

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

Date: 2025-03-13

DASY5 Validation Report for Head TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1029

Communication System: UID 0, CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.947$ S/m; $\epsilon_r = 39.37$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(7.22, 7.19, 7.78) @ 2600 MHz; Calibrated: 2024-05-28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1588; Calibrated: 2024-09-13
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.00 V/m; Power Drift = -0.07 dB

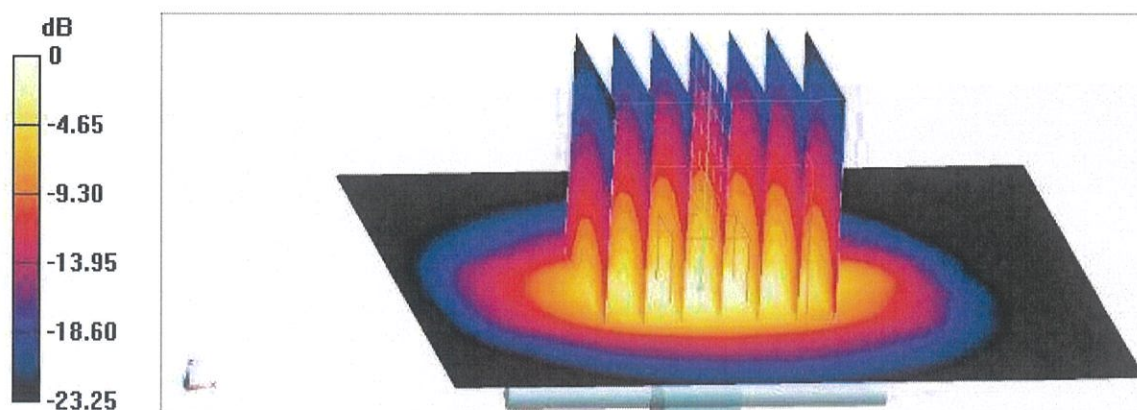
Peak SAR (extrapolated) = 28.7 W/kg

SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.2 W/kg

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 49.1%

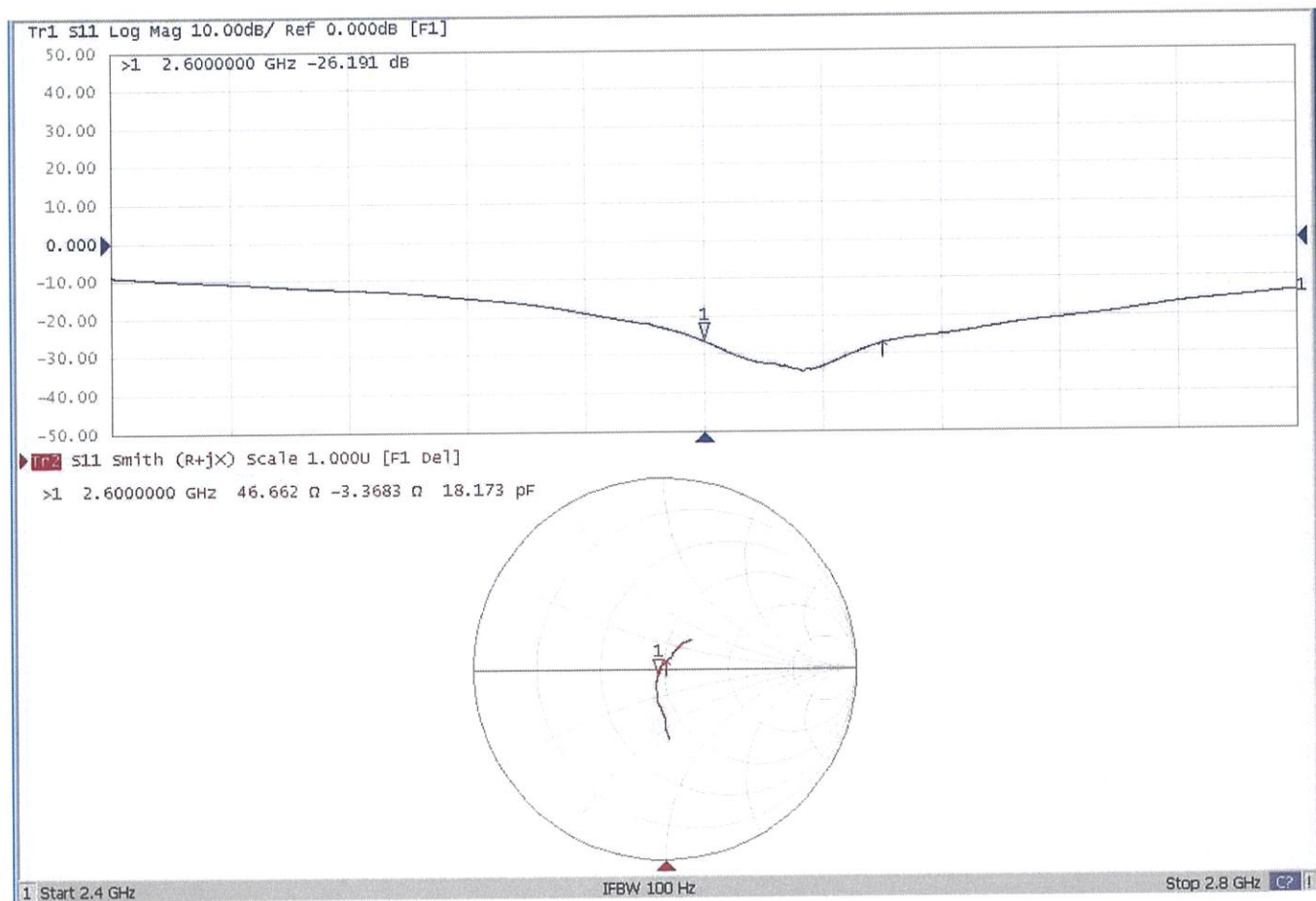
Maximum value of SAR (measured) = 23.3 W/kg



