

## Probe Uncertainty

The following tables provide material and frequency specific uncertainties ( $k=2$ ) for the dielectric probe. The values in the tables represent the measurement capability for the probe when measuring a material in the indicated parameter range. They include all uncertainties of

- probe system
- possible systematic errors due to the design
- calibration
- temperature differences during the calibration and measurements, as described,
- VNA noise

Apart from the material used for the calibration (de-ionized water), material uncertainties of the reference materials used during the measurement in Appendix A are not included in these tables.

| <b>DAK-3.5</b>           |          |                 |                      |                |
|--------------------------|----------|-----------------|----------------------|----------------|
| Permittivity range       |          | Frequency range | (sigma / LT range)   | Unc. ( $k=2$ ) |
|                          | 1 – 15   | 200 MHz - 3 GHz | LT < 0.1             | 2.4%           |
|                          |          | 3 GHz - 6 GHz   | LT < 0.1             | 2.0%           |
|                          |          | 6 GHz - 20 GHz  | LT < 0.1             | 2.1%           |
|                          |          | 6 GHz - 20 GHz  | sigma > 1            | 3.5%           |
|                          |          |                 |                      |                |
|                          | 10 – 40  | 200 MHz - 3 GHz | sigma : 1 – 10 S/m   | 1.9%           |
|                          |          | 3 GHz - 6 GHz   | sigma : 1 – 10 S/m   | 2.3%           |
|                          |          | 6 GHz - 20 GHz  | sigma > 10 S/m       | 3.5%           |
|                          |          |                 |                      |                |
|                          | 35 – 100 | 200 MHz - 3 GHz | sigma : 1 – 10 S/m   | 1.8%           |
|                          |          | 3 GHz - 6 GHz   | sigma : 1 – 10 S/m   | 1.9%           |
|                          |          | 6 GHz - 20 GHz  | sigma > 10 S/m       | 2.4%           |
|                          |          |                 |                      |                |
| Conductivity range (S/m) |          | Frequency range | (epsilon / LT range) | Unc. ( $k=2$ ) |
|                          | 1 – 10   | 200 MHz - 3 GHz | eps : 35 - 100       | 2.7%           |
|                          |          | 3 GHz - 6 GHz   | eps : 35 - 100       | 3.0%           |
|                          |          | 6 GHz - 20 GHz  | eps : 10 - 40        | 3.0%           |
|                          |          |                 |                      |                |
| Loss tangent range       |          | Frequency range | (epsilon / LT range) | Unc. ( $k=2$ ) |
|                          | < 0.1    | 200 MHz - 3 GHz | eps : 1 - 15         | 0.03           |
|                          |          | 3 GHz - 6 GHz   | eps : 1 - 15         | 0.03           |
|                          |          | 6 GHz - 20 GHz  | eps : 1 - 15         | 0.03           |

## Calibration Results

Uncertainty limits ( $k=2$ ) for the material measurements in the figures of Appendix A are represented with red dashed lines. These uncertainties contain - in addition to probe uncertainty - the uncertainty of the material target parameter determination.

The measurements show the results obtained from independent calibrations for the same material. The differences between the individual measurement curves give therefore an indication for the obtainable repeatability and shall lie within the uncertainties stated in the tables.

*Materials for DAK-3.5 calibration:*

*Appendix A with curves for Ethanol\*, HBBL, and 0.05 mol/L NaCl solution (200 MHz - 6 GHz, optional 20 GHz), HS gel and low loss solid substrate are optional.*

*\* Effective immediately, methanol will be replaced with the safer and more environmentally-friendly ethanol as the validation liquid. Each batch of ethanol is calibrated using a methanol reference, ensuring that the validation process is both traceable and consistent with prior measurements.*

## Appendix A: Detailed Results

### A.1 Probe appearance and calibration sequence

#### A.1.1 Appearance

The OCP appearance is fully according to the expectations:

- the flange surface is intact

#### A.1.2 Calibration sequence

The following sequence was repeated 3 times in the low frequency range from 200 – 300 MHz in 5 MHz steps and in the high frequency range from 300 to 6000 MHz in 50 MHz steps, and from 6 GHz to 20 GHz in 250 MHz steps.

- Air
- Short 1 short, then immediate verification with a second short (with eventual repetition)
- Water De-ionized water, temperature measured and set in the software (for DAK-12 0.1 mol/L saline solution, temperature measured and set in the software)
- Methanol Pure methanol, temperature measured and set in the software
- Ethanol Pure ethanol, temperature measured and set in the software
- Liquids Measurement of further liquids (e.g. Head tissue simulating liquid and 0.05 mol/l saline)
- Cleaning Probe washed with water and isopropanol at the end of the sequence.
- Shorts 4 additional separate short measurements to determine the deviation from the original
- Refresh Refresh with Air
- Solid 4 separate solid low loss planar substrate measurements to determine one average (optional)
- Semisolid 4 separate head gel measurements on fresh intact surface to determine one average (optional)
- Cleaning Probe washed with water and isopropanol at the end of the sequence

Evaluation of the additional shorts from the calibrated (ideal) short point at the left edge of the Smith Chart, represented as magnitude over the frequency range (fig. 2.1.x) and in polar representation (fig. 2.2.x).

Evaluation of the Liquid measurements and representation of the permittivity and conductivity deviation from their reference data at the measurement temperature. The results of each of the 3 calibrations is shown in the appendix for each material (fig. 3ff) in black, red, blue. The red dashed line shows the uncertainty of the reference material parameter determination.

Evaluation of the Semisolid measurements (optional) by representing the 3 average deviations (each resulting from the 4 separate measurements per set), equivalent to the liquid measurement. Representation of the permittivity and conductivity deviation from their reference data at the nominal temperature.

