

# Appendix C

## **Phantom Description**

Schmid & Partner Engineering AG

S е а g p

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#### Certificate of Conformity / First Article Inspection

Item	Oval Flat Phantom ELI 5.0
Type No	QD OVA 002 A
Series No	1108 and higher
Manufacturer	Untersee Composites
	Knebelstrasse 8, CH-8268 Mannenbach, Switzerland

#### Tests

Complete tests were made on the prototype units QD OVA 001 A, pre-series units QD OVA 001 B as well as on some series units QD OVA 001 B. Some tests are made on all series units QD OVA 002 A.

Test	Requirement	Details	Units tested
Shape	Internal dimensions, depth and sagging are compatible with standards	Bottom elliptical 600 x 400 mm, Depth 190 mm, dimension compliant with [1] for f > 375 MHz	Prototypes
Material thickness	Bottom: 2.0mm +/- 0.2mm	dimension compliant with [3] for f > 800 MHz	all
Material parameters	rel. permittivity 2 – 5, loss tangent ≤ 0.05, at f ≤ 6 GHz	rel. permittivity 3.5 +/- 0.5 loss tangent ≤ 0.05	Material samples
Material resistivity	Compatibility with tissue simulating liquids .	Compatible with SPEAG liquids. **	Phantoms, Material sample
Sagging	Sagging of the flat section in tolerance when filled with tissue simulating liquid.	within tolerance for filling height up to 155 mm	Prototypes, samples

Note: Compatibility restrictions apply certain liquid components mentioned in the standard, containing e.g. DGBE, DGMHE or Triton X-100. Observe technical note on material compatibility.

#### Standards

- [1] OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01 [2] IEEE 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific
- Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003
- IEC 62209-1 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices Human models, instrumentation, and procedures Part 1:
- Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)\*, 2005-02-18 IEC 62209–2 ed1.0, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices Human models, instrumentation, and procedures Part 2: [4] Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", 2010-03-30

#### Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of body-worn SAR measurements and system performance checks as specified in [1 – 4] and further standards.

Date	25.7.2011

Signature / Stamp



Doc No 881 - QD OVA 002 A - A

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## System Validation from Original Equipment Supplier

Engineering AG eughausstrasse 43, 8004 Zurich,	Of Switzerland	Sector Se	Service suisse d'étalonnage Servízio svizzero di taratura
Accredited by the Swiss Accreditation The Swiss Accreditation Service I Aultilateral Agreement for the rec	is one of the signatorie	es to the EA	ccreditation No.: SCS 0108
Client SGS-TW (Auden	1)	Certificate N	o: D2450V2-727_Apr22
CALIBRATION C	ERTIFICATE		
Object	D2450V2 - SN:7	27	
Calibration procedure(s)	QA CAL-05.v11 Calibration Proce	edure for SAR Validation Sources	s between 0.7-3 GHz
Calibration date:	April 25, 2022		
The measurements and the uncerta			
All calibrations have been conducte	ed in the closed laborato	ry facility: environment temperature $(22 \pm 3)^{\circ}$	
All calibrations have been conducte Calibration Equipment used (M&TE Primary Standards	ed in the closed laborato		
All calibrations have been conducts Calibration Equipment used (M&TE Primary Standards Power meter NRP	ad in the closed laborato critical for calibration) ID # SN: 104778	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 04-Apr-22 (No. 217-03525/03524)	C and humidity < 70%.
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Additional Documentation: c) DASY System Handbook

- Methods Applied and Interpretation of Parameters: Measurement Conditions: Further details are available from the Validation Report at the end
  - of the certificate. All figures stated in the certificate are valid at the frequency indicated. Antenna Parameters with TSL: The source is mounted in a touch configuration below the

  - center marking of the flat phantom. Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
  - .
  - SAR measured: SAR measured at the stated antenna input power. SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
  - SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: D2450V2-727 Apr22

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#### **Measurement Conditions**