0 dB = 23.3 W/kg = 13.67 dBW/kg

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Impedance Measurement Plot for Head TSL



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Client

Dekra-CN

Certificate No: **25J02Z000131**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1078**

Calibration Procedure(s) **FF-Z11-003-01**
Calibration Procedures for dipole validation kits

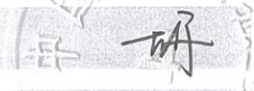
Calibration date: **March 14, 2025**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106276	17-May-24 (CTTL, No. J24X04107)	May-25
Power sensor NRP6A	101369	17-May-24 (CTTL, No. J24X04107)	May-25
Reference Probe EX3DV4	SN 7307	24-May-24(SPEAG, No. EX-7307_May24)	May-25
DAE4	SN 1588	13-Sep-24(CTTL-SPEAG, No. 24J02Z000713)	Sep-25
Secondary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	19-Dec-24 (CTTL, No. 24J02X103931)	Dec-25
NetworkAnalyzer E5071C	MY46110673	18-Dec-24 (CTTL, No. 24J02X103932)	Dec-25
OCP DAKS	SN 0015	09-Oct-24(SPEAG, No. OCP-DAKS-0015_Oct24)	Oct -25

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Jun	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 27, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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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-mounted 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) DASY4/5 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.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5750 MHz $\pm$ 1 MHz	

Head TSL parameters at 5250MHz

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 $\pm$ 0.2) °C	35.6 $\pm$ 6 %	4.66 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL at 5250MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.77 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	77.6 W/kg $\pm$ 24.4 % (k=2)
SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	21.6 W/kg $\pm$ 24.2 % (k=2)

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Head TSL parameters at 5600MHz

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	35.0 ± 6 %	5.03 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL at 5600MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.3 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.6 W/kg ± 24.2 % (k=2)

Head TSL parameters at 5750MHz

The following parameters and calculations were applied.

	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	34.8 ± 6 %	5.20 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

SAR result with Head TSL at 5750MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.77 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	77.4 W/kg ± 24.4 % (k=2)
SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	21.3 W/kg ± 24.2 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL at 5250MHz

Impedance, transformed to feed point	50.6Ω- 6.04jΩ
Return Loss	- 24.4dB

Antenna Parameters with Head TSL at 5600MHz

Impedance, transformed to feed point	56.7Ω- 4.25jΩ
Return Loss	- 22.6dB

Antenna Parameters with Head TSL at 5750MHz

Impedance, transformed to feed point	54.5Ω- 0.24jΩ
Return Loss	- 27.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.104 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point 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 feed-point may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 2025-03-14

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1078

Communication System: CW; Frequency: 5250 MHz, Frequency: 5600 MHz,
Frequency: 5750 MHz

