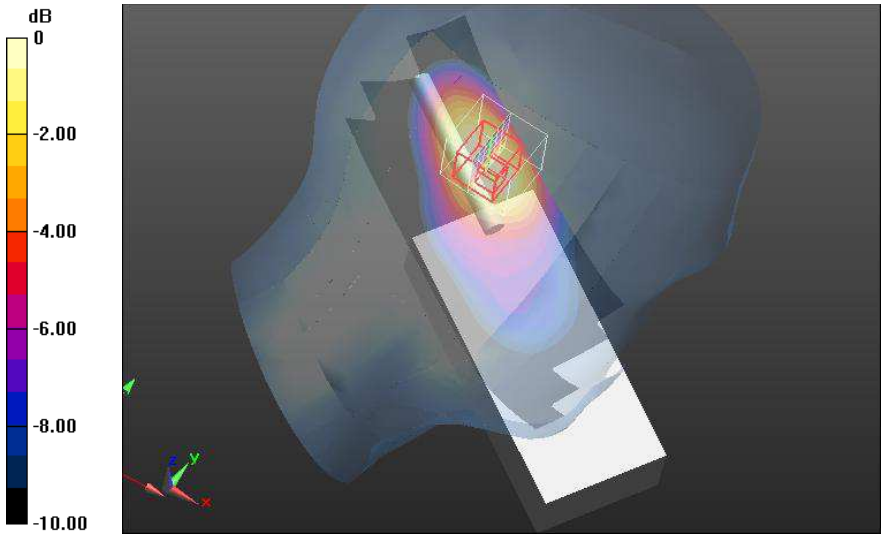
0 dB = 0.793 W/kg = -1.01 dBW/kg



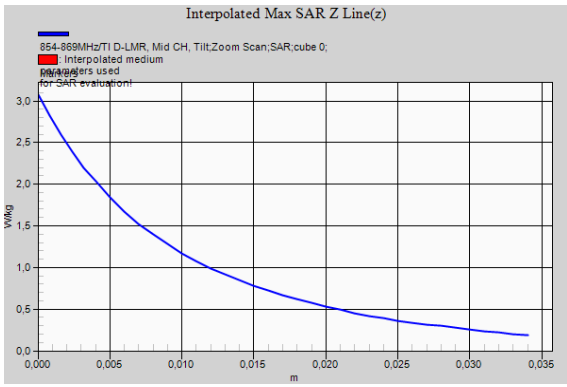
TI D-LMR 854-869 MHz – Left hand side – Tilted position – Plot Nº 15

Test Laboratory: AT4 Wireless; Date: 22/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 861.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 861.5 MHz; σ = 0.95 S/m; ε_r = 41.723; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.25, 8.25, 8.25); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side,/854-869MHz/TI D-LMR, Mid CH, Tilt/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 2.11 W/kg
Left Hand Side,/854-869MHz/TI D-LMR, Mid CH, Tilt/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.34 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.07 W/kg
SAR(1 g) = 1.85 W/kg; SAR(10 g) = 1.16 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.04 W/kg