Evaluation of the Solid measurements (optional) by representing the 3 average deviations (each resulting from the 4 separate measurements per set), equivalent to the liquid measurement. Representation of the permittivity deviation from their reference data and the loss tangent at the nominal temperature.

## A.2 Short residual magnitudes

After each of the 3 calibrations with a single short (as per the DAK software), 4 additional separate, short measurements were performed after the liquid measurements and evaluated from the S11 data. The residuals in the graphs represent the deviation from the ideal short point on the polar representation on the VNA screen.

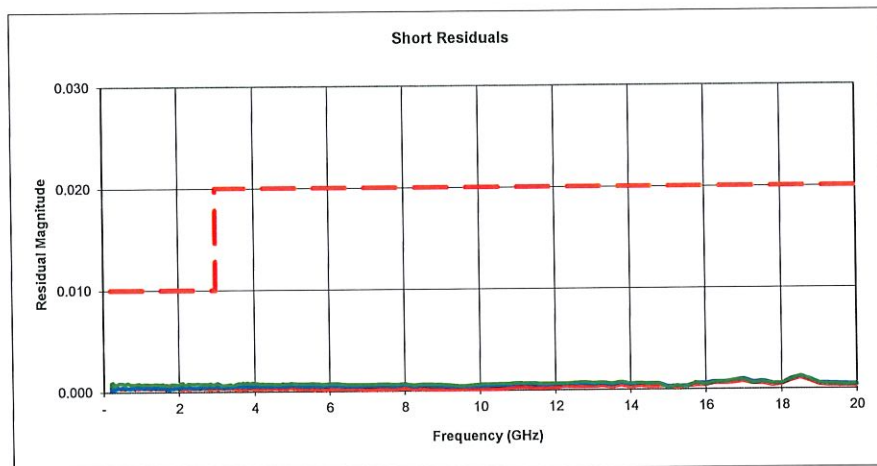


Fig. 2.1a Magnitude of the residual of the shorts, 200 MHz – 20 GHz, after calibration a)

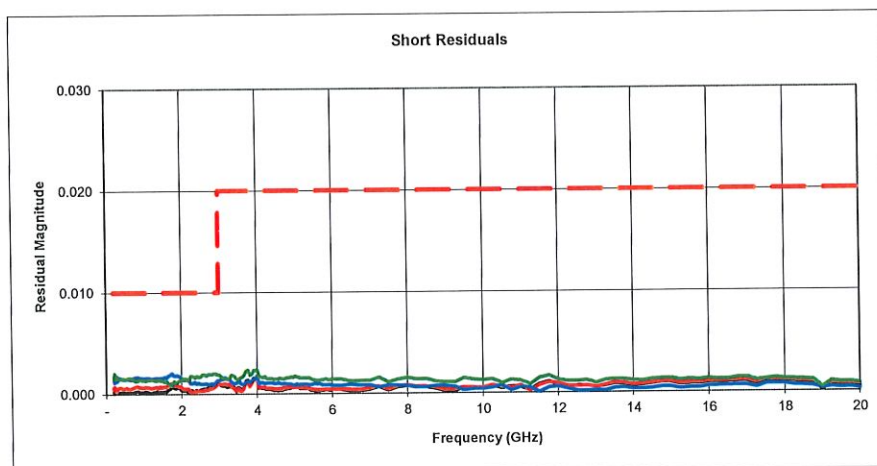


Fig. 2.1b Magnitude of the residual of the shorts, 200 MHz – 20 GHz, after calibration b)

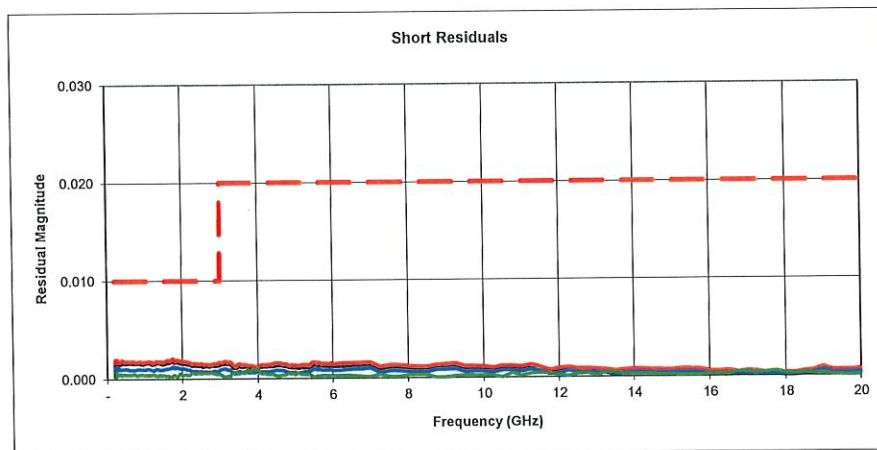


Fig. 2.1c Magnitude of the residual of the shorts, 200 MHz – 20 GHz, after calibration c)