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

#### Head TSL parameters

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	1.87 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.8 W/kg ± 17.0 % (k=2)
SAP averaged over 10 am <sup>2</sup> (10 a) of Head TCI	ennetition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	6.34 W/kg

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.7 Ω + 3.0 jΩ
Return Loss	- 24.4 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.149 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the The update is made or standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded caprolis. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded caprolis. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded caprolis. On some of the dipoles, small end caps according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

The second se	
Manufactured by	SPEAG

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### Report No. : TESA2211000524ES Page: 6 of 34

#### **DASY5 Validation Report for Head TSL**

Date: 25.04.2022

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 727

 $\begin{array}{l} Communication \ System: \ UID \ 0 \ - \ CW; \ Frequency: 2450 \ MHz \\ Medium \ parameters \ used: \ f=2450 \ MHz; \ \sigma=1.87 \ S/m; \ \epsilon_r=37.8; \ \rho=1000 \ kg/m^3 \end{array}$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

#### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Dipole Calibration for Head Tissue/Pin=250 mW, d= Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 115.6 V/m; Power Drift = 0.09 dB Peak SAR (extrapolated) = 26.5 W/kg SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.34 W/kg Smallest distance from peaks to all points 3 dB below = 9 mm Ratio of SAR at M2 to SAR at M1 = 51%Maximum value of SAR (measured) = 22.1 W/kg



Certificate No: D2450V2-727 Apr22

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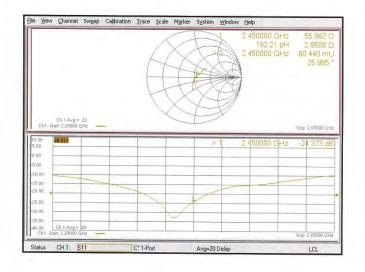
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#### Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727\_Apr22

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### Report No. : TESA2211000524ES Page: 8 of 34

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zoughaugetrages 42 9004 Zurish Sultraria

SGS (Auden)

Client

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Accreditation No.: SCS 0108

Certificate No: D5GHzV2-1023\_Jan22

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С

S

Object	D5GHzV2 - SN:1	023	
Calibration procedure(s)	QA CAL-22.v6 Calibration Proce	edure for SAR Validation Sources	between 3-10 GHz
Calibration date:	January 27, 2022	2	
		onal standards, which realize the physical un robability are given on the following pages an	
All calibrations have been conduct Calibration Equipment used (M&T		y facility: environment temperature (22 $\pm$ 3)°C	C and humidity < 70%.
Primary Standards	D#	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: BH9394 (20k)	09-Apr-21 (No. 217-03343)	Apr-22
		09-Apr-21 (No. 217-03344)	
	SIN: 3109827 06327		
ype-N mismatch combination	SN: 310982 / 06327 SN: 3503		Apr-22 Dec-22
Type-N mismatch combination Reference Probe EX3DV4	and the set of the set of the set of the set of the	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21)	Apr-22 Dec-22 Nov-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4	SN: 3503	31-Dec-21 (No. EX3-3503_Dec21)	Dec-22 Nov-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	SN: 3503 SN: 601	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21)	Dec-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B	SN: 3503 SN: 601 ID #	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house)	Dec-22 Nov-22 Scheduled Check
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A	SN: 3503 SN: 601 ID # SN: GB39512475	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20)	Dec-22 Nov-22 Scheduled Check In house check: Oct-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A	SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20)	Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20)	Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A	SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972 SN: US41080477	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20)	Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: 3503 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: WY41093315 SN: 100972 SN: US41080477 Name	31-Dec-21 (No. EX3-3503_Dec21) 01-Nov-21 (No. DAE4-601_Nov21) Check Date (in house) 30-Oct-14 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 07-Oct-15 (in house check Oct-20) 15-Jun-15 (in house check Oct-20) 31-Mar-14 (in house check Oct-20) Function	Dec-22 Nov-22 Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22