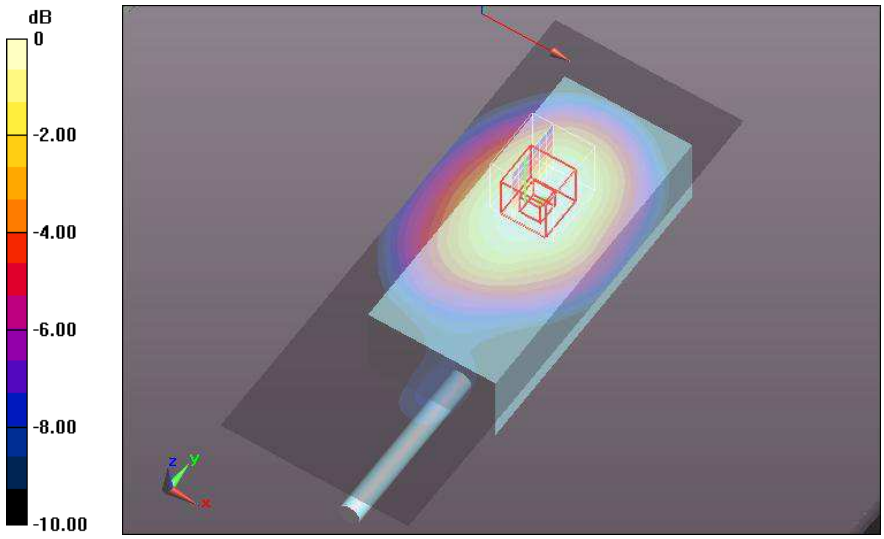
0 dB = 2.04 W/kg = 3.10 dBW/kg



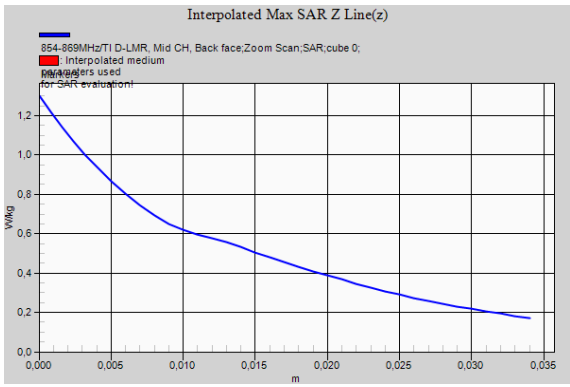
TI D-LMR 854-869 MHz – Body – Back Face 5 mm – Plot Nº 16

Test Laboratory: AT4 Wireless; Date: 01/12/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-15
Communication System: UID 0, TI D-LMR (0); Frequency: 861.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 861.5 MHz; σ = 1.003 S/m; ε_r = 54.029; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.49, 8.49, 8.49); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/854-869MHz/TI D-LMR, Mid CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.08 W/kg
Flat Phantom, Body, d=5mm/854-869MHz/TI D-LMR, Mid CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.20 V/m; Power Drift = -0.28 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.929 W/kg; SAR(10 g) = 0.686 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.995 W/kg



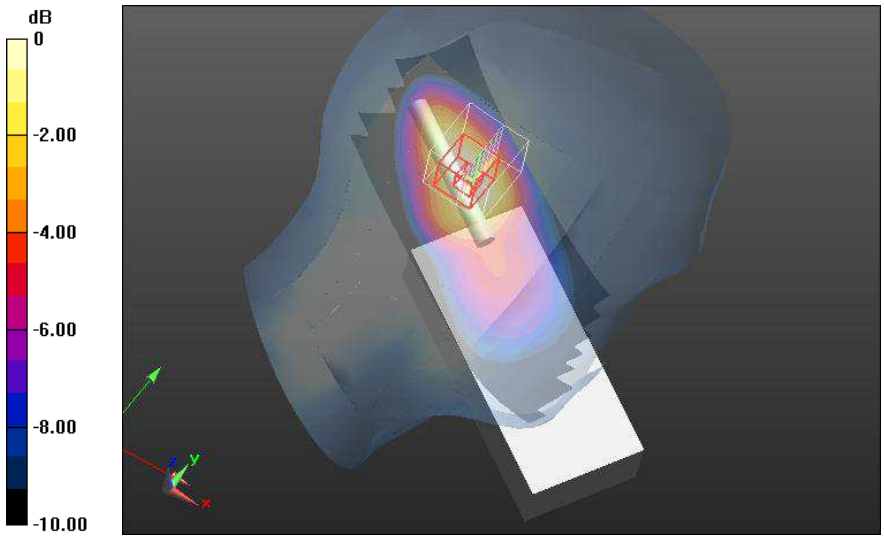
0 dB = 0.995 W/kg = -0.02 dBW/kg



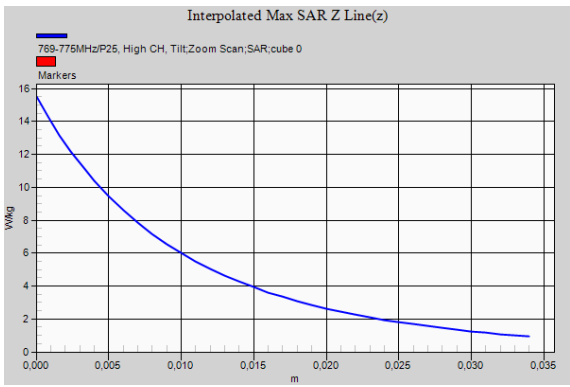
P25 769-775 MHz – Left hand side – Tilted position – Plot Nº 17

Test Laboratory: AT4 Wireless; Date: 29/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, P25 (0); Frequency: 774.987 MHz; Duty Cycle: 1:1
Medium parameters used: f = 775 MHz; σ = 0.91 S/m; εr = 42.71; ρ = 1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/769-775MHz/P25, High CH, Tilt/Area Scan (81x241x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 11.1 W/kg
Left Hand Side/769-775MHz/P25, High CH, Tilt/Zoom Scan (8x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 71.52 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 9.62 W/kg; SAR(10 g) = 6.02 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 10.4 W/kg