Medium parameters used: $f = 5250$ MHz; $\sigma = 4.658$ S/m; $\epsilon_r = 35.63$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5600$ MHz; $\sigma = 5.034$ S/m; $\epsilon_r = 35.03$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5750$ MHz; $\sigma = 5.196$ S/m; $\epsilon_r = 34.81$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7307; ConvF(5.37, 5.49, 5.89) @ 5250 MHz;
ConvF(4.66, 4.74, 5.05) @ 5600 MHz; ConvF(4.69, 4.76, 5.08) @ 5750
MHz; Calibrated: 2024-05-28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1588; Calibrated: 2024-09-13
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial:
1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration /Pin=100mW, d=10mm, f=5250 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.60 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.17 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 64.1%

Maximum value of SAR (measured) = 18.8 W/kg

Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.36 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 36.8 W/kg

SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.27 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 61.6%

Maximum value of SAR (measured) = 20.3 W/kg

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Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan,
dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 61.22 V/m; Power Drift = -0.08 dB

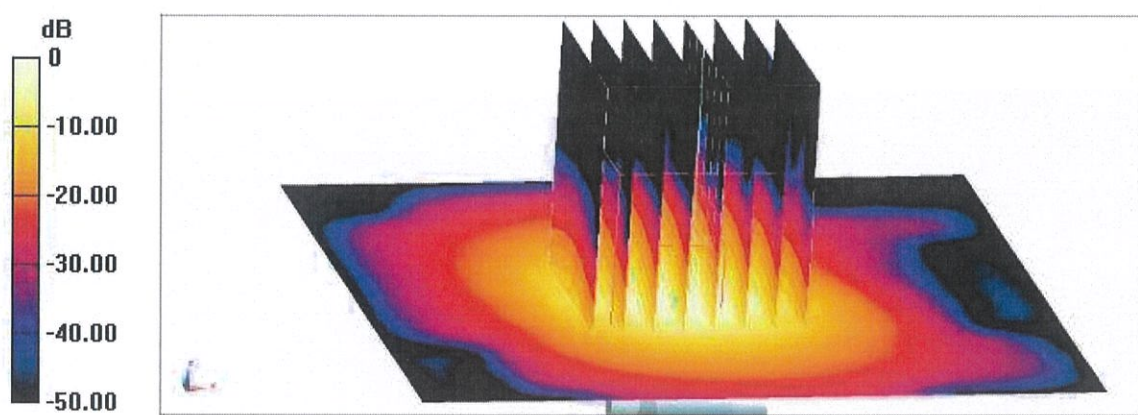
Peak SAR (extrapolated) = 36.2 W/kg

SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.14 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 60.6%

