



Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 77.09 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 28.9 W/kg SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.33 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 68.9% Maximum value of SAR (measured) = 18.3 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 76.69 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 32.9 W/kg SAR(1 g) = 8.60 W/kg; SAR(10 g) = 2.44 W/kg Smallest distance from peaks to all points 3 dB below = 7.2 mm Ratio of SAR at M2 to SAR at M1 = 66.4% Maximum value of SAR (measured) = 19.8 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 = 76.44 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 31.2 W/kg SAR(1 g) = 8.39 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 = 67.3% Maximum value of SAR (measured) = 19.3 W/kg

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 = 73.53 V/m; Power Drift = -0.08 dB Peak SAR (extrapolated) = 31.8 W/kg SAR(1 g) = 8.12 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 = 65.4% Maximum value of SAR (measured) = 19.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 74.35 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 32.9 W/kg SAR(1 g) = 8.27 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 = 65.2% Maximum value of SAR (measured) = 19.4 W/kg

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0 dB = 19.8 W/kg = 12.96 dBW/kg

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Impedance Measurement Plot for Head TSL (5200, 5250, 5300, 5500, 5600 MHz)

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Impedance Measurement Plot for Head TSL (5300, 5500, 5600, 5750, 5800 MHz)

| Eile | ⊻iew | Channel | Sweep | Calibration | Trace | <u>S</u> cale | Marker | System | Window | Help | | |
|------|-------------------|----------------------------|-------------|-------------|---------|---------------|--------------------|-------------------|--------------------------|------------|------------------------------|--------------------------|
| | | | | | | / | - | | | 3: | 5.300000 GHz | 46.215 Ω |
| | | | | | | \wedge | | 1- | A | 4: | 5.500000 GHz | -3.2069 Ω 49.978 Ω |
| | | | | | 1 | 1 | \sim | T | - | 5: | 9.2370 pF 5.600000 GHz | -3.1327 Ω 53.576 0 |
| | | | | | 1 | 4 | | \wedge | XX | | 13.425 pH | 472.39 mΩ |
| | | | | | L | | - | $\leftarrow \neq$ | 280 | 6: | 5.750000 GHz 16.469 pF | 51.897 Ω -1.6807 Ω |
| | | | | | | | 1 | T | XY | >7: | 5.800000 GHz 8.6324 pE | 51.225 Q |
| | | | | | F | -1 | X | \mathcal{N} | $\leftarrow \mathcal{A}$ | | 0.002401 | -0.1700 st |
| | | | | | | | \times | X | 5/ | | | |
| | | | | | | X | - | f | X | | | |
| | Ch1: Sta | Ch 1 Avg = rt 5.00000 (| 20 GHz — | _ | | | - | | | | Stop | 6 00000 GHz |
| i in | | | | | | | | | | | otop | C.COCO GILL |
| 10.0 | 00 | IB \$11 | | | | | | | | 3: | 5.300000 GHz | -25.759 dB |
| 0.0 | 00 | | | | | | | | | 5: | 5.800000 GHz | -29.163 dB |
| -5.0 | 00 | | | | _ | | | | | 6: > 7: | 5.750000 GHz 5.800000 GHz | -32.088 dB -29.463 dB |
| -10 | .00 | | | | | | | | | _ | | |
| -15 | .00 | | | | | | | | - | | | |
| -20 | .00 | _ | - | | | | | | | _ | | |
| -25 | .00 | | | | * | - | | | | | | |
| -30 | .00 | | | 2 | 3 | | | 0 | - | _ | | |
| -35 | .00 | | | | | | 4 | | - | | | |
| -40 | .00 L Ch1: Sta | Ch 1 Avg = rt 5.00000 (| 20 GHz — | _ | | | | | | | Stop | 6.00000 GHz |
| Sh | atue | СН 1. | 11 | | C* 1 D- | | Contraction of the | 1 00 | | | | |

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ANNEX I Sensor Triggering Data Summary

| ANT | P-Sensor Detect | Triggering distances |
|----------|-----------------|----------------------|
| WIFI ANT | Left | 6 mm |

According to the above description, this device was tested to check the SAR sensor triggering distances for the left edge of the device. The measured power state within \pm 5mm of the triggering points (or until touching the phantom) is included for each applicable edge.