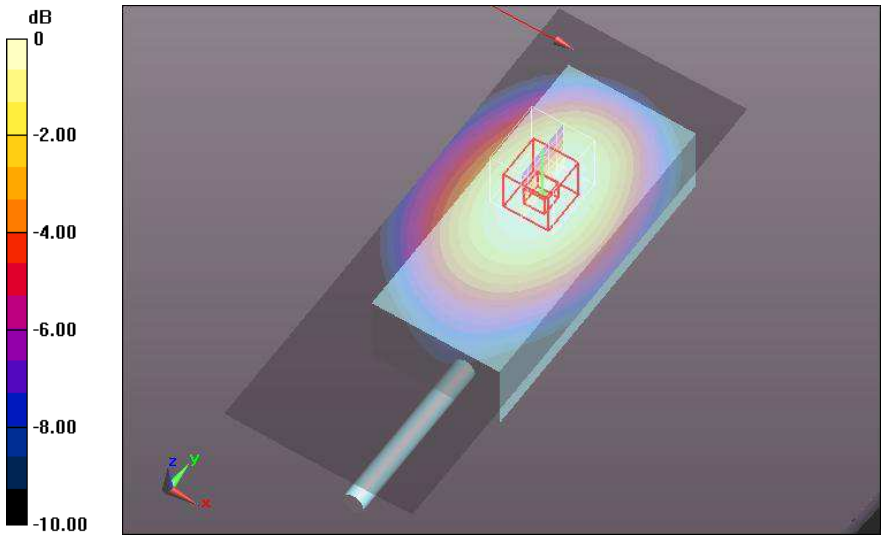
0 dB = 10.4 W/kg = 10.17 dBW/kg



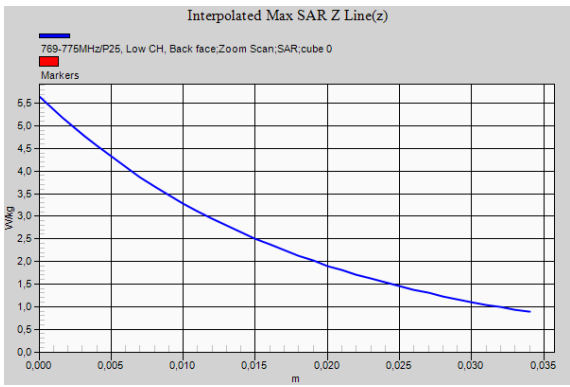
P25 769-775 MHz – Body – Back Face 5 mm – Plot Nº 18

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, P25 (0); Frequency: 769.013 MHz; Duty Cycle: 1:1
Medium parameters used: f = 770 MHz; σ = 0.99 S/m; εr = 54.25; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/769-775MHz/P25, Low CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.93 W/kg
Flat Phantom, Body, d=5mm/769-775MHz/P25, Low CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.22 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 5.65 W/kg
SAR(1 g) = 4.32 W/kg; SAR(10 g) = 3.16 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 4.56 W/kg



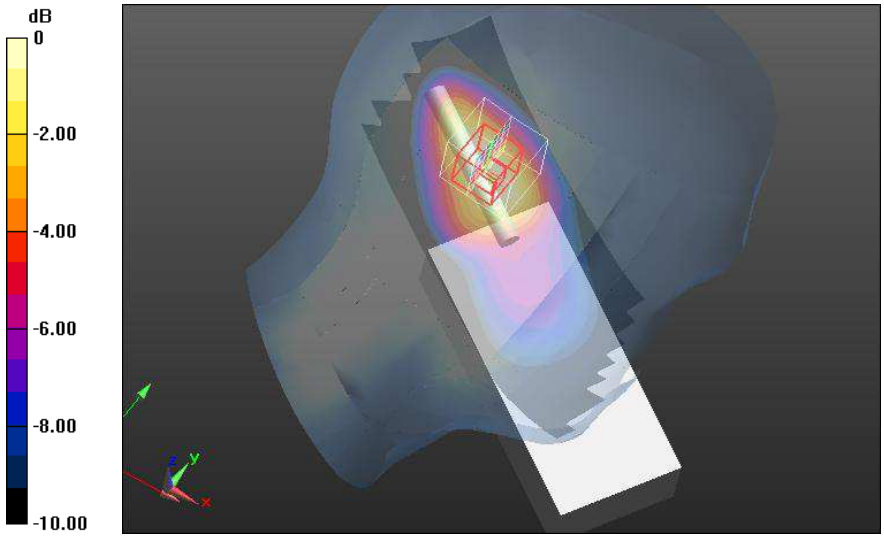
0 dB = 4.56 W/kg = 6.59 dBW/kg



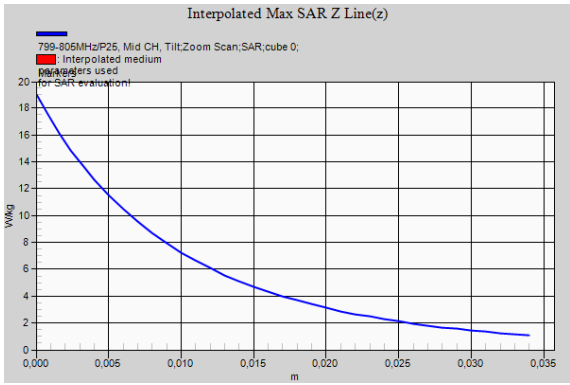
P25 779-805 MHz – Left hand side – Tilted position – Plot Nº 19