Maximum value of SAR (measured) = 19.7 W/kg

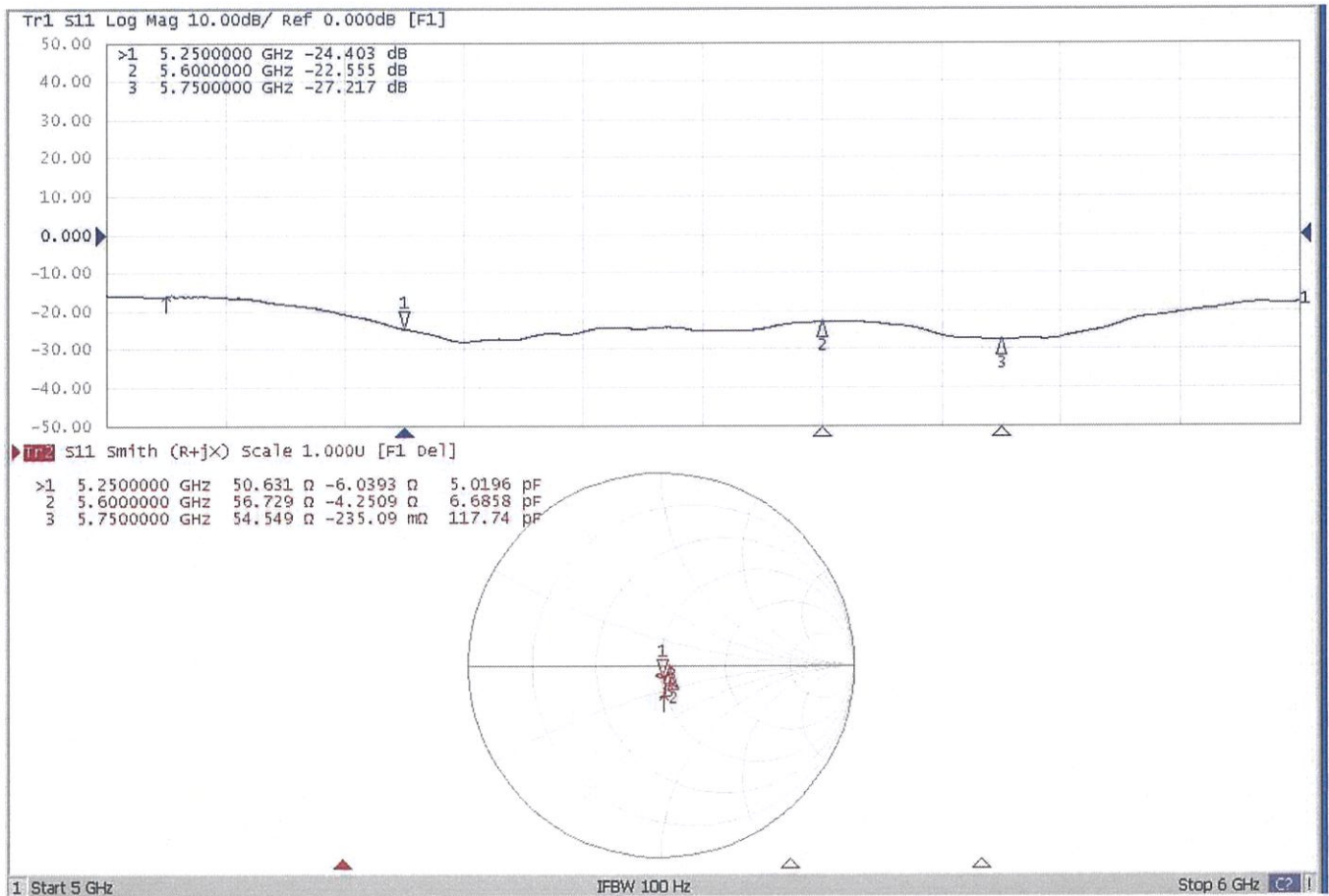


0 dB = 19.7 W/kg = 12.94 dBW/kg



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Impedance Measurement Plot for Head TSL





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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client DEKRA
Suzhou

Certificate No. 5G-Veri10-1055_Sep24

CALIBRATION CERTIFICATE

Object 5G Verification Source 10 GHz - SN: 1055

Calibration procedure(s) QA CAL-45.v5
Calibration procedure for sources in air above 6 GHz

Calibration date: September 16, 2024

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Reference Probe EUmmWV3	SN: 9374	28-Aug-24 (No. EUmm-9374_Aug24)	Aug-25
DAE4ip	SN: 1602	08-Nov-23 (No. DAE4ip-1602_Nov23)	Nov-24
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMF100A	SN: 100184	29-Nov-23 (in house check Nov-23)	In house check: Nov-24
Power sensor R&S NRP18S-10	SN: 101258	29-Nov-23 (in house check Nov-23)	In house check: Nov-24
Network Analyzer Keysight E5063A	SN: MY54504221	31-Oct-19 (in house check Oct-22)	In house check: Oct-25

Calibrated by:	Name Joanna Lleshaj	Function Laboratory Technician
Approved by:	Sven Kühn	Technical Manager

Signature

Issued: September 17, 2024

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Glossary

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Accreditation No.: **SCS 0108**

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CW Continuous wave

Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45, Calibration procedure for sources in air above 6 GHz.
- IEC/IEEE 63195-1, "Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz)", May 2022

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 far-field 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 (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%.