Certificate No: D5GHzV2-1023 Jan22

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### Report No. : TESA2211000524ES Page: 9 of 34

Calibration Laboratory of Schmid & Partner Engineering AG aughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: SCS 0108

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#### Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

#### Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

#### Additional Documentation:

c) DASY System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- . Antenna Parameters with TSL: The source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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#### **Measurement Conditions**

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz	

#### Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.9 ± 6 %	4.52 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL at 5250 MHz

Condition	
100 mW input power	8.16 W/kg
normalized to 1W	81.0 W/kg ± 19.9 % (k=2)
condition	
condition 100 mW input power	2.34 W/kg
	100 mW input power

#### Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.4 ± 6 %	4.87 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	84.4 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 100 mW input power	2.40 W/kg

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#### Head TSL parameters at 5750 MHz

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.2 ± 6 %	5.02 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	****	

#### SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.0 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 100 mW input power	2.31 W/kg

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#### Appendix (Additional assessments outside the scope of SCS 0108)

#### Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	52.0 Ω - 5.2 jΩ
Return Loss	- 25.3 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	54.7 Ω + 0.2 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	57.2 Ω + 2.1 jΩ
Return Loss	- 23.1 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
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Certificate No: D5GHzV2-1023\_Jan22

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#### **DASY5 Validation Report for Head TSL**

Date: 27.01.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1023

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Medium parameters used: f = 5250 MHz;  $\sigma = 4.52 \text{ S/m}$ ;  $\epsilon_r = 34.9$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used: f = 5600 MHz;  $\sigma = 4.87 \text{ S/m}$ ;  $\varepsilon_r = 34.4$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used: f = 5750 MHz;  $\sigma = 5.02 \text{ S/m}$ ;  $\varepsilon_r = 34.2$ ;  $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.5, 5.5, 5.5) @ 5250 MHz, ConvF(5.1, 5.1, 5.1) @ 5600 MHz, ConvF(5.08, 5.08, 5.08) @ 5750 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021 .
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001 .
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 76.83 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 28.0 W/kg SAR(1 g) = 8.16 W/kg; SAR(10 g) = 2.34 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 70.7% Maximum value of SAR (measured) = 18.6 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan. dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 77.04 V/m; Power Drift = 0.06 dB Peak SAR (extrapolated) = 31.5 W/kg SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.40 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 68% Maximum value of SAR (measured) = 20.1 W/kg

Certificate No: D5GHzV2-1023\_Jan22

Page 6 of 8

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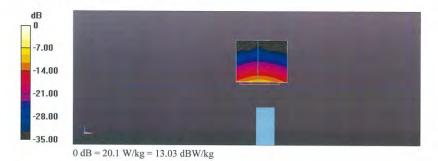
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### Report No. : TESA2211000524ES Page: 14 of 34

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 74.27 V/m; Power Drift = 0.09 dB Peak SAR (extrapolated) = 31.8 W/kg SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.31 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 66.3%Maximum value of SAR (measured) = 19.8 W/kg



Certificate No: D5GHzV2-1023\_Jan22

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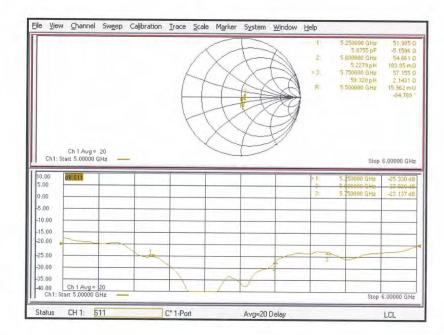
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#### Impedance Measurement Plot for Head TSL

Certificate No: D5GHzV2-1023\_Jan22

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### Report No. : TESA2211000524ES Page: 16 of 34

Calibration Laboratory of
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Engineering AG
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Accreditation No.: SCS 0108