To ensure all production units are compliant it is necessary to test SAR at a distance 1mm less than the smallest distance from the device and SAR phantom with the device at maximum output power without power reduction.

We monitor power changes with software built in the EUT and got the different proximity sensor triggering distances for left edge. The manufacturer has declared 6mm for left edge of WIFI antenna. Therefore, based on the most conservative triggering distances as above, additional SAR measurements were required at 5mm for left edge of WIFI antenna.

WLAN antenna

Left of WLAN antenna

Moving device toward the phantom:

| | The power state | | | | | | | | | | |
|---------------|-----------------|----------|----------|--------|--------|-----|-----|-----|-----|-----|-----|
| Distance [mm] | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Main antenna | Normal | Normal | Normal | Normal | Normal | Low | Low | Low | Low | Low | Low |
| Moving de | vice away | from the | phantom: | | | | | | | | |

| | The power state | | | | | | | | | | |
|---------------|-----------------|-----|-----|-----|-----|-----|--------|--------|--------|--------|--------|
| Distance [mm] | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Main antenna | Low | Low | Low | Low | Low | Low | Normal | Normal | Normal | Normal | Normal |





The influence of table tilt angles to proximity sensor triggering is determined by positioning each edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distance by rotating the device around the edge next to the phantom in $\leq 10^{\circ}$ increments until the tablet is ±45° or more from the vertical position at 0°.



The Left edge evaluation

Based on the above evaluation, we come to the conclusion that the sensor triggering is not released and normal maximum output power is not restored within the $\pm 45^{\circ}$ range at the smallest sensor triggering test distance declared by manufacturer.



ANNEX J SPOT CHECK

J.1 Dielectric Performance and System Validation

Table J.1-1: Dielectric Performance of Tissue Simulating Liquid

| Measurement Date (yyyy-mm-dd) | Туре | Frequency | Permittivity ε | Drift (%) | Conductivity σ (S/m) | Drift (%) |
|----------------------------------|------|-----------|-------------------|--------------|-------------------------|--------------|
| 2024/2/27 | Head | 2450 MHz | 39.97 | 1.96 | 1.866 | 3.67 |

Table J.1-2: System Validation of Head

| Measurement | | Target value (W/kg) | | Measured | value(W/kg) | Deviation | |
|--------------|-----------|---------------------|---------|----------|-------------|-----------|---------|
| Date | Frequency | 10 g | 1 g | 10 g | 1 g | 10 g | 1 g |
| (yyyy-mm-dd) | | Average | Average | Average | Average | Average | Average |
| 2024/2/27 | 2450 MHz | 24.7 | 52.1 | 25.0 | 54.0 | 1.38% | 3.65% |

J.2 Measurement result

| Test Position | Frequency Band | Channel Number | Frequency (MHz) | Test Position | Distance | Figure No | EUT Measured Power (dBm) | Tune up (dBm) | Measured SAR 1g (W/kg) | Calculated SAR 1g (W/kg) | Measured SAR 10g (W/kg) | Calculated SAR 10g (W/kg) | Power Drift |
|------------------|----------------|-------------------|--------------------|---------------|----------|-----------|-----------------------------------|------------------|------------------------------|--------------------------------|-------------------------------|---------------------------------|-------------|
| Body | WLAN-2.4G 11b | 6 | 2437 | Left | 5mm | FIG A.1 | 19.97 | 20 | 1.12 | 1.13 | 0.441 | 0.44 | 0.02 |

J.3 Reported SAR Comparison

| | Body SAR 1g | Body SAR 1g |
|-----------------|-------------|-------------|
| Technology Band | (W/kg) | (W/kg) |
| | Original | Spot check |
| WLAN 2.4GHz | 1.23 | 1.13 |
| WLAN 5GHz | 1.11 | 1 |
| Bluetooth | 0.39 | 1 |

J.4 Main Test Instruments

| No. | Name | Туре | Serial Number | Calibration Date | Valid Period | |
|-----|-----------------------|---------------|------------------|-------------------|--------------|--|
| 01 | Network analyzer | N5239A | MY55491241 | June 5, 2023 | One year | |
| 02 | Power sensor | NRP50S | 101488 | lupo 14, 2022 | One year | |
| 03 | Power sensor | NRP50S | 101489 | Julie 14, 2023 | | |
| 04 | Signal Generator | MG3700A | 6201052605 | June 12 2023 | One Year | |
| 05 | Amplifier | 60S1G4 | 0331848 | No Calibration R | lequested | |
| 07 | DAE | SPEAG DAE4 | 1525 | September 14,2023 | One year | |
| 08 | E-field Probe | SPEAG EX3DV4 | 7600 | December 19, 2023 | One year | |
| 09 | Dipole Validation Kit | SPEAG D2450V2 | 853 | July 11,2023 | One year | |