Measurement Conditions

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

DASY Version	DASY8 Module mmWave	V3.2
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
Number of measured planes	2 (10mm, 10mm + $\lambda/4$)	
Frequency	10 GHz $\pm$ 10 MHz	

Calibration Parameters, 10 GHz

Circular Averaging

Distance Horn Aperture to Measured Plane	<i>Prad</i>¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.4	56.2	1.28 dB

Distance Horn Aperture to Measured Plane	<i>Prad</i>¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Power Density psPDn+, psPDtot+, psPDmod+ (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.0, 60.6, 60.7	55.6, 56.4, 56.6	1.28 dB

Square Averaging

Distance Horn Aperture to Measured Plane	<i>Prad</i>¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.4	56.1	1.28 dB

Distance Horn Aperture to Measured Plane	<i>Prad</i>¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Power Density psPDn+, psPDtot+, psPDmod+ (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.0, 60.5, 60.7	55.5, 56.2, 56.5	1.28 dB

Max Power Density

Distance Horn Aperture to Measured Plane	<i>Prad</i>¹ (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Max Power Density Sn, Stot, Stot (W/m ²)	Uncertainty (k = 2)
10 mm	93.3	152	1.27 dB	61.7, 62.1, 62.2	1.28 dB

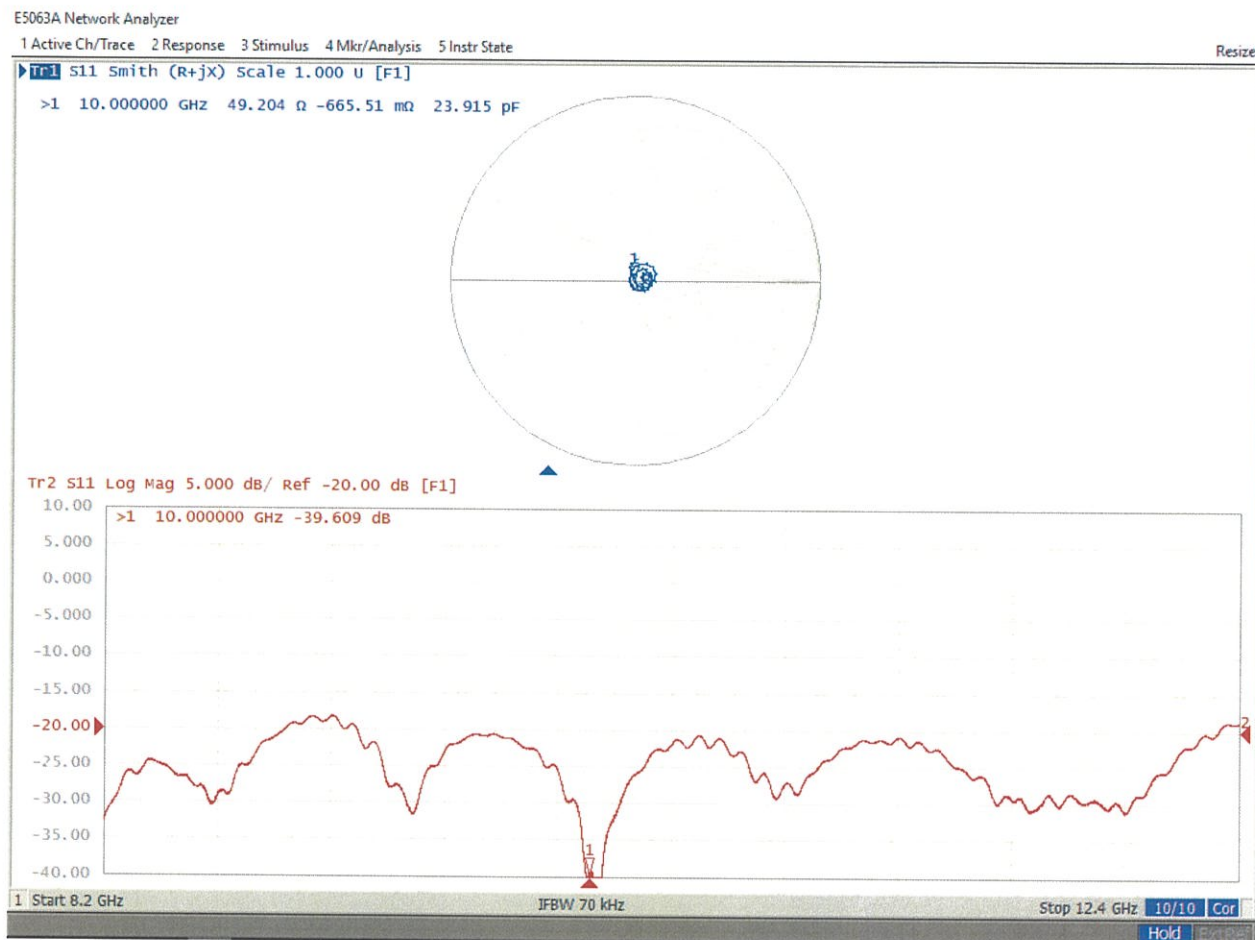
¹ Assessed ohmic and mismatch loss plus numerical offset: 0.30 dB