Certificate No: D6.5GHzV2-1006\_Aug22

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CALIBRATION CI			
Dbject	D6.5GHzV2 - SN	1:1006	
Calibration procedure(s)	QA CAL-22.v6 Calibration Proce	edure for SAR Validation Sources	s between 3-10 GHz
Calibration date:	August 23, 2022		
The measurements and the uncerta	inties with confidence p d in the closed laborato	onal standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature ( $22 \pm 3$ )°C	d are part of the certificate.
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power sensor R&S NRP33T Reference 20 dB Attenuator Mismatch combination Reference Probe EX3DV4 DAE4	SN: 100967 SN: BH9394 (20k) SN: 84224 / 360D SN: 7405 SN: 908	01-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 26-Apr-21 (No. 217-03353) 02-Jun-22 (No. EX3-7405_Jun22) 27-Jun-22 (No. DAE4-908_Jun22)	Apr-23 Apr-23 Apr-24 Jun-23 Jun-23
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSIN20G Network Analyzer Keysight E5063A	SN: 827	18-Dec-18 (in house check Dec-21) 31-Oct-19 (in house check Oct-19)	In house check: Dec-23 In house check: Oct-22
	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	Seef The
	Sven Kühn	Technical Manager	all heger
Approved by:			5.0

Certificate No: D6.5GHzV2-1006\_Aug22

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### Report No. : TESA2211000524ES Page: 17 of 34

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Accreditation No.: SCS 0108

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#### Classer

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Multilateral Agreement for the recognition of calibration certificates

#### Calibration is Performed According to the Following Standards:

 a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range Of 4 MHz To 10 GHz)", October 2020.

#### Additional Documentation:

b) DASY System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled ohantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.
- The absorbed power density (APD): The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%

Certificate No: D6.5GHzV2-1006\_Aug22

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#### **Measurement Conditions**

DASY Version	DASY6	V16.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	6500 MHz ± 1 MHz	

#### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.5 ± 6 %	6.19 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	29.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	292 W/kg ± 24.7 % (k=2)
SAR averaged over 8 cm <sup>3</sup> (8 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	65.8 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	100 mW input power	5.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	53.8 W/kg ± 24.4 % (k=2)

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#### Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	45.7 Ω - 6.7 jΩ	
Return Loss	- 21.6 dB	

#### APD (Absorbed Power Density)

APD averaged over 1 cm <sup>2</sup>	Condition	
APD measured	100 mW input power	291 W/m <sup>2</sup>
APD measured	normalized to 1W	2910 W/m <sup>2</sup> ± 29.2 % (k=2)
APD averaged over 4 cm <sup>2</sup>	condition	
APD averaged over 4 cm <sup>2</sup> APD measured	condition 100 mW input power	132 W/m <sup>2</sup>

\*The reported APD values have been derived using psSAR8g.

#### General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG
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Certificate No: D6.5GHzV2-1006 Aug22

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### Report No. : TESA2211000524ES Page: 20 of 34

#### **DASY6 Validation Report for Head TSL**

Measurement Report for D6.5GHz-1006, UID 0 -, Channel 6500 (6500.0MHz)

Device under T		in the second				3	
Name, Manufa D6.5GHz		mensions 6.0 x 6.0 x		/IEI N: 1006	DUT Typ	e	
00.00112							
Exposure Cond	litions						
Phantom	Position, Test	Band	Group,	Frequency	Conversion	TSL Cond.	TSL
Section, TSL	Distance [mm]		UID	[MHz]	Factor	[S/m]	Permittivity
Flat, HSL	5.00	Band	CW,	6500	5.50	6.19	34.5
Hardware Setu	q						
Phantom	Т	SL		Probe, Calil	bration Date	DAE, Calib	bration Date
WFP V8.0 Cent	er - 1182 H	BBL600-10	000V6	EX3DV4 - SI	N7405, 2022-06-02	DAE4 Sn9	08, 2022-06-27
Scan Setup				Measureme	ent Results		
			Zoom Scar				Zoom Scan
Grid Extents [	mm]		22.0 x 22.0 x 22.0	Date		2	022-08-23, 10:39
Grid Steps [m	im]		3.4 x 3.4 x 1.4	psSAR1g [\	W/Kg]		29.2
Sensor Surfac	e [mm]		1.4	psSAR8g [\	W/Kg]		6.58
Graded Grid			Yes	psSAR10g	[W/Kg]		5.38
Grading Ratio	1		1.4	Power Drif	ft [dB]		0.01
MAIA			N/A	Power Sca	ling		Disabled
Surface Detec	ction		VMS + 6p	Scaling Fac	ctor [dB]		
Scan Method			Measured	TSL Correc	tion		No correction
				M2/M1 [%	6]		50.6
				Dist 3dB P	eak [mm]		4.8