Test Laboratory: AT4 Wireless; Date: 29/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, P25 (0); Frequency: 802.013 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 802.013 MHz; σ = 0.934 S/m; εr = 42.31; ρ = 1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/799-805MHz/P25, Mid CH, Tilt/Area Scan (81x241x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 13.7 W/kg
Left Hand Side/799-805MHz/P25, Mid CH, Tilt/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 75.30 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 11.8 W/kg; SAR(10 g) = 7.27 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 12.7 W/kg



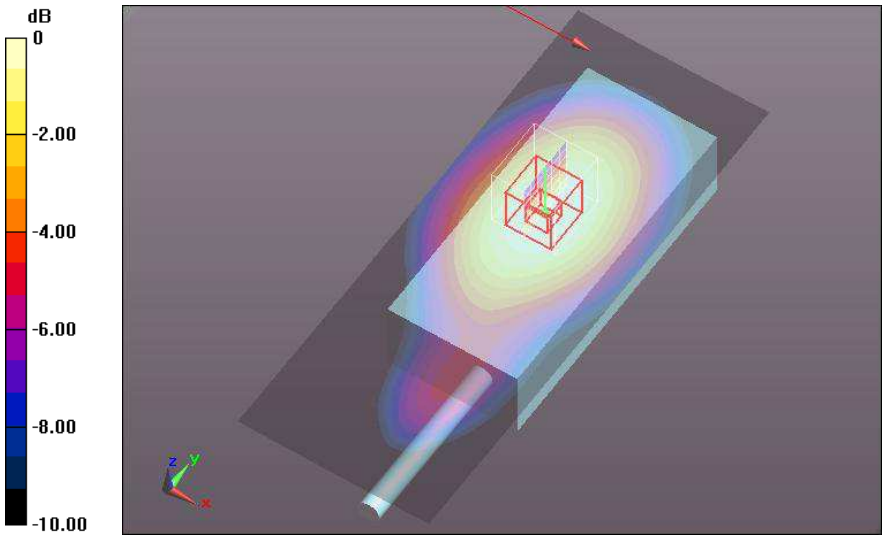
0 dB = 12.7 W/kg = 11.04 dBW/kg



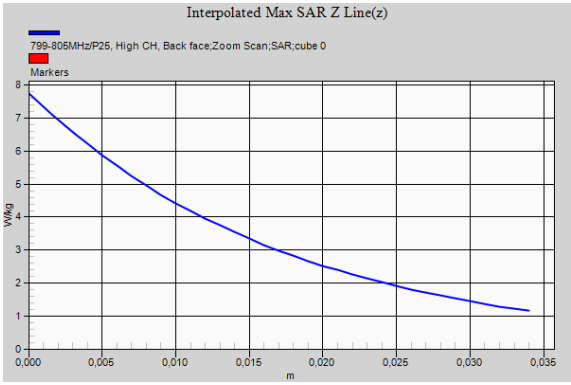
P25 779-805 MHz – Body – Back Face 5 mm – Plot Nº 20

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, P25 (0); Frequency: 799.013 MHz; Duty Cycle: 1:1
Medium parameters used: f = 800 MHz; σ = 0.99 S/m; εr = 53.9; ρ = 1000 kg/m3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom, Body, d=5mm/799-805MHz/P25, High CH, Back face/Area Scan (61x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 6.58 W/kg
Flat Phantom, Body, d=5mm/799-805MHz/P25, High CH, Back face/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.80 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 7.76 W/kg
SAR(1 g) = 5.88 W/kg; SAR(10 g) = 4.25 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 6.23 W/kg