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J.5 Graph Results

WIFI2.4G Body

Date: 2/27/2024 Electronics: DAE4 Sn1525 Medium: H700-6000M Medium parameters used (interpolated): f = 2437 MHz; σ = 1.856 S/m; ϵ r = 39.995; ρ = 1000 kg/m3 Ambient Temperature:23.3°C Liquid Temperature: 22.5°C Communication System: UID 0, WLan 2450 (0) Frequency: 2437 MHz Duty Cycle: 1:1 Probe: EX3DV4 - SN7600 ConvF(8.08, 8.08, 8.08);

Area Scan (101x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm Maximum value of SAR (interpolated) = 1.59 W/kg

Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 21.22 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 2.55 W/kg SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.441 W/kg Maximum value of SAR (measured) = 1.99 W/kg







J.6 System Validation Results

2450MHz

Date: 2/27/2024 Electronics: DAE4 Sn1525 Medium: H700-6000M Medium parameters used: f = 2450 MHz; σ = 1.866 S/m; ϵ r = 39.97; ρ = 1000 kg/m3 Ambient Temperature:23.3°C Liquid Temperature: 22.5°C Communication System: CW (0) Frequency: 2450 MHz Duty Cycle: 1:1 Probe: EX3DV4 - SN7600 ConvF(8.08, 8.08, 8.08);

Area Scan (61x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm Maximum value of SAR (interpolated) = 22.8 W/kg

Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 109.2 V/m; Power Drift = 0.08 dB Peak SAR (extrapolated) = 28.3 W/kg SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.26 W/kg Maximum value of SAR (measured) = 22.8 W/kg







J.7 Probe Calibration Certificate

Probe 7600 Calibration Certificate

| | the second secon | | CALIBRATION |
|---|--|--|--|
| Add: No.52 HuaYuanBei F Tel: +86-10-62304633-211 | oad, Haidian District, Beijing, 100191, | , China Manuality | CNAS L0570 |
| E-mail: emf@caict.ac.cn | http://www.caict.ac.cn | Certificate No: | 23 102780177 |
| Client CT | | Certificate NO. | 23302200177 |
| CALIBRATION C | ERTIFICATE | | |
| Dhiect | | | |
| Djeci | EX3DV4 - SN : 7600 | 0 | |
| Calibration Procedure(s) | EE 711 004 00 | | |
| | Calibration Procedu | res for Dosimetric F-field Probes | |
| | | | |
| Jalibration date: | December 19, 2023 | | |
| his calibration Certificate docu | ments the traceability to national st | tandards, which realize the physical un | its of measurements(SI). The |
| neasurements and the uncerta | nties with confidence probability ar | re given on the following pages and are | e part of the certificate. |
| | | | |
| | | | |