Certificate No: D6.5GHzV2-1006\_Aug22

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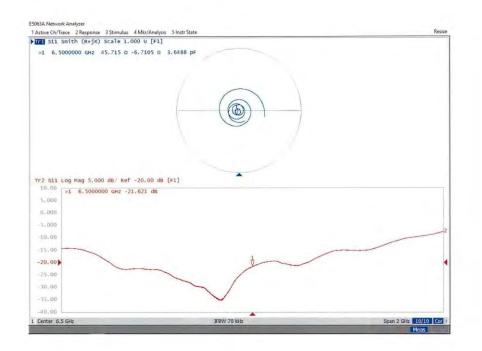
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Impedance Measurement Plot for Head TSL



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Accredited by the Swiss Accreditation The Swiss Accreditation Service is Aultilateral Agreement for the reco	one of the signatorie		Accreditation No.: SCS 0108
CALIBRATION CE	DTIEICAT		No: D7GHzV2-1007_Aug22
	D7GHzV2 - SN:1		
	QA CAL-22.v6 Calibration Proce	edure for SAR Validation Sourc	es between 3-10 GHz
Calibration date:	August 24, 2022		
The measurements and the uncertai	nties with confidence p d in the closed laborato	ional standards, which realize the physical robability are given on the following pages ry facility: environment temperature ( $22 \pm 3$	and are part of the certificate.
The measurements and the uncertain All calibrations have been conducted Calibration Equipment used (M&TE of Primary Standards	nties with confidence p d in the closed laborato critical for calibration)	robability are given on the following pages ny facility: environment temperature (22 ± : Cal Date (Certificate No.)	and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration
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### Report No. : TESA2211000524ES Page: 23 of 34

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

### Calibration is Performed According to the Following Standards:

 a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range Of 4 MHz To 10 GHz)", October 2020.

### Additional Documentation:

b) DASY System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.
- The absorbed power density (APD): The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%

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#### **Measurement Conditions**

DASY system configuration, as far as not given on page 1.

DASY Version	DASY6	V16.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.0 mm, dz = 1.2 mm	Graded Ratio = 1.2 (Z direction)
Frequency	7000 MHz ± 1 MHz	

#### Head TSL parameters

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	33.9	6.65 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.6 ± 6 %	6.81 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	27.8 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	278 W/kg ± 24.7 % (k=2)
SAR averaged over 8 cm <sup>3</sup> (8 g) of Head TSL	condition	
SAR measured	100 mW input power	6.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	60.2 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	100 mW input power	4.94 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	49.3 W/kg ± 24.4 % (k=2)

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#### Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω - 6.1 jΩ		
Return Loss	- 24.0 dB		

#### APD (Absorbed Power Density)

APD averaged over 1 cm <sup>2</sup>	Condition	
APD measured	100 mW input power	277 W/m <sup>2</sup>
APD measured	normalized to 1W	2770 W/m2 ± 29.2 % (k=2)
	in the second se	
APD averaged over 4 cm <sup>2</sup>	condition	
APD averaged over 4 cm <sup>2</sup> APD measured	condition 100 mW input power	121 W/m <sup>2</sup>

#### General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG

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#### **DASY6 Validation Report for Head TSL**