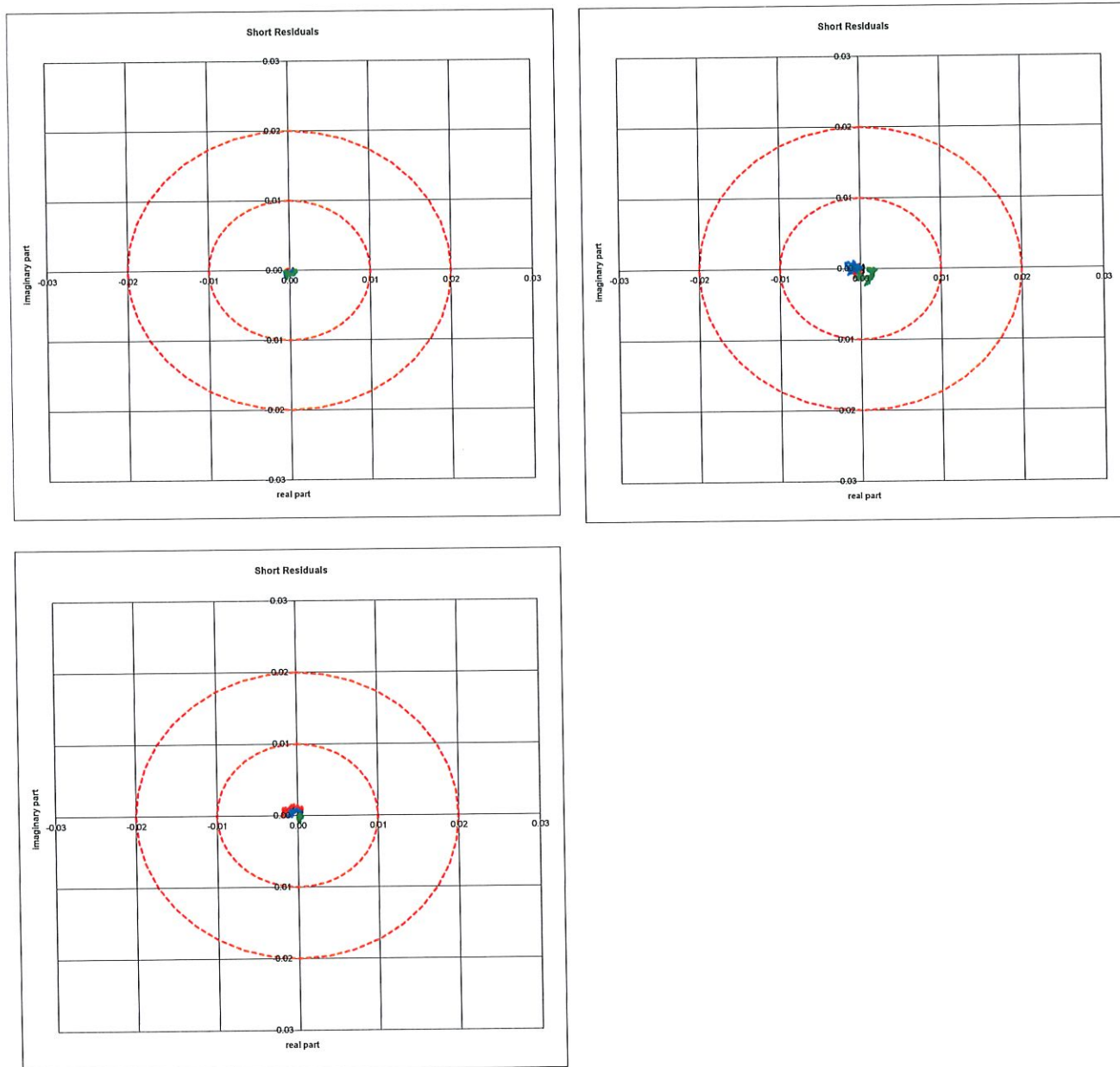


Fig. 2.2a-c Complex representation of the residuals of the shorts, 200 MHz - 20 GHz, after calibrations a)-b) in the top and c) in the bottom

All shorts have good quality. Some minor deviations might be visible from contact quality (left - right).

### A.3 Ethanol

Ethanol (99.9% pure) was measured at a temperature of  $22 \pm 2$  °C. The liquid temperature was stabilized within 0.05 °C of the desired temperature. Deviations are presented relative to the reference data for this material. Those parameters have been evaluated from multiple measurements on the used bath with precision reference OCP and further methods. For the measurements the Noise Filter was activated in the software.