| All calibrations have been cond | ucted in the closed laboratory facilit | ity: environment temperature(22±3)°C ar | nd humidity<70%. |
| All calibrations have been cond | ucted in the closed laboratory facilit | ity: environment temperature(22±3)°C ar | nd humidity<70%. |
| All calibrations have been cond | ucted in the closed laboratory facilit | ity: environment temperature(22±3)°C ar | nd humidity<70%. |
| All calibrations have been cond Calibration Equipment used (M Primary Standards | ATE critical for calibration) | ity: environment temperature(22±3)°C ar ibrated by, Certificate No.) Schedule | nd humidity<70%. |
| All calibrations have been cond Calibration Equipment used (M Primary Standards Power Meter NRP2 | ATE critical for calibration) ID # Cal Date(Calibration) 101919 12-Jun- 101517 12. https://www.calibration.com/calibration/ | ity: environment temperature(22±3)°C ar ibrated by, Certificate No.) Schedule 23(CTTL, No.J23X05435) | nd humidity<70%. Ind Calibration Jun-24 |
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| All calibrations have been cond Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 | ID # Cal Date(Calii) 101919 12-Jun- 101547 12-Jun- 101548 12-Jun- 18N50W-10dB 19-Jan- 18N50W-20dB 19-Jan- SN 3846 31-May SN 1555 24-Aug | ity: environment temperature(22±3)°C ar ibrated by, Certificate No.) Schedule I+23(CTTL, No.J23X05435) I+23(CTTL, No.J23X05435) I+23(CTTL, No.J23X00212) I+23(CTTL, No.J23X00211) I+23(SPEAG, No.EX-3846_May23) I+23(SPEAG, No.DAE4-1555_Aug23) | nd humidity<70%. ad Calibration Jun-24 Jun-24 Jun-24 Jan-25 Jan-25 May-24 Aug-24 |
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| All calibrations have been cond Calibration Equipment used (M Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A | ID # Cal Date(Calii 10 # Cal Date(Calii 101919 12-Jun- 101547 12-Jun- 101548 12-Jun- 18N50W-10dB 19-Jan- 18N50W-20dB 19-Jan- SN 3846 31-May SN 1555 24-Aug ID # Cal Date | ity: environment temperature(22±3)℃ ar ibrated by, Certificate No.) Schedule I+23(CTTL, No.J23X05435) I+23(CTTL, No.J23X05435) I+23(CTTL, No.J23X005435) I+23(CTTL, No.J23X00212) I+23(CTTL, No.J23X00211) y-23(SPEAG, No.EX-3846_May23) j-23(SPEAG, No.DAE4-1555_Aug23) Ite(Calibrated by, Certificate No.) I+23(CTTL, No.J23X05434) | nd humidity<70%. ad Calibration Jun-24 Jun-24 Jun-24 Jan-25 Jan-25 May-24 Aug-24 Scheduled Calibration Jun-24 |
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Certificate No: 23J02Z80177