Measurement Report for D7GHz-1007, UID 0 -, Channel 7000 (7000.0MHz)

Device under 1	<b>Test Properties</b>						
Name, Manufa D7GHz		imensions 4.0 x 6.0 x		IEI I: 1007	DUT Typ	e	
Exposure Cond	litions						
Phantom	Position, Test	Band	Group,	Frequency	Conversion	TSL Cond.	TSL
Section, TSL	Distance [mm]		UID	[MHz]	Factor	[S/m]	Permittivity
Flat, HSL	5.00	Band	CW,	7000	5.80	6.81	33.6
Hardware Setu	qu						
Phantom	TS	L		Probe, Calibration Date		DAE, Calibration Date	
MFP V8.0 Cent	er - 1182 He	BBL600-100	000V6	EX3DV4 - SN7405, 2022-06-02		DAE4 Sn908, 2022-06-27	
Scan Setup				Measureme	ent Results		
			Zoom Scan				Zoom Scan
Grid Extents	[mm]		22.0 x 22.0 x 22.0				022-08-24, 09:46
Grid Steps [m	im]		3.0 x 3.0 x 1.2	1.2 psSAR1g [W/Kg]			27.8
Sensor Surfac	e [mm]		1.4	psSAR8g [W/Kg]		6.0	
Graded Grid	Graded Grid Yes		psSAR10g [W/Kg]		4.9		
Grading Ratio	ading Ratio 1.2		Power Drift [dB]		0.0		
MAIA	A N/A		Power Scaling		Disablec		
Surface Deter	ction		VMS + 6p	Scaling Fac	ctor [dB]		
Scan Method			Measured	TSL Correc	tion		No correction
				M2/M1 [%	6]		52.1
				Dist 3dB P	eak [mm]		4.2



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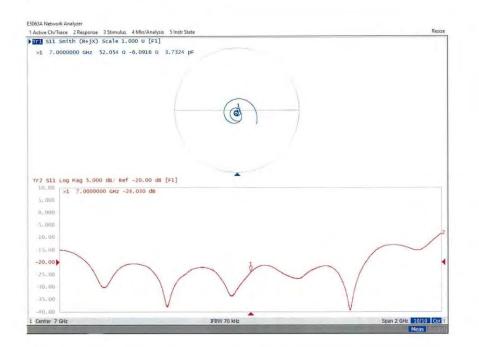
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#### Impedance Measurement Plot for Head TSL



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Accredited by the Swiss Accredita The Swiss Accreditation Servic Multilateral Agreement for the n	e is one of the signa		Ac	ccreditation No.: SCS 0108
Client SGS (Auden)			Certificate No:	: 5G-Veri10-1021_Jan22
CALIBRATION	CERTIFIC	ATE		
Object	5G Verificatio	on Source 10 GHz - S	N: 1021	
Calibration procedure(s)	QA CAL-45.v Calibration p	v3 rocedure for sources	in air above 6 G	Hz
Calibration date:	January 24, 2	2022		
The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards	cted in the closed labo	oratory facility: environment te	emperature (22 ± 3)°C	
Reference Probe EUmmWV3 DAE4ip	SN: 9374 SN: 1602	2021-12-21(No. EUm 2021-06-25 (No. DAE		Dec-22 Jun-22
Secondary Standards	ID #	Check Date (in house	)	Scheduled Check
	Name	Function		Signature
Calibrated by:	Leif Klysner	Laborator	y Technician	Sof Alp
Approved by:	Sven Kühn	Deputy M	anager	SA

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## CW

Continuous wave

Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45-5Gsources
- IEC TR 63170 ED1, "Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz", January 2018