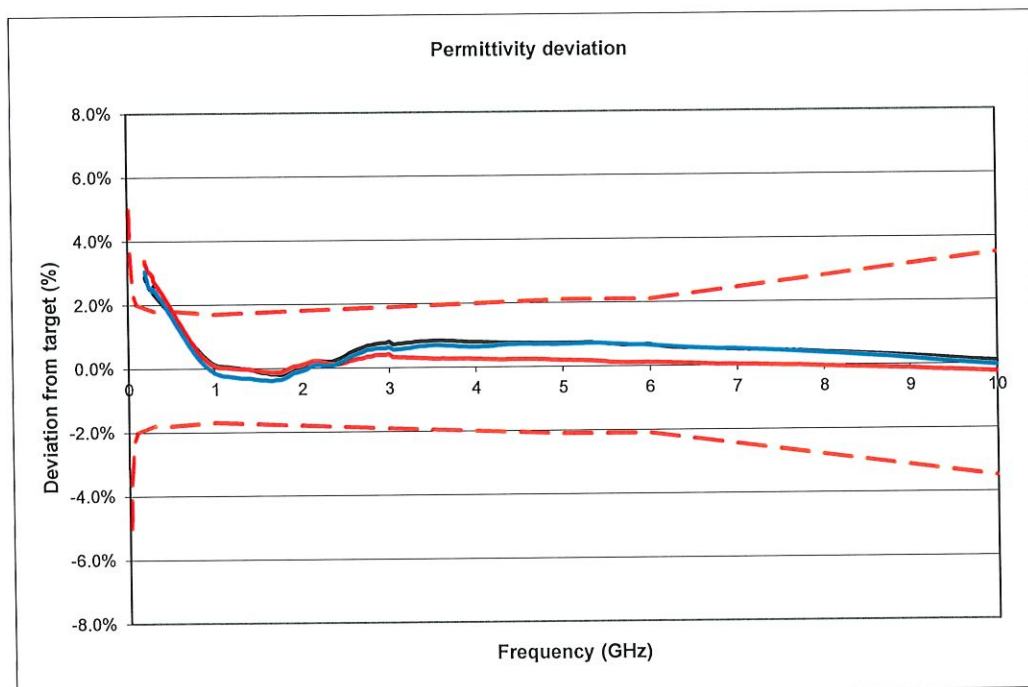


Fig. 3.1 Ethanol permittivity deviation from target, 200 MHz – 10 GHz

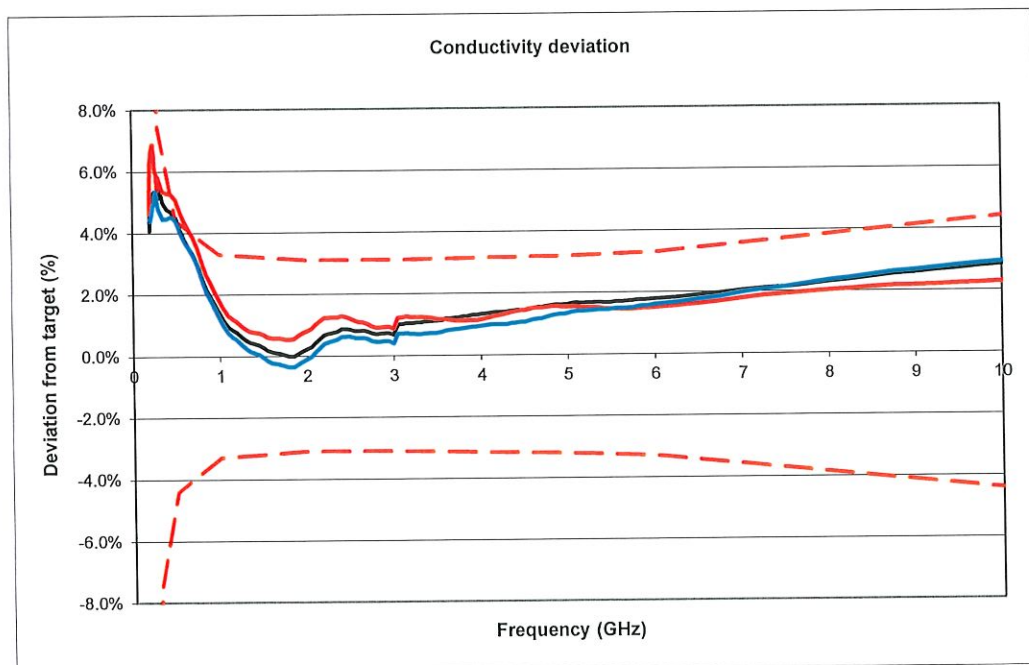


Fig. 3.2 Ethanol conductivity deviation from target, 200 MHz – 10 GHz

**Note:** Conductivity error can be high at low frequencies due to the low absolute conductivity values.

#### A.4 Head Tissue

Broadband head simulating liquid was measured at a temperature of  $22 \pm 2$  °C. The liquid temperature was stabilized within 0.05 °C of the desired temperature. Deviations are presented relative to the reference data for this material. Those parameters have been evaluated from multiple measurements on the used bath with precision reference OCP and further methods. For the measurements the Noise Filter was activated in the software.

