

Appendix C

Phantom Description

Schmid & Partner Engineering AG

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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

OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01
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
- [3] 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 [4] 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: 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

speag Schmid & Partner-Engineering/AG Zeugbarestrasse 43, 8004 Zeich, Smithiand Phone/441 44/255 9708, Few-444 64 44 59779

Doc No 881 - QD OVA 002 A - A

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

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System Validation from Original Equipment Supplier

Accredited by the Swiss Accreditati The Swiss Accreditation Service			ccreditation No.: SCS 0108
Aultilateral Agreement for the rec			
Client SGS-TW (Auder	2)	Certificate N	o: D2450V2-727 Apr22
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CALIBRATION C	ERTIFICATE		
Object	D2450V2 - SN:7	27	
Calibration procedure(s)	QA CAL-05.v11		
		edure for SAR Validation Sources	s between 0.7-3 GHz
Collination data:	An-1 05 0000		
Calibration date:	April 25, 2022		
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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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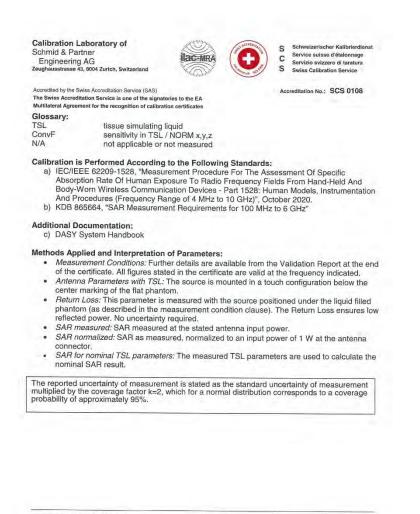
Unless otherwise stated the results shown in this test report reter only to the sample(s) lested and such sample(s) are retained to 90 days only. Mir#JSfabity i, Lt&Bateger and the company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com.tw/Terms-and-Conditions and for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com.tw/Terms-and-Conditions and for electronic format defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fulleest extent of the law. prosecuted to the fullest extent of the law.

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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 ³ (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)
SAB averaged over 10 cm ³ (10 g) of Head TSI	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (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

lectrical Delay (one direction)	1.149 ns
and a start of the second	11140 113

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is diractly 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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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

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

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:

Measurement grid: (x = 5mm, dz = 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

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0 dB = 3	2.1 W/kg = 13.45 dBW/kg

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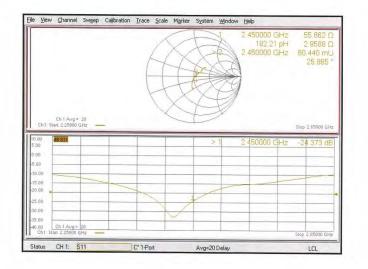
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Impedance Measurement Plot for Head TSL



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ha suits Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates Stime SG (Auden) Certificate No: D5GHzV2-1023_J CALIBRATION CERTIFICATE Doject D5GHzV2 - SN:1023 Calibration procedure(s) QA CAL-22.v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz Calibration date: January 27, 2022 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (s()). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibration Equipment used (M&TE critical for calibration) Primary Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Date (Certificate No.) Scheduled Calibration Priver Standards 10 # Cal Standards 10 # Cal Date (Certificate No.) Nov 22 Standards 10 # Cal Standards 10 # Cal Date (Certificate No.) Nov 22 Standards 10 # Cal Standards 10 # Cal Date (Certificate No.) Scheduled Check Priver Standards 10 # Cal Standards 10 # Check Date (In house Check Oct 20) In house check: Oct 20 Priver Standards 10 # Check Date (Oct 20) In house check: Oct 20 Prive	Engineering AG eughausstrasse 43, 8004 Zurich,	of Switzerland	SC MAA	Service suisse d'étalonnage Servizio svizzero di taratura
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Calibrated by: Name Function Signature Aldonia Georgiadou Laboratory Technician	DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A	SN: GB39512475 SN: US37292783 SN: MY41093315	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)	Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
Calibrated by: Aldonia Georgiadou Laboratory Technician	DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972	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)	Scheduled Check In house check: Oct-22 In house check: Oct-22 In house check: Oct-22 In house check: Oct-22
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Approved by: Sven Kühn Deputy Manager	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: GB39512475 SN: US37292783 SN: MY41093315 SN: 100972 SN: US41080477 Name	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	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