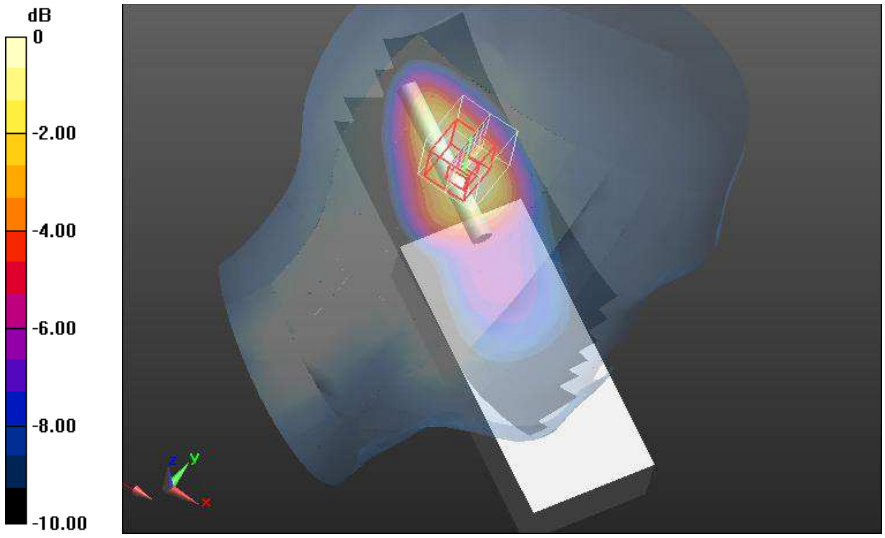
0 dB = 6.23 W/kg = 7.94 dBW/kg



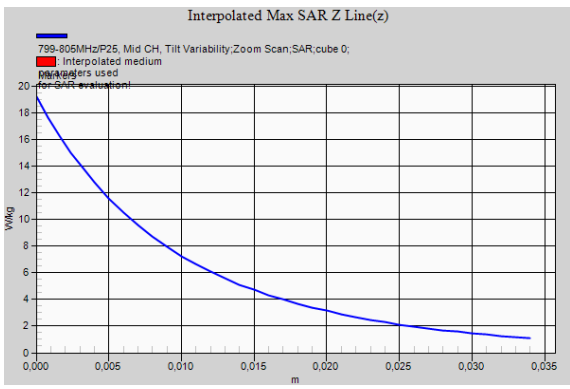
P25 779-805 MHz – Variability – Left hand side – Tilted position – Plot Nº 21

Test Laboratory: AT4 Wireless; Date: 29/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, P25 (0); Frequency: 802.013 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 802.013 MHz; σ = 0.934 S/m; εr = 42.31; ρ = 1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side/799-805MHz/P25, Mid CH, Tilt Variability/Area Scan (81x241x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 13.8 W/kg
Left Hand Side/799-805MHz/P25, Mid CH, Tilt Variability/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 73.43 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 19.2 W/kg
SAR(1 g) = 11.8 W/kg; SAR(10 g) = 7.28 W/kg (SAR corrected for target medium
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 12.8 W/kg



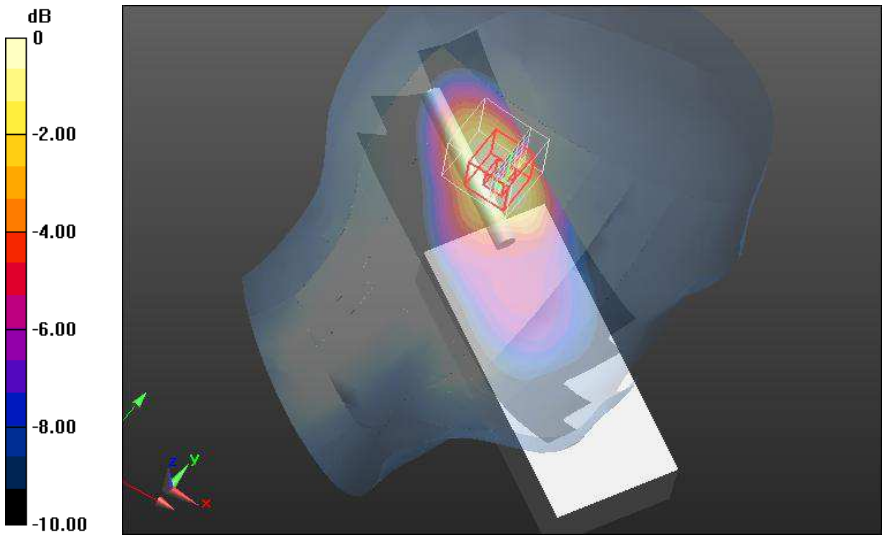
0 dB = 12.8 W/kg = 11.07 dBW/kg



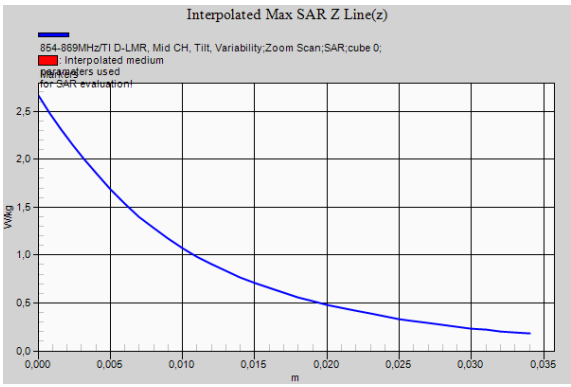
TI D-LMR 854-869 MHz – Variability – Left hand side – Tilted position – Plot Nº 22