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CAICT No. 24T04Z100346-001





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Glossary:

| ISL | tissue simulating liquid |
|----------------|--|
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A,B,C,D | modulation dependent linearization parameters |
| Polarization Φ | Φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i |
| | $\theta=0$ is normal to probe axis |

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "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)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z* frequency_response (see Frequency Response Chart). This
 linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the
 frequency response is included in the stated uncertainty of ConvF.
- DCPx, y, z: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z:A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7600

Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (<i>k</i> =2) |
|---|----------|----------|----------|--------------------|
| Norm(µV/(V/m) ²) ^A | 0.67 | 0.65 | 0.67 | ±10.0% |
| DCP(mV) ^B | 111.0 | 110.7 | 109.8 | |

Modulation Calibration Parameters

| UID | Communication | | A | В | С | D | VR | Unc ^E |
|-----|---------------|---|-----|------|-----|------|-------|------------------|
| | System Name | | dB | dBõV | 1 | dB | mV | (<i>k</i> =2) |
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 210.1 | ±2.1% |
| | | Y | 0.0 | 0.0 | 1.0 | | 204.2 | 7 |
| | | Z | 0.0 | 0.0 | 1.0 | | 209.2 | |

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%.

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7600

Calibration Parameter Determined in Head Tissue Simulating Media

| f [MHz] ^C | Relative | Conductivity | ConvE X | ConvF Y | ConvF Z | Alpha ^G | Depth ^G | Unct. |
|----------------------|----------------|--------------------|---------|---------|---------|--------------------|--------------------|----------------|
| . [] | Permittivity F | (S/m) [⊦] | CONT A | | | | (mm) | (<i>k</i> =2) |
| 750 | 41.9 | 0.89 | 10.95 | 10.95 | 10.95 | 0.13 | 1.42 | ±12.7% |
| 900 | 41.5 | 0.97 | 10.47 | 10.47 | 10.47 | 0.14 | 1.45 | ±12.7% |
| 1450 | 40.5 | 1.20 | 9.28 | 9.28 | 9.28 | 0.19 | 1.05 | ±12.7% |
| 1750 | 40.1 | 1.37 | 8.98 | 8.98 | 8.98 | 0.24 | 1.05 | ±12.7% |
| 1900 | 40.0 | 1.40 | 8.63 | 8.63 | 8.63 | 0.27 | 1.00 | ±12.7% |
| 2000 | 40.0 | 1.40 | 8.55 | 8.55 | 8.55 | 0.24 | 1.08 | ±12.7% |
| 2300 | 39.5 | 1.67 | 8.34 | 8.34 | 8.34 | 0.55 | 0.75 | ±12.7% |
| 2450 | 39.2 | 1.80 | 8.08 | 8.08 | 8.08 | 0.55 | 0.76 | ±12.7% |
| 2600 | 39.0 | 1.96 | 7.89 | 7.89 | 7.89 | 0.62 | 0.69 | ±12.7% |
| 3300 | 38.2 | 2.71 | 7.45 | 7.45 | 7.45 | 0.40 | 0.98 | ±13.9% |
| 3500 | 37.9 | 2.91 | 7.29 | 7.29 | 7.29 | 0.40 | 1.03 | ±13.9% |
| 3700 | 37.7 | 3.12 | 7.12 | 7.12 | 7.12 | 0.40 | 1.06 | ±13.9% |
| 3900 | 37.5 | 3.32 | 6.94 | 6.94 | 6.94 | 0.35 | 1.35 | ±13.9% |
| 4100 | 37.2 | 3.53 | 6.85 | 6.85 | 6.85 | 0.35 | 1.28 | ±13.9% |
| 4200 | 37.1 | 3.63 | 6.75 | 6.75 | 6.75 | 0.35 | 1.35 | ±13.9% |
| 4400 | 36.9 | 3.84 | 6.64 | 6.64 | 6.64 | 0.35 | 1.35 | ±13.9% |
| 4600 | 36.7 | 4.04 | 6.54 | 6.54 | 6.54 | 0.35 | 1.40 | ±13.9% |
| 4800 | 36.4 | 4.25 | 6.49 | 6.49 | 6.49 | 0.35 | 1.48 | ±13.9% |
| 4950 | 36.3 | 4.40 | 6.22 | 6.22 | 6.22 | 0.35 | 1.50 | ±13.9% |
| 5250 | 35.9 | 4.71 | 5.65 | 5.65 | 5.65 | 0.40 | 1.52 | ±13.9% |
| 5600 | 35.5 | 5.07 | 5.00 | 5.00 | 5.00 | 0.45 | 1.48 | ±13.9% |
| 5750 | 35.4 | 5.22 | 5.11 | 5.11 | 5.11 | 0.40 | 1.58 | ±13.9% |

^c Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequency up to 6 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than \pm 1% for frequencies below 3 GHz and below \pm 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM

f=1800 MHz, R22







Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

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Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (k=2)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7600

Other Probe Parameters

| Sensor Arrangement | Triangular |
|---|------------|
| Connector Angle (°) | 42.1 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disable |
| Probe Overall Length | 337mm |
| Probe Body Diameter | 10mm |
| Tip Length | 9mm |
| Tip Diameter | 2.5mm |
| Probe Tip to Sensor X Calibration Point | 1mm |
| Probe Tip to Sensor Y Calibration Point | 1mm |
| Probe Tip to Sensor Z Calibration Point | 1mm |
| Recommended Measurement Distance from Surface | 1.4mm |

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J.8 Dipole Calibration Certificate