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



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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

ASY system configuration, as far as no	t 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

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.0 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.34 W/kg

Head TSL parameters at 5600 MHz

	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 ³ (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 ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (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 ³ (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)
	1	
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (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	
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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 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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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; $\sigma = 4.52 \text{ S/m}$; $\varepsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: f = 5600 MHz; $\sigma = 4.87 \text{ S/m}$; $\epsilon_r = 34.4$; $\rho = 1000 \text{ kg/m}^3$, 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

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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 mmRatio of SAR at M2 to SAR at M1 = 66.3%Maximum value of SAR (measured) = 19.8 W/kg



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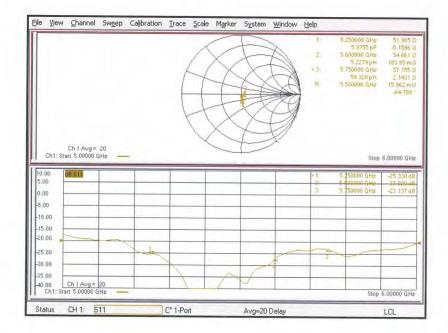
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Impedance Measurement Plot for Head TSL



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Report No. : TESA2210000423ES Page: 16 of 34

Calibration Laboratory Schmid & Partner Engineering AG zeughausstrasse 43, 8004 Zurich, 5			S Schweizerischer Kallbrierdienst C Service suisse d'étalonnage Servizio svizzero di taratura S wiss Calibration Service
Accredited by the Swiss Accreditation The Swiss Accreditation Service is Multilateral Agreement for the reco	one of the signatorie		Accreditation No.: SCS 0108
Client SGS (Auden)			ificate No: D6.5GHzV2-1006_Aug22
CALIBRATION CI	ERTIFICAT	E	
Object	D6.5GHzV2 - SN	1:1006	
	QA CAL-22.v6 Calibration Proc	edure for SAR Validation S	ources between 3-10 GHz
Calibration date:	August 23, 2022		
All calibrations have been conducted Calibration Equipment used (M&TE Primary Standards Power sensor R&S NRP33T Reference 20 dB Attenuator Mismatch combination		Cal Date (Certificate No.) 01-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 26-Apr-21 (No. 217-0353)	(22 ± 3)°C and humidity < 70%. Scheduled Calibration Apr-23 Apr-24
Reference Probe EX3DV4 DAE4	SN: 7405 SN: 908	02-Jun-22 (No. EX3-7405_Jun22 27-Jun-22 (No. DAE4-908_Jun22	
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSIN20G Network Analyzer Keysight E5063A	SN: 827 SN:MY54504221	18-Dec-18 (in house check Dec-2 31-Oct-19 (in house check Oct-1)	
Calibrated by:	Name Leif Klysner	Function Laboratory Technicia	in Signature
Approved by:	Sven Kühn	Technical Manager	5.0
This calibration certificate shall not b	e reproduced except in	full without written approval of the la	Issued: August 28, 2022

Certificate No: D6.5GHzV2-1006_Aug22 Page 1 of 6

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Report No. : TESA2210000423ES Page: 17 of 34

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



Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

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Multilateral Agreement for the recognition of calibration certificates Glossary:

TSL ConvF N/A

not applicable or not measured Calibration is Performed According to the Following Standards:

sensitivity in TSL / NORM x,y,z

tissue simulating liquid

 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%.