Test Laboratory: AT4 Wireless; Date: 23/11/2016
DUT: HTT500; Type: PTT Radio; Serial: NYPA-17
Communication System: UID 0, TI D-LMR (0); Frequency: 861.5 MHz; Duty Cycle: 1:4.30031
Medium parameters used (interpolated): f = 861.5 MHz; σ = 0.95 S/m; εr = 41.723; ρ = 1000 kg/m3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.25, 8.25, 8.25); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side,/854-869MHz/TI D-LMR, Mid CH, Tilt, Variability/Area Scan (51x161x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.98 W/kg
Left Hand Side,/854-869MHz/TI D-LMR, Mid CH, Tilt, Variability/Zoom Scan (8x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.01 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 2.67 W/kg
SAR(1 g) = 1.74 W/kg; SAR(10 g) = 1.1 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.92 W/kg



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



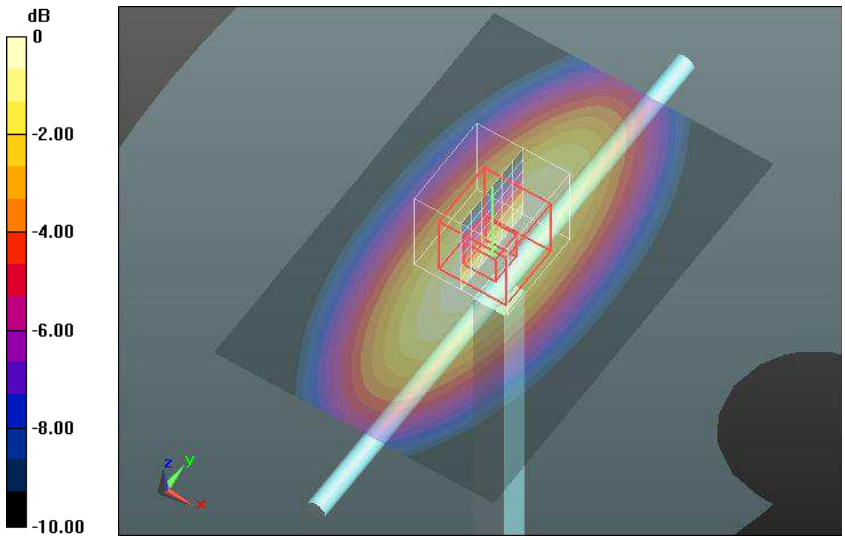
Appendix D – System Validation Reports

Validation results in 750 MHz Band for Head TSL

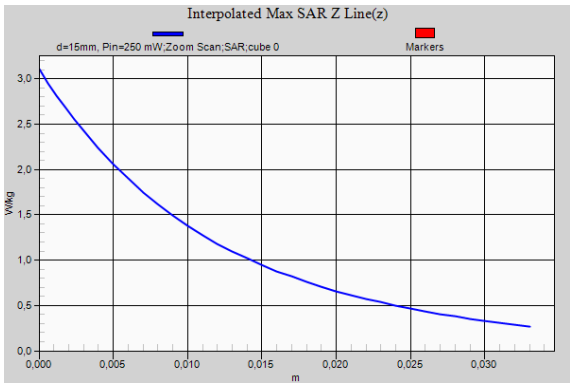
Test Laboratory: AT4 Wireless; Date: 24/11/2016
DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1036
Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.88 S/m; ε_r = 43.24; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 750MHz_2016-11-24/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.41 W/kg
Configuration 750MHz_2016-11-24/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.23 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 2.42 W/kg