2450 MHz Dipole Calibration Certificate

| Client CTIL Beijing Certificate No. D2450V2-853_Jul23 CALIBRATION CERTIFICATE D2450V2 - SN:853 Object D2450V2 - SN:853 Calibration procedure(s) QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: July 11, 2023 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 Slandards 10 # Cal Date (Certificate No.) Scheduled Calibration Mar-24 Power meter NRP-291 SN: 104778 30-Mar-23 (No. 217-03804) Mar-24 Power sensor NRP-291 SN: 103245 30-Mar-23 (No. 217-03805) Mar-24 Power sensor NRP-291 SN: 103245 30-Mar-23 (No. 217-03805) Mar-24 Power sensor NRP-291 SN: 103245 30-Mar-23 (No. 217-03805) Mar-24 Power sensor NRP-291 SN: 103245 30-Mar-23 (No. 217-03805) Mar-24 Power sensor NRP-291 SN: 103245 30-M | The Swiss Accreditation Service | ch, Switzerland ition Service (SAS) e is one of the signatori | es to the EA | S Schweizerischer Kalibrierdienst C Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service Accreditation No.: SCS 0108 |
|---|--|--|---|--|
| CALIBRATION CERTIFICATE Object D2450V2 - SN:853 Calibration procedure(s) QA CAL-05 v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: July 11, 2023 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 calibration shave been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. | Client CTTL Beiling | ecognition of calibration | n certificates Certificate N | o. D2450V2-853_Jul23 |
| Object D2450V2 - SN:853 Calibration procedure(s) QA CAL-05.V12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: July 11, 2023 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 calibration Equipment used (M&TE critical for calibration) Primary Standards D# Cal Date (Certificate No.) Scheduled Calibration Prower neers NRP-291 SN: 103244 SN: 103244 30-Mar-23 (No. 217-03804/03805) Mar-24 Power sensor NRP-291 SN: 103244 SN: 103245 30-Mar-23 (No. 217-03804/03805) Mar-24 Power sensor NRP-291 SN: 103245 SN: 103245 30-Mar-23 (No. 217-03806) Mar-24 SN: 601 Type-N mismatch combination SN: 30982 / 06327 SN: 601 19-Dec22 (No. DAE-4601_Dec22) DAE-4 SN: 601 Power neet F4198 SN: GB369512475 Power neet F4198 SN: CB3792783 SN: 10077 SN: 100372 | CALIBRATION (| ERTIFICAT | E | |
| Calibration procedure(s) QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: July 11, 2023 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%. | Object | D2450V2 - SN:8 | 53 | |
| Calibration date: July 11, 2023 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 procedure(s) | QA CAL-05.v12 Calibration Proce | edure for SAR Validation Source | es between 0.7-3 GHz |
| 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 date: | July 11, 2023 | | 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1. |
| Ower sensor NRP-Z91 SN: 104/78 30-Mar-23 (No. 217-03804/03805) Mar-24 Power sensor NRP-Z91 SN: 103244 30-Mar-23 (No. 217-03804) Mar-24 Power sensor NRP-Z91 SN: 103245 30-Mar-23 (No. 217-03805) Mar-24 Reference 20 dB Attenuator SN: 8H9394 (20k) 30-Mar-23 (No. 217-03809) Mar-24 Reference 20 dB Attenuator SN: 8H9394 (20k) 30-Mar-23 (No. 217-03809) Mar-24 Reference Probe EX3DV4 SN: 310982 / 06327 30-Mar-23 (No. 217-03810) Mar-24 DAE4 SN: 601 19-Dec-22 (No. DAE4-601_Dec22) Dec-23 Secondary Standards ID # Check Date (in house) Scheduled Check Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: 100972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 Network Analyzer Agilent E8358A Name Function Signature Calibrated by: Name Function Signature < | The measurements and the uncer All calibrations have been conduct Calibration Equipment used (M&T | rtainties with confidence p ted in the closed laborato E critical for calibration) | robability are given on the following pages r ry facility: environment temperature (22 \pm 3) | units of measurements (SI). and are part of the certificate.)°C and humidity < 70%. |
| Secondary Standards ID # Check Date (in house) Scheduled Check Power sensor HP 8481A SN: GB39512475 30-Oct-14 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: 10972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter NRP2 | tainties with confidence p ted in the closed laborato 'E critical for calibration) | Cal Date (Certificate No.) | Scheduled Calibration |
| Reference 20 dB Attenuator SN: BH9394 (20k) 30-Mar-23 (No. 217-03809) Mar-24 Type-N mismatch combination SN: BH9394 (20k) 30-Mar-23 (No. 217-03809) Mar-24 Reference Probe EX3DV4 SN: 310982 / 06327 30-Mar-23 (No. 217-03810) Mar-24 DAE4 SN: 7349 10-Jan-23 (No. EX3-7349 Jan23) Jan-24 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: 100972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 Network Analyzer Agilent E8358A Nume Function Signature Calibrated by: Paulo Pina Laboratory Technician Signature | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power sensor NRP-791 | tainties with confidence p ted in the closed laborato 'E critical for calibration) ID # SN: 104778 SN: 10474 | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 20-Mar-23 (No. 217-03804/03805) | Scheduled Calibration Mar-24 |