Certificate No: D6.5GHzV2-1006 Aug22

Page 2 of 6

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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 = 3.4 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 ³ (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 ³ (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 ³ (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 ²	Condition	
APD measured	100 mW input power	291 W/m ²
APD measured	normalized to 1W	2910 W/m ² ± 29.2 % (k=2)
APD averaged over 4 cm ²	condition	
APD averaged over 4 cm ² APD measured	condition 100 mW input power	132 W/m ²

*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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Report No. : TESA2210000423ES Page: 20 of 34

DASY6 Validation Report for Head TSL

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

Device under			format 1	MEI	DUT Typ			
Name, Manuf		Dimensions			DUT Typ	e		
D6.5GHz		16.0 x 6.0 x	300.0	5N: 1006				
Exposure Con	ditions							
Phantom	Position, Test	Band	Group,	Frequency	Conversion	TSL Cond.	TSL	
Section, TSL	Distance		UID	[MHz]	Factor	[S/m]	Permittivity	
	[mm]							
Flat, HSL	5.00	Band	CW,	6500	5.50	6.19	34.5	
Hardware Set	an							
Phantom		TSL		Probe, Calil	bration Date	DAE, Calib	oration Date	
MFP V8.0 Cen	ter - 1182	HBBL600-10	000V6	EX3DV4 - SI	N7405, 2022-06-02	DAE4 Sn9	08, 2022-06-27	
Scan Setup				Measureme	ent Results			
			Zoom Sca	in			Zoom Scan	
Grid Extents	[mm]		22.0 x 22.0 x 22.	0 Date		2	022-08-23, 10:39	
Grid Steps [n	nm]		3.4 x 3.4 x 1.	4 psSAR1g [W/Kg]		29.2	
Sensor Surfa	ce [mm]		1.	4 psSAR8g [\	W/Kg]		6.58	
Graded Grid			Ye	es psSAR10g	[W/Kg]		5.38	
Grading Ratio	D		1.	4 Power Drif	ft [dB]		0.01	
MAIA			N/	A Power Sca	ling		Disabled	
Surface Dete	ction		VMS + 6	p Scaling Fac	ctor [dB]			
Scan Method	l.		Measure	d TSL Correc	tion		No correction	
				M2/M1 [%	6]		50.6	
				Dist 3dB P	eak [mm]		4.8	



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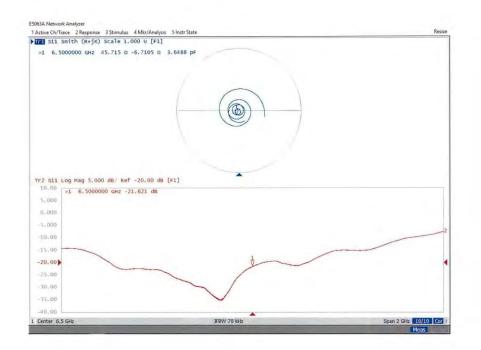
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Impedance Measurement Plot for Head TSL



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lient SGS (Auden)		Certificate N	to: D7GHzV2-1007_Aug22
CALIBRATION CE	RTIFICAT	E	
Dbject	D7GHzV2 - SN:1	007	
	QA CAL-22.v6 Calibration Proce	edure for SAR Validation Source	s between 3-10 GHz
Calibration date:	August 24, 2022		
This calibration certificate documents	s the traceability to nati	onal standards, which realize the physical un	nits of measurements (SI).
The measurements and the uncertai	nties with confidence p d in the closed laborato	onal standards, which realize the physical unrobability are given on the following pages a ry facility: environment temperature $(22 \pm 3)^2$	nd are part of the certificate.
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The measurements and the uncertain All calibrations have been conducted Calibration Equipment used (M&TE of Primary Standards Power sensor R&S NRP33T Reference 20 dB Attenuator Wismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	nties with confidence p d in the closed laborato critical for calibration) ID # SN: 100967 SN: 8H9394 (20k) SN: 8H9394 (20k) SN: 84224 / 360D SN: 7405 SN: 908	robability are given on the following pages a ny facility: environment temperature (22 ± 3)' Cal Date (Certificate No.) 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) Check Date (in house)	nd are part of the certificate. °C and humidity < 70%, Scheduled Calibration Apr-23 Apr-23 Apr-24 Jun-23 Jun-23 Scheduled Check
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The measurements and the uncertain All calibrations have been conducted Calibration Equipment used (M&TE of Primary Standards Power sensor R&S NRP33T Reference 20 dB Attenuator Wismatch combination Reference Probe EX3DV4	ID # ID # ID # SN: 100967 SN: BH9394 (20k) SN: 84224 / 360D SN: 7405 SN: 908 ID # SN: 827	robability are given on the following pages a ry facility: environment temperature (22 ± 3)' Cal Date (Certificate No.) 01-Apr-22 (No. 217-03526) 04-Apr-22 (No. 217-03527) 26-Apr-21 (No. 217-03533) 02-Jun-22 (No. EX3-7405_Jun22) 27-Jun-22 (No. DAE4-908_Jun22) Check Date (in house) 18-Dec-18 (in house check Dec-21)	nd are part of the certificate. *C and humidity < 70%. Scheduled Calibration Apr-23 Apr-23 Apr-24 Jun-23 Jun-23 Scheduled Check In house check: Dec-23
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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