#### Methods Applied and Interpretation of Parameters

- Coordinate System: z-axis in the waveguide horn boresight, x-axis is in the direction of the E-field, y-axis normal to the others in the field scanning plane parallel to the horn flare and horn flange.
- Measurement Conditions: (1) 10 GHz: The radiated power is the forward power to the horn antenna minus ohmic and mismatch loss. The forward power is measured prior and after the measurement with a power sensor. During the measurements, the horn is directly connected to the cable and the antenna ohmic and mismatch losses are determined by farfield measurements. (2) 30, 45, 60 and 90 GHz. The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cub and at the ceiling to minimize reflections.
- Horn Positioning: The waveguide horn is mounted vertically on the flange of the waveguide . source to allow vertical positioning of the EUmmW probe during the scan. The plane is parallel to the phantom surface. Probe distance is verified using mechanical gauges positioned on the flare of the horn.
- E- field distribution: E field is measured in two x-y-plane (10mm, 10mm +  $\lambda$ /4) with a vectorial E-field probe. The E-field value stated as calibration value represents the E-field-maxima and the averaged (1cm<sup>2</sup> and 4cm<sup>2</sup>) power density values at 10mm in front of the horn.
- Field polarization: Above the open horn, linear polarization of the field is expected. This is verified graphically in the field representation.

#### **Calibrated Quantity**

Local peak E-field (V/m) and average of peak spatial components of the poynting vector  $(W/m^2)$  averaged over the surface area of 1 cm<sup>2</sup> and 4cm<sup>2</sup> at the nominal operational frequency of the verification source. Both square and circular averaging results are listed.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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#### **Measurement Conditions**

DASY system configuration, as far as not given on page 1

DASY Version	cDASY6 Module mmWave	V2.4
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
XY Scan Resolution	dx, dy = 7.5 mm	
Number of measured planes	2 (10mm, 10mm + λ/4)	
Frequency	10 GHz ± 10 MHz	

#### Calibration Parameters, 10 GHz

#### **Circular Averaging**

Distance Horn Aperture to Measured Plane	Prad' (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m <sup>2</sup> )		Uncertainty (k = 2)
		11		1 cm <sup>2</sup>	4 cm <sup>2</sup>	
10 mm	86.1	148	1.27 dB	55.2	51.7	1.28 dB

#### **Square Averaging**

Distance Horn Aperture to Measured Plane	Prad <sup>1</sup> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDlot+, psPDmod+) (W/m <sup>2</sup> )		Uncertainty (k = 2)
				1 cm <sup>2</sup>	4 cm <sup>2</sup>	
10 mm	86.1	148	1.27 dB	55.2	51.5	1.28 dB

<sup>1</sup> Assessed ohmic and mismatch loss plus numerical offset: 0.55 dB

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#### **DASY Report**

mmWave Phantom - 1002

Air

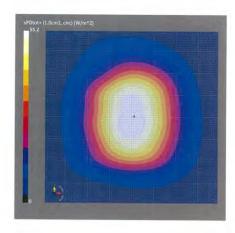
Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer	Dimensions [mm	1]	IMEI	DUT Type	
5G Verification Source 10	GHz 100.0 x 100.0 x 1	172.0	SN: 1021	-	
Exposure Condition	s				
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0
Hardware Setup					
Phantom	Medium		Probe, Calib	ration Date DA	E, Calibration Date

EUmmWV3 - SN9374\_F1-55GHz,

DAE4ip Sn1602,

		2021-12-21	2021-06-25
Scan Setup		Measurement Results	
Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA	56 Scan 120.0 x 120.0 0.25 x 0.25 10.0 MAIA not used	Date Avg. Area [cm <sup>2</sup> ] psPDn+ [W/m <sup>2</sup> ] psPDtot+ [W/m <sup>2</sup> ] psPDmod+ [W/m <sup>2</sup> ] Ems. [V/m] Power Drift [dB]	56 Scan 2022-01-24, 11:01 1.00 55.0 55.2 55.4 1.48 0.01