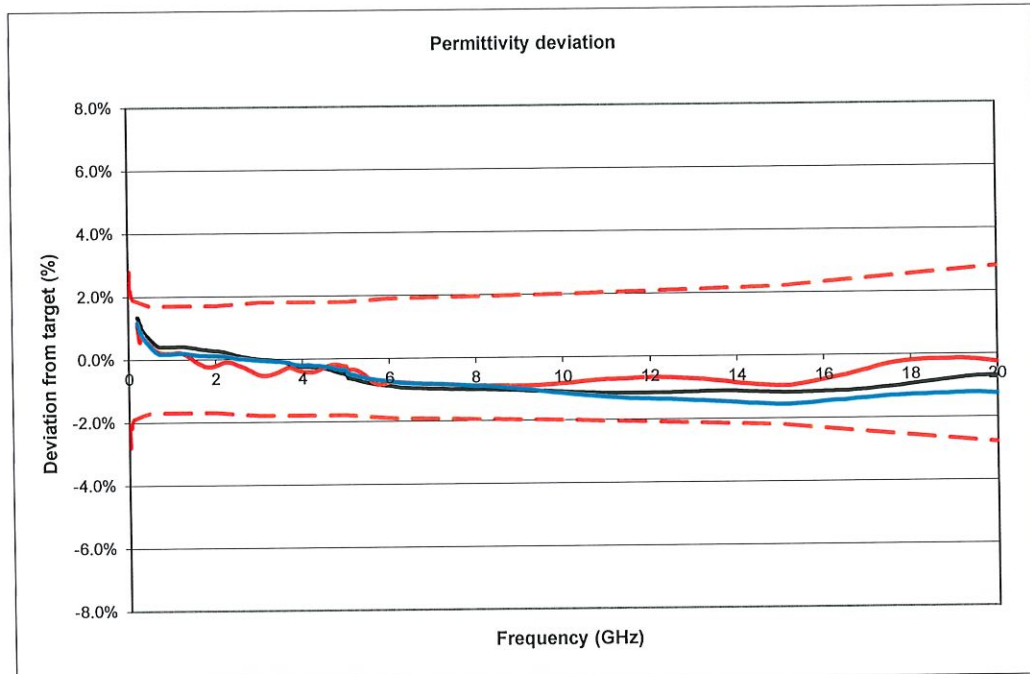


Fig. 4.1 HBBL permittivity deviation from target, 200 MHz – 20 GHz

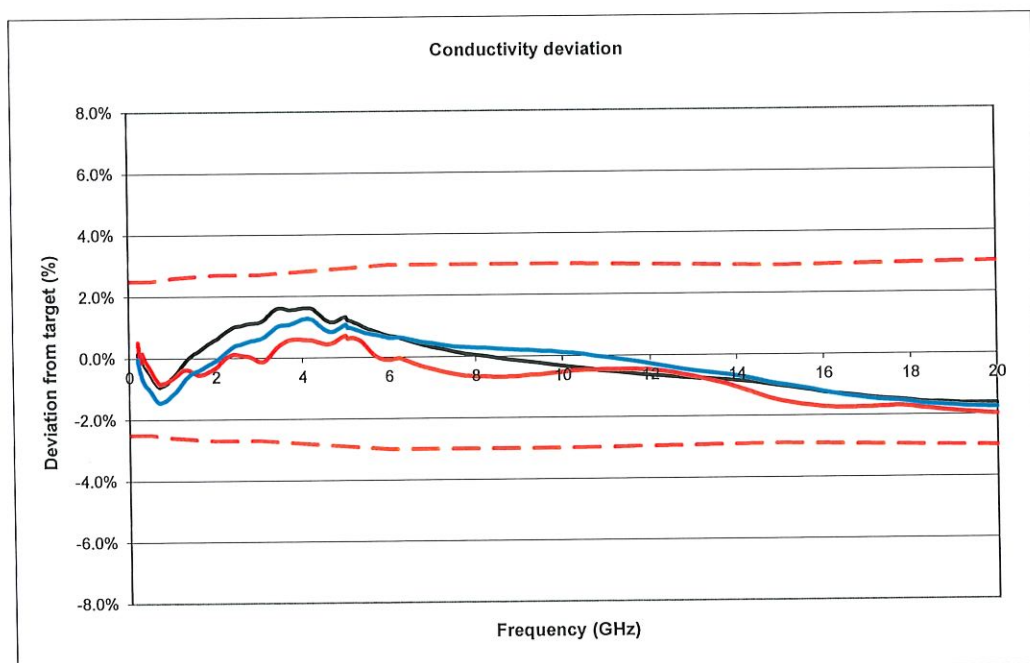


Fig. 4.2 HBBL conductivity deviation from target, 200 MHz – 20 GHz

## A.5 0.05 mol/L NaCl solution

0.05 mol/L NaCl / water solution has a static conductivity of 0.5 S/m, similar to MRI HCL (High Conductivity Liquid). It was measured at a temperature of 22 +/- 2 °C. The liquid temperature was stabilized within 0.05 °C of the desired temperature. Deviations are presented relative to the reference data for this material. These parameters have been derived from the theoretical model according to [7], matched to the measurements from reference probes and other sources.

A quantity of 1 liter was used for the measurement. For the measurements the Noise Filter was activated in the software.

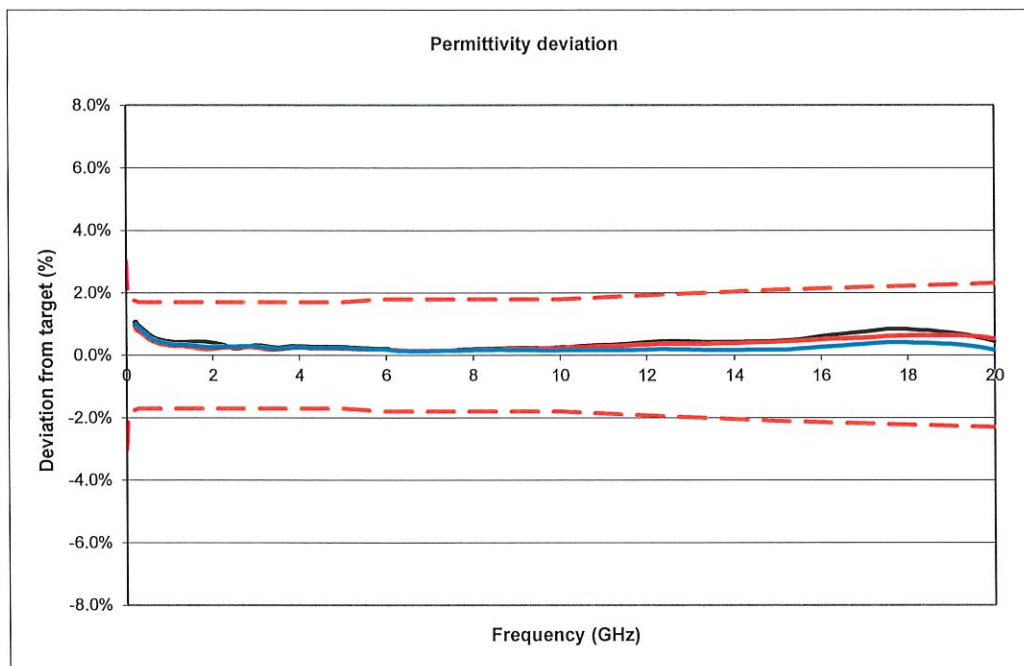


Fig. 5.1 0.05 mol/L solution permittivity deviation from target, 200 MHz – 20 GHz