Glossary

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

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- · 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%.

Certificate No: D7GHzV2-1007 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 = 3.0 mm, dz = 1.2 mm	Graded Ratio = 1.2 (Z direction)
Frequency	7000 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	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 ³ (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 ³ (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 ³ (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

52.1 Ω - 6.1 jΩ	
- 24.0 dB	

APD (Absorbed Power Density)

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

*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

r	
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	Test Properties						
Name, Manufa	acturer	Dimensions	[mm] IN	1EI	DUT Typ	e	
D7GHz		14.0 x 6.0 x	297.0 SM	I: 1007			
Exposure Cond	ditions						
Phantom	Position, Tes	st 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	ar						
Phantom		TSL		Probe, Calil	bration Date	DAE, Calib	oration Date
MFP V8.0 Cent	er - 1182 I	HBBL600-100	00V6	EX3DV4 - SI	N7405, 2022-06-02	DAE4 Sn9	08, 2022-06-27
Scan Setup				Measureme	ent Results		
			Zoom Scan				Zoom Scan
Grid Extents [[mm]		22.0 x 22.0 x 22.0	Date		2	022-08-24, 09:46
Grid Steps [m	im]		3.0 x 3.0 x 1.2	psSAR1g [W/Kg]		27.8
Sensor Surfac	e [mm]		1.4	psSAR8g [W/Kg]		6.03
Graded Grid			Yes	psSAR10g [W/Kg]			
Grading Ratio	2		1.2	Power Drif	ft [dB]		0.05
MAIA			N/A Power Scaling		ling		Disabled
Surface Detec	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



Certificate No: D7GHzV2-1007_Aug22

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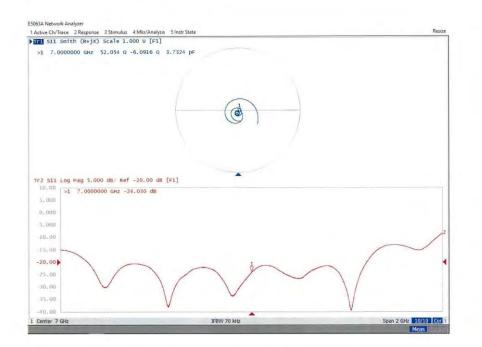
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Impedance Measurement Plot for Head TSL