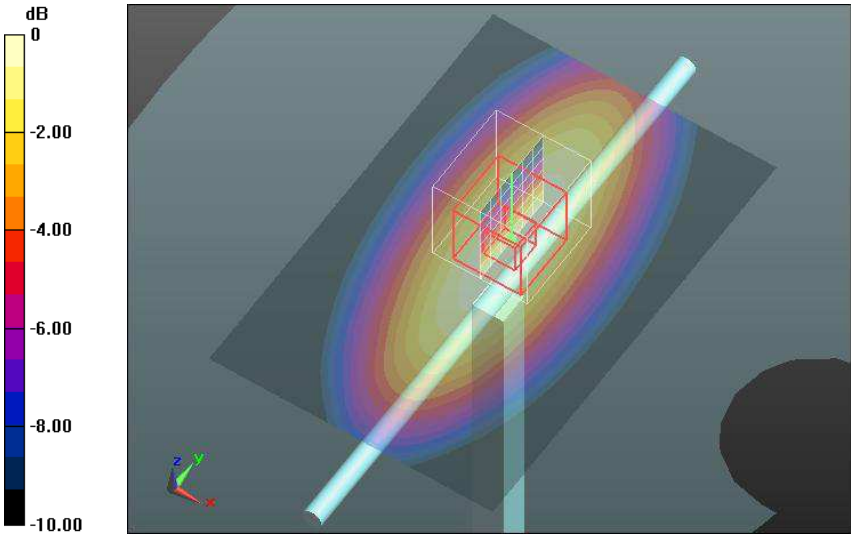
0 dB = 2.42 W/kg = 3.84 dBW/kg



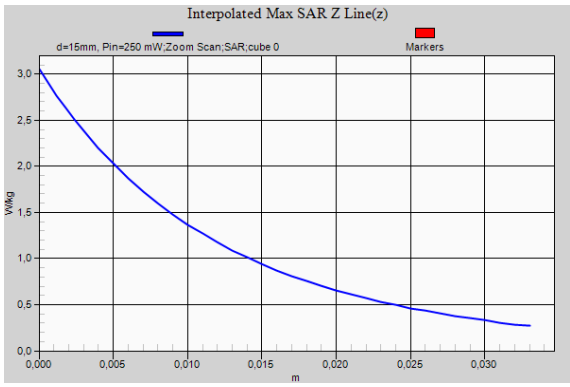
Validation results in 750 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 28/11/2016
DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1036
Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.88 S/m; ε_r = 43.13; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.82, 8.82, 8.82); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 750MHz_2016-11-28/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.41 W/kg
Configuration 750MHz_2016-11-28/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.00 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.35 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 2.39 W/kg



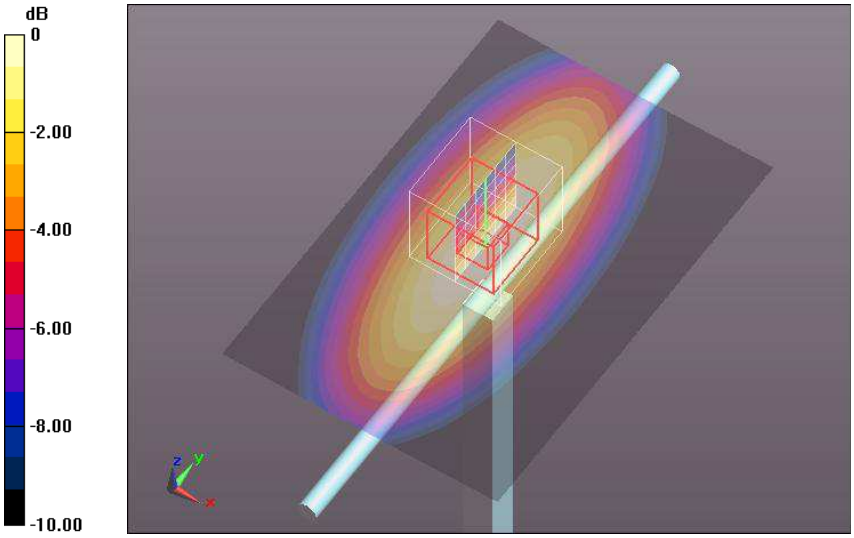
0 dB = 2.39 W/kg = 3.78 dBW/kg



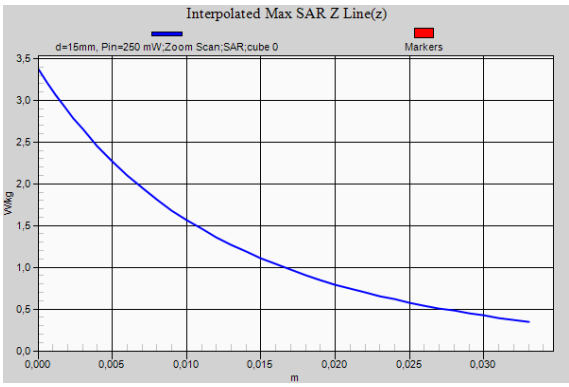
Validation results in 750 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 30/11/2016
DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1036
Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.98 S/m; ε_r = 54.15; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.61, 8.61, 8.61); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 750MHz, 2016-11-30/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.64 W/kg
Configuration 750MHz, 2016-11-30/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.28 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 2.27 W/kg; SAR(10 g) = 1.51 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 2.65 W/kg