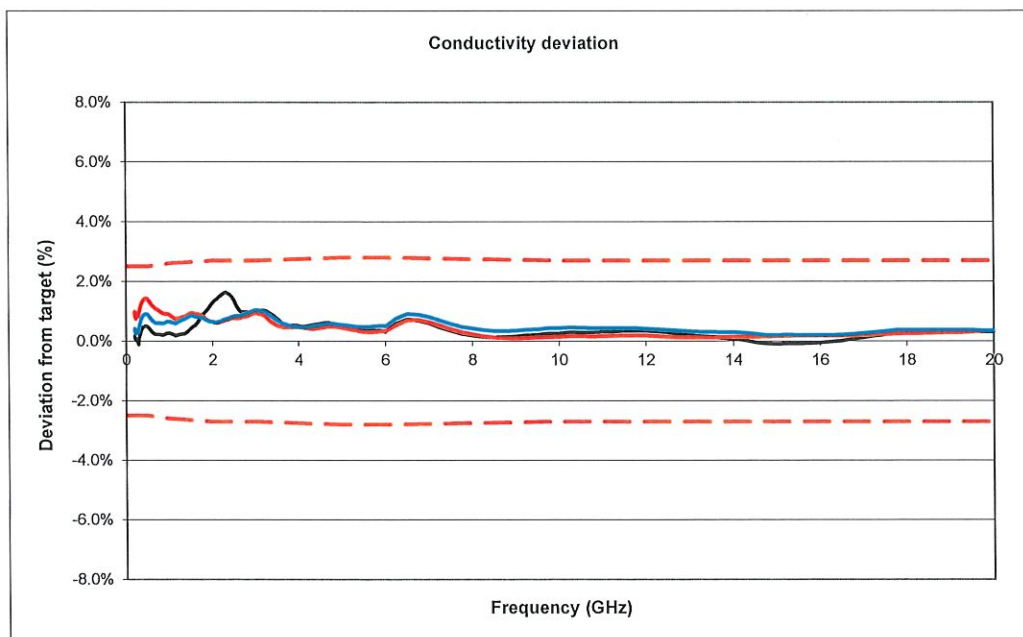


Fig. 5.2 0.05 mol/L solution conductivity deviation from target, 200 MHz – 20 GHz

# Appendix B: Nominal parameters of reference materials used for calibration (additional assessments outside the scope of SCS0108)