Certificate No: D7GHzV2-1007_Aug22

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ccredited by the Swiss Accredita he Swiss Accreditation Servic			editation No.: SCS 0108			
fultilateral Agreement for the r						
Client SGS (Auden)		Certificate No: 5	G-Veri10-1021_Jan22			
CALIBRATION	CERTIFICA	TE				
CALIDITATION	OLITITI IOP					
Object	5G Verificatio	on Source 10 GHz - SN: 1021				
Calibration procedure(s)	QA CAL-45.v3					
	Calibration procedure for sources in air above 6 GHz					
Calibration date:	January 24, 2	0000				
Summer of the state	January 24, 2	ULL				
This calibration certificate docum	nents the traceability to	national standards, which realize the physical units	of measurements (SI).			
The measurements and the unce	ertainties with confiden	nce probability are given on the following pages and a	re part of the certificate.			
All calibrations have been condu	cted in the closed laho	vision facility: anvironment temperature (00 + 2)80 a	ad buestdite 7000			
		pratory facility: environment temperature (22 \pm 3)°C a	nd humidity < 70%.			
Calibration Equipment used (M&	TE critical for calibratic	on)				
Calibration Equipment used (M& Primary Standards	TE critical for calibratic	on) Cal Date (Certificate No.)	Scheduled Calibration			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3	TE critical for calibratic	on)				
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3	TE critical for calibratio	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21)	Scheduled Calibration Dec-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibratio	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	Scheduled Calibration Dec-22 Jun-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibration	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21)	Scheduled Calibration Dec-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibration	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	Scheduled Calibration Dec-22 Jun-22			
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Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibration	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	Scheduled Calibration Dec-22 Jun-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip	TE critical for calibration	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	Scheduled Calibration Dec-22 Jun-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip Secondary Standards	TE critical for calibratic ID # SN: 9374 SN: 1602 ID # ID #	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21)	Scheduled Calibration Dec-22 Jun-22			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip Secondary Standards	TE critical for calibratic D # SN: 9374 SN: 1602 D #	on) Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house)	Scheduled Calibration Dec-22 Jun-22 Scheduled Check			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip Secondary Standards	TE critical for calibratic ID # SN: 9374 SN: 1602 ID # ID #	Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house)	Scheduled Calibration Dec-22 Jun-22 Scheduled Check			
Calibration Equipment used (M& Primary Standards Reference Probe EUmmWV3 DAE4ip Secondary Standards	TE critical for calibratic ID # SN: 9374 SN: 1602 ID # ID #	Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house)	Scheduled Calibration Dec-22 Jun-22 Scheduled Check			
All calibrations have been condu Calibration Equipment used (M& <u>Primary Standards</u> Reference Probe EUmmWV3 DAE4ip Secondary Standards Calibrated by:	TE critical for calibratic D # SN: 9374 SN: 1602 ID # ID # Name Leif Klysner	Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house) Function Laboratory Technician	Scheduled Calibration Dec-22 Jun-22 Scheduled Check			
Calibration Equipment used (M& <u>Primary Standards</u> Reference Probe EUmmWV3 DAE4!p <u>Secondary Standards</u> Calibrated by:	TE critical for calibratic D # SN: 9374 SN: 1602 ID # ID # Name Leif Klysner	Cal Date (Certificate No.) 2021-12-21(No. EUmmWV3-9374_Dec21) 2021-06-25 (No. DAE4ip-1602_Jun21) Check Date (in house) Function Laboratory Technician	Scheduled Calibration Dec-22 Jun-22 Scheduled Check			

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Report No. : TESA2210000423ES Page: 29 of 34

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



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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-fieldmaxima and the averaged (1cm² and 4cm²) 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/m²) averaged over the surface area of 1 cm² and 4cm² 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 ^t Max E-field (mW) (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m ²)		Uncertainty (k = 2)	
		14		1 cm ²	4 cm ²	
10 mm	86.1	148	1.27 dB	55.2	51.7	1.28 dB

Square Averaging

Distance Horn Aperture to Measured Plane	Prad ¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	AVg (psPDi psPDi		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	86.1	148	1.27 dB	55.2	51.5	1.28 dB

¹ Assessed ohmic and mismatch loss plus numerical offset: 0.55 dB

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DASY Report

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

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type	
5G Verification Source 10 GHz	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	
5G -	10.0 mm	Validation band	CW	10000.0,	1.0	