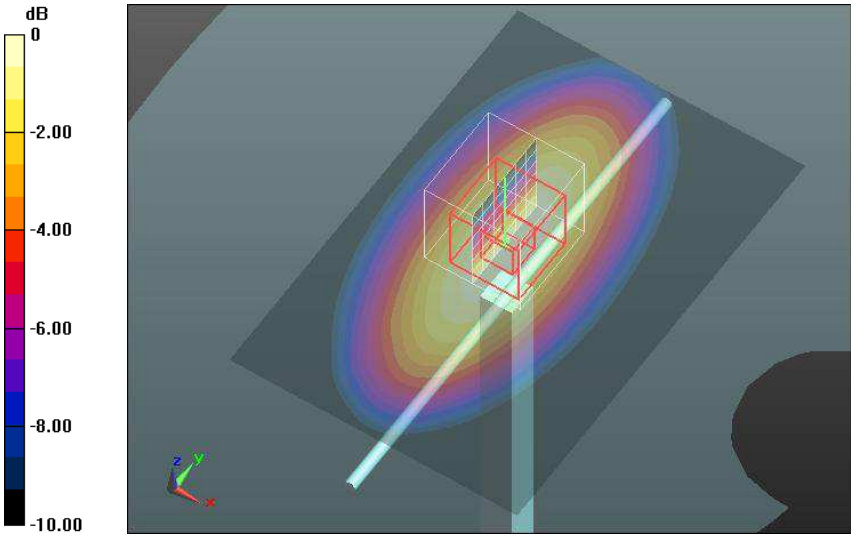
0 dB = 2.65 W/kg = 4.23 dBW/kg



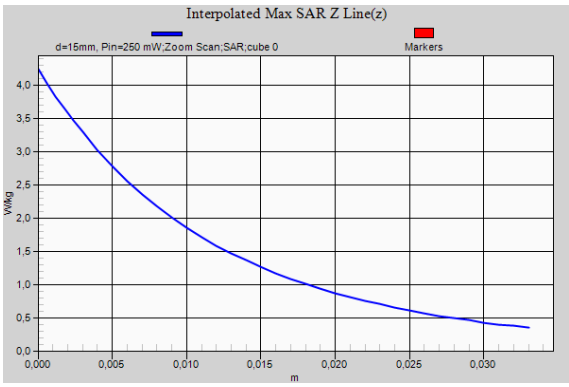
Validation results in 900 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 22/11/2016
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 = 1 S/m; ε_r = 41.18; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.25, 8.25, 8.25); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 900MHz_2016-11-22/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.31 W/kg
Configuration 900MHz_2016-11-22/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.49 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 4.23 W/kg
SAR(1 g) = 2.78 W/kg; SAR(10 g) = 1.8 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 3.29 W/kg



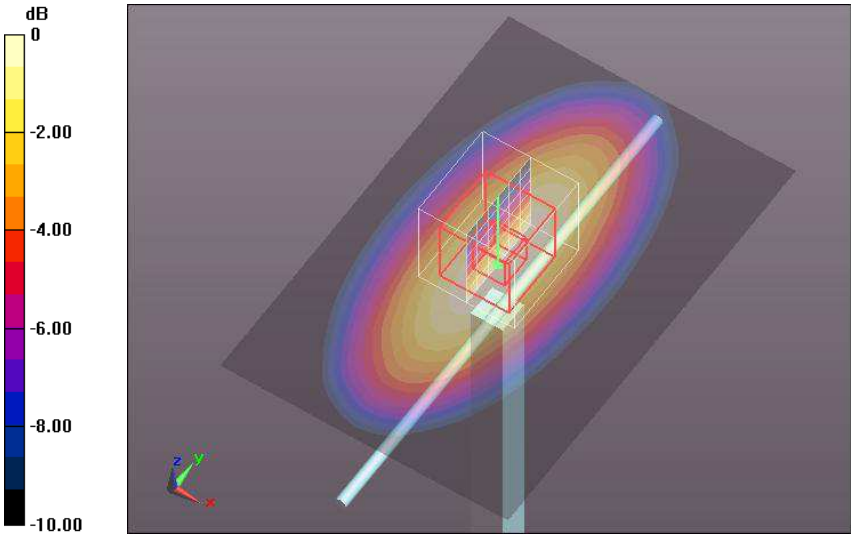
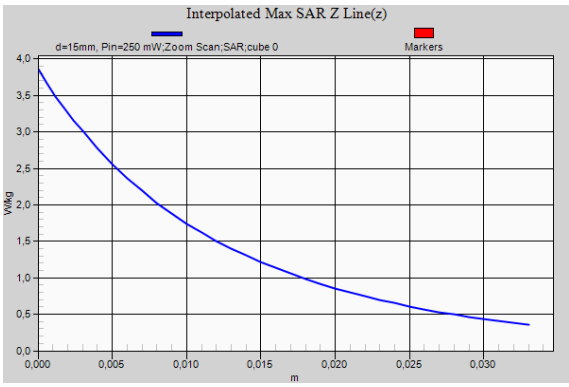
0 dB = 3.29 W/kg = 5.17 dBW/kg



Validation results in 900 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 01/12/2016
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 = 1.06 S/m; ε_r = 53.57; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(8.49, 8.49, 8.49); Calibrated: 26/07/2016;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 18/07/2016
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration 900MHz, 2016-12-01/d=15mm, Pin=250 mW/Area Scan (61x91x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.04 W/kg
Configuration 900MHz, 2016-12-01/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.05 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 3.86 W/kg
SAR(1 g) = 2.57 W/kg; SAR(10 g) = 1.68 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 3.00 W/kg



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