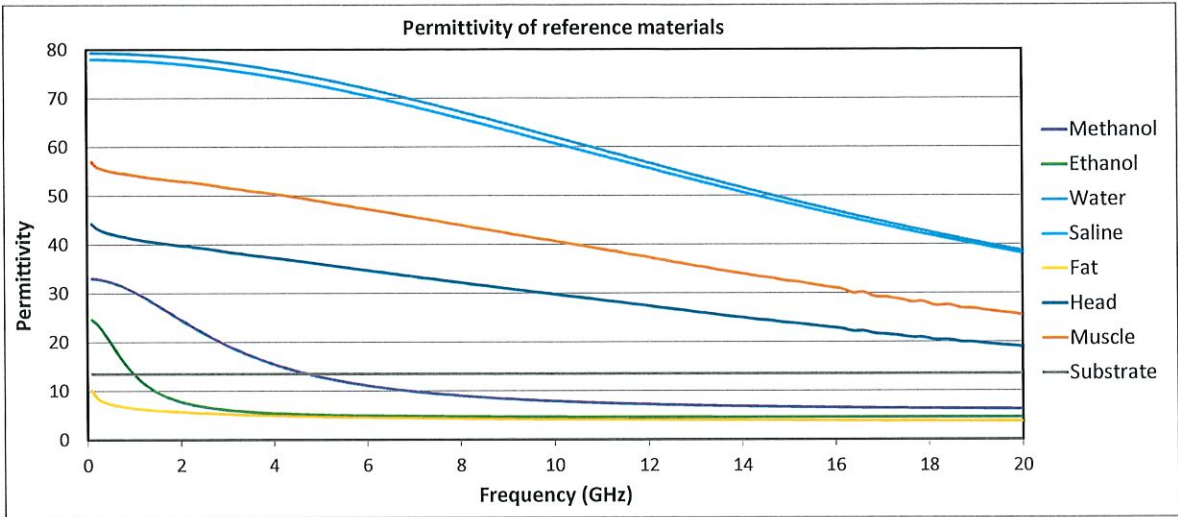


Fig. B.1 Permittivity of reference materials

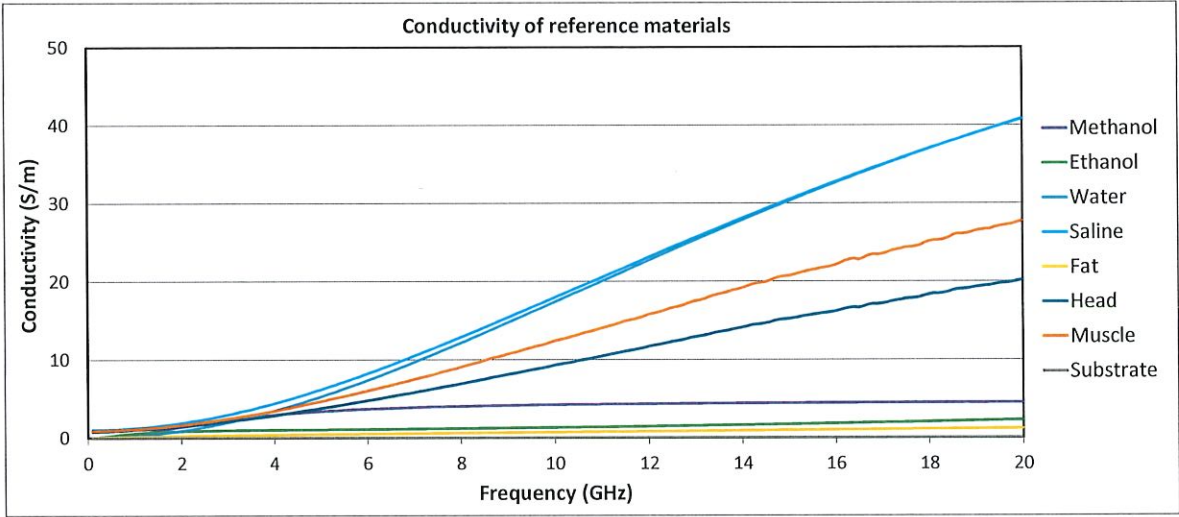


Fig. B.2 Conductivity of reference materials

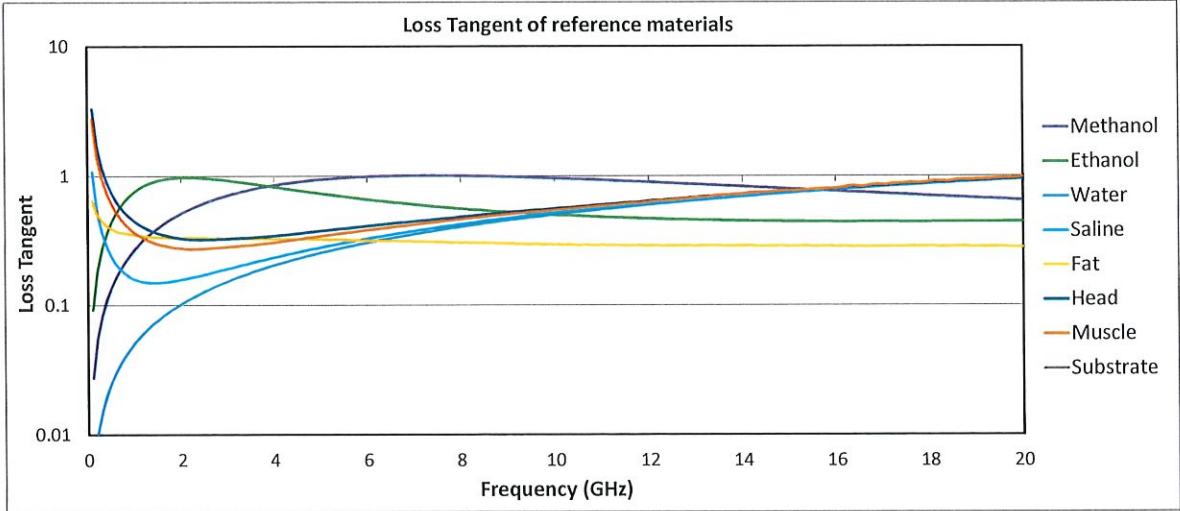


Fig. B.3 Loss tangent of reference materials

Client : **WSCT**

Certificate No: **24J02Z000415**

## CALIBRATION CERTIFICATE

Object **DAE4 - SN: 1495**

Calibration Procedure(s) **FF-Z11-002-01**  
**Calibration Procedure for the Data Acquisition Electronics (DAEx)**

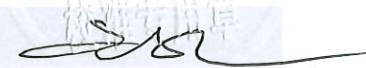
Calibration date: **July 24, 2024**

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards      | ID #    | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|------------------------|---------|------------------------------------------|-----------------------|
| Process Calibrator 753 | 1971018 | 11-Jun-24 (CTTL, No.24J02X005147)        | Jun-25                |

|                | Name        | Function           | Signature                                                                             |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Yu Zongying | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: August 01, 2024

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



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### Glossary:

DAE data acquisition electronics  
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

### Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.



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## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                         | Y                         | Z                         |
|---------------------|---------------------------|---------------------------|---------------------------|
| High Range          | 404.380 $\pm$ 0.15% (k=2) | 404.618 $\pm$ 0.15% (k=2) | 404.873 $\pm$ 0.15% (k=2) |
| Low Range           | 3.96611 $\pm$ 0.7% (k=2)  | 3.97363 $\pm$ 0.7% (k=2)  | 3.99493 $\pm$ 0.7% (k=2)  |

## Connector Angle

|                                           |                |
|-------------------------------------------|----------------|
| Connector Angle to be used in DASY system | 109° $\pm$ 1 ° |
|-------------------------------------------|----------------|

## IMPORTANT NOTICE

### USAGE OF THE DAE4ip

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

**Shipping of the DAE:** Before shipping the DAE to SPEAG for calibration, pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

**E-Stop Failures:** Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

**Repair:** Minor repairs are performed at no extra cost during the calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

**DASY Configuration Files:** Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

**Important Note:**

**Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.**

**Important Note:**

**Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the calibration procedure.**

**Important Note:**

**To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.**



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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 **WSCT**  
Shenzhen

Certificate No: **DAE4ip-1872\_Oct24**

## CALIBRATION CERTIFICATE

Object **DAE4ip - SD 000 D14 AG - SN: 1872**

Calibration procedure(s) **QA CAL-06.v30**  
**Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **October 18, 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 ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #               | Cal Date (Certificate No.) | Scheduled Calibration  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 27-Aug-24 (No:40547)       | Aug-25                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Auto DAE Calibration Unit     | SE UWS 053 AA 1001 | 23-Jan-24 (in house check) | In house check: Jan-25 |
| Calibrator Box V2.1           | SE UMS 006 AA 1002 | 23-Jan-24 (in house check) | In house check: Jan-25 |

|                |                |                       |           |
|----------------|----------------|-----------------------|-----------|
| Calibrated by: | Name           | Function              | Signature |
|                | Adrian Gehring | Laboratory Technician |           |
| Approved by:   | Sven Kühn      | Technical Manager     |           |