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters

Impedance, transformed to feed point	49.2 Ω - 0.7 j Ω
Return Loss	- 39.6 dB

Impedance Measurement Plot



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: 1055	-

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

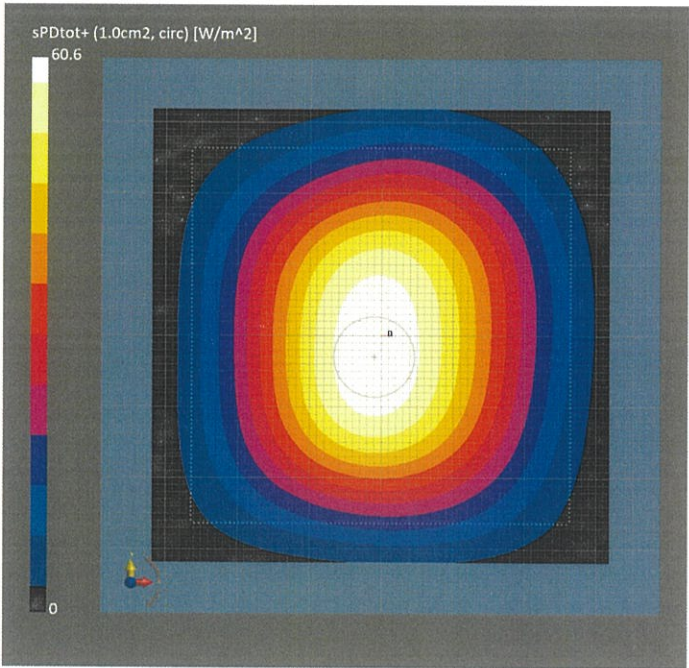
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0 MAIA not used

Measurement Results

Date	5G Scan
2024-09-16, 15:15	
Avg. Area [cm²]	1.00
Avg. Type	Circular Averaging
psPDn+ [W/m²]	60.0
psPDtot+ [W/m²]	60.6
psPDmod+ [W/m²]	60.7
Max(Sn) [W/m²]	61.7
Max(Stot) [W/m²]	62.1
Max(Stot) [W/m²]	62.2
E _{max} [V/m]	152
Power Drift [dB]	0.01



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: 1055	-

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

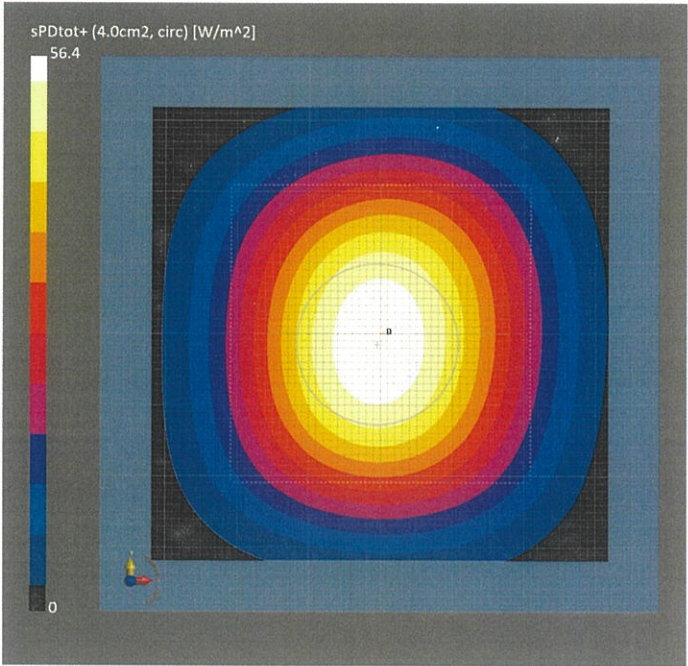
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0 MAIA not used

Measurement Results

Date	5G Scan
2024-09-16, 15:15	
Avg. Area [cm ²]	4.00
Avg. Type	Circular Averaging
psPDn+ [W/m ²]	55.6
psPDtot+ [W/m ²]	56.4
psPDmod+ [W/m ²]	56.6
Max(Sn) [W/m ²]	61.7
Max(Stot) [W/m ²]	62.1
Max(Stot) [W/m ²]	62.2
E _{max} [V/m]	152
Power Drift [dB]	0.01