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#### **DASY Report**

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer	Dimensions [mm	1	IMEI	DUT Type	
5G Verification Source 10 G	Hz 100.0 x 100.0 x 1	172.0	SN: 1021		
<b>Exposure Conditions</b>					
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	cw	10000.0, 10000	1.0
Handware Catur					
Hardware Setup					
Phantom	Medium		Probe, Calibra	ation Date	DAE, Calibration Date
mmWave Phantom - 1002	Air		FUmmWV3 -	SN9374 E1-55GHz	DAEdin Sn1602

#### Scan Setup

Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA

	5G Scan
120.	0 x 120.0
0.	25 x 0.25
	10.0
MAIA	not used

Measurement Results

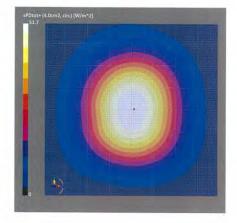
Avg. Area [cm<sup>2</sup>] psPDn+ [W/m<sup>2</sup>] psPDtot+ [W/m<sup>2</sup>] psPDmod+ [W/m<sup>2</sup>] E<sub>max</sub> [V/m] Power Drift [dB]

2021-12-21

2022-01-24, 11:01
4.00
51.5
51.7
51.8
148
0.01

5G Scan

2021-06-25



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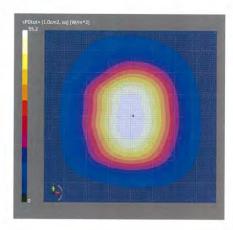


#### **DASY Report**

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Name, Manufacturer	Dimensions [mm	]	IMEI	DUT Type	
5G Verification Source 10 G	Hz 100.0 x 100.0 x 1	172.0	SN: 1021	-	
Exposure Conditions					
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0
Hardware Setup					
Phantom	Medium		Probe, Calibr	ation Date	DAE, Calibration Date
mmWave Phantom - 1002	Air		EUmmWV3 -	SN9374 F1-55GHz	DAF4in Sn1602

Hardware Setup Phantom mmWave Phantom - 1002	Medium Air	Probe, Calibration Date EUmmWV3 - SN9374_F1-55GHz, 2021-12-21	DAE, Calibration Date DAE4ip Sn1602, 2021-06-25
Scan Setup		Measurement Results	
	5G Scan		5G Scan
Grid Extents [mm]	120.0 × 120.0	Date	2022-01-24, 11:01
Grid Steps [lambda]	0.25 x 0.25	Avg. Area [cm <sup>2</sup> ]	1.00
Sensor Surface [mm]	10.0	psPDn+ [W/m <sup>2</sup> ]	55.0
MAIA	MAIA not used	psPDtot+ [W/m <sup>2</sup> ]	55.2
		psPDmod+ [W/m <sup>2</sup> ]	55.4
		E <sub>max</sub> [V/m]	148
		Power Drift [dB]	0.01



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4.00 4.00 51.3 51.5 51.7 148

0.01

#### **DASY Report**

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Pro	operties				
Name, Manufacturer	Dimensions [mn	n]	IMEL	DUT Type	
5G Verification Source 10 G	Hz 100.0 x 100.0 x	172.0	SN: 1021		
Exposure Conditions					
Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
iG -	10.0 mm	Validation band	CW	10000.0, 10000	1.0
Hardware Setup Phantom mmWave Phantom - 1002	Medium Air		Probe, Calibra EUmmWV3 - 2021-12-21	ation Date SN9374_F1-55GHz,	DAE, Calibration Date DAE4ip Sn1602, 2021-06-25
Scan Setup			Measurem	ent Results	
		5G S	can		5G Scar
Grid Extents [mm]		120.0 x 12			2022-01-24, 11:01
Grid Steps [lambda]		0.25 x 0	O	m²]	4.00
Sensor Surface [mm]			LO.0 psPDn+ [W/		51.3
MAIA		MAIA not u	ised psPDtot+ [W	//m²]	51.5

	psPDmod+ [W/m <sup>2</sup> ] E <sub>max</sub> [V/m] Power Drift [dB]
sPDtot+ (4.0cm2, sq) [W/m*2] \$1.5	

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## - End of report -

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