Hardware Setup

Phan Medium mmWave Phantom - 1002 Air

Probe, Calibr	tion Date
EUmmWV3 -	SN9374_F1-55GHz,
2021-12-21	

DAE, Calibration Date DAE4ip Sn1602, 2021-06-25

Scan Setup

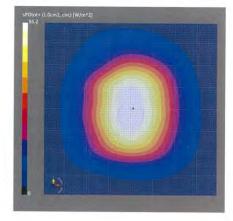
Grid Extents [mm] Grid Steps [lambda] Sensor Surface [mm] MAIA

1	20.0 x 120.0
	0.25 x 0.2
	10.0
M	AIA not used

Measurement Results
Date
Avg. Area [cm ²]
psPDn+ [W/m ²]
psPDtot+ [W/m ²]
psPDmod+ [W/m ²]

E_{max} [V/m] Power Drift [dB]

5G Scan 2022-01-24, 11:01 1.00 55.0 55.2 55.4 148 0.01



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DASY Report

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

Device under Test Name, Manufacturer	Dimensions [mn	1	IMEL	DUT Type	
5G Verification Source			SN: 1021	-	
Exposure Conditio	ns				
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 Phante mmWave Phantom - 1002

Medium

Air

Probe, Calibration Date EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 DAE, Calibration Date DAE4ip Sn1602, 2021-06-25

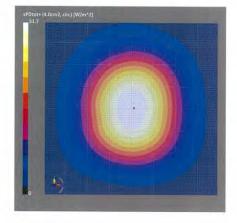
Scan Setup

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

	Meas
5G Scan	
120.0 x 120.0	Date
0.25 x 0.25	Avg. A
10.0	psPDr
MAIA not used	psPDt
	psPDr
	Emax []

P	Measurement Results
	Date
	Avg. Area [cm ²]
	psPDn+ [W/m ²]
	psPDtot+ [W/m ²]
	psPDmod+ [W/m ²]
	Emax [V/m]
	Power Drift [dB]

5G Scan 56 Scan 2022-01-24, 11:01 4.00 51.5 51.7 51.8 148 0.01



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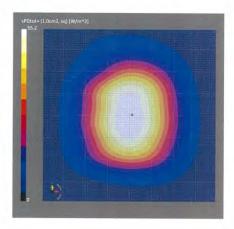
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DASY Report

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, Calibra	tion Date	DAE, Calibration Date
mmWave Phantom - 1002	Air			N9374_F1-55GHz,	DAE4ip Sn1602, 2021-06-25
Scan Setup			Measureme	ent Results	
		5G S	can		5G Scan
Grid Extents [mm]		120.0 × 12	0.0 Date		2022-01-24, 11:01
Grid Steps [lambda]		0.25 x 0		n²]	1.00
Sensor Surface [mm]			.0.0 psPDn+ [W/r		55.0
MAIA		MAIA not u	hou acor list		55.2
			psPDmod+ [\	W/m²]	55.4
			Emax [V/m]	101	148
			Power Drift [dBJ	0.01



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DASY Report

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

Name, Manufacturer 5G Verification Source 1	Dimensions [mm 0 GHz 100.0 x 100.0 x 1	5	IMEI SN: 1021	DUT Type	
Exposure Condition	IS				
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

Phantom mmWave Phantom - 1002

Medium

Air

Scan Setup

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

	Measuren
5G Scan	
120.0 x 120.0	Date
0.25 x 0.25	Avg. Area [
10.0	psPDn+ [W
MAIA not used	psPDtot+ [\
	psPDmod+
	Emax [V/m]

EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 easurement Results ate sPDn+ [W/m²] sPDt+ [W/m²] sPDtot+ [W/m²]

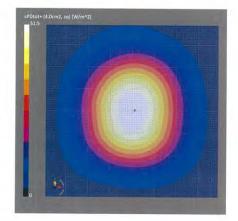
Power Drift [dB]

Probe, Calibration Date

5G Scan 2022-01-24, 11:01 4.00 51.3

DAE, Calibration Date DAE4ip Sn1602, 2021-06-25

51.5 51.7 148 0.01



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- End of report -

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