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: 1055	-

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

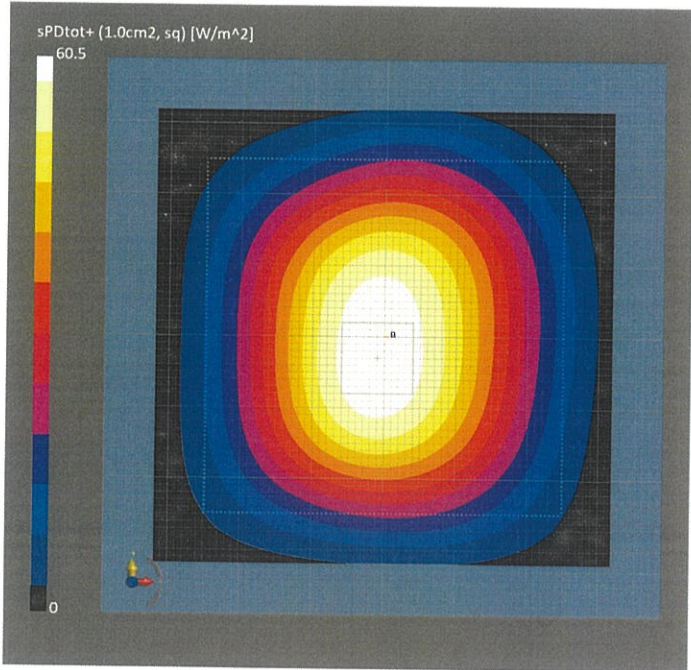
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0 MAIA not used

Measurement Results

Date	5G Scan
Avg. Area [cm²]	2024-09-16, 15:15
Avg. Type	1.00
psPDn+ [W/m²]	Square Averaging
psPDtot+ [W/m²]	60.0
psPDmod+ [W/m²]	60.5
Max(Sn) [W/m²]	60.7
Max(Stot) [W/m²]	61.7
Max(Stot) [W/m²]	62.1
E _{max} [V/m]	62.2
Power Drift [dB]	152
	0.01



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: 1055	-

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

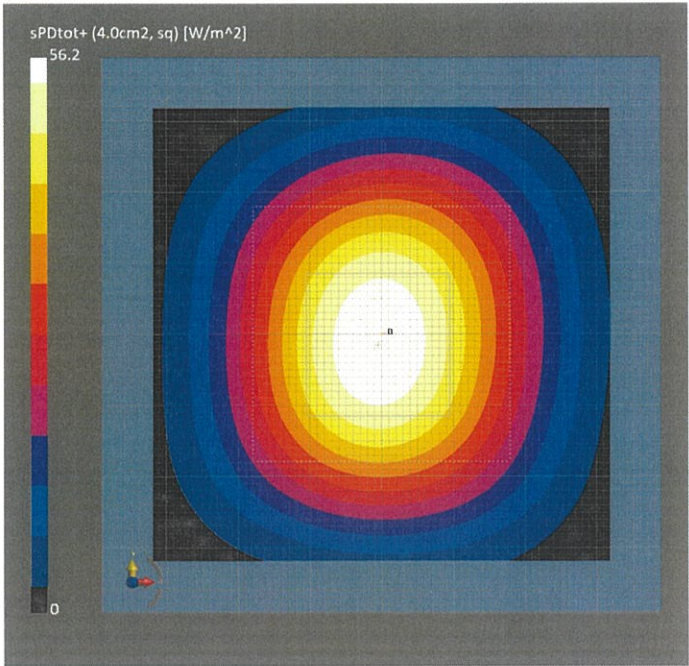
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0 MAIA not used

Measurement Results

Date	5G Scan
Avg. Area [cm²]	2024-09-16, 15:15 4.00
Avg. Type	Square Averaging
psPDn+ [W/m²]	55.5
psPDtot+ [W/m²]	56.2
psPDmod+ [W/m²]	56.5
Max(Sn) [W/m²]	61.7
Max(Stot) [W/m²]	62.1
Max(Stot) [W/m²]	62.2
E _{max} [V/m]	152
Power Drift [dB]	0.01





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 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client

DEKRA
 Suzhou

Certificate No.