| Type-N mismatch combination SN: 310982 / 06327 30-Mar-23 (No. 217-03810) Mar-24 Reference Probe EX3DV4 SN: 7349 10-Jan-23 (No. EX3-7349 Jan23) Jan-24 DAE4 SN: 601 19-Dec-22 (No. DAE4-601_Dec22) Dec-23 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: 100972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 Network Analyzer Agilent E8358A Name Function Signature Calibrated by: Paulo Pina Laboratory Technician Signature | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power sensor NRP-Z91 Power sensor NRP-Z91 | tainties with confidence p ted in the closed laborato 'E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) | Inits of measurements (SI), and are part of the certificate.)°C and humidity < 70%. <u>Scheduled Calibration</u> Mar-24 Mar-24 Mar-24 |
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| DAE4 SN: 601 19-Dec-22 (No. DAE4-601_Dec22) Dec-23 Secondary Standards ID # Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: WY41093315 07-Oct-15 (in house check Oct-22) In house check: Oct-24 Power sensor HP 8481A SN: MY41093315 07-Oct-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 Name Function Signature Calibrated by: Paulo Pina Laboratory Technician | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination | tainties with confidence p ted in the closed laborato E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: BH9394 (20k) SN: 310982 / 06327 | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) | Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 |
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| Power sensor HP 8481A SN: MY41093315 07-Oct-15 (in house check Oct-22) In house check: Oct-24 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-22) In house check: Oct-24 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-22) In house check: Oct-24 Name Function Signature Calibrated by: Paulo Pina Laboratory Technician | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E4419B | tainties with confidence p ted in the closed laborato 'E critical for calibration) ID # SN: 104778 SN: 103244 SN: 103245 SN: 103245 SN: 8H9394 (20k) SN: 310982 / 06327 SN: 7349 SN: 601 ID # SN: 6B39512475 | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. EX3-7349_Jan23) 19-Dec-22 (No. DAE4-601_Dec22) Check Date (in house) 30-Oct-14 (in house check Oct-22) | Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Jan-24 Jan-24 Dec-23 Scheduled Check |
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| Calibrated by: Paulo Pina Laboratory Technician | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A | ID # ID # SN: 104778 SN: 103244 SN: 103244 SN: 103245 SN: 310982 / 06327 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: 100972 SN: US41080477 | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03809) 30-Mar-23 (No. 217-03810) 10-Jan-23 (No. 217-03810) 10-Jan-23 (No. 2X3-7349_Jan23) 19-Dec-22 (No. DAE4-601_Dec22) Check Date (in house) 30-Oct-14 (in house check Oct-22) 07-Oct-15 (in house check Oct-22) 15-Jun-15 (in house check Oct-22) 31-Mar-14 (in house check Oct-22) | Scheduled Calibration Scheduled Calibration %C and humidity < 70%. Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-2 |
| fantha | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter E44198 Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A | ID # SN: 104778 SN: 103245 SN: 109324 SN: 109324 SN: 061 ID # SN: GB39512475 SN: US3729783 SN: 100972 SN: US41080477 Name | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03805) 30-Mar-23 (No. 217-03809) 30-Oct-14 (in house check Oct-22) Check Date (in house) 30-Oct-14 (in house check Oct-22) 07-Oct-15 (in house check Oct-22) 15-Jun-15 (in house check Oct-22) 31-Mar-14 (in house check Oct-22) Function | Scheduled Calibration Scheduled Calibration Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Jan-24 Dec-23 Scheduled Check In house check: Oct-24 In house check: Oct-24 |
| Approved by: Sven Kühn Technical Manager 5/1 | The measurements and the uncer All calibrations have been conduc Calibration Equipment used (M&T <u>Primary Standards</u> Power meter NRP2 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 <u>Secondary Standards</u> Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent E8358A Calibrated by: | ID # SN: 104778 SN: 103244 SN: 103245 SN: 7349 SN: 601 ID # SN: GB39512475 SN: US37292783 SN: US41080477 Name Paulo Pina | Cal Date (Certificate No.) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804/03805) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03804) 30-Mar-23 (No. 217-03809) 30-Oct-14 (in house check Oct-22) Check Date (in house) 30-Oct-15 (in house check Oct-22) 07-Oct-15 (in house check Oct-22) 15-Jun-15 (in house check Oct-22) 31-Mar-14 (in house check Oct-22) Function Laboratory Technician | Scheduled Calibration Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Mar-24 Jan-24 Jan-24 Dec-23 Scheduled Check In house check: Oct-24 In house check: Oct-24 |
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Calibration Laboratory of Schmid & Partner **Engineering AG** Zeughausstrasse 43, 8004 Zurich, Switzerland



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

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.
- 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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