Issued: October 18, 2024

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



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Multilateral Agreement for the recognition of calibration certificates

## Glossary

DAE data acquisition electronics  
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                         | Y                         | Z                         |
|---------------------|---------------------------|---------------------------|---------------------------|
| High Range          | 405.516 $\pm$ 0.02% (k=2) | 405.743 $\pm$ 0.02% (k=2) | 405.517 $\pm$ 0.02% (k=2) |
| Low Range           | 3.97808 $\pm$ 1.50% (k=2) | 3.99468 $\pm$ 1.50% (k=2) | 3.97864 $\pm$ 1.50% (k=2) |

## Connector Angle

|                                           |                   |
|-------------------------------------------|-------------------|
| Connector Angle to be used in DASY system | 206.5 ° $\pm$ 1 ° |
|-------------------------------------------|-------------------|

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range        | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 199998.14                 | 1.11                         | 0.00      |
| Channel X + Input | 20003.88                  | 1.08                         | 0.01      |
| Channel X - Input | -20001.65                 | 0.61                         | -0.00     |
| Channel Y + Input | 199999.84                 | 2.82                         | 0.00      |
| Channel Y + Input | 20001.02                  | -1.73                        | -0.01     |
| Channel Y - Input | -20002.12                 | 0.19                         | -0.00     |
| Channel Z + Input | 199995.41                 | -1.01                        | -0.00     |
| Channel Z + Input | 20001.78                  | -0.94                        | -0.00     |
| Channel Z - Input | -20002.55                 | -0.24                        | 0.00      |

| Low Range         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 2001.17                   | -0.31                        | -0.02     |
| Channel X + Input | 202.08                    | 0.64                         | 0.32      |
| Channel X - Input | -197.21                   | 0.83                         | -0.42     |
| Channel Y + Input | 2001.25                   | 0.08                         | 0.00      |
| Channel Y + Input | 201.01                    | -0.31                        | -0.16     |
| Channel Y - Input | -198.91                   | -0.55                        | 0.28      |
| Channel Z + Input | 2001.51                   | 0.45                         | 0.02      |
| Channel Z + Input | 200.43                    | -0.89                        | -0.44     |
| Channel Z - Input | -199.69                   | -1.39                        | 0.70      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | 19.34                                        | 18.17                                       |
|           | - 200                          | -17.47                                       | -18.30                                      |
| Channel Y | 200                            | 6.89                                         | 6.47                                        |
|           | - 200                          | -6.94                                        | -7.73                                       |
| Channel Z | 200                            | 10.21                                        | 9.75                                        |
|           | - 200                          | -12.83                                       | -12.52                                      |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 0.42                        | -2.57                       |
| Channel Y | 200                | 5.19                        | -                           | 2.08                        |
| Channel Z | 200                | 8.69                        | 2.55                        | -                           |

#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 15797            | 17374           |
| Channel Y | 16064            | 13550           |
| Channel Z | 15971            | 14566           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | 0.67               | 0.01                   | 1.30                   | 0.27                      |
| Channel Y | -0.40              | -1.22                  | 0.56                   | 0.36                      |
| Channel Z | -0.58              | -1.57                  | 0.50                   | 0.51                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |

Client

**WSCT**

**Certificate No: 24J02Z000487**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN : 7391**

Calibration Procedure(s) **FF-Z11-004-02**  
**Calibration Procedures for Dosimetric E-field Probes**

Calibration date: **August 29, 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(Calibrated by, Certificate No.)  | Scheduled Calibration |
|--------------------------|--------------------|-------------------------------------------|-----------------------|
| Power Meter NRP2         | 106277             | 19-Oct-23(CTTL, No.J23X11026)             | Oct-24                |
| Power sensor NRP8S       | 104291             | 19-Oct-23(CTTL, No.J23X11026)             | Oct-24                |
| Power sensor NRP8S       | 104292             | 19-Oct-23(CTTL, No.J23X11026)             | Oct-24                |
| Reference 10dBAttenuator | 18N50W-10dB        | 19-Jan-23(CTTL, No.J23X00212)             | Jan-25                |
| Reference 20dBAttenuator | 18N50W-20dB        | 19-Jan-23(CTTL, No.J23X00211)             | Jan-25                |
| Reference Probe EX3DV4   | SN 7307            | 28-May-24(SPEAG, No.EX-7307_May24)        | May-25                |
| DAE4                     | SN 771             | 19-Jan-24(SPEAG, No.DAE4-771_Jan24)       | Jan-25                |
| Secondary Standards      | ID #               | Cal Date(Calibrated by, Certificate No.)  | Scheduled Calibration |
| SignalGenerator MG3700A  | 6201052605         | 12-Jun-24(CTTL, No.24J02X005419)          | Jun-25                |
| SignalGenerator APSIN26G | 181-33A6D0700-1959 | 26-Mar-24(CTTL, No.24J02X002468)          | Mar-25                |
| Network Analyzer E5071C  | MY46110673         | 25-Dec-23(CTTL, No.J23X13425)             | Dec-24                |
| Reference 10dBAttenuator | BT0520             | 11-May-23(CTTL, No.J23X04061)             | May-25                |
| Reference 20dBAttenuator | BT0267             | 11-May-23(CTTL, No.J23X04062)             | May-25                |
| OCP DAK-12               | SN 1174            | 25-Oct-23(SPEAG, No.OCP-DAK12-1174_Oct23) | Oct-24                |

|                | Name        | Function           | Signature                                                                             |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Yu Zongying | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

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