D6.5GHzV2-1084_Sep25

CALIBRATION CERTIFICATE

Object **D6.5GHzV2 - SN: 1084**

Calibration procedure(s) **QA CAL-22.v7**
Calibration Procedure for SAR Validation Sources between 3 - 10 GHz

Calibration date **September 17, 2025**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Cal
Power Sensor R&S NRP-33T	SN: 100967	30-Apr-25 (No. 1020-300791789)	Apr-26
Power Sensor R&S NRP18A	SN: 101859	06-Feb-25 (No. 4030A315009541)	Feb-26
Spectrum Analyzer R&S FSV40	SN: 101832	29-Jan-25 (No. 4030A315009658)	Jan-26
3.5mm mismatch combination	SN: 1152	24-Mar-25 (No. 217-04293)	Mar-26
OCP DAK-12	SN: 1016	16-Sept-25 (No. OCP-DAK12-1016_Sep25)	Sep-26
OCP DAK-3.5	SN: 1249	16-Sept-25 (No. OCP-DAK3.5-1249_Sep25)	Sep-26
Reference Probe EX3DV4	SN: 7349	10-Jan-25 (No. EX3-7349_Jan25)	Jan-26
DAE4ip	SN: 1836	04-Sep-25 (No. DAE4ip-1836_Sep25)	Sep-26

Secondary Standards	ID	Check Date (in house)	Scheduled Check
ACAD Setup 1	SN: 1000	27-May-25 (No. 675-ACAD_Source_Box-250527)	May-26
Signal Generator R&S SMB100A	SN: 182081	27-May-25 (No. 675-CAL16-S4588-250527)	May-26
Mismatch; SMA	SN: 1102	24-Apr-25 (No. 675-Mismatch_SMA-250424)	Apr-26
OCP DAK-12	SN: 1029	27-Feb-25 (No. OCP-DAK12-1029_Feb25)	Feb-26
OCP DAK-3.5	SN: 1336	09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)	Dec-25

	Name	Function	Signature
Calibrated by	Claudio Leubler	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: September 18, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 0108

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

- 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.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation

- 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.
- *Electrical Delay*: One-way delay between the SMA connector and the antenna feed point. 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%.

Measurement Conditions

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

DASY Version	DASY8 Module SAR	17.0.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with spacer
Zoom Scan Resolution	dx, dy = 3.4mm, dz = 1.4mm	Graded Ratio = 1.4 mm (Z direction)
Frequency	6500MHz $\pm$ 1MHz	

HSL parameters at 6500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal HSL parameters	22.0 °C	34.5	6.07 mho/m
Measured HSL parameters	(22.0 $\pm$ 0.2)°C	34.7 $\pm$ 6%	6.14 mho/m $\pm$ 6%
HSL temperature change during test	< 0.5 °C		

SAR result with HSL at 6500 MHz

SAR averaged over 1 cm ³ (1 g) of HSL	Condition	
SAR for nominal HSL parameters	20 dBm input power	29.3 W/kg
SAR for nominal HSL parameters	normalized to 1W	293 W/kg $\pm$ 24.7% (k = 2)

SAR averaged over 8 cm ³ (8 g) of HSL	Condition	
SAR for nominal HSL parameters	20 dBm input power	6.57 W/kg
SAR for nominal HSL parameters	normalized to 1W	65.7 W/kg $\pm$ 24.4% (k = 2)

SAR averaged over 10 cm ³ (10 g) of HSL	Condition	
SAR for nominal HSL parameters	20 dBm input power	5.41 W/kg
SAR for nominal HSL parameters	normalized to 1W	54.1 W/kg $\pm$ 24.4% (k = 2)

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with HSL at 6500 MHz**

Impedance	52.6 Ω – 4.8 j Ω
Return Loss	-25.4 dB

APD (Absorbed Power Density)

APD averaged over 1 cm ³	Condition	
APD measured	20 dBm input power	293 W/kg
APD measured	normalized to 1W	2930 W/kg $\pm$ 29.2% (k = 2)

APD averaged over 4 cm ³	Condition	
APD measured	20 dBm input power	131 W/kg
APD measured	normalized to 1W	1310 W/kg $\pm$ 28.9% (k = 2)

*The reported APD values have been derived using the psSAR1g and psSAR8g.